

# Factors affecting willingness to HIV Counseling and Testing among patients presenting with conventional Sexually Transmitted Infections in Addis Ababa

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## Abstract

**Background:** There is ample scientific evidence that a person with an untreated sexually transmitted infection (STI), particularly those inducing ulcers or discharge, is at an increased risk of passing on or acquiring HIV during sexual intercourse. HIV counseling and testing (HIV CT) for STI cases is thus an important tool in the public health response to HIV/AIDS.

**Objective:** To assess factors affecting willingness towards HIV CT among patients with conventional STIs in Addis Ababa.

**Methods:** A cross-sectional study, involving 422 STI cases, was conducted in Addis Ababa from December 2006 to April 2007. STI patients were consecutively selected during an outpatient visit in ten government health centers, which were purposively selected mainly on the basis of their high STI case load. A pre-tested, interviewer administered, structured questionnaire was applied for data collection. The Pearson chi-square test was used to assess statistical significance of associations between willingness towards HIV CT and respondents' socio-demographic status, knowledge, and behavior. Moreover, bivariate and multivariate logistic regression analyses were done to identify predictors of willingness for HIV CT. For all statistical significance tests, the cut-off value set was  $p < 0.05$ .

**Results:** Nearly 74% of STI patients said that they would be willing to undergo HIV CT at the time or 3 months after their STI diagnosis. Furthermore, 97.4% and 71.8% of STI patients had heard about HIV/AIDS and STIs, respectively. The majority, 93% of STI patients knew at least one prevention method, and 61.2% identified all the three major methods for preventing HIV/AIDS. Overall, 43.8% of the STI patients had at least one misconception, and 38% had comprehensive knowledge about HIV/AIDS. Ever tested for HIV and being in the age group of 15-34 years were found to be significantly and positively associated with willingness towards HIV CT whereas perceiving small or moderate chance of contracting HIV infection was found to have a significant and negative association.

**Conclusion:** The findings of this study indicated the need for promotion and expansion of sustainable provider initiated HIV CT with subsequent follow up of STI patients as part of a range of services and support, and intensive patient-centered risk reduction counseling for STI patients during the initial visit to health care facilities. [*Ethiop. J. Health Dev.* 2011;25(2):116-125]

## Introduction

Sexually transmitted infections (STIs) remain among the major public health problems in all countries, especially in developing countries, where access to adequate diagnostic and treatment facilities are very limited or non-existent. Despite the ability to cure, many of the classical STIs continue worldwide to be a major public health problem, causing serious health, economic and social consequences. World Health Organization (WHO) estimated that globally as many as 340 million new cases of curable STIs (gonorrhea, syphilis, chlamydial trachomatis and trichomoniasis) occurred in 1999 in men and women aged 15-49 years, of whom 69 million occurred in sub-Saharan African countries (1).

In Ethiopia, STIs have increasingly been recognized among certain risk groups, such as commercial sex workers (2-4). In spite of the high prevalence of STIs in the country, relatively little epidemiological research has

been carried out on their prevalence and incidence. During a national review meeting on STIs in 2003, a total of 451, 686 cases were reported from all regions except SNNPR for the period 1990 – 1994 E.C (1997/98 2001/02). In addition, in 1995 E.C. (2002/03) the Integrated Disease Surveillance Team of the Ministry of Health compiled 27, 947 STI cases from all the regions in its routine quarterly report of 2002/03 (5).

The presence of STI creates more chance of broken skin or mucous membranes allowing the virus to enter or leave the body. Moreover, certain STIs have been shown to greatly increase the amount of virus in genital secretions as well as the number of inflammatory target cells that HIV needs to replicate. According to current estimation, the probability that a person with STI will transmit or acquire HIV during a single sexual exposure, range as high as 300 fold (6). Above all, there is tangible scientific evidence that untreated STIs, particularly those

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inducing ulcers or discharge, increase the risk of passing on or acquiring HIV during sexual intercourse.

Meanwhile, there is a critical opportunity to expand access to HIV prevention amongst STI cases that continues to be the mainstay of the response to the HIV epidemic. Without effective HIV prevention, there will be an ever-increasing number of people who will require HIV treatment. Among the interventions, which play a pivotal role both in treatment and in prevention, HIV CT stands out to be of paramount importance (7).

There are compelling arguments for HIV CT services for STI cases in sub-Saharan Africa (8). First, individuals have the right to know their infection status and plan for the future to reduce further transmission of the virus. Especially, the high viral load associated with acute HIV infection has critical public health importance since the magnitude of viral load is likely to predict the probability of sexual transmission of HIV (9). Second, early detection of HIV may improve medical and psychosocial support for HIV-infected individuals. Third, HIV CT may enable people to cope with the anxiety associated with HIV sero-status. Finally, HIV CT promotes behavioral change (10).

However, HIV CT programs currently in place are not reaching substantial numbers of HIV-infected people who are unaware that they are infected with HIV. For example, an estimated one-fourth of the roughly one million Americans believed to be living with HIV at the end of 2003 remain unaware of their infection (11). Programs that wish to link up with HIV CT services need to be aware of the most common obstacles to testing and do what they can to help reduce or eliminate them. This helps increase routine HIV screening of patients in health care settings, including STI cases; to foster earlier detection of HIV infection; to identify and counsel persons with unrecognized HIV infection and link them to clinical and prevention services; and to reduce further transmission of HIV in the community (12). The aim of this study is thus to bring to light some of the very important hypothesized factors affecting willingness to HIV CT among STI cases, on which we need to focus our attention during the work of promotion of HIV CT.

## Methods

**Study area and period:** The study was conducted from December 2006 to April 2007 in 10 government health centers in Addis Ababa, including: Kazanchis, Teklehaimanot, Arada, Kirkos, Addis Ketema, Woreda 23, Woreda 17 (Bole), Kolfe, Shiromeda and Yeka health centers, which were purposively selected mainly on the basis of their high STI case load based on the preliminary assessment by the principal investigators.

**Study design:** A cross-sectional study design was employed, as determined by the conventional syndromic approach for STI case management.

**Study population:** STI cases, aged 15-49 yrs, who presented with the conventional STI syndromes including, genital ulcers, urethral discharges (for males), and vaginal discharges with/without lower abdominal pain (for females). The age groups 15-49 years were chosen as targets for the study because of their potentially high risk for STIs, including HIV, and to make a fair comparison between men and women and other similar literatures (1,13,14), as well.

**Sample size calculation:** The total sample size of 422 was determined by using the formula of estimating a single population proportion for a cross-sectional survey, assuming a 50% willingness towards HIV CT, to obtain the maximum sample size, with a 5% margin of error, 95% confidence interval, and 10% non-response rate.

**Sampling procedures:** First of all, 10 health centers were purposively selected and included in the study mainly on the basis of their high STI case load. Then, study subjects, who were clinically diagnosed to have STIs based on the national syndromic approach guideline (15), were consecutively recruited every day (Monday through Friday) during an outpatient visit. STI cases that showed up consecutively on their own free will and consented to respond to the issues set out in the questionnaire were eligible for the interview. However, those individuals, particularly “vaginal discharge” cases, who were risk assessment negative, and those who refused to participate were excluded. This was due to the fact that non-STI “vaginal discharge” is very much common among females (16). Those STI patients, who were seriously ill to the extent being unable to respond to the questionnaire, were also excluded. Owing to the fact that STI patients of this study were consecutive (not randomly selected), representativeness of the sample was not much of a concern. That was also characteristic of facility-based studies where there were limited numbers of study subjects (STI cases) within a specified study period.

**Data collection:** A pre-tested, interviewer administered structured questionnaire, first prepared in English and then translated to Amharic, was applied to collect the information. Data collectors were health professionals, including medical doctors, nurses and HIV counselors working as permanent employees of the respective health centers. They received a three days intensive training on how to collect the required information objectively. The questionnaires were mostly completed while patients were seen at the out-patient department (OPD). However, in those health facilities, where there was health service provider constraint with a large volume of patients seen at the OPD, those individuals diagnosed to have STIs (usually by medical doctors or nurses) were referred to HIV counselors for the interview. To keep the quality of the data, completed questionnaires were checked daily for consistency and completeness by the supervisors.

**Data analysis:** Data entry and analysis was performed using SPSS 10.0 for Windows 98 statistical software. Socio-demographic data were summarized by frequency tables and summary statistics. Proportions, percentages, and tables were used for description of the data as appropriate. Odds ratio (OR) with 95% confidence interval (CI) was used to identify the factors affecting willingness towards HIV CT. The Pearson chi-square tests and cross-tabulations were used to assess the statistical significance of associations between willingness towards HIV CT and respondents' socio-demographic characteristics, knowledge and behavioral factors, and previous history of HIV CT. Moreover, bivariate and multivariate logistic regression analyses were done to identify predictors of willingness towards HIV CT. For all statistical significance tests, the cut-off value set was  $p < 0.05$ .

**Ethical clearance:** Ethical clearance was obtained from the Medical Faculty Research and Publication Committee of Addis Ababa University. The necessary permission to undertake the study was obtained from the Addis Ababa Health Bureau. All the study participants were informed about the purpose of the study, their right to refuse was maintained and informed verbal consent was obtained prior to the interview. To ensure confidentiality, anonymous type of interview was followed. Moreover, all the study subjects were intensively counseled to avoid risky sexual behaviors and thus prevent the acquisition of STIs again. A few of them were also referred to the next higher level of service delivery point for further investigation and better treatment.

## Results

**Socio-demographic characteristics:** A total for 422 STI patients were recruited to the study. However, four (3 female and 1 male) questionnaires filled partially and/or completed incorrectly were excluded, giving a non-response rate of 0.95%. Therefore, the final analysis was calculated for 418 (99.05%) eligible STI patients.

Of the total number of respondents, 271 (64.8%) were female while 147 (35.2%) were male. The median age of the respondents was 28 from a range of 15 to 49 years. The majority 188 (45.0%) of the study subjects were Amhara by ethnicity and a little more than three-fourth 319 (76.3%) of the respondents were Orthodox Christians. With regard to marital status, 172 (41.2%) were married, 116 (27.8%) single, 48 (11.5%) living with a co-habiting partner, 37 (8.9%) divorced, 25 (6.0%) widowed, and 20 (4.8%) were separated. Nearly forty percent 166 (39.7%), of them had attended secondary school, 146 (34.9%) primary school, 31 (7.4%) had a tertiary level of education, and the rest 75 (17.9%) had no formal education at all. The largest proportion (23.4%) of STI cases were also found out to be jobless (Table 1).

## Diagnosis of syndromes

The diagnosis of STI amongst the study subjects was carried out by using the syndromic approach and/or laboratory confirmation protocol. Accordingly, the presence of STIs was diagnosed by syndromic approach alone in 385 (92.1%) of the study subjects, and syndromic approach combined with laboratory confirmation in 33 (7.9%) of the study subjects. Meanwhile, STI syndromic case management was provided at the time of examination, based on physical and clinical findings, according to the standard national syndromic approach protocol (Table 2).

## Knowledge of STI Symptoms

To assess general knowledge about STIs, study subjects were asked whether they had heard of diseases that could be transmitted through sexual intercourse. The majority (71.8 %) said that they had heard of STIs, of whom 120 (40%) were male and 180 (60 %) were female. Moreover, males had better knowledge about STIs than females, accounting 120 (81.6 %) and 180 (66.4%), respectively. Those who had heard of STIs were asked to describe the symptoms of STIs, for men and women separately (N.B. the symptoms were not read out). The most commonly mentioned symptoms of STIs in women were increased vaginal discharge 112/300 (37.3%), foul smelling vaginal discharge 101 (33.7%), painful urination 94 (31.3%), genital itching 77 (25.7%), genital ulcer 71 (23.7%), lower abdominal pain 59 (19.7%), inguinal swelling 41 (13.7%), and others 4 (1.3%). For STI in men, urethral discharge was the most commonly mentioned symptom 126/300 (42%), followed by painful urination 113 (37.7%), genital ulcer/sore 92 (30.7%), inguinal swelling 64 (21.3%), and others 6 (2%).

## Knowledge and Misconception about STIs/HIV/AIDS Transmission and Prevention

The vast majority 407 (97.4%) of the respondents confirmed the fact that they had heard of HIV/AIDS and 296 (72.7%) of them reported that they knew someone who was infected with HIV or had died of AIDS. In fact, 89 (21.3%) of the study subjects reported that a healthy-looking person can't be infected by HIV (Table 3).

Amongst STI patients, 391 (93.5%) reported that HIV can be transmitted through unsafe sexual practice. Regarding the acquisition of STIs, 202 (48.3%) reported that they are acquired through unprotected sexual intercourse, whereas 28 (6.7%), 24 (5.7%), 8 (1.9%), 6 (1.4%), and 6 (1.4%) said that STIs are acquired by urinating towards the moon/sun, sharing of clothes, urinating in places where dogs urinated, lack of personal hygiene, and work overload, respectively. Surprisingly, 165 (39.5%) of STI patients didn't know how someone can acquire STIs (Table 3).

Table 1: Socio-demographic characteristics of STI cases identified from 10 government health centers, Addis Ababa, 2007 (n=418)

Socio-demographic characteristics	Number	Percentage
<b>Sex</b>		
Male	147	35.2
Female	271	64.8
<b>Age group in years</b>		
15-19	46	11.0
20-24	73	17.5
25-29	100	23.9
30-34	54	12.9
35-39	49	11.7
40-44	49	11.7
45-49	47	11.2
<b>Ethnicity</b>		
Amhara	188	45.0
Oromoo	88	21.1
Guraghe	78	18.7
Tigree	30	7.2
Seltie	21	5.0
Others	13	3.1
<b>Religion</b>		
Orthodox Christian	319	76.3
Muslim	65	15.6
Protestant	34	8.1
<b>Marital Status</b>		
Married	172	41.2
Single	116	27.8
Co-habitation	48	11.5
Divorced	37	8.9
Widowed	25	6.0
Separated	20	4.8
<b>Education</b>		
No formal education	75	17.9
Primary school	146	34.9
Secondary school	166	39.7
Tertiary level	31	7.4
<b>Occupation</b>		
Jobless	98	23.4
Daily laborer	67	16.0
House wife	53	12.7
Merchant	41	9.8
Maid	35	8.4
Government employee	31	7.4
Student	21	5.0
Farmer	18	4.3
Guard	14	3.4
Others	40	9.6
<b>Site (Health Center)</b>		
Kazanchis	297	71.0
Shiromeda	30	7.2
Woreda 17 (Bole)	25	6.0
Arada	18	4.3
Woreda 23	15	3.6
Teklehaimanot	11	2.6
Addis Ketema	7	1.7
Kirkos	5	1.2
Kolfe	5	1.2
Yeka	5	1.2

Table 2: **Distribution of STI patients' syndromes by sex from 10 selected government health centers, Addis Ababa, 2007 (n=418).**

STI Patients' syndromes	Male	Female
	No. (%)	No. (%)
Urethral discharge alone	106 (25.4)	-
Vaginal discharge alone	-	190 (45.5)
Genital ulcer alone	20 (4.8)	23 (5.5)
Lower abdominal pain alone	-	4 (1.0)
Urethral discharge + genital ulcer	21 (5.0)	-
Vaginal discharge + genital ulcer	-	54 (12.9)

The majority, 360 (86.1%) and 351 (84%) of STI patients mentioned avoiding sex (abstinence) and faithfulness to only one uninfected partner as prevention methods against STIs/HIV/AIDS, respectively. Moreover, 302 (72.3%) of STI patients reported that most STIs can be cured whereas 13 (3.1%) and 103 (24.6%) said that there is no cure for STIs and don't know whether STIs can be

cured or not, respectively. Above all, 231 (55.3%) of the study subjects said that untreated STIs, particularly those inducing ulcers or discharge, increase the risk of passing on or acquiring HIV during sexual intercourse and a similar proportion (55.6%) of study subjects thought that a person with untreated STIs is at risk of being infected with HIV (Table 3).

Table 3: **Knowledge of STI patients on the modes of STI/HIV transmission and its preventive methods from 10 government health centers, Addis Ababa, 2007**

HIV/AIDS related questions	Number of respondents	
	Yes	Percent
<b>Ever heard of HIV/AIDS</b>	407	97.4
<b>Know someone who is infected with HIV or died of AIDS (n=407)</b>	296	72.7
<b>A healthy looking person can't be infected by HIV (n=418)</b>	89	21.3
<b>Mode of HIV transmission (n=418)*</b>		
Unsafe sexual practice	391	93.5
Sharing of used sharp instruments with someone who is infected with HIV	369	88.3
Transfusion of infected blood	323	77.2
From HIV +ve mother to child during breast feeding	286	68.4
From HIV +ve mother of fetus during pregnancy	281	67.2
Eating egg from a chicken that has swallowed a used condom	146	34.9
Eating raw meat (raw "kitfo") prepared by an HIV infection person	146	34.9
Mosquito bite which has already fed on a person with AIDS	127	30.4
Shaking hands with someone who is infected	16	3.8
Sharing a meal with People Living With HIV/AIDS (PLWHA)	11	2.6
Wearing clothes of PLWHA	11	2.6
<b>How someone can get (acquire) STIs? (n=418)*</b>		
Having unprotected sexual intercourse	202	48.3
Urinating towards the moon/sun	28	6.7
Sharing of clothes	24	5.7
Urinating in places where dogs urinated	8	1.9
Lack of personal hygiene	6	1.4
Work overload	6	1.4
Don't know	165	39.5
<b>How can people protect themselves from getting STIs/HIV/AIDS?*</b>		
Avoiding sex (abstinence)	360	86.1
Staying with only one uninfected partner faithful	351	84.0
Using a condom correctly every time during sex	292	69.9
Avoid sharing of sharp instruments	131	31.3

\* More than one response was possible.

Comprehensive knowledge about HIV/AIDS, which is defined as respondents' knowledge about the three most programmatically important HIV/AIDS prevention methods (namely abstinence, having one faithful uninfected sexual partner and consistent and correct condom use) with no misconceptions about HIV transmission (13), was used to assess the STI patients' knowledge about HIV/AIDS. Accordingly, 183 (43.8%) of the STI patients were identified to have at least one misconception. Furthermore, nearly 93% (388/418) of the study subjects knew at least one prevention method

and 256 (61.2%) of them identified all the three major methods for preventing HIV/AIDS. Overall, the results from this study indicated that despite a higher level of knowledge of at least one preventive method, there is still low comprehensive knowledge, 159 (38%). (N.B. data not shown in the table)

#### **STI patients' perception of risk towards contracting HIV**

STI patients were also asked about the chances that they have been exposed to HIV and nearly half 204 (48.8%)

of them perceived their risk of HIV infection to be nil, while 53 (12.7%), 41 (9.8%), and 65 (15.6%) perceived themselves to be at small, moderate and high risk of HIV infection, respectively. However, 50 (12%) of the STI patients couldn't rank their chance of contracting the HIV infection and the remaining 5 (1.1%) said that they already had HIV. The reasons commonly given for perceiving no/little chance of contracting the HIV infection were: trusted their partner 116 (45.1%), abstaining from sex (secondary abstinence) 58 (22.6%), had only one sexual partner 43 (16.7%), always use condoms 26 (10.1%), partner tested negative 22 (8.6%), partner looks healthy 13 (5.1%), and others 47 (18.3%).

#### Knowledge and attitude towards HIV CT

Regarding HIV CT services, 381 (91.1%) confirmed the fact that they had heard of HIV CT. The commonest

sources of information about HIV CT reported by STI patients were mass media 279 (66.7%), followed by health workers 248 (59.3%), friends/peers 100 (23.9%), school 59 (14.2%), family 49 (11.8%), neighbors 48 (11.5%), kebele health education programs 20 (4.7%), and others 42 (10%).

#### HIV Testing

Ninety five percent, 398 (95%) of the study subjects agreed that HIV CT is important, and the reasons commonly given that are described in Table 4. Regarding previous history of HIV CT, 188 (45%) of the study subjects self-reported having had a previous HIV test (Table 4). Again, of the 188 STI patients, who had previous history of HIV CT, 181 (96.3%) and 177 (94.2%) had pre-test and post-test counseling, respectively.

Table 4: Reasons commonly given for the importance and practice of HIV CT among STI patients identified from 10 government health centers, Addis Ababa, 2007

HIV CT related questions	Percentage of respondents*
<b>Reasons given for the importance of HIV CT (n=398)</b>	
To know one's own HIV status	93.5
To protect oneself from being infected by HIV	87.8
If positive to get care and support services	84.7
If positive not to transmit to others	84.0
If positive to get ART	80.4
To be free from stress	76.8
<b>Reasons given for having had a previous HIV test (n=188)</b>	
Just to know the HIV status	44.7
Before marriage	18.6
Suspicion of being infected	14.9
To travel abroad	10.0
To know HIV status during pregnancy	9.6
Ordered by a health worker	6.4
Death or illness of partner	4.8
Donation of blood	1.6
Others	5.3

\* Percents do not add up to 100% since more than one answer was possible

Overall, nearly three-fourths, 309 (73.9%) of the study subjects showed their willingness to undertake HIV counseling and testing at the time or 3 months after their STI diagnosis. The majority, 290 (69.4%) of the study subjects preferred anonymous testing, while 174 (41.6%) preferred confidential testing. The most important reasons mentioned for not showing willingness to have HIV counseling and testing were: to think over it, 73/109 (67%), fear of test results 8 (7.3%), need to discuss with partner first 8 (7.3%), no suspicion of being infected 7 (6.4%), and others 13 (11.9%).

Study subjects were also asked about the types of HIV CT methods they prefer (more than one answer was possible), and 389 (93.1%) preferred VCT, whereas 272 (65.1%) preferred diagnostic HIV CT, 287 (68.7%) preferred routine offering of HIV CT, and only 6 (1.4%) preferred mandatory HIV CT methods. Regarding the way to obtain HIV test results, the majority 382 (91.4%) of study subjects preferred face-to-face (verbally), followed by secretive letter 24 (5.7%), and the rest 12 (2.9%) said "I don't know."

#### Factors affecting willingness towards HIV CT

Out of the 418 STI patients, 309 cases, who showed their willingness towards HIV CT, were taken as denominator for the evaluation of factors affecting willingness towards HIV CT (Table 5). On crude bivariate analysis, the factors found to be significantly associated with willingness towards HIV CT were: being female, being in the age group 15-34 years, ever tested for HIV, agreed that HIV CT is important, moderate risk perception, saying that control of STIs help in the prevention of HIV/AIDS, HIV/AIDS can be cured, and PLWHA should be quarantined. Analysis of willingness towards HIV CT with respect to other socio-demographic factors showed that level of education, religion, marital status, and occupation had no effect on the STI patients' willingness towards HIV CT.

On multivariate logistic regression analysis, however, 'ever tested for HIV' and 'being in the age group 15-34 years' were found to be significantly and positively associated with willingness towards HIV CT while 'perceiving little or moderate chance of contracting the

HIV infection' was found out to be significantly and negatively associated with willingness towards HIV CT. The multivariate analyses showed that those STI patients in the age group of 15-24 years and 25-34 years were 5 times (OR, 5.27; 95% CI, 2.33-11.9) and 2 times (OR, 2.43; 95% CI, 1.30-4.56) more likely to be willing to have HIV CT at the time or 3 months after their STI

diagnosis than those in the age group of 35-49 years, respectively. Furthermore, those STI patients who reported ever having an HIV test preceding the survey were about 4 times more likely to be willing to have HIV CT at the time or 3 months after their STI diagnosis than those who didn't have previous HIV CT (OR, 3.51; 95% CI, 1.89, 6.51) (Table 5).

**Table 5: Bivariate and multivariate logistic regression analysis of factors affecting willingness towards HIV CT among STI patients identified from 10 government health centers, Addis Ababa, 2007**

Variables	No (%) of respondents willing to have HIV CT	Crude OR (95% CI)	Adjusted OR (95% CI)
<b>Sex</b>			
Male	100 (32.4)	1	1
Female	209 (67.6)	1.58 (1.01, 2.48)*	1.09 (0.61, 1.98)
<b>Age group in years</b>			
15-24 years	105 (33.9)	5.60 (2.93, 10.71)*	5.27 (2.33, 11.9)*
25-34 years	121 (39.2)	2.74 (1.65, 4.55)*	2.43 (1.30, 4.56)*
35-49 years	83 (26.9)	1	1
<b>Ever tested for HIV</b>			
Yes	166 (53.7)	4.59 (2.73, 7.71)*	3.51 (1.89, 6.51)*
No	143 (46.3)	1	1
<b>Agree that HIV CT is Important</b>			
Yes	300 (97.1)	3.74 (1.51, 9.30)*	2.09 (0.41, 10.8)
No	9 (2.9)	1	1
<b>STI patients' perception of contracting the HIV infection (n=278)</b>			
No chance	163 (58.6)	0.90 (0.44, 1.84)	0.85 (0.38, 1.90)
Little chance	36 (12.9)	0.48 (0.21, 1.12)	0.34 (0.13, 0.90)*
Moderate chance	26 (9.4)	0.39 (0.16, 0.69)*	0.27 (0.10, 0.74)*
High chance	53 (19.1)	1	1
<b>Control of STIs help in the prevention of HIV/AIDS</b>			
Yes	133 (43.0)	2.34 (1.42, 3.85)*	1.83 (0.97, 3.43)
No	34 (11.0)	1.52 (0.73, 3.19)	1.07 (0.43, 2.67)
I don't know	142 (45.9)	1	1
<b>HIV/AIDS can be cured</b>			
Yes	35 (11.33)	3.70 (1.24, 11.09)*	1.56 (0.38, 6.41)
No	240 (77.6)	1.48 (0.79, 2.75)	0.66 (0.25, 1.73)
I don't know	34 (11.0)	1	1
<b>PLWHA should be quarantined</b>			
Yes	23 (7.4)	10.22 (1.81, 57.69)*	7.81 (0.64, 95.5)
No	277 (89.6)	2.49 (0.93, 6.62)	1.85 (0.25, 13.8)
I don't know	9 (2.9)	1	1

\* Statistically significant association has occurred

## Discussion

According to the findings of the present study, almost three quarters 309 (73.9%) of all the respondents said that they would be willing to undergo HIV CT at the time or 3 months after their STI diagnosis if they were offered by health care service providers. This finding is comparable with that of the Ethiopian BSS 2002 (13) and with the study conducted among pregnant mothers in Uganda (17). This finding is, however, lower than other study findings conducted in Northwest Ethiopia (18), Harer Town (19), Dabat High School students (20), and among TB patients in North Gondar Administrative Zone (21). But, the result of this study is higher compared to similar studies done in the US and UK, where voluntary HIV testing rates among STI clinic attendees were found to be 58% and 18%, respectively (22,23). The higher figure from this study compared to the US and UK

studies may partly be due to the fact that, while the US and UK studies determined VCT acceptance, this study specifically assessed willingness to HIV CT. As the methodologies used for the surveys and the study subjects are different, they are not meant for strict comparison, however. Moreover, 95.2% (398) of STI patients had the knowledge of the importance of checking one's own HIV status. Nevertheless, it is generally assumed that intention did predict performing specific HIV-preventive behavior, and if these attitudes of STI patients could be practical on the actual ground, it would be highly likely to be taken as indication of the need for promotion and expansion of sustained and strong provider initiated HIV CT service to the public in general, and STI patients in particular.

The vast majority (97.4%) of the STI patients confirmed the fact that they had heard of HIV/AIDS, which is comparable with the 2005 round of the Ethiopian BSS (24) and Ethiopian DHS 2005 (14). Nearly 93% of the study subjects knew at least one prevention method. Moreover, 61.2% of the STI patients identified all the three main methods for preventing HIV/AIDS, which is a little bit higher than that of the Ethiopian BSS round two (24). However, misconceptions about transmission of HIV from person to person, especially local misconceptions like “eating uncooked egg laid by a chicken that has swallowed a used condom could transmit HIV” and “mosquito bites could spread HIV” are higher. Overall, 43.8% of the STI patients had at least one misconception, a comparable finding with that of the Ethiopian BSS round two (24). The results from this survey also indicated that despite higher levels of knowledge about at least one preventive method, there was still low comprehensive knowledge 38%. According to the Ethiopian DHS 2005 results, 16% of women and 30% of men in Ethiopia had comprehensive knowledge of HIV/AIDS prevention and transmission (14). Although the vast majority of subjects included in this study claimed that they had heard of HIV/AIDS, the investigation done on their knowledge of the modes of transmission and preventive measures indicated the fact that most of the interviewed STI patients were lacking the correct knowledge. This indicates the prevailing fact among our population in general, and STI patients in particular.

A number of socio-demographic status, knowledge, attitude and behavioral factors were evaluated to identify those factors associated with willingness towards HIV CT, and based on those factors to target individuals with an increased likelihood of being willing to have HIV CT for subsequent and appropriate HIV CT interventions. Accordingly, ‘ever tested for HIV’ was found to be significantly and positively associated with willingness towards HIV CT (p-value, 0.001). Analysis of ‘ever tested for HIV’ with respect to willingness towards HIV CT showed that those STI patients who reported ever having an HIV test preceding the survey were about 4 times more likely to be willing to have HIV CT at the time or 3 months after their STI diagnosis than those who didn’t have previous HIV CT (OR, 3.51; 95% CI, 1.89, 6.51). Even though showing willingness to have HIV CT has its own public health importance, it is likely that this high rate of positive intention to repeat HIV CT may reflect a desire for reassurance among uninfected persons and others might have denied knowledge of their sero-status. Moreover, this may also suggest that, those HIV-negative STI patients, who are more likely to have positive intention to repeat HIV CT may assume that they have been fortunate in their choice of partners, or believe themselves to be immune to HIV, and these misconceptions may lead to persistent risky behaviors. There is, therefore, an urgent need to correct these misconceptions through appropriate IEC interventions as deemed necessary.

Nearly three-fourth (73.1%) of STI patients who showed their willingness to have HIV CT were in the age groups 15-24 and 25-34 years. Furthermore, significant and positive association was found between willingness towards HIV CT and the age groups 15–34 and 35–49 years. Those STI patients in the age groups 15–24 and 25-34 years were 5 times (OR, 5.27; 95% CI, 2.33-11.9; P-value, 0.001) and 2 times (OR, 2.43; 95% CI, 1.30-4.56; P-value, 0.006) more likely to be willing to have HIV CT at the time or 3 months after their STI diagnosis than those in the age group of 35-49 years, respectively. This finding is in accordance with other studies done in other places in Ethiopia (25, 26). This is perhaps a good opportunity for early detection of HIV, given that the age group 15-24 years has the highest HIV prevalence of all age groups in Ethiopia (27). Furthermore, it allows them to access the available treatment and support services, to bring about behavioral change and to plan for the future. Most importantly, since this age group is highly sexually active and potentially at high risk for HIV infection, it clearly indicates the need for intensive patient-centered risk reduction counseling that might empower them to take action to protect themselves and their sexual partners, and be determined and very cautious about another episode of STIs.

Although this study has identified important action points of public health importance, it should be noted here that it was subject to the following methodological limitations. First, the sampling method used was non-probability purposive sampling, which may affect the representativeness of the study. Next, certain questions are of course sensitive, and it is important to remember that respondents’ answers are likely subject based for social acceptance. The study was mainly focused on an urban setting, and the rural population was under-represented.

In conclusion, this study showed that the level of HIV testing was low despite a high level of willingness to undergo HIV CT at the time or 3 months after their STI diagnosis. Moreover, more than a quarter of the respondents did not have knowledge of the three preventive methods and misconceptions about HIV/AIDS existed amongst 43.3% of STI patients. Those STI patients, who had a previous HIV test and those in the age group 15-34 years, were more likely to be willing to have an HIV CT at the time or 3 months after their STI diagnosis. Whereas, those STI patients, who perceived themselves to be little or moderate chance of contracting the HIV infection, were found to be significantly and negatively associated with willingness towards HIV CT. Therefore, promotion and expansion of routine provider initiated HIV CT with subsequent follow up of STI patients as part of a continuum of services and support, and intensive patient-centered risk reduction counseling for STI cases is highly required during the initial visit to health care facilities.

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### References

1. WHO. Global prevalence and incidence of selected curable STIs, overview and estimate. Geneva, Switzerland. 2001.
2. Desta S, Yosuf M, Feleke W, Mihret M, Geyid A, Ghidinelli M, *et al.* Prevalence of STD and STD related factors in sex workers of Addis Ababa. *Ethiop J Health Dev* 1990;4(2):149-53.
3. Gemed A. Magnitude of STDs problem in Ethiopia. MOH [Ethiopia], Addis Ababa. 1990.
4. Geyid A, Tesfaye H, Abraha A, Lemeneh Y, Desta S, Feleke W. Isolates of STD causative agents from sex workers in Addis Ababa (a preliminary report). *Ethiop J Health Dev.* 1990;4(2):155-61.
5. MOH [Ethiopia]. Health and health related indicators, 1995 E.C. Addis Ababa, Ethiopia. Feb 2004.
6. FHI, HIV/AIDS prevention and care department. Sexually transmitted infections: a strategic framework. Arlington, USA. Jun 2001; p2.
7. UNAIDS/WHO. Policy statement on HIV testing. Geneva, Switzerland. Jun 2004.
8. Sweat M, Gregorich S, Sangiwa G, Furlonge C, Balmer D, Kamenga C, *et al.* Cost-effectiveness of voluntary HIV-1 counseling and testing in reducing sexual transmission of HIV-1 in Kenya and Tanzania. *The Lancet.* 2000;8(356):13-21.
9. Leynaert B, Downs AM, de Vincenzi I. Heterosexual transmission of human immunodeficiency virus: variability of infectivity throughout the course of infection. *Am J Epidemiol* 1998;148(1):88-96.
10. Margaret E, Kai S, Mary E, Raman R, S.Thilikavathi, Robert C, *et al.* HIV testing and counseling among men attending sexually transmitted disease clinics in Pune, India: Changes in condom use and sexual behavior over time. *AIDS* 1998;12(4):1869-77.
11. Glynn M, Rhodes P. Estimated HIV prevalence in the United States at the end of 2003 [Abstract]. Presented at the National HIV Prevention Conference. Atlanta, Georgia. 12–15 June 2005.
12. CDC. Fact sheet: CDC's revised recommendations for HIV testing of adults, adolescents, and pregnant women in health care settings. Atlanta, USA. 21 Sept 2006.
13. Mitike G, Lemma W, Berhane F, Ayele R, Assefa T, G/Michael T, *et al.* HIV/AIDS behavioral surveillance survey (BSS) Ethiopia 2002, round one. Addis Ababa, Ethiopia. Jun 2003;6-12 and 37-88.
14. CSA [Ethiopia], ORC Macro. Ethiopia demographic and health survey 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA. Sept 2006.
15. MOH [Ethiopia]. National guideline for the management of sexually transmitted infections using the syndromic approach. Addis Ababa, Ethiopia. March 2006.
16. King K. Sexually transmitted diseases: overview and clinical approach. In: Dennis L. Kasper, Eugene Braunwald, Anthony S. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson. *Harrison's principles of internal medicine.* 16<sup>th</sup> ed. New York: McGraw-Hill; 2002. p765.
17. Lukwago S. Factors influencing utilization of voluntary HIV counseling and testing services among pregnant mothers in Kawempe division, Kampala district, Uganda [Abstract]. Presented at the international AIDS society conference on HIV pathogenesis and treatment. Rio de Janeiro. 24-27 Jul 2005.
18. Alemu S, Abseno N, Degu G, Wondmikun Y, Amsalu S. Knowledge and attitude towards VCT for HIV: a community based study in North-West Ethiopia. *Ethiop J Health Dev* 2004;18(2):82-89.
19. Mohammed F. Factors related to VCT among 15-49 years urban community of Ethiopia. MPH thesis. SPH, Addis Ababa University. 2000.
20. Fitaw Y, Tefera W, Ayelegne G, Abebe H, Assefa S, Kerela S, *et al.* Factors affecting the acceptance of VCT among Dabat High School students [Abstract]. EPHA XIV<sup>th</sup> Annual Public Health Conference. Addis Ababa, Ethiopia. October 2003.
21. Ayenew A. Assessment of willingness of TB patients towards VCT in selected health centers, North Gondar administrative zone. MPH thesis. SPH, AAU. April 2004.
22. Weinstock HS, Dale M, Linley L, Gwinn M. Unrecognized HIV infection among patients attending sexually transmitted disease clinics. *Am J Public Health.* Feb 2002;92(2):280-3.
23. Day S, Lakhani D, Rodgers C. Uptake of HIV testing in patients with a confirmed sexually transmitted infection. *Sex Transm Infect.* 2002;78:386–90.
24. Mitike G, Tesfaye M, Ayele R, Gadisa T, Enqusillasie F, Lemma W, *et al.* HIV/AIDS behavioral surveillance survey (BSS) Ethiopia 2006, Round two. Addis Ababa, Ethiopia. Feb 2007.
25. Ermias Mulugeta. Socio-demographic characteristics, sexual behavior and reasons for attending VCT service at Bethzatha VCT project

- [Abstract]. EPHA XIVth Annual Public Health Conference. Addis Ababa, Ethiopia. October 2003.
26. Admassu M, Fitaw Y. Factors affecting acceptance of VCT among different professional and community groups in North and South Gondar administrative zones, North West Ethiopia. *Ethiop J Health Dev.* 2006;20(1):24-31.
27. MOH [Ethiopia]. AIDS in Ethiopia, sixth report. Addis Ababa, Ethiopia. 2006.