

# Consistent Use of Condom and Associated Factors Among Sero-discordant Couples in Northeast Ethiopia, 2020: Qualitative Design Embedded

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## Research article

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# Abstract

**Background:** Despite significant progress over the past decades to reduce transmission, HIV is continuing a public health problem. Although, consistent condom use has paramount help in reducing HIV transmission, its prevalence, and associated factors are not well studied. Therefore, this study was aimed to assess the proportion and factors associated with condom use among discordant couples in Northeast Ethiopia.

**Methods:** An institution-based cross-sectional study by embedding qualitative design was conducted from October 1 2019 to June 2020. A total of 417 HIV discordant couples were included. A pre-tested structured and interviewer-administered questionnaire was used to collect the quantitative data. An interview guide unstructured questions were used to collect qualitative data. Binary logistic regression was employed to identify factors associated with the outcome variable. Variable those that had a *P*-value less than 0.05 in multivariable logistic regression were considered as statistical predictors of condom use.

**Results:** A total of 401 HIV serodiscordant couples were participated, making a 94.8% response rate. The proportion of consistent condom use was 58.4%(95%CI: 53.1-63.1%). Unmarried partners AOR=0.44(95%CI: 0.229-0.877), students and employees AOR=0.33(95%CI 0.130-0.846), AOR=0.39(95%CI: 0.165-0.939) respectively, couples live together AOR=1.86(95%CI: 1.197-2.195), receiving counseling about condom use AOR=1.90(95%CI: 1.182-3.076), and knowledgeable participants AOR=1.61(95%CI: 1.031-2.525) were the independent predictors of consistent condom use.

**Conclusions:** Despite its importance, the proportion of consistent condom use among serodiscordant couples was significantly low. Therefore, planners, policymakers, and health care practitioners should consider the aforementioned factors to improve consistent condom use. Also, special intervention on students and employees should be started. The authors recommend the researcher to quantify the new variable explored by qualitative design. Therefore, these results have high importance in designing tailored intervention method.

## Introduction

Human immunodeficiency virus (HIV) continues to take a tremendous toll on human health, having claimed more than 35 million lives globally[1].

Sub-Saharan Africa is the most affected region, and accounts for two-thirds of the global total new HIV infections. The vast majority of people living with HIV(PLWHA) are in low-and middle-income countries including Ethiopia[2].

The transmission of HIV is related to the risk of exposure to the virus[3]. HIV infection risk is related to situations that increase the chance of HIV transmission[4], the repeated low-risk sexual acts translate into a significant cumulative risk over time especially with unprotected sexual experiences[5].

In Sub-Saharan Africa, it is estimated that half of HIV-positive people have negative couples and that the percentage of sero-discordant partnerships is 0–6% in generalized epidemics and 9–17% in concentrated epidemics [6, 7]. The risk of transmission in sero-discordant couples is affected by many variables as per the findings of different studies. These include sociodemographic [8–10], personal behavior[8, 11–13], cultural [14, 15], and lack of awareness [16].

The three primary behaviors that can prevent sexual transmission of HIV abstaining from sex, having sex with only one uninfected partner at a time, and using condoms are well-known as the components of the ABC approach [17]. Among those prevention methods, consistent and correct condom use is a critical component in a comprehensive and sustainable approach to the prevention of HIV [2, 18–22]. The world has exceeded the AIDS targets of Millennium Development Goal (MDG) 6, halting and reversing the spread of HIV, and more countries are getting on the Fast-track targets to end the AIDS epidemic by 2030 as part of the Sustainable Development Goals[1, 23]

Despite its significance, consistent condom use is underutilized [24]. The problem is paramount among the sero-discordant couples. Roughly half of couples affected by HIV in sub-Saharan Africa are in HIV-sero-discordant relationships[25]) and majority of new infections originate with the HIV-positive index rather than concurrent, outside partners[26]. In HIV sero-discordant couples, 65–85% new infections are acquired from their married/cohabiting partners[27, 28], without any interventions, the annual rate of HIV transmission is 6.3% among the negative sero-discordant partners[29]

The low utilizations consistent condom use in different studies have been associated with cost, religious ideology, alcohol or drug use, younger sexual debut, poor knowledge of HIV/AIDS, beliefs of diminished sexual pleasure and male emotional fulfillment, disbelief in prevention efficacy, distrust in relationships, gender inequality and perceptions of modesty, partner characteristics and type of relationship, lower education and unemployment, and psychological problems [30–34].

There is a global target of achieving the elimination of new HIV infections in 2030. However, HIV serodiscordant couples are increasing through time with a source of new infection for the negative spouses including newborn babies. Hence, this study will be used for health managers, policymakers, non-governmental organizations to consider new strategies and policy environment and make an eye-opening for researchers to the next insight.

## **Material And Methods**

### **Study area and period**

The study was conducted from October 2019 to June 2020 in South Wollo Zone public health institutions. Dessie is the main city of South Wollo Zone, Amhara regional state. It is located 401 kilometers to the North of Addis Ababa, Capital of Ethiopia. It has an estimated population of 218,471(*unpublished observation*).

# Study design

A facility-based cross sectional study with qualitative design embedding was conducted

## Study participants

All HIV positive spouses (either male or female) from discordant couples who follow on ART treatment at public health institutions in South Wollo Zone were the study participants. Inclusion criteria included the following: in a constant, sexually active couple, both members of a couple had to be  $\geq 18$  years of age, aware of their HIV sero-discordancy, and willing to participate in this study. Participants were excluded if they were single or had separated from their sexual partners. In addition, participants who are admitted and unable to communicate were excluded from the study. Similarly, gender-matched four Focus Group Discussions (FGDs) were conducted. The participants were only the Sero-positive couples who come for ART follow up. Two FGDs from each gender which used condoms consistently and inconsistently was employed.

## Sample Size Determination and Data Collection Procedure

The sample size was determined by using the single population proportion formula taking the proportion of consistent condom use(55.8%) in Northwest Ethiopia[35], assumptions of 5% margin of error, and 95% confidence level.

$$n = \frac{(Z_{\alpha/2})^2(p(1-p))}{d^2} = 379 \quad (1)$$

Where:

n = the minimum sample size

Z = critical value of the desired level of confidence 95%(1.96)

P = the proportion of consistent condom use in a study of Northwest Ethiopia

d = margin of error (5%)

Finally, after adding 10% nonresponse rates, the sample size used was 417.

A well-structured pretested and interviewer-based questionnaire was used to collect appropriate data from the sero-positive couples who are on ART follow-up. The term discordant couple was defined if an intimate partnership in which one person is HIV sero-positive and the other HIV sero-negative and started treatment of the positive spouse. Consistent condom user of discordant couples was defined as if the heterosexual couples used condoms during every act of sexual contact without interruption throughout

their sex life until the data collection period. A semi-structured questionnaire was used during the Focus Group Discussion (FGD).

## Data processing and analysis

Epi Data version 3.1 and STATA 14 statistical package software were used for data entry and analysis respectively. Proportion and summary statistics were described using frequency, percentage, and figures. Hosmer and Lemeshow test was applied to test the logistic regression model goodness of fit. Those independent variables having *P*-value less than or equal to 0.2 in the bivariable analysis were fitted to a multivariable logistic regression model. Variables those *P*-value less than 0.05 in multivariable logistic regression were considered as statistically significant. Odds ratios with 95%CI was computed to determine the direction and strength of the association of the variables.

Qualitative data were analyzed by theme based on the nature of the issues.

## Ethical consideration

Ethical clearance was obtained from the Ethical Review Committee of the College of Medicine and Health Sciences, Wollo University. Similarly, a permission letter from the study sites was secured. A written signed consent was obtained from each study participants. Information about the purpose and benefit of the study was provided for participants. They were also told about their rights to withdraw from the study at any time of interview or refusal. Confidentiality of the information was maintained by using anonymity identifiers, keeping their privacy by interviewing them individually at a separate place. No identifiers of study participants were included in data collection forms.

## Results

### Sociodemographic characteristics of participants

A total of 417 sero-discordant couples were participated in this study, making 96.2% of the response rate. The age of respondents was ranged from 18 to 72 with the mean ( $\pm$  SD) of  $34.9 \pm 10.86$  years. Among those 219(54.6%) were female seropositive partners. The majority, 289(72.1%) of 401 participants were urban dwellers. Two hundred-seventeen (54.1%) of the participants had less than 2000 Ethiopian Birr income on average monthly (Table 1).

Table 1  
Sociodemographic characteristics of participants

<b>Characteristics</b>	<b>Frequency</b>	<b>Percent</b>
<b>Age of participants (Mean ± SD) 34.9 ± 10.86</b>		
18–24	76	19.0
25–35	151	37.7
36–48	127	31.7
49 and Above	47	11.7
<b>Gender of the participants</b>		
Male	182	45.4
Female	219	54.6
<b>Participants residency</b>		
Rural	112	27.9
Urban	289	72.1
<b>Religion</b>		
Orthodox	130	32.4
Muslim	210	52.4
Protestant	51	12.7
Others	10	2.5
<b>Participants occupation</b>		
Housewife	55	13.7
Student	71	17.7
Employee	102	25.4
Others	173	43.1
<b>Educational status of participants</b>		
Unable to read and write	81	20.2
Able to read and write	85	21.2
Grade 1–8	29	7.2
Grade 9–12	102	25.4
Diploma and above	104	25.9

Characteristics	Frequency	Percent
<b>Numbers of alive children</b>		
No have	114	28.4
1–5	248	61.8
Above 5	39	9.7
<b>Average monthly income of spouses in Ethiopian Birr (median = 2000)</b>		
Median and below	217	54.1
Above the median	184	45.9

## Participants of the FGD

Four focus group discussions were conducted among individuals in seropositive couples. The group arrangement was designed by gender. Two FGDs were comprised of female seropositive couples, while the rest were males. The group formation was; HIV seropositive female (g1n1 = 9), HIV seropositive female (g2n2 = 8), HIV seropositive men (g3n3 = 7), and HIV seropositive men (g4n4 = 12). Group one (g1) and group three (g3) from each gender were sero-discordant who used condoms consistently, while the other groups were inconsistent condom users.

The mean age of males was 36 and females 29.

Twenty-eight females and 12 males reported having had sex with someone besides their stable partner in the past twelve months. Six and three females in each group had their jobs that can survive them independently. While all males had jobs that can earn money monthly.

## Behavioral and knowledge variables

Out of the study participants, 226(56.4%) of couples were living together in this study. Of those pairs who participated in the study, 109(27.2%) were paired for a temporary occasion. Seventy-seven (19.2%) of those seropositive partners had sexual intercourse with other than their partners in the last 12 months of this study. Widely held, 299(74.6%) of the seropositive partners have used condoms during their last sexual intercourse. Out of those partners who used condom, 188(50.2%) were decided by both partners. Only 229(57.1%) of the seropositive partners have received counseling about condom use during every appointment of Anti-Retroviral treatment (ART) follow up. Similarly, 231(57.6%) of the seropositive partners denied sexual intercourse if their seronegative partner refused to use condoms. Roughly 58.4% (95%CI: 53.1–63.1%) of 401 sero-discordant couples were consistently used condoms in every act of sexual intercourse (Table 2).

Table 2  
 Consistence condom use, Behavior, and knowledge related characteristics of participants, 2020

<b>Characteristics</b>	<b>Frequency</b>	<b>Percent</b>
<b>Condom use</b>		
Consistence	234	58.4
Inconsistence	167	41.6
<b>Partners live together</b>		
Yes	226	56.4
No	175	43.6
<b>Couples type</b>		
Temporary	109	27.2
Permanent	292	72.8
<b>Years you live together after know sero-positive</b>		
< 3 years	188	46.9
≥ 3 years	213	53.1
<b>Make sexual intercourse with other than your partner in the past 12 months?</b>		
Yes	77	19.2
No	324	80.8
<b>Gave birth after know sero positivity</b>		
Yes	176	43.9
No	225	56.1
<b>Did you use condom in your last sexual intercourse?</b>		
Yes	299	74.6
No	102	25.4
<b>Who decided to use condom?(N = 377)</b>		
Respondent	68	18.2
Partner	118	31.6
Both partners	188	50.2
<b>Take medication for sexually transmitted diseases in last six months?</b>		

<b>Characteristics</b>	<b>Frequency</b>	<b>Percent</b>
Yes	77	19.2
No	324	80.8
<b>Use medication or alcohol to increase sense of intercourse?</b>		
Yes	117	29.2
No	284	70.8
<b>Used family planning methods other than condom?</b>		
Yes	140	34.9
No	261	65.1
<b>Took training about condom use?</b>		
Yes	188	46.9
No	213	53.1
<b>Received advice about condom use in every visit?</b>		
Yes	229	57.1
No	172	42.9
<b>Knowledge variables</b>		
<b>Could HIV transmit to you partner if not use condom?</b>		
Yes	270	67.3
No	131	32.7
<b>Condom can prevent HIV transmission during sexual intercourse?</b>		
Yes	260	64.8
No	141	35.2
<b>Did you denied sexual intercourse if your partner do not need to use condom?</b>		
Yes	231	57.6
No	170	42.4
<b>Your partner can survive for long time by protecting from HIV by using condom?</b>		
Yes	268	66.8
No	133	33.2
<b>Anti-Retroviral treatment can protect HIV for partner?</b>		

Characteristics	Frequency	Percent
Yes	223	55.6
No	178	44.4

## Factors associated with consistence condom use

After adjusting confounding variables in multivariable regression analysis, marital status, occupation, partners living together, knowledge, and counseling of partners about condom use were the independent predictors of condom use among sero-discordant couples.

Unmarried seropositive partners were 56% times less likely condom use consistently AOR = 0.44(95%CI 0.229–0.877) compared to married sero-discordant.

Likewise, partners who were students and employees were almost 70% and 60% less likely to consistently used condoms compared to housewives AOR = 0.33(95%CI 0.130–0.846), AOR = 0.39(95%CI 0.165–0.949) respectively.

Sero-positive participants who lived together with their spouses were almost two times more consistently used condom AOR = 1.86(95%CI 1.197–2.195).

Regarding counseling, partners who received counseling about condom use during their ART appointment were roughly two times more odds of consistent condom use compared to their counterparts AOR = 1.90(95%CI 1.182–3.076).

Similarly, knowledge of partners increased consistent condom use almost by more than one and half time more AOR = 1.61(95%CI 1.031-2.525) compared to non-knowledgeable partners (Table 3).

Table 3

Bivariable and Multiple regression of factors associated with consistency condom use among sero-discordant couples, 2020.

Characteristics	Use condom consistently		COR (95%CI)	AOR (95%CI)
	Yes	No		
<b>Marital status</b>				
Married	139	89	1	1
Unmarried	35	28	0.80(0.455,1.460)	<b>0.44(0.229,0.877)</b>
Partner	40	21	1.21(1.675,2.203)	0.91(0.395,2.127)
Others <sup>a</sup>	20	29	0.44(0.233,0.828)	0.69(0.277,1.754)
<b>Seropositive partner occupation</b>				
Housewife	29	26	1	1
Students	48	23	1.87(0.905,3.867)	<b>0.33(0.130,0.846)</b>
Employee	65	37	1.57(0.809,3.064)	<b>0.39(0.165,0.939)</b>
Others <sup>b</sup>	92	81	1.01(0.555,1.870)	0.93(0.458,1.874)
<b>Educational status</b>				
Unable to read and write	49	32	0.77(0.424,1.419)	0.73(0.327,1.653)
Able to read and write	44	41	0.54(0.302,0.980)	1.01(0.461,2.209)
level 1–8	21	8	1.33(0.535,3.308)	0.53(0.189,1.513)
level 9–12	51	51	0.50(0.289,0.890)	1.83(0.884,3.796)
College and above	69	35	1	1
<b>Residency</b>				
Rural	61	51	0.80(0.516,1.145)	1.18(0.708,1.984)
Urban	173	116	1	1
<b>Monthly average income of the spouses in Ethiopian Birr (Median = 2000)</b>				
Median and below	136	81	1	1
Above the median	98	86	0.72(0.485,0.1.070)	0.80(0.486,1.335)
<b>Did you live together with your partner?</b>				

<sup>a</sup> widowed, separated and divorced; <sup>b</sup> daily laborers, farmer, merchant, pension, \*significant at  $P < 0.05$ , \*\* significant at  $P < 0.001$

Characteristics	Use condom consistently		COR (95%CI)	AOR (95%CI)
	Yes	No		
Yes	119	107	1	1
No	115	60	1.72(1.147,2.589)	<b>1.86(1.197,2.195)</b>
<b>Type of partner</b>				
Temporary	69	40	0.58(0.36,0.937)	0.67(0.383,1.937)
Permanent	218	74	1	1
<b>Use medication/alcohol before sexual intercourse?</b>				
Yes	72	45	1	1
No	162	122	0.82(0.534,1.289)	0.85(0.514,1.419)
<b>Received advice about condom use at every ART visit</b>				
Yes	173	56	1.57(1.015,2.432)	<b>1.90(1.182,3.076)**</b>
No	114	58	1	1
<b>Knowledge of participants about condom</b>				
Knowledgeable	163	100	1.53(1.014,2.332)	<b>1.61(1.031,2.525)</b>
Not knowledgeable	71	67	1	1
<sup>a</sup> widowed, separated and divorced; <sup>b</sup> daily laborers, farmer, merchant, pension, *significant at $P < 0.05$ , ** significant at $P < 0.001$				

## Factors explored by FGD

The majority of the FGD members (10 females and 12 males) reported a high level of openness with their spouse about their sexual needs. Fewer females than males said they trusted their spouse.

More females than men were happy with the decision to use condoms in every sexual intercourse.

Based on the FGD result, persuasion, refusing sex without condoms, and crying were the methods that females used to use condoms consistently.

Consistent condom user females persuade their seronegative partners by using different methods. Of which, they express their heartfelt love for their male partners. They told that their partners becoming agreed to use condoms during this situation. Similarly, if females were economically independent, they refused sexual intercourse without a condom.

*"I used different methods to use condoms consistently. Sometimes, I tried to persuade my partner as I could not use other pregnancy prevention methods. The other time, I cried to him as he does not love me.*

*Moreover, he insults me. During that time, I just tried to shout out” (g1, p3).*

Almost all of the females who did not use condom consistently was not because of their problem. They reported that they were very interested if always use condoms. But they used condoms inconsistently by different reasons. Among which their economic dependency on their male partners was a very crucial and new factor. Although females are seronegative, and if they are living by their partners' income, they enforced not to use a condom unless their partners need it.

*“g2, p5: I am six years past living with my seropositive partner. We knew his seropositivity after two years of our start of living together. I was seronegative during his examination time. We are using condoms inconsistently. We have also got a child after we knew his HIV status. This was by the need of my partner alone. I was refused but he insulted me aggressively. I do not have relatives, and my job to earn money. Therefore, I am obligated to live with inconsistent use of condoms. Even, I do not know my HIV status now. This was because of my economic dependency” (mask face by cloth to hide her crying).*

Two females who did not use condoms consistently were not disclosed their HIV status to their male partners. They expressed that they were economically dependent on their partners. Therefore, if disclosed, they distressed their partners will either dispatched or kill them.

*“I know that it is a sin that I closed my seropositivity. But I do not have any choice. If I disclosed to my partner, I am sure that he will chase me without any property. Sometimes, we used a condom. He asked me the reason why I tried to use condoms. I replied that I have gastritis to use an oral contraceptive, I am sick to take other family planning methods. Often, he trusted me and we used condoms. Crying” (g2, p10)*

Regarding males, five were use condoms consistently in love. Males' insistence on condom use did not upset their partners. For some, discussing condom use went smoothly, and negative expectations were solved by discussion.

*“using condoms for us in pleasure. We were advised about the importance of condoms in my ART follow up. Sometimes, my partner brings a condom as a surprise. I also receive it because there is nothing more than a condom for our life. I never forget that one day she said to me:*

*“Inkoklish: to mean (take a pulse)”,*

*I replied “manyawkilsh: to mean (who would know yours?)”,*

which is not a bar of gold, not money, etc., and nobody will never give you as a gift, but only me brought it. What is that?

*I tried to think more but could not answer it. According to Ethiopian culture, I gave a country like Addis Ababa, Bahir Dar, etc. but she refused to receive it. Rather she asked me to give her myself. I agreed,*

*“that is a “condom” she laughed and I was very surprised. Therefore, I advise everyone to use condom consistently. If need a child, they can consult their doctors” (g3 p23).*

On the other hand, males who did not use condoms consistently had different reasons. Six of 12 did not disclose their HIV status to their partners. Three were used condoms consistently with their stable partner. However, they had other casual sexual intercourse without condoms. The other three believed they accepted to acquire what a health condition occurred on their partners. They want to live together and to pass away also.

*"I believe that HIV is an earn given by God for our sin. However, I am ready to share everything that comes with my wife. I knew that she is HIV positive three years before. But we did not use condoms even once since we knew her HIV status. I tested myself three times, and last was before seven months ago. Although, I am ready to acquire it, still negative for HIV. Of course, my wife always nagging me to use a condom. But I refused. I tried to tell her the spiritual reality of our relationship" (g4, p32).*

*"I did not remember the occasion when I was infected with HIV, but now I am HIV seropositive before fifteen years back. I remember my wife was seronegative after three months of my positivity. I did not know her HIV status now. We used condoms inconsistently. Sometimes, she cried that she has gastric pain, and complained because of oral contraceptive. During that time, we tried to use a condom. Otherwise, we did not use it. I do not desire to use it, and using condoms had too less my sexual pleasure" (g4, p29).*

*"Even I have a doubt, some person believed that condom contains a chemical that makes people impotence. But I did not accept it fully. As you defined, a person who did not use condoms for the sake of a child is an inconsistent user. Sometimes, we did not use condoms. For example, we got two children after we knew my HIV seropositivity." (g4, p33). "By the way, let me add one thing, there are also persons who believed condom itself contains HIV, which is the source for most people infection" (g4, p30).*

The other factors mentioned by the FGD had similar themes with the quantitative findings of this research.

## Discussion

Despite various and through time modernized interventions are being used, HIV continues to cause a catastrophic effect on human health. Among those interventions, consistent and correct condom use has a paramount help to reduce HIV transmission among sero-discordant partners. And the maximum protective effect of condoms is achieved when their use is consistent. Similarly, if there is inconsistent use of a condom by people living with HIV (PLWHA) on ART will lead to worsening the HIV infection, reinfection with new drug-resistant viral strains, and infection of a newborn. This study revealed that the proportion of consistent condom use among sero-discordant partners was 58.4% (95%CI 53.1–63.1%). Despite its need, the proportion of consistent condom use in this study was not satisfactory. The main reasons that the sero-discordant couples reported for not using condoms consistently were they desire to have a child 38 (9.5%), their feeling that condom reduces sexual pleasure 88 (21.9%), and no need to use at all 55 (13.7%). This finding is consistent with the studies in Northwestern Ethiopia (55.8%)(35) and Mekelle (55.7%)[36]. This consistency might be since sociodemographic characteristics of participants,

study design used, and sample size similarities of the studies. Similarly, it is consistent with the research finding in Kenya (57.4%)[37] and Portugal (53%)[38].

The proportion of consistent condom use in this study is higher when compared to the study in Nigeria (45.8%)[39] and in the same country (29.4%)[40]. The difference might be due to study time which the later was conducted seven years back from this study. At a current time, many interventions to use condoms consistently are done; which in turn, will increase the prevalence of consistent condom use.

However, the result is lower than in studies done in Gondar, Ethiopia (78.9%)[41] and Guatemala (85.0%) [42] (39), and Cambodia (78%)[43]. This discrepancy might be due to a lack of professional's commitment to creating awareness on PLWHA on ART to use condom consistently. In this study, nearly half of 172(42.7%) of sero-discordant couples were not received advice about condom use. Similarly, receiving an advice during ART follow up was statistically significant variable to increase consistent condom use. This implies that health professionals should improve a strong and responsible indexed activity of advising the clients.

After adjusting the confounding variables in multivariable regression, marital status, occupation, partners living together, receiving advice about condom use, and knowledge of participants were the independent predictors of consistent condom use.

This study revealed that unmarried couples were roughly 60% less likelihood of condom use consistently compared to married couples. This finding is supported by the finding in Gondar[44] (43) and Portugal [38].

Unlike other studies [41, 44, 45] that have reported participants with higher educational status more likely to use condoms consistently compared to lower educational status participants, this study did not show any significant association between educational status and consistent condom use. Although, being urban [44] and rural [41] residents were more likely used condom consistently, this study revealed that residency of participants did not show statistically significant association with consistent condom use. This might be study setting, sample size, and methodological difference of the studies.

Student and employed participants were less likely use condoms consistently compared to housewives. In this study students were the least in monthly income compared to other occupation categories. This might be a reason for unable to buy condoms in every act of sexual intercourse. In addition, students were in the fire age group in this study. These might be the attributes for inconsistent use of condom. Likewise, employees have higher probability of contacting different and many peoples compared to housewives. This might increase to have multiple sexual partners. Out those participants who had multiple sexual partners (77), 35(45.5%) did not use condoms consistently. This might be the fact for the employees not to use condoms consistently.

Consistent condom use was statistically associated with couples living together. Couples who are living together were more likely used condoms consistently compared to their counterparts. This might be

because if partners are not living together, they will have another sexual partner. Which might favor them to use condoms inconsistently. However, this finding is contradicted with a multilevel analysis study[46]. The discrepancy might be due to the study population in which the later study was conducted among drug users and study year.

Furthermore, participants who received an advice about condom use were more likely to use condoms consistently when compared with their counterparts. This is in line with a study in Gondar[41].

This study provides information about the presence of statistical association of knowledge of participants and their consistent condom use. Those sero-discordant couples who have good knowledge were as more as use condoms consistently. Demonstration and education about condom use can increase knowledge about the benefit of condom. This intern improve consistent condom use[47]. Similarly, access to information through various means such as media and health institutions may contribute to increased general awareness/knowledge about the importance of consistent condom use among people[47]. This might increase consistent condom use among discordant couples.

The present findings have several implications in preventing of new HIV infection from the sero-discordant couples by using condoms consistently. If preventing new HIV infection to zero by 2030, strategies and programs should emphasize on unmarried couples.

The findings also suggest that school and employer-based HIV prevention programs which primarily emphasize on the transfer information about consistent condom use will succeed in promoting student and employee consistent condom use of HIV preventive measure.

Also, to be effective, prevention programs should employ a broad spectrum of interactive health education and communication strategies such as advice at every ART follow up visits, use of different medias, and work places.

Moreover, this study has an implication of recommending the federal labor and social affairs ministry to strengthen and promote the sero-discordant couples to live together. This should be compulsory by law and regulation.

## **Conclusion**

Despite its importance, the proportion of consistent condom use among sero-discordant couples was significantly low. Unmarried couple members, students, employees, couples live together, received advice, and knowledge of participants were the independent predictors of consistent condom use among sero-discordant couple. Therefore, planners, policymakers, and health care practitioners should consider the aforementioned factors to improve consistent condom use. Economic dependency of females, peoples believe condom use could get males impotence, condom itself contains HIV, and arrogance on religion were variable explored by the qualitative design. Therefore, the authors of this study recommended the

researchers to quantify the above-mentioned variables; which capable to change or development of new strategies of HIV prevention.

## Abbreviations

**AOR**  
Adjusted Odds Ratio, **FGD**:Focus Group Discussion, **g1**:group1, **g2**:group2, **g3**:group3, **g4**:group4,  
**OR**:Odds Ratio, **p**:person in each group

## Declarations

### Ethical approval and consent to participate

Ethical clearance was insured from Wollo University, College of Medicine and Health Sciences ethical review committee. A written consent was obtained from each study participants after clarifying of the objective of the study. They were also told their rights in discontinuing or not responding of the interview.

### Consent for publication

Not applicable

### Availability of data and materials

All the necessary data are included in the manuscript.

### Competing Interests

All the authors declared that there are no competing interests.

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### Author contributions

WMA is the author involved in the design, implementation, data cleaning, and analysis and draft the manuscript. WMA, TBT, YD, MGC, and AM participated in data collection, manuscript preparation, and edition. WMA reviewed the manuscript. All the authors have read and approved the manuscript.

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