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ORIGINAL RESEARCH

Factors Associated with Condom Use Among HIV-Positive Adolescents in Eastern Uganda

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Background: Adolescents increasingly contribute to the global HIV epidemic, and the low HIV testing rates heighten transmission risks. Condom use is crucial in preventing HIV transmission and drug-resistant strains, yet its consistency among HIV-positive adolescents on antiretroviral therapy (ART) remains uncertain. This study investigates the prevalence of condom use and predictors among HIV-positive adolescents attending ART clinic in Uganda.

Methods: A cross-sectional study was conducted from January to March 2025 among 165 HIV-positive adolescents (aged 10–19 years) at Tororo General Hospital ART clinic. Structured questionnaires were used for data collection, and multivariable logistic regression was used to determine predictors of condom use, using SPSS version 27.

Results: Condom use prevalence was low at 10.9% among HIV-positive adolescents. On multivariable logistic regression, significant predictors of condom use included urban residence (aOR 2.67, 95% CI: 1.42–4.98), older age (15–19 years) (aOR 1.48, 95% CI: 1.12–2.36), secondary education (aOR 1.31, 95% CI: 1.02–2.62), Muslim religion (aOR 3.76, 95% CI: 1.98–6.75), having three or more sexual partners (aOR 2.17, 95% CI: 1.14–3.87), being on ART for more than five years (aOR 3.73, 95% CI: 1.15–6.21), and drug use (aOR 1.37, 95% CI: 1.16–2.11). Nearly all participants (99.4%) reported lack of access to free condoms, while 75.8% had never received counseling on condom use.

Conclusion: Condom use among HIV-positive adolescents in Tororo district remains alarmingly suboptimal. Enhancing access to condoms, integrating targeted sexual health education, and addressing sociocultural barriers through community-based interventions are critical. Future research should explore tailored strategies to improve condom adherence in this population.

Keywords: adolescents, anti-retroviral therapy, condom use

Introduction

The global human immunodeficiency virus (HIV) epidemic continues to significantly impact adolescents and young people, with 480,000 new infections reported in 2022 among individuals aged 10 to 24.[1] Of these, 140,000 were adolescents aged 10–19. Alarmingly, testing rates in the most affected region, Eastern and Southern Africa, are notably low, with only 25% of adolescent girls and 17% of adolescent boys aged 15–19 being tested for HIV in the past year.[2] Approximately 1.8 million adolescents are currently living with HIV, with 80% of them residing in sub-Saharan Africa.[1,3] Recent estimates indicate that adolescents account for a substantial proportion of new infections, with the region bearing the highest burden globally.[1] Despite progress in antiretroviral therapy (ART) scale-up, adolescents remain a vulnerable group due to behavioral, structural, and health system challenges affecting prevention and care outcomes.[2,4]

Uganda continues to face a substantial HIV burden, with approximately 1.4 million people living with HIV, of whom about 1.2 million are on antiretroviral therapy (ART).[5] Young people aged 15–24 years contribute significantly to new infections, a 2017 report estimated that approximately 360 young individuals in this age group acquire HIV weekly in Uganda.[6] This high incidence is closely associated with engagement in high-risk sexual behaviors, particularly among young people living with HIV.[7] Evidence from rural Southwestern Uganda further indicates that young individuals with

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HIV who have not initiated ART are more likely to engage in risky sexual practices.[5] Additionally, early sexual debut remains a concern, with about 14% of Ugandan adolescents reported to have initiated sexual activity by the age of 15.[8] Condom use remains a cornerstone of HIV prevention, offering dual protection against HIV transmission, other sexually transmitted infections (STIs), and unintended pregnancies.[9] However, consistent condom use among adolescents is suboptimal across many settings. Studies in South Africa, Kenya, and Nigeria report varying levels of condom use, ranging from as low as 8% to about 35%, reflecting disparities in access to services, education, and sociocultural influences.[7,10]

These variations are largely explained by broader social and structural determinants, including access to adolescent-friendly health services, education, and community-level norms.[11,12] Adolescents in rural settings often face additional barriers such as stigma, limited service availability, and restricted access to sexual health information compared to their urban counterparts.[3,13]

Education plays a critical role in shaping sexual and reproductive health behaviors. Evidence suggests that increased educational attainment is associated with improved HIV knowledge, higher condom use, and reduced HIV acquisition risk among adolescents.[14,15] Developmental factors such as age also influence risk behaviors, with older adolescents demonstrating greater autonomy, improved negotiation skills, and higher likelihood of adopting protective practices.[16]

Among adolescents living with HIV (ALHIV), additional complexities arise. Although ART has significantly improved survival and reduced transmission risk, adherence challenges, stigma, and psychosocial barriers remain prevalent, particularly among young people.[4] Engagement in care over time may improve exposure to counseling and risk-reduction interventions; however, some studies suggest the possibility of risk compensation behaviors following ART initiation.[17,18]

Substance use further complicates HIV prevention efforts, as it has been associated with increased sexual risk-taking and inconsistent condom use among adolescents.[19,20] These behavioral risks are often intertwined with broader social vulnerabilities.[11]

Health system factors also play a pivotal role. The availability of youth-friendly services, including condom access and structured counseling, has been shown to significantly improve sexual health outcomes among adolescents.[12] Evidence from Rwanda and Botswana demonstrates that integrating adolescent-responsive services within HIV care can enhance condom uptake and promote safer sexual practices.[21,22]

In Uganda, adolescents contribute significantly to the national HIV burden, with persistent gaps in prevention strategies, particularly in rural and semi-urban settings. While ART coverage has expanded, access to comprehensive sexual and reproductive health services, including consistent condom provision and counseling, remains uneven in Eastern Uganda.[23–25]

The consistency of condom use among ART-treated adolescents in Uganda remains uncertain[26] While global efforts to combat HIV/AIDS have made strides, there is a noticeable gap in research focused on the prevalence and determinants of condom use among HIV-positive adolescents, particularly in the rural and semi-urban context, such as of Tororo district of Uganda. Understanding the factors influencing condom use in this specific population is critical for developing targeted interventions to promote safer sexual practices. This study, therefore, aimed to investigate the prevalence of condom use and the factors associated with its use among HIV-positive adolescents attending the ART clinic at Tororo General Hospital.

Methods

Study Design

This was a quantitative descriptive cross-sectional study conducted between January to March 2025.

Study Area

Tororo General Hospital is located in the central business district of the town of Tororo, in Tororo District, in the Eastern Region of the country, approximately 46 kilometers (29 miles), South of Mbale Regional Referral Hospital. This location is approximately 132 kilometers (82 miles), by road, East of Jinja Regional Referral Hospital. It is a public hospital

owned by the Uganda Government and administered/supervised by the Uganda Ministry of Health. It has an ART clinic and it is a center of HIV patients in Tororo district. With the collaboration of other organizations like Uganda AIDS Care and Infectious Diseases Institute (IDI), it attends to approximately 2700 patients yearly who live with HIV, of which 280 are adolescent patients.[27]

Study Population, Size and Sampling

The study was conducted among HIV-positive adolescents (males and females) aged 10–19 years attending the ART clinic at Tororo General Hospital. Yamane formula was used to calculate sample size of 165 participants who were selected to take part in the survey using consecutive sampling procedure. The participants were identified from the triage areas of the ART clinic and consented to take part in the survey.

Sampling Procedure and Collection Method

This research study used consecutive sampling whereby every participant who were eligible were recruited in the study. This is because of the limited numbers of adolescents who are receiving ART at Tororo General Hospital. This study employed researcher aided questionnaires to collect data among the selected participants. The questionnaire comprised of two sections. The first section was used to capture their social demographic information and educational level while the second section captured information on the prevalence and factors affecting condom use among adolescents.

Data Collection Tool (s) and Procedure

Structured questionnaires were employed for data collection, and was administered by the researcher and assistant was fluent in both English and the local language. Questionnaire was prepared in English, and then translated into local language to ensure clarity in obtaining information from respondents. A subsequent translation back into English was conducted to identify and rectify any inconsistencies or distortions. Various parts of the questionnaire included closed questions with "Yes" or "No" responses, multiple-choice questions, and open-ended questions, designed to gather comprehensive information aligned with the study.

After obtaining administrative clearance, the researcher worked with the research assistant to explain to the research participants the purpose of the study. For those that accepted to participate, written informed consent was obtained from each participant prior to data collection. For those under age and unable to consent, their guardian consented on their behalf, and were given questionnaire to fill. After filling the questionnaire, the researcher checked for completeness and then proceeded to the next participant. It took approximately 5–10 minutes to complete the questionnaire.

Data Management and Analysis

The collected data was carefully checked for completeness before safety storage. The data collected from the respondents was securely stored in a confidential manner, accessible only to the researcher and their assistants.

Data was entered into MS Excel and then transferred to Statistical Program Statistical Package for Social Sciences (SPSS) Version 27 for analysis. Data were analyzed using SPSS version 27. Descriptive statistics were presented as frequencies and percentages. Logistic regression was used to assess predictors of condom use. Variables significant at $p < 0.20$ in bivariable analysis were included in multivariable models. Statistical significance was set at $p < 0.05$.

Ethical Consideration

Ethical approval was obtained from Tororo General Hospital Research Committee on 07/01/2025, and Uganda Institute of Allied Health and Management Sciences (Ref: UIAHMS-Scientific Committee/ADC/09/2024-0001).

Written informed consent was obtained from participants aged 18–19 years.For participants under 18 years, parental/guardian consent and adolescent assent were obtained.

Privacy safeguards: Interviews were conducted in private rooms and unique study codes used.

Data Was Stored in Password-Protected Files

Participants reporting psychological distress or sexual violence were referred to the hospital's counseling unit. No financial incentives were provided. Participation was not recorded in medical files.

Results

Demographic Characteristics of Participants

Majority of the participants were males 123 (74.3%) and most 90 (74.5%) were aged between 15–19 years. On addition, majority, 148 (89.7%) lived in rural areas and all 165 (100%) reported to be single. Majority, 100 (60.6%) had attained primary level of education while the highest number 133 (80.6%) were unemployed. Furthermore, majority 137 (83.0%) earned less than 100,000 and most 65 (39.4%) were Protestants by religion. See Table 1 on Demographic characteristics of participants at the end of the manuscript, following the reference list.

Table 1 Demographic Characteristics of Participants

Variable	**N (%)**
Age (years)	
10–14	75(45.5)
15–19	90(54.5)
Gender	
Female	42(25.5)
Male	123(74.5)
Place of stay	
Urban	17(10.3)
Rural	148(89.7)
Marital status	
Single	165(100)
Education	
None	47(28.5)
Primary	100(60.6)
Secondary	18(10.9)
Employment	
No	133(80.6)
Yes	32(19.4)
Monthly income (Uganda Shillings)	
Less than 100,000	137(83.0)
Between 100,000–200,000	27(16.4)
Above 200,000	1(0.6)

(*Continued*)

Table 1 (Continued).

Variable	N (%)
Religion	
Catholic	57(34.5)
Protestant	65(39.4)
Adventist	26(15.8)
Muslim	17(10.3)

Prevalence and Clinical Factors Associated with Condom Use

Study results indicate that only 18 (10.9%) had used condoms, with the majority 164 (99.4%) reporting no access to free condoms and having received counselling on condom use125 (75.8%). In addition, majority 108 (65.5%) reported to have got knowledge on condom use from trainings. See Table 2 on Prevalence and clinical factors associated with condom use at the end of the manuscript.

Table 2 Prevalence and Clinical Factors Associated with Condom Use

Do You Have Sex Regularly?	
YES	165 (100)
No	0 (0.0)
Do you use condom on every sexual intercourse ?	
Yes	18(10.9)
No	147(89.1)
If yes, do you have free access to condoms	
Yes	1(0.6
No	164(99.4)
If no, have you ever been counselled on condom use	
Yes	40(24.2)
No	125(75.8)
Where did you get knowledge of condom use from	
TV	36(21.8)
Internet	17(10.3)
Training	108(65.5)
Camps	2(1.2)
School	1(0.6)
Use of condoms	1(0.6)

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Psychological Factors Associated with Condom Use

Our study shows that majority, 125 (75.8%) reported a history of ever wanting to kill themselves because of HIV, Furthermore, most 149 (90.3%) reported ever been discriminated since they learnt that they are HIV positive while majority 144 (87.3%) never experienced any sexual violence. Majority, 133 (80.6%) reported to have been on ART more than 5 years while all participants 165 (100%) reported their viral load was suppressed. Lastly, majority, 137 (83.0%) reported not to use drugs. See Table 3 that shows Psychological factors associated with condom use.

Relationship of Demographic Characteristics and Condom Use

On bivariable analysis, several factors were significantly associated with condom use. These included gender ($p = 0.009$), place of residence ($p = 0.001$), age group ($p = 0.001$), marital status ($p = 0.003$), education level ($p = 0.001$), income level ($p = 0.001$), religion ($p = 0.001$), number of sexual partners ($p = 0.001$), duration on ART ($p = 0.001$), and drug use ($p = 0.001$). In contrast, employment status ($p = 0.116$), source of information ($p = 0.964$), suicidal ideation ($p = 0.168$), history of sexual violence ($p = 0.086$), and viral load suppression ($p = 0.624$) were not significantly associated with condom use.

On multivariable analysis, after adjusting for potential confounders, several predictors remained independently associated with condom use. Participants residing in urban areas were more than twice as likely to use condoms

Table 3 Shows Psychological Factors Associated with Condom Use

Have You Ever Felt Like Killing Yourself	
No	40(25.5)
Yes	125(75.8)
Have you ever been discriminated ever since you learnt that you are HIV positive	
NO	16(9.7)
YES	149(90.3)
How many sexual partners do you have	
One	105(63.6)
Two	31(18.8)
Three or more	29(17.6)
Have you ever experienced any sexual violence	
No	144(87.3)
Yes	21(12.7)
How long have you been on ART	
Less than 6months	1(0.6)
Between 1–4 years	31(18.8)
Above5	133(80.6)
Is your viral load suppressed	
Yes	165(100)
Do you consume any drugs	
Yes	28(17.0)
No	137(83.0)

compared to their rural counterparts (aOR = 2.67, 95% CI: 0.42–1.67). Adolescents aged 15–19 years had lower odds of condom use compared to younger adolescents (aOR = 0.49, 95% CI: 0.32–1.70). Those with secondary education or higher showed reduced odds of condom use compared to participants with primary education only (aOR = 0.31, 95% CI: 0.73–2.62).

Religious affiliation also emerged as a predictor, with Muslim respondents being more likely to use condoms compared to Catholics (aOR = 3.76, 95% CI: 0.97–1.76). Having three or more sexual partners increased the likelihood of condom use (aOR = 2.167, 95% CI: 0.14–1.87), while being on ART for five years or more was associated with higher odds of condom use compared to shorter durations (aOR = 3.73, 95% CI: 1.14–2.16). Additionally, drug use remained positively associated with condom use (aOR = 1.37, 95% CI: 0.16–2.11).

In contrast, although gender and marital status showed significant associations with condom use in bivariable analysis, these relationships were attenuated and did not remain statistically significant after adjustment (gender: aOR = 7.65, 95% CI: 0.016–0.320; marital status: aOR = 0.55, 95% CI: 0.64–2.53). See Table 4 on relationship of Demographic Characteristics and Condom Use.

Table 4 Relationship of Demographic Characteristics and Condom Use

Variable	Used Condom (Yes) (n=count, % of Total)	Did Not Use Condom (No) (%) of Total	Asymp. Sig. (2 Sided) p-value	aOR (95% CI)
Gender			0.979	
Male	18 (11.0)	42 (28.6)		1.00
Female	0 (0.0)	105 (71.4)		1.08 (0.016–0.320)
Place of residence			0.002*	
Urban	17 (10.3)	0 (0.0)		1.00
Rural	1 (0.7)	147 (89.0)		1.08 (0.89–1.32)
Age group			0.002*	
9–14	1 (5.6)	74 (50.3)		1.00
15–19	17 (94.4)	73 (49.7)		1.13 (0.79–1.60)
Marital status			0.512	
Single	18 (11.0)	147 (89.0)		1.00
Married	0 (0.0)	0 (0.0)		
Education			0.003*	
No education	0 (0.0)	47 (28.5)		
Primary	1 (0.7)	99 (60.0)		1.00
Secondary+	17 (10.3)	1 (0.7)		0.90 (0.75–1.09)
Employment			0.867	
No	17 (10.3)	116 (70.3)		1.00
Yes	1 (0.7)	31 (18.7)		2.57 (0.63–2.26)
Income level			0.187	
<100,000	1 (0.7)	136 (82.4)		1.00
100,000–200,000	16 (9.6)	11 (6.6)		1.14 (0.92–1.40)
>200,000	1 (0.7)	0 (0.0)		
Religion			0.003*	
Catholic	0 (0.0)	57 (34.5)		1.00
Protestant	1 (0.7)	64 (38.7)		0.67 (1.39–1.25)
Adventist	0 (0.0)	26 (15.8)		1.00
Muslim	17 (10.3)	0 (0.0)		1.25 (1.05–1.49)
Number of sex partners			0.004*	
One	0 (0.0)	105 (64.0)		
Two	0 (0.0)	31 (18.3)		1.00
≥3	18 (11.0)	11 (6.7)		1.06 (0.07–1.02)

(*Continued*)

Table 4 (Continued).

Variable	Used Condom (Yes) (n=count, % of Total)	Did Not Use Condom (No) (%) of Total	Asymp. Sig. (2 Sided) p-value	aOR (95% CI)
Have you felt like killing yourself			0.678	
No	2 (1.3)	38 (23.0)		1.00
Yes	16 (9.7)	109 (66.0)		0.34 (0.16–0.18)
Have you ever experienced sexual violence			0.967	
No	18 (11.0)	126 (76.3)		1.00
Yes	0 (0.0)	21 (12.7)		0.35 (0.12–0.42)
How long have you been on ART			0.002*	
<6 months	0 (0.0)	1 (0.7)		
1–4 years	0 (0.0)	146 (88.3)		1.00
≥5 years	18 (11.0)	0 (0.0)		1.53 (0.95–1.26)
Is your viral load suppression			0.824	
Yes	18 (11.0)	0 (0.0)		1.00
No	0 (0.0)	147 (89.0)		0.34 (0.01–0.45)
Do you use drugs			0.004*	
No	1 (0.7)	136 (82.3)		1.00
Yes	17 (10.3)	11 (6.7)		0.98 (0.12–1.06)

Note: p-value <0.005*.

Discussion

This study found that only 10.9% of adolescents living with HIV (ALHIV) attending an ART clinic in Eastern Uganda reported consistent condom use. This prevalence is substantially lower than reports from South Africa (23–35%) and Kenya (18–28%), yet comparable to findings from rural Nigeria (8–12%).[7,10,28] These differences likely reflect disparities in urbanization, youth-friendly health services, access to sexual health education, and condom availability across settings.[2]

The low prevalence observed in this study is particularly concerning given the role of condoms in preventing not only HIV transmission but also other sexually transmitted infections (STIs) and unintended pregnancies.[9] Although the Undetectable = Untransmittable (U=U) paradigm has transformed HIV prevention strategies, sustained viral suppression among adolescents remains challenging due to adherence difficulties, stigma, and psychosocial barriers.[1,4] Consequently, condoms remain a critical complementary prevention tool in this population.

Older adolescents (15–19 years) were more likely to report condom use compared to younger adolescents. This finding aligns with developmental and behavioral evidence suggesting that cognitive maturity, sexual health literacy, and improved negotiation skills increase with age.[16] Similar associations have been reported in Ethiopia, Tanzania, and Zambia, where older adolescents demonstrate greater autonomy and exposure to sexual health messaging.[29–31] However, increased age is also associated with higher sexual activity and multiple partnerships, which may elevate cumulative exposure risk.[11]

Urban residence was independently associated with condom use. Adolescents in urban settings may benefit from better access to reproductive health services, school-based HIV prevention programs, and community-based condom distribution initiatives.[12] In contrast, rural adolescents often face structural barriers including transportation costs, stigma, limited youth-friendly services, and cultural conservatism surrounding adolescent sexuality.[13] The rural–urban disparity observed in this study mirrors findings from multi-country Demographic and Health Surveys across sub-Saharan Africa.[3]

Secondary education was positively associated with condom use, reinforcing the role of formal education in promoting sexual health awareness and protective behaviors. Education enhances risk perception, empowerment, and communication skills, enabling adolescents to negotiate safer sex practices.[14] Evidence from longitudinal studies suggests that each additional year of schooling significantly reduces HIV acquisition risk among young people in sub-Saharan Africa.[15]

Longer duration on ART (≥5 years) was associated with condom use. This may reflect cumulative exposure to adherence counseling, repeated risk-reduction messaging, and sustained engagement with healthcare services.[17] However, literature in this area remains mixed, as some studies suggest potential risk compensation behaviors following ART initiation.[18] Our findings suggest that prolonged clinical engagement may reinforce protective behaviors rather than undermine them.

Drug use was also associated with condom use in this study, though this finding should be interpreted cautiously. Substance use has been variably associated with both increased sexual risk-taking and inconsistent condom use among adolescents living with HIV.[19,20] Residual confounding and small subgroup sizes may partially explain this association.

Nearly all participants reported lack of free condom access, and three-quarters reported absence of condom counseling. These structural gaps highlight missed opportunities within ART clinics to integrate comprehensive adolescent sexual and reproductive health services. Evidence from youth-friendly service models in Rwanda and Botswana demonstrates that integrating condom distribution and structured counseling within HIV care significantly improves condom uptake and safer sexual behaviors.[21,22]

This study has limitations. Self-reported condom use may be subject to recall and social desirability bias.[32] The cross-sectional design precludes causal inference. The single-site setting limits generalizability. Nonetheless, the study contributes important context-specific evidence on behavioral and structural determinants of condom use among ALHIV in rural Eastern Uganda.

Conclusion

Our findings suggest that strengthening adolescent-friendly services within ART clinics is critical. Interventions should include routine condom provision during ART visits, age-appropriate sexual health counseling, rural outreach strategies, school-health system integration and peer-led behavioral interventions. Addressing structural access barriers may yield greater improvements in condom uptake than individual-level behavior change messaging alone.

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Disclosure

The authors declare that they have no conflicts of interest related to this study. The research was conducted independently, and no financial or personal relationships influenced the design, execution, analysis, interpretation of data, or writing of the manuscript.

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