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ORIGINAL RESEARCH

Consistent condom use in HIV/AIDS patients receiving antiretroviral therapy in northwestern Ethiopia: implication to reduce transmission and multiple infections

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Background: Human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) is one of the greatest public health problems of sub-Saharan African countries. Consistent condom use, among others, remains the most effective barrier method against HIV transmission. However, existing reports on frequency of consistent condom use have targeted the general public, rather than HIV/AIDS patients due, to the assumption that condom use is not important in HIV-infected persons. Since consistent condom use among HIV/AIDS patients is vital, to prevent the virus transmission from the infected to noninfected as well as to prevent multiple infections among already infected persons, its frequency and determining factors need to be investigated.

Methods: A cross-sectional study was conducted from April 2013 to May 2013 among 317 randomly selected patients who were currently taking antiretroviral therapy (ART). Logistic regressions were performed to examine predictors of consistent condom use.

Results: A total of 317 HIV/AIDS patients who were currently receiving ART participated in the study, and the mean age of the study population was 31.4 (standard deviation [SD] 10.5) years. Overall, 250 (78.9%) participants reported consistent condom use in the past 6 months. Of these, 140 (88.6%) were males and 110 (69.1%) females. Multivariate analysis indicated that respondents with an advanced level of education were more likely to report regular use of condoms (odds ratio [OR] 8.98; 95% confidence interval [CI] 5.06–14.45) compared with illiterate participants. Being male (OR 6.87; 95% CI 3.84–11.22), living in or around a town (OR 4.65; 95% CI 3.09–9.11), and taking ART for longer time (OR 3.91; 95% CI 2.07–6.25) were also positively associated with consistent condom use.

Conclusion: Females, patients living in rural areas, uneducated groups, and new ART users were less likely to use condoms consistently. The importance of consistent condom use should be well-addressed in HIV/AIDS patients, to prevent transmission and multiple infections of HIV.

Keywords: barrier method against HIV, patients on ART, Ethiopia

Introduction

Human immunodeficiency virus (HIV)/ acquired immune deficiency syndrome (AIDS) affects 22.4 million to 28 million people and is responsible for the deaths of 1.4 million in the sub-Saharan African countries alone.[1] Ethiopia is home to approximately 800,000 patients with HIV/AIDS, and the prevalence of HIV/AIDS in the general population is estimated to be 1.5%.[2] Antiretroviral therapy (ART) has reduced mortality and morbidity from HIV disease, improving the wellbeing of many people living

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with HIV, and has enabled many HIV-infected parsons to live a longer and healthier life.[3–6] Yet if they have sex without a condom, those with higher viral load or low CD4 count before or at the initiation of ART have the potential to infect a seronegative sexual partner or may themselves be at risk of acquiring drug-resistant viral strains from a sexual partner who is already infected.[7,8] In Ethiopia, HIV-positive people face a verity of social, psychological, and health problems that may be caused by various factors. In particular, HIV-positive women and girls suffer a high level of domestic sexual violence and experience pervasive economic, social, and legal discrimination.[9]

One of the key methods of prevention of HIV/AIDS transmission is the use of condoms during all types of sexual intercourse. Given that unprotected intercourse with a HIV-infected person is a source of transmission, poor use of condoms and other preventive mechanism by those patients will add more to the disease prevalence. Although, free condoms are made available by the Ethiopian governmental health institutions throughout the country, the emphasis has been on people uninfected with HIV. As a result, data regarding the magnitude of consistent condom use among HIV/AIDS patients appear to be scarce. Therefore, the present study is intended to generate information about the frequency of consistent condom use and the determining factors among adult HIV/AIDS patients receiving ART.

Methods

Study area

The study was conducted at the University of Gondar Hospital ART clinic, located 727 km north-west of the capital city, Addis Ababa. The university of Gondar Hospital is one of the oldest health institutions, providing different inpatient and outpatient services for more than 5 million people. The total number of HIV/AIDS patients who have registered at the ART clinic since 2003 is 4,063. In 2013, at the time of study, approximately 3,000 active patients were receiving their medication, and 1,372 of them were on ART for at least 3 months and were aged above 18 years.

Design and sampling

A hospital-based, cross-sectional study design was adopted, from April to May 2013. The data on variables of interest were collected, using an interview guide, among 317 randomly selected subjects. The sample size was calculated from the total population of 1,372 patients who had been treated for at least 3 months and were aged above 18 years, using the formula for estimation of a single proportion. The proportion of consistent condom use was assumed to be 50% since there was no similar previous finding, and the margin of error of estimation was assumed to be 5%, or 0.05. A total of 13 patients, who came to the clinic without appointment, were unable to communicate, were mentally handicapped, seriously ill, unwilling to participate, or who were aged less than 18 years, were excluded from the study and were replaced with other participants, to reach the final sample size of 317.

Data collection procedure

A structured interview questionnaire, first prepared in English then translated into the national language, Amharic, was used to collect data. Then, the questionnaire was back-translated to English from Amharic for the data entry. Three pharmacists who were not working in that clinic were recruited and trained as data collectors. Participants were interviewed in an isolated, private room found close to the ART clinic. Before the actual data collection, a pretest was conducted with 30 clients who were not included in the main study, in order to standardize the data collections tools.

Variables

The dependent variable was consistent condom use (use of condom in every sexual encounter in the last 6 months preceding the study), and the independent variables included sociodemographic characteristics, such as age, sex, marital status, religion, residence (urban/rural), employment status (employed/not employed), and duration since ART commencement. A binary scale (yes/no) was employed to measure the general awareness regarding condom use among HIV/AIDS patients, based on eight related questions. The number of "yes" or "no" answers were considered to examine participants' awareness for specific topics related to condom use. Participants' response as "yes" or "no" for a given statement questionnaire was treated separately. The proportion of respondents who said yes or no for single question was discussed instead of how many questions answered.

Data analysis

SPSS Statistics, version 20 for Windows was adopted to analyze the data. Bivariate analysis was carried out to see the association of each independent variable and the dependent variable, and those that had less than a 0.2 level of significance remained in the final models. Finally, a stepwise multiple logistic regression analysis technique was carried

out; both adjusted and unadjusted odds ratio (OR) and corresponding 95% confidence interval (CI) were employed to examine associations.

Ethical considerations

Ethical clearance was obtained from the University of Gondar, and the verbal informed consent of participants was obtained.

Results

Study population characteristics

The total study participants were 317 in number, with an age range of 18–69 years. The mean age of the study population was 31.4 (standard deviation [SD] 10.5) years. Female dominated slightly, constituting 159 (50.2%) of the total participants. The majority of respondents 212 (66.9%) were orthodox Christians. More than two-thirds of participants were urban residents 234 (73.8%), while approximately one-third of the total respondents 118 (37.2%) had completed secondary school, and 54 (17%) participants were illiterate. More than one-third of respondents had been taking their medication for more than 3 years (Table 1).

Table 1 Sociodemographic characteristics of participants

Variables	Frequency	Percentage
Sex		
Male	158	49.8
Female	159	50.2
Age (years)		
18–30	105	33.1
31–45	148	46.7
46–65	50	15.8
>65	14	4.4
Religion		
Orthodox	212	66.9
Muslim	82	25.9
Protestant	23	7.2
Marital status		
Married	140	44.2
Single	67	21.1
Divorced	57	18.0
Widowed	53	16.7
Residence		
Urban	234	73.8
Rural	83	26.2
Educational status		
Primary school	105	33.1
Secondary school	118	37.3
Higher education	40	12.6
Illiterate	54	17.0
Duration since ART initiated (in months)		
3–6	29	9.2
6–12	71	22.4
12–36	78	24.6
>36	139	43.8

Note: N=317.
Abbreviation: ART, antiretroviral therapy.

General awareness about condom use

Despite that 305 (96.2%) participants had heard about condoms, only just over one-half (57.4%) of the total participants had attended a special awareness session. The majority, 275 (86.8%), of respondents were aware that condoms generally prevent sexually transmissible diseases, including HIV/AIDS. Additionally, 295 (93.1%) knew that condoms prevent unwanted pregnancies as well. Despite that the majority had good awareness about condoms, only 250 (78.9%) of the participants had used condoms on regular basis (Table 2).

Determinants of consistent condom use

The predictors of consistent condom use were examined using logistic regression analysis. The result showed that the sex, residential area (urban or rural), achieving

Table 2 Participants' general awareness regarding condom and its utilization

Questionnaire statements	Frequency	Percentage
Have you ever heard of condom		
Yes	305	96.2
No	12	3.8
Have you ever attended any condom demonstration session		
Yes	182	57.4
No	135	42.6
Correct use of condom will prevent HIV/AIDS transmission		
Yes	275	86.8
No	42	13.2
Correct use of condom will prevent STIs		
Yes	267	84.2
No	50	15.8
Correct use of condom will prevent pregnancy		
Yes	295	93.1
No	22	6.9
Correct use of condom will reduce the chance of getting HIV		
Yes	269	84.9
No	48	15.1
The HIV virus cannot pass through the condom		
Yes	238	75.1
No	79	24.9
I always use condom during sex in the last 6 months		
Yes	250	78.9
No	67	21.1

Note: N=317.
Abbreviations: AIDS, acquired immune deficiency syndrome; HIV, human immunodeficiency virus; STI, sexually transmitted infection.

Table 3 Factors associated with consistent condom utilization

Variables	Consistent condom use		COR (95% CI)	*P*-value	AOR (95% CI)	*P*-value
	Yes (%)	No (%)				
Sex						
Male	140 (88.6)	18 (11.4)	8.38 (4.83–13.99)	0.0001	6.87 (3.84–11.22)	0.001
Female	110 (69.1)	49 (30.9)	1.00		1.00	
Age (years)						
18–30	81 (77.1)	24 (22.9)	1.00		1.00	
31–45	121 (81.7)	27 (18.35)	1.07 (0.75–1.45)	0.024	0.98 (0.51–1.29)	0.052
46–65	38 (76)	12 (24)	0.88 (0.56–1.23)	0.092	0.89 (0.59–1.20)	0.180
>65	10 (71.4)	4 (28.6)	0.67 (0.40–1.02)	0.180	0.82 (0.51–1.30)	0.200
Religion						
Orthodox	162 (76.4)	50 (23.6)	1.00		1.00	
Muslim	65 (79.3)	17 (20.7)	0.85 (0.52–1.29)	0.030	0.89 (0.35–1.40)	0.440
Protestant	23 (100)	0 (0)	1.28 (0.99–1.89)	0.041	0.92 (0.68–1.44)	0.090
Marital status						
Married	115 (82.1)	25 (17.9)	1.00		1.00	
Single	60 (89.6)	7 (10.4)	3.50 (2.77–6.90)	0.017	2.90 (1.98–4.90)	0.060
Divorced	42 (73.7)	15 (26.3)	1.09 (0.59–1.40)	0.095	0.87 (0.41–1.10)	0.284
Widowed	33 (62.3)	20 (37.7)	0.79 (0.25–1.19)	0.110	0.80 (0.26–1.28)	0.196
Residential area						
Urban	188 (80.3)	46 (19.7)	6.40 (3.44–11.80)	0.001	4.65 (3.09–9.11)	0.001
Rural	62 (74.6)	21 (25.4)	1.00		1.00	
Educational status						
Primary	84 (80)	21 (20)	1.98 (1.43–2.48)	0.010	1.45 (1.03–2.23)	0.023
Secondary	99 (83.9)	19 (16.1)	2.00 (1.43–3.87)	0.010	1.74 (1.23–2.98)	0.011
Higher	37 (92.5)	3 (7.5)	12.38 (7.70–20.84)	0.001	8.98 (5.06–14.45)	0.001
Illiterate	30 (55.6)	24 (44.4)	1.00		1.00	
Duration on ART (in months)						
<3	19 (65.5)	10 (34.5)	1.00		1.00	
3–12	61 (85.9)	10 (14.1)	1.22 (0.84–1.77)	0.003	1.14 (82–1.54)	0.078
12–36	61 (78.2)	17 (21.8)	2.39 (2.03–2.86)	0.020	2.19 (1.90–2.64)	0.069
>36	109 (78.4)	30 (21.6)	4.54 (2.33–7.67)	0.001	3.91 (2.07–6.25)	0.001

Abbreviations: AOR, adjusted odds ratio; ART, antiretroviral therapy; CI, confidence interval; COR, crude odds ratio.

better educational level, and staying longer on ART had a strong association with consistent condom use among the participants. Age level, marital status, and religion failed to present a significant difference in the final multivariate analysis (Table 3).

Discussion

Data regarding consistent use of condoms and factors associated with this among HIV-positive clients in Ethiopia appear to be inadequate. Previous studies addressed the issue of consistent condom use among the general public. However, due to the assumption that HIV-infected individuals do not need condoms since they are already infected, there is paucity of reports regarding the frequency and determinants of consistent condom use in HIV/AIDS patients. This study, therefore, may provide important information regarding the general patterns of condom use and factors that facilitate or limit condom use among HIV/AIDS patients receiving ART.

The findings in this study indicated that 305 (96.2%) respondents had heard of the condom as a preventive method for sexually transmitted diseases and pregnancy (Table 2). This result was higher than that in a study done in Uganda which reported 80%. (Uganda Ministry of Health, unpublished data, 2003). This difference could be ascribed to the time variation, in that the accessibility of information pertaining to condoms is now better than before.

Previous studies have shown that inconsistent condom use was associated with various behaviors that affect the use of condoms negatively. This may be explained by the theory of planned behavior, which posits that behavioral intentions are determined by attitudes, subjective norms, and perceived control, leading to considerable variation in actual behavior under different circumstances.[10–12] Empirical evidence from studies of high school and university students in South Africa similarly found that intention to use a condom was determined by normative beliefs, attitudes, and subjective norms.[10] These behavioral factors are believed to be improved through

time with the arrival of various mechanisms that inform individuals on the use of consistent condom use.

As illustrated in Table 3, consistent condom use was reported by 140 (88.6%) males and 110 (69.1%) females, and the overall regular condom use was 78.9% in 6 months prior to the study. This is almost in agreement with the reported 83% of condom use among HIV-positive heterosexual men and women in Guatemala. This is an indication that male sex is a strong predictor of consistent condom use (OR 6.87; 95% CI 3.84–11.22) in the past 6 months. This difference is perhaps due to the fact that men are more exposed to dialogues with friends and or colleagues that increased their awareness on use of condoms.[5,6]

On the other hand, the above difference could have been due to the fact that females are unable to negotiate condom use during sexual intercourse in most of African countries. Additionally, lower condom use among females could be explained by the fact that women are less likely to attend a health education intervention or to participate in associations for people living with HIV/AIDS, due to cultural differences and home-related duties that leave them too busy.[13,14]

Ntozi et al[15] reported that female sex workers' use or nonuse of condoms was situational – sometimes customers would force them to have sex without condoms or, in other instances, customers paid extra for non-condom use. Kibombo et al[16] reported that females in Uganda had little or no negotiation power when it came to condom use. In most of African countries, women are very disempowered and unable to decide to use condom; rather, the decision is made by the man. The present finding of our study exactly identified similar situations. Therefore, this is a factor that should be addressed during counseling at the clinic, in order to heighten the negotiation capacity of females and the willingness of male partners to openly discuss condom use with their partners.

According to a study conducted in South Africa, most of the women reporting condom use were also using another method of contraception (94%), which indicates condoms were being used by women primarily not for disease prevention.[17]

Participants aged between 31 and 45 years (OR 0.98; 95% CI 0.51–1.29) were more likely to practice consistent condom use compared with other age groups. It is not surprising that participants at sexually active age and with some maturity were more likely to have better information concerning condoms than were other groups. Participants in the age range of 31–45 years may possibly have a greater intention to talk to a partner about a condom, to use it during intercourse, and to say no to sex without a condom. In light of their intentions to protect themselves from unprotected sexual activities, they may more actively participate in condom-related educations.[13–15]

Consistent use of condom was significantly different between urban (OR 4.65; 95% CI 3.09–9.11) and rural participants. This could be explained by the information gap that would exist between these areas. Access to information, through media and various health institutions, may contribute to increased general awareness of and the importance of consistent condom use among people who are living in and around towns and cities.[14]

Respondents with an advanced level of education were more likely to report regular use of condoms (OR 8.98; 95% CI 5.06–14.45) compared with those without education. This result is quite similar to that of a study in Addis Ababa public hospitals and could possibly be due to behavioral changes acquainted through education.[18]

Further, we found that duration of ART was a significant predictor of consistent condom use. Accordingly, patients who had received ART for more than 3 years (>36 months) were more likely to use condoms consistently compared with those on ART for shorter duration. This could be due to the effect of more robust HIV prevention programs and counseling among ART-experienced patients compared with those who were new to ART. It was also found that uptake of condom use increased with time – the longer the follow-up period, the higher the prevalence of condom use. This may be a reflection of the fact that continual exposure to secondary prevention messages has a greater impact as time progresses.[19,20]

Conclusion

This study shows that there are groups of HIV/AIDS patients who are inconsistent condom users. Females, rural dwellers, uneducated groups, and new ART users were less likely to use condoms consistently. In light of this, increasing awareness about the importance of using condom can be a powerful means of fostering consistent condom use among patients receiving HIV drug treatment, in order to reduce the transmission. There were a few limitations in this study. First, the study subjects were recruited from a single referral hospital, which may limit the generalizability of the study. However, this study was able to generate important data on the frequency of consistent condom and possible determinants among patients who are HIV/AIDS-positive. In this regard, it is the first study to reveal the condom-use status of HIV/AIDS patients who are on ART. Finally, another limitation for the

study was that the inability to recall past sexual experiences could have caused measurement error.

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Author contributions

ZS and BL supervised the data collection. BT, ASB, and AE wrote the first draft of the manuscript. All contributed to the study design, data analysis, interpretation of the study findings, and drafting and revising the paper. All authors reviewed and approved the final manuscript prior to submission, and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflict of interests in this work.

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