

# Sexual behaviors and associated factors among antiretroviral treatment attendees in Ethiopia

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**Background:** Human immunodeficiency virus (HIV)/acquired immune deficiency syndrome is one of the major public health problems throughout the world. Nowadays, antiretroviral treatment (ART) is available in health institutions and HIV-positive individuals who are eligible for ART are taking it. But studies show reinfection of HIV is occurring in them for unknown reasons.

**Purpose:** This study aimed to assess risky sexual practice and associated factors among HIV-positive ART attendees.

**Methods:** An institution-based cross-sectional study was employed in ten randomly selected health centers in Addis Ababa, between October 05 and November 05, 2013. Simple random sampling technique was employed to select 376 respondents for face-to-face interviews from ART registration book. After the data collection process, data were entered and analyzed using the SPSS version 20 statistical package. Then the effect of each variable was observed by regression analysis to identify the predictors for risky sexual practice at a significant level of  $P < 0.05$ .

**Results:** A total of 376 respondents were included in the study, with 100% response rate. The mean age of the total respondents was  $35.28 \pm 8.94$  (standard deviation). Of the 376 respondents, 30.4% had a history of risky sexual practice, which was inconsistent condom use in the last 3 months prior to the study period. Factors associated with risky sexual practice included alcohol consumption (adjusted odds ratio [AOR] = 2.01, 95% CI: 1.07, 3.77), being single (AOR = 0.29, 95% CI: 0.15, 0.59) and widowed (AOR = 0.32, 95% CI: 0.13, 0.77) respondents, and the gender of the respondents, with an AOR of 1.55 (95% CI: 1.01, 2.33), shows a significant relationship with risky sexual behavior.

**Conclusion:** Generally, a significant number (30%) of the respondents engaged in risky sexual behavior; so health providers should encourage, support, and allow clients to effectively use condoms during their sexual practice.

**Keywords:** sexual behaviors, inconsistent condom use, ART user, HIV prevention, reinfection, alcohol consumption

## Introduction

In Ethiopia, human immunodeficiency virus (HIV) was first detected in stored sera collected in 1984. The first two acquired immune deficiency syndrome (AIDS) cases were reported in 1986. In 2005 it was estimated that a total of 1,320,000 were living with HIV/AIDS. Of these, 634,000 were living in rural areas and 686,000 in urban areas. It was estimated that in 2005, a total of 137,500 new AIDS cases, 128,900 new HIV infections (353 a day), including 30,300 HIV-positive births, and 134,500 (368 a day) AIDS deaths (including 20,900 in children under 15 years) occurred. AIDS accounted for an estimated 34% of all young adult deaths (age, 15–49) in Ethiopia and

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66.3% of all young adult deaths between 15 and 49 years of age in urban Ethiopia. The estimated total number of persons requiring antiretroviral treatment (ART) in 2005 was 277,800 (including 43,100 children).<sup>1,2</sup>

Over the past 10 years, ART has become available for an ever-growing number of people living with HIV, with 56% of those in need of treatment having access to it in 2011 as opposed to only 3% in 2003. In view of the nonaffordability of ART by most HIV-infected persons in Ethiopia, the Ministry of Health launched the free ART rollout program in January 2005.<sup>3,4</sup>

Until recently, the worldwide focus of HIV prevention effort was largely on people uninfected with HIV/AIDS, but the sexual behavior of HIV-infected persons did not receive any serious attention for a variety of reasons. Initially, a diagnosis of HIV infection counted as a death sentence. In that context, the sexual life of those infected persons seemed a secondary issue, which made prevention focused on sexual behavior hard to imagine. Furthermore, the conviction that stigmatization should be avoided also precluded an interest in the sexual behavior of HIV-infected persons.<sup>5,6</sup> Although many HIV-infected individuals avoid risky sexual behaviors, substantial numbers of them continue to engage in HIV-transmission-risk behaviors, which puts them at risk of reinfection by HIV strains resistant to ARV drugs or acquiring other sexually transmitted diseases (STDs) which hasten AIDS progression.<sup>7,8</sup>

The advent of highly active antiretroviral therapies has helped to improve the health status and life expectancy of people living with HIV/AIDS, which has led to a belief that HIV is no longer a serious and deadly disease. Actually, ART significantly reduces patients' viral loads, often to undetectable levels, which may lead to the perception that they are no longer infectious. In addition, ART significantly improves physical health and the quality of life, which may enable or encourage individuals to resume sexual activity, including risky sexual practice.<sup>9,10</sup> This may also create a venue for transmission of the virus to serodiscordant partners or the risk of reinfection with new drug-resistant viral strains.<sup>11</sup>

People living with HIV and AIDS (PLWHA) who engage in unprotected sex increase the risk for sexually transmitted infections, including another strain of the HIV virus and drug-resistant HIV virus, which may require even more expensive second- or third-line regimens of antiretroviral drug treatment.<sup>12</sup>

Although PLWHA are imparted knowledge about safer sexual behavior during the ART clinic sessions, there is growing evidence that suggests that ART users are increasingly

becoming sexually active and that many of them are having unprotected sex with partners who are HIV negative due to improvement of their health status by the use of ART drugs.<sup>9</sup> Currently, this problem is pervasive in developing countries, especially in sub-Saharan African countries. The reason behind the problem has not been well studied, and the factors that contribute to this problem are not well addressed, especially in newly growing cities such as the study area (Addis Ababa, Ethiopia). So this study aimed to assess the prevalence of risky sexual behavior among ART users, along with its determinate factors that contribute for the high prevalence of the risky sexual behavior.

## Materials and methods

### Study area and period

The study was conducted in Addis Ababa, the capital city of Ethiopia, which covers an area of 527 km<sup>2</sup>. According to the City Government of Addis Ababa, the total population is 3,149,999, with a male-to-female ratio of 47.64% and 52.36% and with an average of 4.1 persons per household. The health institutions in the city comprise a total of 43 hospitals, 32 health centers, 109 special clinics, 169 higher clinics, and 146 medium clinics. Among these, ART service is provided in 31 health facilities, which are under Addis Ababa Health Bureau, and a total of 80,071 HIV-positive adults have visited these health facilities and have taken ART in 2012/2013 fiscal year. This study was conducted in randomly selected health institutions that give ART service, from October 5 to November 5, 2013. The sample size was calculated using single population proportion formula:

$$[(n = (Z_{1-\alpha/2})^2 p(1-p)/d^2)]$$

using a prevalence rate of risky sexual practice (unprotected sex) after initiation of ART (p) 36.9%,<sup>10</sup> 5% marginal error (d) and  $Z_{\alpha/2}$  Standard variant (1.96) which corresponds to 95% confidence level. This yields a total sample size of 358 respondents. As the number of population (sexually active ART attendees) was less than 10,000 in the study area, the sample size was corrected, and considering a 5% nonresponse rate, the final sample size was 376 individuals.

### Sampling procedure

The study was conducted in ten randomly selected health centers out of the 31 health centers that were offering ART for people living with HIV/AIDS. Private health sectors were excluded due to the assumed socioeconomic differences between those who utilized private health institutions and those who utilized public health institutions for ART.

The total numbers of clients who were on ART during the study period were identified, and the total samples for each facility were proportionally allocated to the size of adult ART clients who were taking ART service in the respective health institution. To select the sample unit, we were using simple random sampling techniques using PLWHAs card number from the registration book. Each client has his or her own appointment date, and those clients who were randomly included in our sample were interviewed after we took their informed consent, till the required sample size was fulfilled.

## Instruments and measurements

A pretested and structured questionnaire was used to collect the data. The questions for each item were adopted and adapted from previously conducted similar studies<sup>10,11</sup> and adapted to the local context. The instrument contained six parts, the first of which was the sociodemographic status of the clients (eight items). Second was stigma, assessed by four questions addressing enacted stigma (stigmas encountered since testing positive related to avoidance, social rejection, and shame), with a “Yes” and “No” response, and six questions addressing perceived stigma (any perceived stigmas related to avoidance, social rejection, and shame), again with “Yes” or “No” responses, adopted from a previous study on predictors of stigma among people living with HIV/AIDS.<sup>13</sup> “Yes” was coded as 1 and “No” and “I don’t know” as 0. Each respondent’s score was summed, and those who scored higher than the mean were considered as stigmatized.<sup>10</sup>

Alcohol and substance use (four items) and HIV status disclosure (four items) were the third and fourth parts of the instrument, with a combination of response formats of “Yes” and “No” and “Don’t know” (score of “yes” =1, either of “I don’t know” or “No” =0), and for every correct item, during analysis, some of the incorrect items were reversely coded.

The fourth part, attitude toward safe sex, had ten items, all of which eliciting responses on a 5-point Likert scale format, ranging from “strongly disagree” to “strongly agree”, the scores for each of the responses being “strongly disagree” =1, “disagree” =2, “undecided/not sure” =3, “agree” =4, and “strongly agree” =5.

After reversing for negatively worded items to positively worded items, the score was summed for each of the respective factors and a construct validity was ensured. To ensure reliability of the scale, internal consistency of items was seen separately for each construct using Cronbach’s alpha score of  $\geq 70\%$  as cutoff point.

Risky sexual practice, the sixth part, was measured by inconsistent use of condoms or no condom-protected sex with HIV-negative, HIV-positive, or unknown-status partners in the previous 3 months.<sup>10</sup> In this research, this variable was measured by “Yes” and “No”, and if the respondent’s answer was Yes for any one of the choice, then he or she was considered as engaged in risky sexual practice.

## Data collection

The data were collected for 30 days in each of the study health centers. They were collected through face-to-face interviews with patients who were on ART in those selected health centers. Ten trained nurses were involved in the data collection process and were supervised by three master’s students. For all data collectors and supervisors, a 1-day training was given to brief them on the data collection instrument, interview technique, and importance of taking informed consent before starting the real data collection process. Each day, data were checked for completeness and consistency.

## Statistical analysis of the data

All filled questionnaires were checked for completeness and consistency, and double data entry was made using the Epidata 3.1 software. Then the data were exported to the SPSS statistical package version 20 for further analysis. Frequencies, proportion, and summary statistics were used to describe the study population in relation to relevant variables and presented in tables afterward; bivariate analysis was carried out to identify candidate variables for the multivariable regression analysis. Then, to identify the predictors of sexual behaviors among ART attendants, only variables that were significantly associated in the bivariate analysis were entered into multinomial regression modes. In the first regression model, those variables with a level of significance  $P < 0.05$  were entered to the final model to assess the predicting power of sexual behaviors of ART attendants. Interactions between different variables were checked and collinearity diagnostics was done by checking the variance inflation factor. All tests were two sided, and a value of  $P < 0.05$  was considered statistically significant. The results are reported as odds ratios (ORs) with 95% confidence interval.

## Ethical clearance

A letter of ethical clearance was obtained from the Research Ethics Committee of Jimma University. Then, a formal letter was addressed to the Addis Ababa Administrative Health Bureau, subcity health offices, and the respective health centers. Each respondent was asked for willingness to

participate after confidentiality and anonymity were assured. Verbal consent with “yes” and “no” check boxes was included on the questionnaire’s cover page. If the participant was willing to take part, the “yes” box was marked and the interview continued. Further, each study participant was informed of the right to withdraw from participation if they felt uneasy during the interview. However, since the interview did not incur any health hazard, and a written consent negatively affects true responses, such a consent was not sought from participants, and the researchers deliberately avoided the written consent to get maximum true responses. Also, the College of Public Health and Medical Science Research Ethical Committee (CPHMSREC) approved informed consent was obtained. Ethical approval was given and followed during this study.

## Results

### Sociodemographic characteristics of the respondents

A total of 376 respondents participated in the study. The majority of the respondents (244, 64.9%) were females, and 132 (35.1%) were males. The mean age of the total respondents was 35.28 (SD  $\pm$ 8.94). Majority of the respondents (34.6%) and (31.9%) were in the age groups 25–31 and 32–38, respectively (Table 1).

### Descriptive statistics of factors affecting risky sexual behaviors among ART attendants

From individual factors, the attitude toward safe sex of 376 respondents showed a mean score of 26.55 (SD  $\pm$ 3.94). The range was 25, with the highest score of 38 and the lowest score of 13 (Table 2).

Regarding alcohol consumption, 61 (16.2%) of the respondents had a history of alcohol consumption in the last 3 months; concerning other substance use, 89 (23.7%) had a history of substance use and 74 (19.7%) used khat and the remaining nine (2.5%) and six (1.6%) used cigarettes and shisha, respectively. As for the HIV serostatus disclosure, about half of the respondents (211, 56.1%) had disclosed their serostatus to their friends and family, whereas 165 (43.9%) had not (Table 3).

### Stigma experience

Regarding stigma, 122 (32.4%) of the respondents had experienced a history of stigma (enacted stigma) and 171 (45.5%) were under the feeling of perceived stigma (Table 4).

**Table 1** Sociodemographic characteristics of ART attendants in selected health centers of Addis Ababa, Ethiopia (2013)

Characteristics	Frequency (N=376)	Percent
Gender		
Male	132	35.1
Female	244	64.9
Age		
18–24	18	4.8
25–31	130	34.6
32–38	120	31.9
39–45	69	18.4
$\geq$ 46	39	10.4
Ethnicity		
Amhara	191	50.8
Oromo	97	25.8
Guraghe	50	13.3
Tigre	27	7.2
Other <sup>a</sup>	11	2.9
Educational status		
Unable to read and write	49	13.0
Able to read and write	44	11.7
Grade 1–8	119	31.6
Grade 9–10	84	22.3
Grade 11–12	41	10.9
Above grade 12	39	10.4
Religion		
Orthodox	291	77.4
Muslim	41	10.9
Protestant	32	8.5
Other <sup>b</sup>	11	3.2
Marital status		
Married	196	52.1
Single	74	19.7
Divorced	51	13.6
Widow	44	11.7
Widower	11	2.9
Occupational status		
Employed	255	67.9
Unemployed	121	32.1
Income status (BIRR)		
150–300	98	26.1
301–650	88	23.4
651–1,200	98	26.1
1,201–1,600	92	24.5

**Notes:** <sup>a</sup>Wolyta, dorzie, siltie, gamo, hadya; <sup>b</sup>Catholic, Adventist, no religion.

**Abbreviation:** ART, antiretroviral treatment.

### Factors associated with risky sexual behaviors

Factors that are independently associated with risky sexual practice (inconsistent condom use) were explored by using a multivariate analysis. Those variables that showed a significant association ( $P < 0.05$ ) with risky sexual practices were assessed. From sociodemographic characteristics, individual factors which showed a significant association ( $P < 0.05$ ) in bivariate analysis were candidates for the multivariate

**Table 2** Attitude toward safe sex of respondents among ART attendants in selected health centers of Addis Ababa, Ethiopia (2013)

Variable	Frequency (N)	Mean	Standard deviation	Range
Attitude sum	376	26.55	3.94	25

**Abbreviation:** ART, antiretroviral treatment.

analysis. In the final model, those variables that were retained were gender, marital status, and alcohol consumption, which were significantly associated with risky sexual behavior (inconsistent condom use). Gender has a significant effect on risky sexual practice. Males are one and half times more likely to engage in risky sexual practice than females (adjusted odds ratio [AOR]=1.55, 95% CI: 1.01, 2.33). As for marital status, being single and widowed respondents were significantly associated (AOR =0.299, 95% CI: 0.151, 0.594; and AOR =0.316, 95% CI: 0.129, 0.778, respectively). Concerning individual factors, alcohol consumption was significantly associated with risky sexual practice (AOR =2.01, 95% CI: 1.070, 3.768) (Tables 5 and 6).

## Discussion

Currently, research has found that some ART users remain sexually active, that they experience trouble using condom regularly, and that there are still men and women living with HIV who encounter difficulty in maintaining safe sex.<sup>14,15</sup> This study showed that 30.4% of the respondents had engaged in risky sexual practice, inconsistent use of a condom during

**Table 3** HIV status disclosure and alcohol and other substance use of respondents among ART attendants in selected health centers of Addis Ababa, Ethiopia (2013)

Variable	Frequency	Percent
<b>Alcohol and substance abuse</b>		
Alcohol use		
Yes	61	16.2
No	315	83.8
Khat		
Yes	74	19.7
No	302	80.3
Smoking		
Yes	9	2.4
No	367	97.6
Shisha		
Yes	6	1.6
No	374	99.5
HIV status disclosure		
Yes	211	56.1
No	165	43.9

**Abbreviations:** HIV, human immunodeficiency virus; ART, antiretroviral treatment.

**Table 4** Stigma experience of respondents among ART attendants in selected health centers of Addis Ababa, Ethiopia (2013)

Variable	Frequency (N=376)	Percent
<b>Stigma experienced</b>		
Enacted stigma		
Stigmatized	122	32.4
Not stigmatized	254	67.6
Perceived stigma		
Stigmatized	171	45.5
Not stigmatized	205	54.5

**Abbreviation:** ART, antiretroviral treatment.

sexual intercourse within the last 3 months prior to the study period. This result is consistent with the results of the study conducted in South Africa and Kenya, which had a prevalence of 30% and 28%, respectively. This may be due to the similarity in geographical area and other socioeconomic status of the two populations. Another study conducted in Dar es Salaam, Tanzania, showed that the prevalence of unprotected sex was around 40.0%.<sup>16</sup> This is relatively higher than that seen in this study. This may be due to high numbers of tourists flowing and expansion of hotels as compared to Addis Ababa, thus making young women and men engage in commercial sex.

Independent variables gender, marital status, and alcohol consumption showed a significant relationship with risky sexual practice in regression analysis. Regarding marital status, in this study half of the respondents were married, which accounts for 52.1%. The remaining were single, widowed, and divorced. There was a significant relationship established between marital status and the risky sexual practice of respondents who were taking ART. This result is supported by a study conducted in Central Uganda, where marital status has a significant relationship with the risky sexual practice.<sup>9</sup> In this study, married respondents were more likely engaging in risky sexual practices as compared with single and widowed respondents. This might be due to the high intention of having a child and, married ART users blame each other for first contracting the virus in marriage, so as revenge they practice more risky sex compared to single and widowed respondents. Being single shows significant association with risky sexual practice, which is inconsistent with the result of a study done in south west of Uganda.<sup>17</sup> In addition to this, widowed individuals showed a significant relationship with risky sexual practice as protective factors. This may be because those single and widowed respondents have no intention and desire for reproduction and they may prefer to lead an abstinent type of relationship so that they

**Table 5** Regression analysis of sociodemographic characteristics and individual factors with risky sexual practice (inconsistent condom use) among ART attendants in Addis Ababa health centers (2013)

Characteristics	Inconsistent condom use		COR (95% CI)	AOR (95% CI)
	Yes <sup>a</sup>	No <sup>a</sup>		
Gender				
Male	81 (31)	51 (44.3)	<b>1.78 (1.14–2.83)*</b>	<b>1.55 (1.01–2.33)*</b>
Female	180 (69)	64 (55.7)	1.00	1.00
Age				
18–24	12 (4.6)	6 (5.2)	1.21 (0.42–3.46)	
25–31	92 (35.2)	38 (33.0)	1.00	
32–38	84 (32.2)	36 (31.3)	1.04 (0.60–1.79)	
39–45	45 (17.2)	24 (20.9)	1.29 (0.69–2.40)	
≥46	28 (10.7)	11 (9.6)	0.951 (0.43–2.10)	
Educational status				
Unable to read and write	37 (14.2)	12 (10.4)	0.75 (0.35–1.59)	
Able to read and write	25 (9.6)	19 (16.5)	1.75 (0.86–3.58)	
Grade 1–8	83 (31.8)	36 (31.3)	1.00	
Grade 9–10	57 (21.8)	27 (23.5)	1.05 (0.57–1.93)	
Grade 11–12	33 (12.6)	8 (7.0)	0.56 (0.24–1.33)	
Above grade 12	26 (10.0)	13 (11.3)	1.15 (0.53–2.49)	
Marital status				
Married	117 (44.8)	79 (68.7)	1.00	1.00
Single	61 (23.4)	13 (11.3)	<b>0.32 (0.16–0.62)*</b>	<b>0.30 (0.15–0.59)*</b>
Widow	34 (14.2)	7 (6.1)	<b>0.28 (0.12–0.67)*</b>	<b>0.32 (0.13–0.78)*</b>
Widower	9 (3.4)	2 (1.7)	0.33 (0.07–1.58)	0.25 (0.05–1.27)
Divorced	37 (14.2)	14 (12.2)	0.57 (0.29–1.12)	0.64 (0.32–1.29)
Religion				
Orthodox	201 (77)	90 (78.3)	1.00	
Muslim	27 (10.3)	14 (12.2)	1.17 (0.59–2.34)	
Protestant	23 (8.8)	9 (7.8)	0.88 (0.39–1.99)	
Others <sup>b</sup>	9 (3.14)	3 (1.76)	0.57 (0.12–2.71)	
Ethnicity				
Amhara	127 (48.7)	64 (55.7)	1.00	
Oromo	77 (29.5)	20 (17.4)	0.52 (0.29–1.93)	
Guraghe	35 (13.4)	15 (13.0)	0.86 (0.44–1.69)	
Tigre	16 (6.1)	11 (9.6)	1.39 (0.61–3.16)	
Other	6 (2.3)	5 (4.3)	1.68 (0.49–5.72)	
Occupational status				
Employed	178 (68.2)	77 (67.0)	1.00	
Unemployed	83 (31.8)	38 (33.0)	0.97 (0.61–1.55)	
Income status (BIRR)				
150–300	72 (27.6)	26 (22.8)	1.00	
301–650	58 (22.2)	30 (26.3)	1.43 (0.76–2.69)	
651–1200	67 (25.7)	31 (27.2)	1.28 (0.69–2.38)	
1,201–1,600	64 (24.5)	27 (23.7)	1.17 (0.62–2.21)	

**Notes:** \* $P < 0.05$ ; <sup>a</sup>values in parentheses indicate percentages; <sup>b</sup>Catholic, Adventist, and no religion. Bold indicates that this variable has a significant relationship with risky sexual practice.

**Abbreviations:** ART, antiretroviral treatment; COR, crude odd ratio; AOR, adjusted odds ratio.

do not infect their other partners. Another possible explanation may be that those single and widowed respondents may experience stigma, which affects their interaction with the community as compared to married respondents.

In this study the prevalence of alcohol consumption was around 16.2%. Studies have established that engaging in sex under the influence of alcohol can weaken judgment, compromise the power of balanced decision making about sex, and increase risky sexual behavior. In relation to this, about one

sixth of the respondents admitted to consumption of alcohol in the previous 3 months. Those who used alcohol in the last 3 months had about twofold higher possibility of having risky sexual practice than those who did not use alcohol. Similarly, a study conducted in Addis Ababa showed that those who consumed alcohol were two times more likely to have risky sexual practice than those who did not use alcohol.<sup>14</sup> This was also supported by a research conducted in SNNPR that showed that those who reported alcohol use were found to

**Table 6** Multiple logistic regression analysis of individual and perceived social factors with risky sexual practice (inconsistent condom use) among ART attendants in Addis Ababa health centers (2013)

Variable	Inconsistent condom use		COR (95% CI)	AOR (95% CI)
	Yes <sup>a</sup>	No <sup>a</sup>		
HIV disclosure status				
Yes	151 (57.9)	60 (52.2)	1.00	
No	110 (42.1)	55 (47.8)	0.80 (0.51–1.24)	
Alcohol use				
Yes	34 (13.0)	27 (23.5)	<b>2.05 (1.17–3.59)*</b>	<b>2.01 (1.070–3.77)*</b>
No	227 (87.0)	88 (76.5)	1.00	1.00
Kaht				
Yes	51 (19.5)	23 (20.0)	1.03 (0.59–1.78)	
No	210 (80.5)	92 (80)	1.00	
Smoking				
Yes	7 (2.7)	2 (1.7)	0.642 (0.13–3.14)	
No	254 (97.3)	113 (98.3)	1.00	
Shisha				
Yes	5 (1.9)	1 (0.9)	0.45 (0.05–3.88)	
No	256 (98.1)	114 (99.1)	1.00	
<b>Stigma experience</b>				
Enacted stigma				
Stigmatized	77 (29.5)	45 (39.1)	0.65 (0.41–1.03)	
Not stigmatized	184 (70.5)	70 (60.9)	1.00	
Perceived stigma				
Stigmatized	113 (43.3)	58 (50.4)	0.75 (0.48–1.17)	
Not stigmatized	148 (56.7)	57 (49.6)	1.00	

**Notes:** \* $P < 0.05$ ; <sup>a</sup>values in parentheses indicate percentages. Bold indicates that this variable has a significant relationship with risky sexual practice.

**Abbreviations:** ART, antiretroviral treatment; COR, crude odd ratio; AOR, adjusted odds ratio; HIV, human immunodeficiency virus.

be six times more likely to practice risky sexual behavior compared to nonalcohol users.<sup>18</sup>

Furthermore, in a study conducted in South Africa on sexual risk behavior among HIV-positive individuals in clinical care in urban KwaZulu-Natal, consumption of alcohol had a significant relationship with engagement in risky sexual practice, which was similar to the results of a study conducted in southwestern Uganda.<sup>17,19</sup> Similarly, in a study conducted in Papua New Guinea, alcohol consumption was statistically associated with risky practice. Individuals in this study were twice more likely to have risky sexual practice as compared to nonalcohol users.<sup>20</sup> This finding was very similar to our results, which showed that individuals who consumed alcohol were two times more likely to engage in this practice. This may be due to the fact that alcohol use can hinder the thinking and decision-making ability about safe sex.

In this study, the gender of the respondents showed a significant association with risky sexual practice; among the respondents, males were 1.56 times more likely to engage in risky sexual practice than were female respondents. This may be due to the effect of a male-dominant culture, where male individuals practicing sex with many partners is considered more acceptable than females doing the same. Others studies reveal that females

usually underreport their risk behaviors due to different undisclosed reasons.<sup>21,22</sup> This may be due to gender norms that are prevalent in Africa and other Asian countries with a male-dominant culture.

## Conclusion and recommendations

Generally, this study found that the prevalence of risky sexual practice among ART attendees is relatively higher and that there was also a significant association between having risky sexual practice and gender, marital status, and alcohol consumption in the last 3 months of the study. On the other hand, single and widowed respondents were less likely to engage in risky sexual practices than were married couples.

This study also revealed that a high number of ART users continued to have a risky sexual practice. This may be due to the improvement of health status of the respondents after the introduction of ART. So experts who are responsible for the prevention of disease at this level should follow the existence of proper counselling as well as health education by strengthening supportive supervision and conducting basic and refreshment training for the health providers so that health workers encourage, support, and allow clients to effectively use condoms.

Marital status, alcohol use, and the gender of the respondent were statistically associated variables for risky sexual

practice. Widowed and single individuals were less likely to engage in risky sexual practice as compared with married ones. And males are more likely to engage in risky sexual behavior than are females. Alcohol users were more likely to engage in risky sexual practice. These conditions could lead to the risk of reinfection of HIV/AIDS and aggravate the burden of HIV/AIDS for the whole community as well as for the country. So responsible individuals, organizations, as well as the government should work hand in hand in fighting this huge problem.

## Limitations of the study

The study has a cross-sectional design and could not address the dynamic nature of sexual behavior, which could be better addressed through a longitudinal study. The research addressed sensitive issues of ART clients, and hence the possibility of social desirability bias is unavoidable.

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## Disclosure

The authors report no conflicts of interest in this work.

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