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Condom Use Behaviors and Correlates of Use in the Botswana Defence Force

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Abstract

Preventing HIV infection is a priority for militaries. HIV prevention research is needed to monitor existing programs, identify areas for modification, and develop new interventions. Correct and consistent condom use is highly effective against HIV. However, use among soldiers is lower than ideal. This study describes condom use behaviors and examines correlates of use in the Botswana Defence Force (BDF). Analyses were based on 211 male personnel, aged 18–30, who completed a cross-sectional survey that collected baseline data for an intervention study. Results showed that 51% of participants reported always using condoms, 35% used condoms most times, and 14% used condoms occasionally/never. Condom use varied by partner type and was typically higher with casual partners in comparison to regular partners. After adjustment for age and marital status, factors associated with lower condom use included excessive alcohol use, perception that using condoms reduce sexual pleasure, and having a trusted partner. However, higher levels of HIV knowledge and reports of being circumcised were protective against lower condom use. HIV interventions aimed at increasing condom use in the BDF should address condom perceptions, alcohol abuse, and issues of trust. Innovative ways to increase condom use in this population should also be explored.

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Conflict of Interest
The authors have declared that no competing interests exist.

Keywords

HIV/AIDS; military populations; sexual behaviors; condom use

Introduction

Botswana has one of the highest HIV prevalence rates in the world, estimated at 25% among adults aged 15–49.[1] While the HIV epidemic in Botswana is generalized, there is concern that military personnel may be particularly vulnerable due to unique circumstances that surround military service. They are predominately young, susceptible to peer pressure [2, 3], and highly mobile. To relieve stress and loneliness during deployments, soldiers may engage in risky sexual behaviors, such as having unprotected sex with sex workers.[4] Furthermore, studies have found high HIV risk-taking behaviors in this population, including having multiple sexual partners and abusing alcohol.[5–7]

There is overwhelming evidence that condoms are highly effective in preventing sexual transmission of HIV if used correctly and consistently.[8–10] However, consistent condom use among sexually active military personnel has generally been reported to be very low. For example, studies in the Nigerian military showed that consistent condom use was only found in 16–20% of participants [7], and 41% did not use a condom the last time they had sex with a sex worker.[4] In the Rwanda Defence Forces, 24% did not use a condom the last time they had sex with a sex worker.[11] And in the Angolan military, only 54% of participants reported using a condom during their last sexual encounter with a sex worker.[6]

While several studies have examined correlates and predictors of condom use among military personnel [6, 12, 13], additional research in other militaries is needed to better characterize these predictors, evaluate the effectiveness of existing military HIV prevention programs, and identify key program areas that need targeting or modification. This study describes current condom use behaviors and examines correlates of use in the Botswana Defence Force (BDF), which to our knowledge, has never been previously investigated.

Materials and Methods

Study Design and Participants

Data used for this analysis was based on a cross-sectional survey conducted among the BDF which formed the baseline data for a non-randomized intervention study of the effect of condom wrapper graphics and scent on condom use in the BDF. Participants were male BDF personnel who ever had sex, aged 18–30 years, and stationed at one of four selected military sites. Participants were recruited through flyers, command newsletters, and standard military communication channels. Interested personnel attended an informational briefing where the study purpose and procedures were explained. A total of 211 men (81.2%), of a target sample size of 260, provided written informed consent. This study was approved by institutional review boards in the United States (Naval Health Research Center and San Diego State University, San Diego, California) and Botswana (Ministry of Health, Gaborone, Botswana).

Study Procedures

Study personnel briefed interested individuals on the procedures and conducted the written informed consent process. Consented participants self-completed a paper-based survey that was administered in a group setting. Questions were read out loud by a trained survey administrator while participants followed along and marked responses on their surveys. The baseline survey collected demographics, sexual behavior history, condom use frequency, attitudes, and behaviors, HIV risk perception, HIV knowledge, alcohol use, and circumcision status.

Correlates of Interest

Sexual history correlates included age at sexual debut, number of lifetime partners, number of regular and casual partners in the past 12 months, and having more than one sexual partner in the past 3 months. HIV risk perception correlates included knowledge of one's HIV status, knowledge of others in the unit known to have HIV, and ever cared for or lived with someone with HIV/AIDS. Participants were tested on HIV prevention, transmission, and general knowledge with eight questions: five were based on the United Nations General Assembly Special Session (UNGASS) on HIV/AIDS core indicators [14], and three were locally adapted. The HIV knowledge score was calculated as a percent of the 8 HIV knowledge questions correctly answered. Participants with missing values for HIV knowledge questions were excluded from this calculation.

Circumcision status was self-reported. Alcohol use was measured using the Alcohol Use Disorders Identification Test (AUDIT), which has been validated in several countries world-wide [including those in Africa] [15] and previously used in African military personnel.[6, 11] The AUDIT consists of 10 questions that measure alcohol use, harmful and hazardous drinking, and alcohol dependence. Responses to each question were scored on a range of 0–4 and were summed for a composite score ranging from 0–40. Non-drinkers were defined as those having an AUDIT score of 0, mild drinkers had a score of less than 8, and problem drinkers had a score of 8 or higher. Participants who were missing all AUDIT questions (n = 1) and those missing several questions from the AUDIT but had a computed score bordering on problem drinking were excluded from analyses (n = 3).

Participants were asked to provide their opinions (agree, disagree, or don't know) about condom use on 10 statements. Denominators for each statement varied and only included those who agreed or disagreed; those responding "don't know" were excluded. Participants were also asked to provide reasons for not using condoms and indicate how often they carried condoms with them, such as in their uniform or wallet.

Outcome Measures

The outcome was condom use frequency in the past 3 months defined as always, most times, occasionally, or never using condoms. The categories occasionally and never were collapsed into one group due to few responses in each.

Statistical Analysis

Descriptive statistics were computed, including frequencies and percentages for categorical variables and means and standard deviations, or medians and ranges, for continuous variables. Bivariate ordinal regression analyses were used to examine the relation of each correlate of interest with the outcome of condom use frequency, defined as the odds of decreasing condom use. Variables significant at $p \leq 0.15$ were examined further in individual ordinal models adjusting for continuous age and marital status, since these covariates have been found to be significantly associated with condom use.[16, 17] All variables significant at $p \leq 0.15$ were entered into a backwards selection regression model, which also adjusted for age and marital status. The Likelihood Ratio test was used to determine whether a variable was kept in the model at each step of the elimination process. A two-tailed $p < 0.05$ was used to determine statistical significance in the Likelihood Ratio test and the final backwards selection regression model. The proportional odds assumption was satisfied for all models. Multicollinearity was assessed by examining the variance inflation factor (VIF) and tolerance values; no variables in the model were determined to be collinear. Logistic regression analyses were also performed treating condom use frequency as a binary outcome in two separate models: 1) occasional/never vs. most times/always and 2) occasional/never/most times vs. always. All statistical analyses were performed using SAS statistical software version 9.3 (SAS Institute, Cary, NC).

Results

The mean age of the participants was 25.1 years and it ranged from 21–30. Most (82.0%) were single, never married, had completed at least senior secondary school (equivalent to high school) (74.4%), and of Christian faith (82.5%). The majority (51.2%) were ranked Private and in the Fighting (36.2%) or Logistics unit (34.8%). The mean years of military service was 4.1 years (Table I).

Approximately 69% of participants who were single and 72% of those who were cohabitating reported having more than one sexual partner in the past 3 months. One of two married participants (50.0%) reported having more than one sexual partner. Participants were asked a series of questions about sexual behaviors with their two most recent partners during the past three months. Of the 168 single participants who provided responses to these questions, 25.6% reported having one regular partner only, 20.8% reported two regular partners, 5.4% one casual partner only, 13.1% two casual partners, and 35.1% reported having both one casual and one regular partner. Of 36 cohabitating (non-married) participants who provided responses, 27.8% reported having one regular partner only, 16.7% two regular partners, and the remainder (55.5%) reported having both one casual and one regular partner. Of the two married participants, one reported having one regular partner only and the other reported having 2 regular partners (data not shown).

Characteristics of condom use correlates are presented in Table II. The mean age of sexual debut was 17.5 years. The median lifetime number of partners was 10.0, and the median total number of regular and casual partners in the past 12 months was 3.0. Approximately 70% reported having more than one sexual partner in the past 3 months. Most (75.2%) knew their HIV status. A little under half (47.1%) knew someone in their unit who was HIV-

positive, and about 40% had ever cared for or lived with an HIV-positive person. The majority (75.4%) scored 85% or higher on the HIV knowledge questions, with a mean score of 87.9%. Responses to circumcision status showed that 21.9% were circumcised. Over half (58.9%) of the participants were defined as problem drinkers according to their AUDIT score. Among those who reported drinking in the past 3 months (AUDIT score > 0), 16.7% indicated alcohol use prevented condom use and 8.1% reported alcohol use prevented correct condom use (data not shown). Most participants had a positive attitude towards condoms, with 74.3% agreeing that condoms are quite convenient to use and 90.9% agreeing that condoms are effective in preventing HIV infection. Most also agreed it was alright for women and men to ask their spouse to use a condom (98.0% and 97.5%, respectively), and that using a condom showed you cared for your sexual partner (99.0%). Commonly reported reasons for not using condoms included condoms make sex less enjoyable (17.5%), reported trust for a sexual partner (13.7%), and condoms smell bad (6.2%). Few (9.1%) reported always carrying condoms with them.

Condom use frequency in the past 3 months is presented in Figure 1. Approximately 51.2% of participants reported always using condoms, 35.1% reported using condoms most times, and 13.7 % reported using condoms occasionally/never. Among 54 participants with one regular partner in the past 3 months, 51.9% reported always using condoms with this partner. Of 9 participants with one casual partner, 77.8% reported always using condoms with that partner. Of 79 participants with one casual and one regular partner, 84.8% reported always using condoms with their casual partner, while 40.5% reported always using condoms with their regular partner (data not shown).

Table III reports associations between each correlate of interest and decreasing condom use in individual unadjusted and adjusted models (controlling for age and marital status). From the unadjusted models, significant correlates of decreasing condom use (at $p \leq 0.15$) included HIV knowledge score, circumcision status, alcohol use, several opinions about condom use (condoms are quite convenient to use, condoms are effective in preventing HIV infection, a woman would lose respect if she asked a man to use a condom), and several reported reasons for not using condoms (condoms make sex less enjoyable, condoms break easily, condoms smell bad, I trust my partner(s), I don’t have the right brand). All variables remained significant (at $p \leq 0.15$) after adjusting for age and marital status, with the exception of the variable condoms are convenient to use ($p = 0.18$).

Results from the final backwards selection regression model are presented in Table IV. Adjusting for all variables in the model, HIV knowledge score, circumcision status, alcohol use, and two reported reasons for not using condoms (condoms make sex less enjoyable and I trusted my partner) were identified as significant correlates of condom use. For every one unit increase in the HIV knowledge score, the odds of decreasing condom use were lowered by 3.0% (OR = 0.97, 95% CI = 0.95–0.99). The odds of decreasing condom use were also lowered by 58% among those who reported being circumcised (OR = 0.42, 95% CI = 0.20–0.90). Alcohol use was strongly associated with decreasing condom use. The odds of decreasing condom use were 2.27 times higher among problem drinkers compared with non/mild drinkers (95% CI = 1.22–4.23). Additionally, the odds of decreasing condom use were almost four times higher among participants who indicated that condoms make sex less

enjoyable (OR = 4.06, 95% CI = 1.83–9.03) and among those who reported not using condoms due to trusting their sexual partner (OR = 3.76, 95% CI = 1.64–8.65). Similar associations were observed from the adjusted logistic regression models (data not shown).

Discussion

Increasing condom use is critical to reducing HIV infection. It is one of the least expensive and most accessible methods for HIV prevention. However, its use continues to be disappointingly low among military personnel due to many factors, including the belief that condoms are ineffective [18] or unreliable [19], conflict with religious beliefs [18], trust issues that are raised with its use [20], and a desire to become pregnant. Results show that consistent condom use was relatively low in the BDF, with only 51% of participants reporting always using condoms. Similar to other studies, condom use was also generally higher with casual partners than with regular partners.[6, 21, 22] However, while we may be encouraged by the high percentage of participants reporting condom use with their casual partners, this percentage is still not 100%. Military personnel in multiple sexual partnerships who are not consistently using condoms place themselves and their partners at higher risk for HIV infection.

The correlate most strongly associated with lower condom use was the belief that condoms make sex less enjoyable. As reported in other studies, putting on a condom dampens sexual mood [18], using condoms causes discomfort [19], or skin-to-skin sexual contact is preferred[18]. Furthermore, there could be physical attributes of the condom that discourages use. As observed in this study, lower condom use was bivariately associated with the belief that condoms smell bad. These findings have important implications regarding condom use in general, and specifically the use of government-issued condoms (i.e., condoms provided free of charge by the BDF to their members). Anecdotal reports suggest that government-issued condoms are often not used due to an unpleasant scent (personal communication with BDF, September 2009). Therefore, while most (82%) agreed they would use condoms more often if they were available for free, the authors speculate they may not be using government-issued condoms because of the unpleasant odor. The BDF should consider providing condoms that are appealing to their members, which may help increase usage. Further qualitative research examining why condoms reduce sexual pleasure among this population is also needed.

The high percentage (59%) of problem alcohol use in the BDF, and its association with lower levels of condom use and hindrance of condom use raises concern. The percentage of BDF personnel categorized as problem alcohol users in the AUDIT (59%) are much higher than those reported in the general male Botswanan population of comparable mean age (39%).[23] Alcohol abuse, risky behaviors, and HIV risk should be addressed in BDF prevention programs. Other potential preventive measures include supporting the Botswana government initiatives of increasing tax on alcohol purchases, limiting alcohol availability on the military bases, and providing free condoms where alcohol is sold. The BDF should also bolster and increase their alcohol abuse prevention, treatment, and rehabilitation programs.

This study found a significant association between reported trust for a sexual partner and lower condom use, as shown in other quantitative [24, 25] and qualitative studies.[26] While lower condom use among those in a monogamous relationship is expected, lower and inconsistent condom use among those involved in multiple sexual partnerships or HIV discordant relationships may be extremely risky. As observed in this study, nearly 70% of participants reported having more than one sexual partner in the past 3 months, suggesting that multiple partnerships are quite common; therefore, the practice of consistent condom is highly important. The BDF should encourage couples' HIV testing and counseling and support the disclosure of HIV status to all sexual partners, which will assist in making informed decisions regarding sexual practices and condom use.

Although not statistically significant, due to a low numbers of affirmative responses, highly elevated odds of lower condom use were observed among those who agreed with the statement that a woman would lose respect if she asked a man to use a condom. These findings suggest some BDF personnel may have a negative attitude towards condoms or they may be influenced by norms that affect usage, as shown in other studies.[27, 28] This area of research should be further explored among military personnel as it touches on important factors that may affect condom use.

Consistent with other studies [29, 30], higher levels of HIV knowledge were found to be associated with more frequent condom use. Elevated levels of HIV knowledge may be an indication that the BDF HIV educational programs have been effective, and are reaching the younger populations. The BDF should continue to educate their members on HIV prevention and transmission, coupled with messages of correct and consistent condom use.

Lastly, the finding of increased condom use among men who reported being circumcised is promising, since there is concern that circumcised men may practice more risky sexual behaviors following male circumcision (MC) because their perception of HIV risk may be falsely reduced. These results support findings from other studies that show circumcised men do not engage in more risky sexual behaviors than uncircumcised men [31–33] and suggest that BDF prevention messages regarding correct and consistent condom use after MC may be highly effective. The BDF should continue to promote consistent condom use after MC.

There were a few limitations to this study including the cross-sectional study design, and the fact that the target sample size was not reached, possibly affecting the study power. Due to strict participant eligibility criteria, results may only be generalizable to BDF members of comparable age. Although not all BDF sites were included in the study, the four that were selected contained the largest number of personnel of diverse backgrounds. Respondent bias may also have been an issue, with participants providing socially desirable responses. However, confidentiality measures were in place to ensure privacy during survey administration and participants were informed they could skip any questions they did not feel comfortable answering. Despite these limitations, the study also has several strengths. For instance, the survey was self-completed, which may have encouraged participants to provide reliable responses. In addition, numerous correlates of condom use were examined and the participation rates were considered high, with very little missing data in the baseline

survey. These allowed for more complete statistical analyses of factors associated with condom use among military personnel in Botswana.

In summary, this study described condom use behaviors in the BDF, highlighted factors associated with lower condom use, and discussed approaches to increase condom use among military personnel, a population at increased risk for HIV. Because condoms are the most effective way to prevent sexual transmission of HIV, understanding why condoms are not used and developing methods to increase use in this population should be a high priority for militaries.

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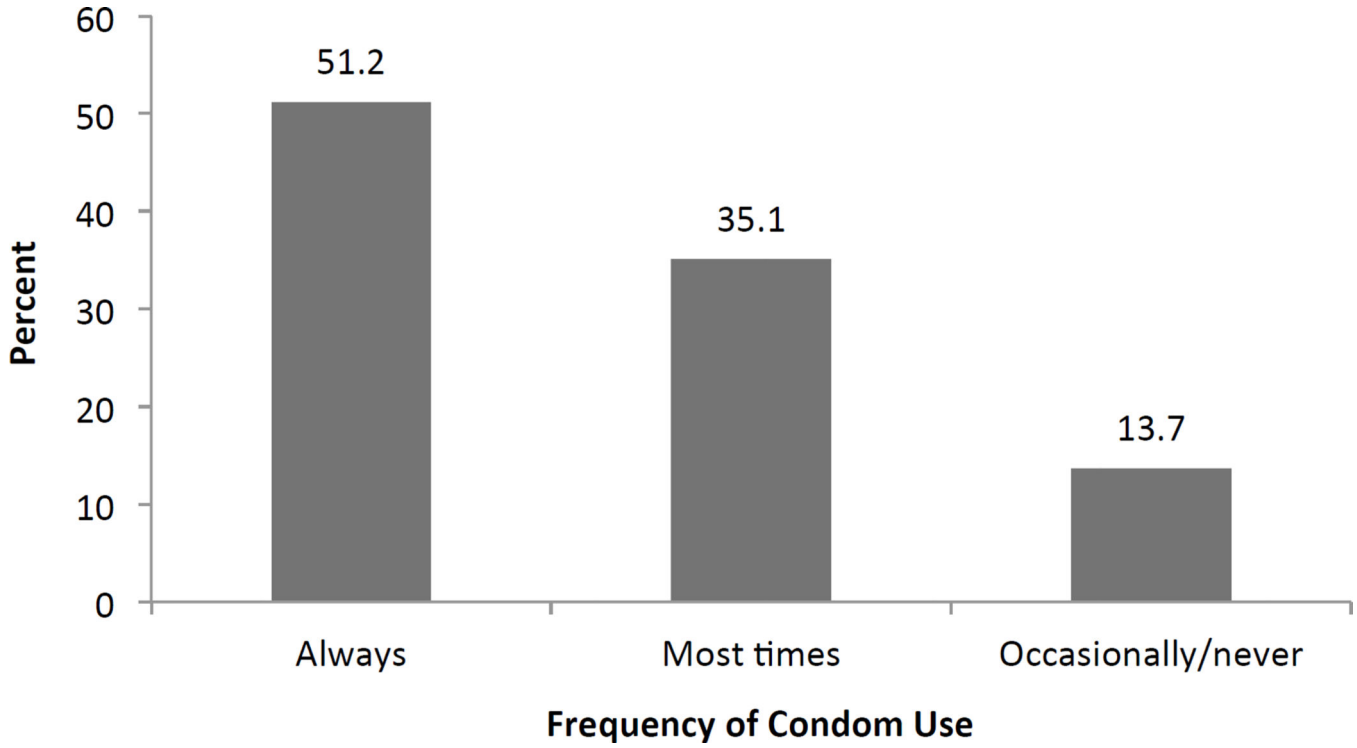

Figure 1.
Study participants' reported condom use frequency in the past 3 months (N = 205)

Table I

Demographic characteristics of study participants (N = 211)

Variable	Mean (SD)	%
Age in years	25.1 (2.4)	
Marital status		
Single, never married		82.0
Married		1.0
Cohabitating		17.0
Education		
Primary		0
Junior secondary		0.4
Senior secondary		74.4
Tertiary		20.9
Vocational		4.3
Religion		
Christian		82.5
Traditional		4.7
African Traditional		3.3
No religious affiliation		9.0
Other non-Christian		0.5
Years in the military	4.1 (2.4)	
Military rank		
Private		51.2
Junior NCO		43.6
Warrant Officer/Senior NCO		0
Junior Officer		5.2
Military unit[a]		
Air Arm		0
Fighting		36.2
Logistics		34.8
Support		28.6
Cadets		0
Trainers		0.4

NCO, non-commissioned officer; SD, standard deviation

[a]Excludes one participant with a missing response

Table II

Characteristics of condom use correlates of study participants (N = 211)

Variable[a]	Mean (SD)	Median (Range)	%
Sexual history			
Age at first sexual debut in years	17.5 (2.7)		
Number of lifetime partners		10.0 (5–200)	
Number of regular partners in past 12 months		3.0 (1–35)	
Number of casual partners in past 12 months		3.0 (1–115)	
More than one sexual partner in past 3 months			69.1
HIV risk perception and knowledge of HIV			
Knowledge of one's HIV status			75.2
Knowledge of someone in unit with HIV/AIDS			47.1
Ever cared for or lived with an HIV-positive person			40.4
Scored 85% or higher on HIV knowledge questions[b]			75.4
HIV knowledge score	87.9 (12.5)		
Circumcision status			
Uncircumcised			78.1
Circumcised			21.9
Alcohol use			
Non-drinkers (AUDIT score = 0)			24.6
Mild drinkers (AUDIT score < 8)			16.4
Problem drinkers (AUDIT score ≥ 8)			58.9
Opinions about condoms[c]			
Using a condom shows you care for your partner			99.0
It is alright for a married woman to ask her husband to use a condom			98.0
It is alright for a married man to use a condom with his wife			97.5
Condoms are effective in preventing HIV infection			90.9
I would use condoms more often if they were available for free			81.5
Condoms are quite convenient to use			74.3
Buying and handling condoms is the man's responsibility			26.3
It is embarrassing to buy condoms			12.1
One condom can be used more than once			1.9
A man would lose respect if he suggested to a woman that they use a condom			1.5
A woman would lose respect if she asked a man to use a condom			1.5
Reported reasons for not using condoms			
Condoms make sex less enjoyable			17.5
I trust my partner(s)			13.7
Condoms smell bad			6.2
Condoms dampen the mood			5.2
Other reasons			3.3
Condoms break easily			1.9
Partner does not want me to use one			1.9

Variable[a]	Mean (SD)	Median (Range)	%
Condoms don't fit properly			1.4
I don't have the right brand			1.4
Frequency of carrying condoms			
Always			9.1
Most times			19.1
Occasionally			37.8
Never			34.0

AUDIT, Alcohol Use Disorders Identification Test; SD, standard deviation

[a] Excludes participants with missing responses

[b] Percentage of correct responses to eight HIV knowledge questions: HIV can be prevented by having sex with one faithful uninfected partner (94.8%), by using condoms (99.5%), and remaining abstinent (91.0%). A healthy looking person can have HIV (98.1%). HIV cannot be transmitted through mosquito bites (86.3%), witchcraft/supernatural means (76.8%), or by sharing a meal with an infected person (96.2%). HIV can be transmitted through traditional practices (60.2%)

[c] Agreement with each statement

Table III

Unadjusted and adjusted associations of each condom use correlate with decreasing condom use frequency

	Bivariate model			Adjusted model[a]		
Variable	**OR**	**(95% CI)[b]**	***p*-value**	**OR**	**(95% CI)[b]**	***p*-value**
HIV knowledge score	0.98	(0.96–1.00)	0.06	0.98	(0.96–1.00)	0.08
Circumcision status						
Not circumcised	1.0			1.0		
Circumcised	0.53	(0.27–1.03)	0.06	0.53	(0.27–1.03)	0.06
Alcohol use						
Non/mild drinkers (AUDIT score < 8)	1.0			1.0		
Problem drinkers (AUDIT score ≥ 8)	2.67	(1.52–4.70)	<0.001	2.73	(1.54–4.84)	<0.001
Opinions about condoms						
Condoms are quite convenient to use						
Agree	1.0			1.0		
Disagree	1.68	(0.89–3.16)	0.11	1.55	(0.81–2.98)	0.18
Condoms are effective in preventing						
HIV infection						
Agree	1.0			1.0		
Disagree	2.07	(0.82–5.22)	0.13	1.99	(0.78–5.06)	0.15
A woman would lose respect if she asked a man to use a condom						
Disagree	1.0			1.0		
Agree	5.29	(0.61–45.65)	0.13	6.13	(0.70–53.64)	0.10
Reported reasons for not using condoms						
Condoms make sex less enjoyable						
No	1.0			1.0		
Yes	5.75	(2.83–11.69)	<0.001	5.42	(2.65–11.11)	<0.001
Condoms break easily						
No	1.0			1.0		
Yes	4.42	(0.69–28.23)	0.12	5.34	(0.82–34.89)	0.08
Condoms smell bad						
No	1.0			1.0		

	Bivariate model			Adjusted model[a]		
Variable	**OR**	**(95% CI)[b]**	***p*-value**	**OR**	**(95% CI)[b]**	***p*-value**
Yes	3.40	(1.19–9.77)	0.023	3.30	(1.13–9.59)	0.029
I trust my partners(s)						
No	1.0			1.0		
Yes	4.75	(2.21–10.18)	<0.001	4.79	(2.22–10.31)	<0.001
I don’t have the right brand						
No	1.0			1.0		
Yes	5.33	(0.62–45.88)	0.13	5.83	(0.67–50.93)	0.11

AUDIT, Alcohol Use Disorders Identification Test; CI, confidence interval; OR, odds ratio

[a] Adjusted for age and marital status

[b] Estimates may be wide due to small samples

Table IV

Multivariate ordinal regression model examining the association between correlates of condom use and decreasing condom use frequency (N = 192)

	Decreasing odds of always using condoms[a]		
Variable	**OR**	**(95% CI)[b]**	***p*-value**
Age in years	0.92	(0.81–1.06)	0.20
Marital status			
Single	1.0		
Married or cohabitating	2.15	(0.96–4.80)	0.06
HIV knowledge score	0.97	(0.95–0.99)	0.040
Circumcision status			
Not circumcised	1.0		
Circumcised	0.42	(0.20–0.90)	0.026
Alcohol use			
Non/mild drinkers (AUDIT score < 8)	1.0		
Problem drinkers (AUDIT score ≥ 8)	2.27	(1.22–4.23)	0.010
Opinions about condoms			
A woman would lose respect if she asked a man to use a condom			
Disagree	1.0		
Agree	8.73	(0.73–103.85)	0.09
Reported reasons for not using condom			
Condoms make sex less enjoyable			
No	1.0		
Yes	4.06	(1.83–9.03)	<0.001
I trust my partner(s)			
No	1.0		
Yes	3.76	(1.64–8.65)	0.002

AUDIT, Alcohol Use Disorders Identification Test; CI, confidence interval; OR, odds ratio

[a] Adjusted for age, marital status, and other variables in the model

[b] Estimates may be wide due to small samples