

Prevalence of HIV and discordant rate and their associated factors among premarital Voluntary Counseling and Testing (VCT) clients in Addis Ababa public VCT centers, Addis Ababa, Ethiopia

Girma Temam¹, Ahmed Ali²

Abstract

Background: Understanding and monitoring the prevalence of Human Immunodeficiency Virus (HIV) infection among premarital clients and determining discordant rate and applying specific interventions targeted at this group could bring dual benefits as it prevents both heterosexual and vertical transmission of the disease.

Objective: To assess the prevalence of HIV and discordant rate and factors associated with them among premarital voluntary counseling and testing (VCT) clients in public VCT centers in Addis Ababa.

Methods: A cross-sectional facility-based study was conducted from March to April 2008. Seven public VCT centers were selected using simple random sampling. Then all consecutive premarital VCT clients were interviewed using a pre-tested structured questionnaire.

Results: Of the 392 premarital VCT clients who participated in the study, 8.2% were sero-positive. HIV sero-status was significantly associated with the number of lifetime sexual partners (AOR (95%CI) = 9.06 (2.66-30.83)), previous history of HIV testing (AOR (95%CI) = 6.70 (2.32-19.35)) and type of VCT service utilization (AOR (95%CI) = 4.17 (1.53-11.36)). Out of the 138 couples, 6.5% were found to be sero-discordant, while concordant negatives and concordant positives accounted for 92.0% and 1.4% respectively. Both HIV sero-positivity and discordance were relatively higher among those who were previously separated/divorced and widowed.

Conclusion and recommendation: As considerable prevalence of sero-positivity and sero-discordant among premarital couples were observed in this study, every effort needs to be made to make premarital couples become aware of their own and their partners' sero-status before engagement. [*Ethiop. J. Health Dev.* 2012;26(3):160-168]

Introduction

The Joint United Nations Program on HIV/AIDS (UNAIDS) on its 2011 World AIDS Day Report revealed that globally there were an estimated 34 million people [31.6 million–35.2 million] living with HIV at the end of 2010 and about 2.7 million people [2.4 million–2.9 million] were newly infected with HIV in the same year (1). Sub-Saharan Africa is more heavily affected by HIV and AIDS than any other region of the world (1, 2). An estimated 22.9 million people were living with HIV in the region (about 68% of the global total) in 2010; in the same year, around 1.2 million people died from AIDS and 1.9 million people became infected with HIV in this region. Since the beginning of the epidemic, 14.8 million children have lost one or both parents to HIV/AIDS in the region (1, 2).

Recent results of a national survey showed that the overall adult HIV prevalence in Ethiopia is low. According to the EDHS 2011 report, the HIV prevalence among adults aged 15-49 is 1.5 percent (confidence interval 1.2-1.7 percent), and it was 1.4 percent (confidence interval 1.1-1.8 percent) in the 2005 EDHS. However, the report recommended further in-depth

analysis on existing data and other data sources to understand the epidemic in more detail (3).

HIV counseling and testing has been identified as a cost-effective measure for the prevention and control of HIV and as key entry point to prevention, care, treatment and support services where people learn whether they are infected, and are helped to understand the implication of their HIV status and make informed choice for their future (4, 5). About 5,839,586 people utilized VCT service in 2007/2008 (2001 E.C) at the national level of whom 2.7% were positive for HIV. A total of 218,086 people utilized VCT service in Addis Ababa in the same year and 8.8% of them were found to be HIV positive (6).

Premarital HIV counseling and testing protects individuals from infection by HIV sero-positive partner that in turn protects their infants from HIV infection (7). It also helps couples make informed decisions and adopt risk reduction strategies. In many high HIV prevalence countries, parents of young people and religious organizations (for instance, the Catholic community organizations in Nigeria) are promoting pre-marital HIV testing (8).

¹Department of Public Health, College of Medicine and Health Sciences, Arba Minch University, Tel +251-9-11959683, Email girmatemam2@yahoo.com, P. O. Box 21, Fax: +251-046-8810279;

²School of Public Health, Addis Ababa University, Tel +251-0115535851, Mobile +251 0911684399, Fax: +251-1-5517701, Email ahmedaa5050@yahoo.com

A study conducted on the magnitude and determinants of utilization and demand for pre-marital VCT in civil marriages in Addis Ababa, Ethiopia, showed that out of the total respondents, 356 (55.6%) indicated to have had pre-marital HIV testing (56.6% of males and 54.7% of females) (9). The prevalence of HIV among premarital couples varies from place to place, 7.8% in south-eastern Nigeria among individuals referred from faith-based organizations for mandatory pre-marital HIV screening (10), 21% in Addis Ababa, Ethiopia, among VCT clients from public hospitals (11) and 13.2% among people visiting HIV counseling and testing centers in Addis Ababa (12).

The prevalence of sero-discordant couples varies from population to population: In sub-Saharan Africa, studies have reported rates of 3–20% in the general population, and higher rates of 20–35% in studies of those presenting to voluntary counseling and testing (VCT) services (13). In Dessie (Ethiopia), among all couples who visited VCT centers the prevalence of sero discordance was 9.8% (14). In studies done in different settings: gender, history of previous marriage, presenting oneself as an individual, educational status, and having more than one lifetime partner were shown to be associated factors for HIV sero-status (11, 12, 15-17).

The HIV sero-negative partners of people with HIV are the group of people who are at greatest risk of contracting HIV through sexual transmission. It was observed from studies (18-20) that the risk of HIV for sero-negative partners among sero-discordant couples was much higher than that of partners within sero-concordant HIV-negative couples.

Understanding and monitoring the prevalence of HIV infection and discordant rate among premarital couples and applying specific interventions targeted at this group could bring dual benefits as it prevents both heterosexual and vertical transmission of the disease. Therefore; this study was carried out to assess the prevalence of HIV infection and discordant rate among premarital VCT clients and factors associated with them.

Methods

Study Area and Design:

A facility-based, cross-sectional study was conducted in Addis Ababa at public VCT centers. At the time of the study (in 2008), there were a total of 34 VCT centers operating in the city.

Sample Size:

Considering a HIV prevalence rate of 13.2% among premarital VCT clients (12), a sample size of 360 was calculated with a 95% confidence level and a margin of

error of 3.5%. Allowing a 10% non-response rate, final sample size was estimated at 396.

Sampling Procedures:

Out of the 34 public VCT centers operating under the Addis Ababa Health Bureau, seven were selected using simple random sampling. After a proportional to size allocation of the sample to these seven centers, all premarital VCT clients, who visited the selected centers between March and April 2008, were interviewed until the required sample size was attained in each center.

Data Collection and Quality:

A structured and pre-tested questionnaire was employed to collect information on variables like socio-demographic factors, sexual history, substance use and knowledge about STD/HIV. The questionnaire was developed in English and translated into Amharic, then back to English to check for its consistency. Finally the Amharic version was used for data collection. After identifying the premarital VCT clients by asking them their reasons for HIV testing, the interview took place in the counseling room, before the usual session of pre-test counseling. In cases where participants presented themselves as couples, each member of the couples was interviewed separately with a separate questionnaire. Data collectors were counselors in the respective health institutions. Two days training was given to the supervisors and the data collectors on the procedure. The data were checked for completeness, accuracy, clarity, and consistency, which were then intensively cleaned up before analysis.

Data Analysis:

Data were entered into EPI Info version 3.4.1 and SPSS version 13 software was used for analysis. HIV sero-status (positive vs negative and discordant vs concordant) was the dependent variable. Independent variables included socio-demographic factors, sexual history, knowledge about STD/HIV, substance use, previous history of HIV testing, number of life time sexual partners and type of VCT service utilization (as couple versus individually). Mean (SD) and percentage values of different variables were computed for description as appropriate. Chi-square statistics and odds ratio with 95% confidence interval were computed to assess the presence and degree of association between dependent and independent variables. Furthermore, logistic regression analysis was done to control the possible confounding effect of selected variables. P-value of 0.05 was set as a cut-off point for the significance of the association between dependent and independent variables.

Ethical Considerations:

Ethical clearance and approval was obtained from the Ethical Committee of the School of Medicine of Addis Ababa University and a support letter was secured from the Addis Ababa Health Bureau. After explaining the purpose of the study, written consent was obtained from each respondent. To assure the confidentiality of the response and the test results, anonymous interviews were conducted.

Operational Definitions:

Sero-discordant couples - Premarital couples tested for HIV and had different serum test results (one of them was positive and the other negative).

Sero-concordant couples -Premarital couples tested for HIV and had identical serum test results.

Results**Socio-Demographic Characteristics:**

A total of 392 participants were interviewed with a response rate of 99%. Two hundred twenty six (57.7%), 155 (39.5%) and 11 (2.8%) of the study participants were from health centers, hospital and clinic, respectively. Of all participants, 116 (29.6%) presented alone and the rest 276 (70.4%) with their sexual partners. Overall the mean (\pm SD) age of the participants was 27.5 (\pm 7.7) with 30.6 (\pm 8.5) for males and 24.7 (\pm 5.5) for females.

Two hundred thirty seven (60.4%) of the respondents had educational level of grade 9 and above and 43(11.0%) were illiterate or only could read and write. Three hundred five (77.8%) of the study participants were employed and the rest were unemployed (Table1). The socio-demographic characteristics of the participants are summarized in Table 1.

Table 1: **Socio demographic characteristics of study participants by sex, Addis Ababa, 2008**

Characteristics	Male (n=188) Freq. (%)	Female (n=204) Freq. (%)	Total (n=392) Freq. (%)
Age			
18-24	50 (26.6)	109 (53.4)	159 (40.5)
25-34	88 (46.8)	82 (40.2)	170 (43.4)
35 & above	50 (26.6)	13 (6.4)	63 (16.1)
Religion			
Orthodox	131 (69.7)	152 (74.5)	283 (72.2)
Muslim	34 (18.1)	27 (13.2)	61 (15.6)
Catholic	0	2 (1.0)	2 (0.5)
Protestant	23 (12.1)	23 (11.3)	46 (11.7)
Ethnicity			
Amhara	88 (46.8)	103 (50.5)	191 (48.7)
Oromo	36 (19.1)	35 (17.2)	71 (18.1)
Gurage	36 (19.1)	48 (23.5)	84 (21.4)
Tigre	14 (7.4)	10 (4.9)	24 (6.1)
Others	13 (6.9)	8 (3.9)	21 (5.4)
Non response	1 (0.5)	0	1 (0.3)
Education			
Illiterate/ read & write	13 (6.9)	30 (14.7)	43 (11.0)
Elementary (1-8)	52 (27.7)	60 (29.4)	112 (28.6)
Secondary & above (\geq 9)	123 (65.4)	114 (55.9)	237 (60.4)
Employment status			
Employed	181 (96.3)	124 (60.8)	305 (77.8)
Unemployed	7 (3.7)	80 (39.2)	87 (22.2)
Monthly income			
No income	4 (2.1)	73 (35.8)	77 (19.6)
50-300	26 (13.8)	58 (28.4)	84 (21.4)
301-600	43 (22.9)	30 (14.7)	73 (18.6)
601 & above	92 (48.9)	28 (13.7)	120 (30.6)
No response	23 (12.2)	15 (7.4)	38 (9.7)
Residence area			
Addis Ababa	182 (96.8)	195 (95.6)	377 (96.2)
Outside Addis Ababa	6 (3.2)	9 (4.4)	15 (3.8)

Sexual History and Experience of Substance Use:

Two hundred ninety (74%) of the respondents reported having initiated sexual intercourse, of whom 155 (53.4%) reported having more than one sexual partner in their lifetime and 120 (41.4%) used condom in their last sexual intercourse. Of all respondents who ever had sexual intercourse, 173 (59.7%) had intercourse in the

last one year, of whom 37 (21.4%) had intercourse with more than one partner and 58 (33.5%) consistently used condom. The median age at first sex was 19 (20 for males and 18 for females). One hundred thirty one (33.4%) of the respondents reported having sexual contact with their current partner with whom they want to get married and 69 (17.6%) of the respondents reported a

history of prior marriage. One hundred thirty seven (34.9%) reported as having consumed alcohol, while 17 (12.4%) of them reported as chewing *khat* (Table 2). None of the respondents reported experience of intravenous (IV) drugs use.

Table 2: **Sexual history and experience of substance use of study participants, Addis Ababa, 2008**

Characteristics	Number	Percent
Ever have sex (n=392)		
Yes	290	74.0
No	101	26.0
No. of life time sexual partner (n=290)		
One	135	46.6
Two & above	155	53.4
Condom use during their last sex (n=290)		
Yes	120	41.4
No	170	58.6
Sexual intercourse during past 12 months (n= 290)		
Yes	173	59.7
No	117	40.3
No. of sexual partner last 12 months (n=173)		
One	136	78.6
Two & above	36	21.4
Condom use last 12 months (n=173)		
Always	58	33.5
Some times	44	25.4
Never	71	41.0
Age at first sex (n=290)		
10-14	12	4.1
15-19	124	42.8
20-24	77	26.6
24 & above	25	8.6
No response	52	17.9
Sex with current partner (n=392)		
Yes	131	33.4
No	261	66.6
Condom use with current partner (n=131)		
Always	36	27.5
Some times	32	24.4
Never	63	48.1
HIV test before sex with current partner (n=131)		
Yes	25	19.1
No	106	80.9
No. of marriage (n=392)		
The current one only	232	82.4
Other prior marriage/s	69	17.6
Ever drink alcohol (n=392)		
Yes	137	34.9
No	255	17.6
Ever chew <i>khat</i> (n=392)		
Yes	55	14.0
No	337	86.0

Experiences and Knowledge about HIV and Sexually Transmitted Infections (STIs):

All of the respondents reported to have heard of HIV and 333 (85.0%) knew people infected of HIV. A total of 195 (49.7%) and 232 (59.7%) respondents had adequate knowledge (correctly mentioned at least three) means of HIV transmission and prevention, respectively. One

hundred fourteen (29.1%) of the participants reported that they felt they were at risk of HIV infection (Table 3).

Sero-status of Study Participants and Factors Associated with Sero-status:

From the total study participants, who had their blood tested, 32 (8.2%) turned out to be HIV positive. Of 276 respondents, who came with their sexual partners, 13

(4.7%) were found to be HIV positive. The prevalence of HIV was seen to be significantly ($P=0.002$) higher among participants who had a history of previous marriage than those without. Among those who were widowed, 70% were found to be HIV positive while 15.3% of those with a history of divorce/separation were HIV positive. Only 5% of those who had no history of marriage were found to be HIV positive.

Females were about five times more likely to be HIV positive than males (AOR (95%CI) =5.07(1.59-16.11)). Participants with educational status of secondary and above were less likely to be infected than those who were illiterate or could only read and write (AOR (95%CI) =0.21(0.06-0.79)) (Table 4).

Table 3: Experiences and knowledge on HIV and STIs of the study participants, Addis Ababa, 2008

Characteristics	Number	Percent
Heard about HIV		
Yes	392	100
No	0	0
Know people infected with HIV		
Yes	333	85.0
No	59	15.0
Knowledge on HIV transmission		
Yes	195	49.7
No	197	50.3
Knowledge on HIV prevention		
Yes	232	59.2
No	160	40.8
Risk perception		
Yes	114	29.1
No	278	70.9
Heard about other STIs		
Yes	304	77.6
No	88	22.4
Had STIs in last 12 months		
Yes	11	2.8
No	381	97.2
Abnormal genital discharge in last 12 months		
Yes	10	2.6
No	382	97.4
Genital ulcer in last 12 months		
Yes	4	1.0
No	388	99.0
Previous HIV test		
Yes	242	61.7
No	150	38.3

Prevalence of HIV was 9.06 times higher among participants with two or more lifetime sex partner than those who had only one life time sex partner (AOR (95%CI) =9.06(2.66-30.83)). Participants who did not use condom during their last sexual intercourse were more than three times more likely to be infected than those reported to have used (AOR (95%CI) =3.42(1.06-11.06)). Participants who had no history of previous HIV test were about seven times more likely to be positive than who had history of previous HIV test (AOR (95%CI) =6.70(2.32-19.35)). Participants who presented themselves alone were about four times more likely to be positive than who presented themselves as couples (AOR (95%CI) =4.17(1.53-11.36)). Participants who never drank alcohol were less likely to be HIV positive than those who did (AOR (95%CI)=0.30(0.10-0.88)) (Table 4).

Discordant Rate and Factors Associated with it, among Premarital Couples:

Out of the 276 respondents who presented themselves with their sexual partners 18 (6.5%) were found to be sero-discordant while concordant negative (both negative) and concordant positive (both positive) accounted for 254 (92.0%) and 4 (1.4%), respectively. Out of these 276 respondents who presented with sexual partners 80 (29.0%) reported to have initiated sex with their current partner and of them only 22 (27.5%) used condom consistently. Out of 58 respondents who did not use condom consistently, 6 (10.4%) were found to be sero-discordant. Out of the total nine discordant couples, in six females were sero-positive while in three males were sero-positive.

The prevalence of sero-discordance was significantly ($P=0.002$) higher among those who had a history of other previous marriage 9/51(17.6%) than those with the current one only 9/225(4.0%). Higher prevalence of discordant serum outcome was observed among previously separated/divorced and widowed partners 6/43(14.0%) and 3/8(37.5%), respectively than those who had no other previous marriage 9/225(4.0%). The association was statistically significant with χ^2 (P-value) of 12.3(0.002) (Table5).

Sero-discordant rate was 18.2% among those who were illiterate or could only read and write and 4.3% among those with educational status of secondary and above, which was statistically significant ($P=0.009$). Significantly ($P=0.024$) a higher proportion 14 (12.8%) of the study subjects with lifetime sex partner of two or more were discordant than those with only one lifetime sex partner 3(3.1%). The prevalence of sero-discordance was also significantly ($P=0.004$) higher among study participants who did not have a history of previous HIV test [12 (13.0%)] than those who did [6 (3.3%)] (Table 5).

Table 4: Association of selected socio-demographic and other selected characteristics with sero-status of the study participants, Addis Ababa, 2008

Characteristics	Sero-status (Freq.)		OR (95% CI)**	AOR (95% CI)***
	Positive	Negative		
Age				
18-24	6	153	1.00	1.00
25-34	17	153	2.83 (1.09-7.38)*	1.97 (0.56-6.95)
35 & above	9	54	4.25 (1.44-12.50)*	1.32 (0.29-5.99)
Sex				
Male	11	177	1.00	1.00
Female	21	183	1.85 (0.87-3.94)	5.07 (1.59-16.11)*
Education				
Illiterate/read & write	8	35	1.00	1.00
Primary	11	101	0.48 (0.18-1.28)	0.39 (0.10-1.47)
Secondary & above	13	224	0.25 (0.10-0.66)*	0.21 (0.06-0.79)*
Life time sex partner				
One	6	129	1.00	1.00
Two & above	26	129	4.33 (1.73-10.88)*	9.06 (2.66-30.83)*
Last sex condom use				
Yes	6	114	1.00	1.00
No	26	144	3.43 (1.37-8.62)*	3.42 (1.06-11.06)*
STIs in the last 12 months				
Yes	5	6	1.00	1.00
No	27	354	0.09 (0.03-0.32)*	0.55 (0.09-3.58)
Previous HIV test				
Yes	7	235	1.00	1.00
No	25	125	6.71 (2.83-15.96)*	6.70 (2.32-19.35)*
VCT utilization				
As couple	13	263	1.00	1.00
As individual	19	97	3.96 (1.89-8.33)*	4.17 (1.53-11.36)*
Ever drink alcohol				
Yes	16	121	1.00	1.00
No	16	239	0.51 (0.24-1.05)	0.30 (0.10-0.88)*

* Statistically significant;

** Crude odds ratio;

***Adjusted for age, sex, education, life time sex partner, last sex condom use, history of STs, previous HIV test, type of VCT utilization and ever drink alcohol.

Table 5: Prevalence of sero-discordance by socio-demographic and some other

characteristics of the study participants, Addis Ababa, 2008

Characteristics	Discordant Freq. (%)	Concordant Freq. (%)	X ² (p=value)
Marriage history			
The current one only	9 (4.0%)	216 (96.0%)	10.0 (0.002)
Other previous one	9 (17.6%)	42 (82.4%)	
Previous Marital status			
Single (the concurrent one only)	9 (4.0)	216 (96.0%)	12.3 (0.002)
Separated/divorced	6 (14.0%)	37 (86.0%)	
Widowed	3 (37.5%)	5 (62.5%)	
Age			
18-24	5 (4.5)	106 (95.5)	2.2 (0.142)
25-34	8 (6.7)	112 (93.3)	
35 & above	5 (11.1)	40 (88.9)	
Education			
Illiterate/ read & write	6 (18.2)	27 (81.8)	8.7 (0.009)
Elementary (1-8)	6 (6.2)	75 (93.8)	
Secondary & above (>=9)	7 (4.3)	156 (96.7)	
Employment status			
Employed	13 (5.9)	206 (94.1)	0.6 (0.456)
Unemployed	5 (8.8)	52 (91.2)	
Life time sex partner			
One	3 (3.1)	93 (96.9)	5.1 (0.024)
Two or more	14 (12.8)	95 (87.2)	
Condom use in last sex			
Yes	4 (4.7)	82 (95.3)	1.8 (0.177)
No	13 (10.9)	106 (89.1)	
Sexual contact with current partner			
Yes	8 (10.0)	72 (90.0)	0.2 (0.653)
No	9 (7.2)	116 (92.8)	
Knowledge on HIV transmission			
Yes	10 (7.3)	127 (92.7)	0.08 (0.783)
No	8 (5.8)	131 (94.2)	
Previous HIV test			
Yes	6 (3.3)	178 (96.7)	8.1 (0.004)
No	12 (13.0)	80 (87.0)	

Discussion

The prevalence of HIV infection in this study population, which was 8.2%, is comparable to the findings of a study from south-eastern Nigeria (7.8%) among individuals referred from faith-based organizations for mandatory pre-marital HIV screening (10). But it is lower than the results of a study in Addis Ababa public hospitals among VCT clients, where the overall prevalence was 21% (11). This may be due to the fact that the study participants were general VCT clients and all of them were from hospitals. General VCT clients and clients from hospitals were most likely to include patients who present due to HIV related problems and these were less likely to be the respondents of the current study (premarital VCT clients).

The current study revealed that HIV prevalence was higher among participants who were previously separated/divorced and widowed than those without previous marriage. This is in line with another study (15) which showed those previously married (OR 1.7 (1.2-2.3); divorced (OR 1.9 (1.4-2.5); or widowed (OR 6.3 (4.4-9.0) had significantly higher rates of HIV infection than those who did not have a history of marriage. It is also comparable with the finding of the study conducted in Addis Ababa public hospitals among VCT clients (11), which gave a higher rate of HIV infection among divorced (53.2%) and widowed (64.5%) than those never

married (12.5%). This finding suggests the need for undergoing HIV testing prior to marriage for couples intending to re-marry after separation/divorce or partner's death.

Unlike the case in other parts of the world, the majority of people living with HIV in sub-Saharan Africa are women (1). The same is true for Ethiopia (6). In the current study, females were found to be more likely to be HIV positive than males. This finding is similar to the result of another study in Port Harcourt, Nigeria on premarital HIV testing in couples from faith-based organizations (16), in which HIV infection rate was significantly higher among females than males (p-value=0.036). This may be due to the biological, social and economical reasons associated with females.

The current study also showed significantly higher rate of HIV infection among participants who were illiterate or could only read and write than among those with educational status of secondary or above. A similar finding was observed in another study (11) in which a higher rate of HIV infection (34%) was observed among those who had never gone to a regular school than among those with secondary or above educational level (17.1%). However, this finding is not comparable with another study (12) in which a statistically significant number of people with educational level of grade 12 or above were

found to be HIV sero-positive. This may be due to the fact that the study participants of the previous study were most likely to be in their first contact with VCT centers than participants of the current study. Individuals with higher education were aware of the services and were more likely to screen themselves prior to presentation as couples. This is substantiated by the fact that 68.4% of participants with secondary education or above were tested prior to the current study.

A significantly higher rate of HIV infection was seen among participants with more than one lifetime sexual partners than those with only one. This is in line with the finding of a study conducted among street dwellers in Gondar City, northwest Ethiopia (17). This signifies the importance of one of the preventive means of sexual transmission of HIV: being faithful with only one uninfected sexual partner. The current study showed that HIV prevalence was significantly lower among participants who used condom during the last sexual intercourse than among those who did not use condom. Condom use in the last sex can be a rough predictor of consistent use of condom.

Prevalence of HIV was significantly lower among participants who had been tested for HIV previously. This may indicate that individuals who were tested alone and become positive might not return for retesting with their partners. This might lead to an underestimation of the magnitude of HIV and discordant results among premarital couples. Hence, further investigation of the prevalence of the disease among premarital couples may be required.

The prevalence of HIV was significantly higher among participants who presented themselves alone than those who did so with their sexual partners. The same association was observed in other studies (11, 15). This may be because of the fact that VCT clients who come alone are more likely to have some risky behaviors, as a result of which they may not have the confidence to come with their partners. On the other hand, clients may come as couples either because they have less risky behavior or might have tested themselves individually prior to coming as couples. The prevalence of HIV was significantly higher among participants who had ever consumed alcohol than among those who never had. This agrees with a study done in Addis Ababa (12) in which the prevalence of HIV was significantly higher among those who had ever consumed alcohol than those who never had [AOR=2.48 (1.65, 3.72)].

According to the current study, out of all premarital couples, 6.5% were found to be sero-discordant. This is relatively lower than the result of a study in Dessie

(Ethiopia) in which the prevalence of sero-discordance was 9.8% among all couples who visited VCT centers (14). This may be due to the fact that most of the participants in the current study were premarital couples, who were most likely to have been tested prior to their coming to the VCT centers. This is substantiated by the fact that 66.7% of the individuals who presented themselves as couples were tested previously. On the other hand, only 11.9% of the study subjects of the previous study claimed that they had previous history of voluntary counseling and testing. In 66.7% of discordant premarital couples, it was the women who were HIV-infected. This agrees with the finding of another study (15), which showed that, in the majority of discordant premarital couples, it was the women who were HIV-infected.

The prevalence of sero-discordance was higher among those who had been separated/divorced (14.0%) and widowed (37.5%) than those without a history of previous marriage (4.0%). This goes along with the finding of another study (14) in which 13.7% of married couples were found to be discordant, while the prevalence of sero-discordance among the never married was 53 (6.2%) and a relatively higher prevalence of discordant outcome was observed among the separated (21.4%) and divorced (21.8%). This result signifies the importance of HIV testing prior to marriage particularly when couples intend for marital reunion after separation/divorce or partner death.

A significantly higher proportion of sero-discordance was observed among participants with two or more lifetime sexual partners. The prevalence of sero-discordance was also significantly higher among study participants who did not have a history of previous HIV test. This may be because of the fact that most individuals screen themselves individually prior to coming as couples. This may have led to an underestimation of the prevalence of sero-discordance among premarital couples and suggests the need for further investigations.

Finally, the findings of this study cannot represent all premarital VCT clients, as only government owned VCT centers were included. Besides, the use of health professionals as data collectors may have created bias as they might have directed the respondents during the interview and social desirability and recall biases could also be other limitations of the current study.

In conclusion, even though the prevalence of sero-positivity and discordance identified by the current study were still high, they might have been underestimated as the majority of the study participants had undergone prior

HIV testing. Both HIV sero-positivity and discordance rates were relatively higher among those who had been separated/divorced and widowed. In any case, every effort should be made to make premarital couples become aware of their own and their partners' sero-status before marriage. Premarital couples in general and discordant couples in particular should be aware of the presence of possible risk reduction strategies. As the current study included only VCT clients from public VCT centers, a further study in different settings is recommended. Besides, the perception and reaction of the community towards mandatory premarital HIV testing should be assessed for possible consideration of mandatory premarital HIV testing.

Acknowledgements

The researchers of this study are greatly thankful to the Ethiopian Public Health Association and the US Centers for Disease Control and Prevention for funding the research work.

We also would like to thank the study participants for their willingness to participate in this study and the data collectors and supervisors for their hard work and sincere contributions.

References

1. Joint United Nations Program on HIV/AIDS (UNAIDS). World AIDS Day Report, Geneva: WHO, 2011.
2. AVERT.org. HIV and AIDS in Africa. 2012. UK [Cited 2012 July 16]; Available from: URL:<http://www.avert.org/hiv-aids-africa.htm>.
3. Central Statistics Agency: Ethiopian Demographic and Health Survey 2011. Central Statistical Agency; Addis Ababa, Ethiopia; 2012.
4. Federal HIV/AIDS prevention and control office (HAPCO). Guidelines for HIV counseling and testing in Ethiopia. Addis Ababa, Ethiopia; July, 2007.
5. Thomas J, Olga A, Steven E, et al. Efficacy of Voluntary HIV-1 counseling and testing in individuals and couples in Kenya, Tanzania and Trinidad: a randomized trial. *Lancet* 2000;356:103-12.
6. Federal Ministry of Health. Health and health related indicators. Addis Ababa, Ethiopia. 2008/2009.
7. Painter TM. Voluntary counseling and testing for couples; a high-leverage intervention for HIV/AIDS prevention in SSA. *Soc Sci Med* Dec. 2001;53(11):1397-411.
8. Joint United Nations Program on HIV/AIDS (UNAIDS). The impact of Voluntary Counseling and Testing. A global review of the benefits and challenges. Geneva; WHO, 2001.
9. Habte D, Deyessa N, Davey G. Assessment of the utilization of pre-marital HIV testing services and determinants of VCT in Addis Ababa, 2003 *Ethiop J Health Dev* 2006;20(1):18-23.
10. Uneke C J, Alo M, & Ogbu O. Mandatory premarital HIV testing in Nigeria: The public health and social implications. *AIDS Care* 2007;19(1):116-121.
11. Dillnessa E. Assessment of Couples Voluntary Counseling and Testing Service Utilization at Addis Ababa Government Hospital VCT Sites. MPH Thesis: School of Public Health, Addis Ababa University, 2007.
12. Seme A, Haille Mariam D, Worku W. The association between substance abuse and HIV infection among people visiting HIV counseling and testing centers in Addis-Ababa, 2002. *Ethiop J Health Dev* 2005;19(2):116-125.
13. Bunnell RE, Naddozi J, Marum E, et al. Living with discordance: knowledge, challenges, and prevention strategies of HIV-discordant couples in Uganda. *AIDS Care* 2005;17:999-1012.
14. Assefa W. Socio-demographic and behavioral determinants of sero-discordance among couples taking HIV test in Dessie (Ethiopia): MPH Thesis: School of Public Health, Addis Ababa University, 2006.
15. Nganga L, Marum E, Odoyo J, Hawken M, Kamau P, De Cock KM. Premarital testing in the context of VCT in Kenya. *Int Conf AIDS* 2004 Jul 11-16; 15: Abstract no. ThPeC7565.
16. Akani C, Erhabor O, Babatunde S. Pre-marital HIV testing in couples from faith-based organizations: experience in Port Harcourt, Nigeria. *Nigerian Journal of Medicine* 2005;14(1):39-44.
17. Feleke M, Yenew K, Afework K, et al. Sero-prevalence of HIV, hepatitis B infections and syphilis among street dwellers of Gondar city, North West Ethiopia, 2004. *Ethiop J Health Dev* 2006;20(3):160-165.
18. Hugonnet S, Mosha F, Todd J, et al. Incidence of HIV infection in stable sexual partnerships: a retrospective cohort study of 1802 couples in Mwanza Region, Tanzania. *J Acquir Immune Defic Syndr* 2002; 30:73-80.
19. Serwadda D, Gray RH, Wawer MJ, et al. The social dynamics of HIV transmission as reflected through discordant couples in rural Uganda. *AIDS* 1995;9:745-750.
20. Carpenter LM, Kamali A, Ruberantwari A, et al. Rates of HIV-1 transmission with in marriage in rural Uganda in relation to the HIV sero-status of the partners. *AIDS* 1999;13:1083-1089.