

## RESEARCH ARTICLE

# Factors Associated with Condom Use among University Female Students in Uganda

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## Abstract

**Background:** This study sought to document predictors of condom use at recent sexual intercourse among university female students.

**Methods:** This cross-sectional correlational study was conducted among 371 female students. The students were enrolled from three randomly selected halls of residence at Makerere University. Data were collected using a self-administered questionnaire. Binary logistic regression was used to analyze the odds for condom use.

**Results:** More than half (n = 220, 59.3%) of participants reported to have engaged in previous vaginal sexual intercourse, and the majority (n = 184, 83.6%) had vaginal sexual intercourse in the last 6 months preceding the survey. Condom use at last vaginal intercourse was reported by 8 out of 10 of the participants. The predictors of condom use at last vaginal intercourse included: perceived confidence to negotiate condom use (adjusted odds ratio [aOR] 385; 95% confidence interval [CI]: .185- .801,  $P \leq .011$ ), withholding sex if partner declined condom use (aOR.371; 95% CI .177- .775;  $P \leq .008$ ) and intention to negotiate condom use (aOR 212; 95% CI.056 - .811;  $P \leq 0.023$ ).

**Conclusion:** We found high sexual activity and condom use rates among University female students. The predictors of condom use at last vaginal sexual intercourse were: perceived confidence to negotiate condom use, withholding sex if a partner declined condom use and having intentions to negotiate condom use. The findings of this study have important implications for research and development of effective safer sex campaigns among students in higher institutions of learning.

**Keywords:** Condom use; Female; Sexual Activity; Uganda; University Students

**List of abbreviations:** HIV: Human Immunodeficiency Virus; AIDS: Acquired Immunodeficiency Syndrome; STIs: Sexually Transmitted Infections; PCA: Principal Component Analysis; KMO: Kaiser-Meyer-Olkin measure; MakSHS-IRB: Makerere University School of Health Sciences Institutional Review Board

## Background

Incidences of high-risk sexual behaviors have been reported among university students. In Ethiopia, a survey established that non-condom use with a non-regular partner was 30.9% among University students [1]. A survey report among Tanzanian female university students reported low condom use of 24.3% [2]. Studies have observed similar findings among Ugandan university students [3,4]. In Uganda, not using a condom during the latest sexual intercourse was significantly associated with HIV infection, other STIs, or bacterial vaginosis (OR 2.16; 95% 1.26–3.78) among university females [4].

The consequences of high-risk sexual behaviors include unwanted pregnancies, and transmission sexually transmitted infections (STIs) including HIV/AIDS among young people have been well documented [5,6]. Additionally sub-Saharan Africa continues to shoulder the biggest burden of these consequences [5,7-9]. Young people including university students contribute to the high burden of unsafe sex-related consequences in the region. Almost half of the 14 million unintended pregnancies estimated in Sub-Saharan Africa occur among women aged 15-24 years [5]. Furthermore, in 2015, women comprised 56% of the new HIV infections among adults; and the proportion being higher among young women aged 15-24, who made up 66 of the new infections [10].

In 2013, HIV prevalence among young people aged 15-24 years in Uganda was estimated at 4.9% among women compared to 2.1% for men [11]. Current evidence indicates that 64% of the Ugandan women aged 25-49 years have their sexual debut before the age

of 18 years [11,12]. In Uganda, most students enroll into universities at an age above the median sexual debut, suggesting they are sexually active.

The associated effects of high-risk sexual behaviors including unwanted pregnancies, unsafe abortions and STIs pose socioeconomic challenges to Uganda. Researchers show that Uganda spends on average \$ 13.9 million per year on post abortion care services [13,14]. The overall socioeconomic cost is far beyond \$ 13.9 million when individual costs like school dropout, loss of productivity and premature death are considered [14]. Condoms when used consistently and correctly have been found to reduce the risk of unintended pregnancies and STIs among young people [15-17]. A study in Uganda reported male condoms to be the commonest method of contraceptive among university students [18].

The Ugandan government recognizes the role of condom use in abetting consequences related to unsafe sex practices among adolescents [19]. The national adolescent policy guidelines and service standards includes condoms as a service package for prevention of STI/HIV/AIDS and unplanned pregnancies [20]. However, data from the national AIDS indicator survey show that condom use at most recent high risk sexual activity was still low at less than 40 % [11]. Of the respondents aged 15-49 years in 2011 who engaged in sex 12 months preceding the survey with a non-marital or non-cohabiting partner, only 29% of women compared to 38% of the men reported using a condom [11].

Studies conducted within Uganda and the region have also reported high incidences of risky sexual behaviors among university students [1-4]. However, most of these studies have documented the prevalence of risky sexual and condom use behaviors. Little has been documented about the predictors of condom use among university female students in the region and Uganda. However, evidence from other African countries suggests that factors including; social networks, gender, power, nature of relationship, partner communication, sexual sensation are associated with condom use [21-23]. Of recent, condom use negotiation skills or self-efficacy are now considered strong predictors of condom use among women [21,24]. Understanding the context-specific predictors of condom use among female University students is essential in designing and implementation of condom use campaigns. Therefore this study determined the predictors of condom use among female students of Makerere University.

## Methods

### Design and study setting

We conducted a cross sectional study between May to June, 2017 among 371 female undergraduate students at Makerere University in Kampala. The University is the largest and oldest public institution of higher education in Uganda. The institution offers both undergraduate and graduate programs to an estimated population of 40,000 students. Half the current student population is said to be female.

### Study variables

The major study outcome was condom use at recent sexual activity. Recent sexual activity was defined as reporting vaginal sexual intercourse within the last 6 months preceding the survey. It was operationalized based on the following question “*if you had vaginal sexual intercourse in the last 6 months, did you or your partner use a condom at the last recent sex?*” It was measured on a dichotomous scale of “Yes” or “No”. The major independent variables were perception of unsafe sex to be risky, perceived confidence to discuss and negotiate condom use, preparatory behaviors (belief than one can purchase a condom, can support a partner put on a condom, and withholding sex if a partner refuses to use it) and intention to negotiate condom use. The categories were derived based on literature on psychosocial theories and condom use [25,26].

### Measures

Risk perception was operationalized as perception of suffering health-related consequences as result of engaging in unprotected sex. Six items measured on 5- point were used. Participants were asked to estimate on 5 - point scale their chances of contracting (1 = very low, 5 = very high); STIs, HIV, unplanned pregnancies and associated social and economic effects. Confidence to discuss and negotiate condom use was conceptualized as perceived ease or difficulty to discuss and persuade a male partner to use a condom. Five items measured on 5-point scale, for example I can ask any male partner to use a condom (1 = strongly disagree, 5 = strongly agree) were used. In addition five items, for example I am confident I can persuade a male to use a condom. Other pre-preparatory behaviors like I can purchase a condom, can support partner put on condom, can refuse intercourse if male partner refuses condom use and intention to negotiate condom use were measured on 5-point as single item questions.

### Sample size estimation

A total of 371 female students were estimated as the appropriate sample size for the study. The sample was estimated basing on Kish-Leslie formula for cross sectional studies. The sample size determination assumed 41% of the female students using condoms at last vaginal sexual intercourse, 5% margin of error at 95% confidence interval.

### Participant recruitment and data collection

The participants were recruited from all the three female halls (Mary Stuart, Complex and Africa) of residence on campus and one

outside campus (J.B Girls hostel). Using records from the custodian, the total number of registered residents in the four halls was 1516 female students. The total number of participants for enrollment per hall of residence was determined as a proportion of the total number of registered female students in the hall over the sum of the combined totals of the four halls multiplied by estimated sample size. At hall level, we obtained information on the number of rooms and occupants per room. Rooms were randomly selected, and occupants were invited to participate in the study after explaining the objectives and procedures for the study. Data were collected using a self-administered questionnaire. The questionnaire was pre-tested on 30 female students of a university within Kampala.

## Statistical analysis

Analyses were completed using SPSS version 21.0. Contingency tables, exploratory factor analysis, and logistic regression were the major analyses performed. Exploratory factor analysis using a principal component analysis (PCA) was first used on items in the questionnaire related to self-perceived risks of unprotected sex, perceived confidence to discuss condom use, and perceived confidence to negotiate condom use to establish any underlying structure.

The assumptions for conducting a PCA (sample adequacy and large enough correlations between items), Kaiser-Meyer-Olkin (KMO) measure, and Bartlett's test of sphericity were obtained. The PCA was applied to test whether the items employed to measure independent variables loaded on distinct components. PCA was conducted on 6 items for self-perceived risks of unprotected sex (I can get pregnant any time, I can contract HIV, I can contract other STIs, I could lose on my educational opportunities, and I will let down my parents and my future could be destroyed) using oblimin rotation.

A good KMO value (0.849) and Bartlett's test of sphericity (2115.146,  $P \leq 0.001$ ) indicated that the correlations between the items were sufficiently large for PCA. Analysis was done to obtain eigenvalues for each component in the data. Two components had eigenvalues over Kaiser's criterion of 1, explaining 66.4% of the variance was interpretable. The scree plot's inflexion point also justified retention of two components. The items that clustered on the component suggested that the items represent Self-perceived health and social risks of unprotected sex. Scale reliability analysis was performed and only self-perceived health risks (I can contract HIV, STIs and unintended pregnancy) had a high reliability; Cronbach's  $\alpha = .853$ . The social risks (lose on educational opportunities, let down my parents, future destroyed) had a low reliability; Cronbach's  $\alpha = .418$ .

The same procedure was conducted on 10 items for perceived confidence to discuss condom use, and confidence to negotiate condom use. A good KMO value (0.877) and Bartlett's test of sphericity (4469.776,  $P \leq 0.001$ ) indicated that the correlations between the items were sufficiently large for PCA. Analysis was done to obtain eigenvalues for each component in the data. Two components had eigenvalues over Kaiser's criterion of 1, explaining 68.9% of the variance was interpretable. The scree plot's inflexion point also justified retention of two components. In concordance with Kaiser's criterion, the items that clustered on the component suggested that the items represented confidence to discuss condom use, and confidence to negotiate condom use. Reliability analysis was done on the two components.

High reliability; Cronbach's  $\alpha = 0.903$ , and  $0.905$ , were obtained for perceived confidence to discuss condom use (I can talk to a male partner about condom use, can ask a male partner to use a condom, and I can suggest condom use to a male partner), and confidence to negotiate condom use (I am confident I can persuade a male partner, I can convince a male partner, and I can motivate a male partner) respectively. The subscales that had high reliability were treated for further analysis.

The scale means for the scale components; perceived confidence to discuss condom use, self-perceived health risks of unsafe sex and confidence to negotiate condom use with a male partner were obtained. The participants were considered to either score low (below the mean) or high (above the mean) on each scale component. Participants who scored low on self-perceived risks, perceived confidence to discuss condom use, and perceived confidence to negotiate condom use were hypothesized to be less likely to use a condom at recent vaginal sexual intercourse. Using contingency tables and binary logistic regression, the established components, preparatory behaviors, and age were compared with condom use at recent vaginal sexual intercourse to establish any relationships.

## Results

Table 1 shows the demographic characteristics of the study participants. A total of 371 female students were enrolled in the study. The mean (SD) age was 21.8 (1.5) years, with majority ( $n = 326$ , 87.9%) reporting ever being in a sexual relationship. Over half ( $n = 212$ , 57.1%) reported being in a current sexual relationship, with 14.2% reporting having more than one sexual partner. A significant number ( $n = 220$ , 59.3%) reported ever engaging in vaginal sexual intercourse, with majority ( $n = 184$ , 83.6%) in the last 6 months preceding the survey. Most of students ( $n = 176$ , 80%) of those who reported recent vaginal intercourse reported using a condom.

Table 2 shows students score on the scale dimensions derived from factor analysis. The scales; perceived confidence to discuss condom use, self-perceived health risks of unsafe sex and confidence to negotiate condom use with a male partner were dichotomized using the mean. Most of the students (227, 61.2%), (301, 81.4%), (249, 67.1%) scored high on perceived confidence to discuss condom use, self-perceived health risks of unsafe sex and confidence to negotiate condom use with a male partner respectively.

Variable	Frequency (%)	Mean	Median	Range
Age in years		21.8	22	8
Relationship duration (months)		17.67	13	83
<b>Ever been in a sexual relationship</b>				
Yes	326 (87.9)			
No	45 (12.1)			
<b>Currently have a sexual partner</b>				
Yes	212 (57.1)			
No	159 (42.9)			
<b>Description of the relationship</b>				
Married	15 (7.1)			
Causal	74 (34.9)			
Stable	123 (58)			
<b>Number of sexual partners</b>				
1	182 (85.8)			
2	21 (9.9)			
3	5 (2.4)			
4	4 (1.9)			
<b>Ever had vaginal intercourse</b>				
Yes	220 (59.3)			
No	151 (40.7)			
<b>Engaged in vaginal intercourse in the last 6 months</b>				
Yes	184 (83.6)			
No	36 (16.4)			
<b>Intention to negotiate for condom use</b>				
Yes	236 (63.6)			
No	135(36.4)			
<b>Ever negotiated condom use</b>				
Never	153 (41.2)			
Sometimes	93 (25.1)			
Always	124 (33.7)			
<b>In the last vaginal intercourse, did you or your partner use a condom</b>				
Yes	176 (80)			
No	44 (20)			
<b>purchase a condom</b>				
Yes	305 (82.2)			
No	66 (17.8)			
<b>support a male partner put on a condom</b>				
Yes	261 (70.4)			
No	110 (29.6)			
<b>Refusal of intercourse if partner declines condom use</b>				
Yes	278 (74.9)			
No	93 (25.1)			

**Table 1:** Participants socio-demographic characteristics

Scale Component (Cronbach's $\alpha$ )	Mean	Median	SD	Above the Mean%(n)	Below the Mean%(n)
Perceived confidence to discuss condom use (.903)	13.65	15.00	1.91	227 (61.2)	144 (38.8)
Self-perceived health risks of unsafe sex (.853)	24.54	25.00	1.19	301 (81.4)	69 (18.6)
Confidence to negotiate condom use with a male partner (.905)	13.73	15.00	1.88	249 (67.1)	122 (32.9)

**Table 2:** Participants score on the scale dimensions derived from factor analysis

Table 3 shows bivariate analysis of the factors associated with condom use at recent vaginal intercourse. There were significant statistical associations between perceived confidence to discuss condom use ( $P \leq 0.011$ ), confidence to negotiate condom use ( $P \leq 0.0001$ ) and condom use at last vaginal intercourse. Other statistically significant factors were; belief that can purchase a condom ( $P \leq 0.008$ ), belief that can support a partner put on a condom ( $P \leq 0.002$ ), withholding sex if partner declines condom use ( $P \leq 0.000$ ) and intention to negotiate condom use ( $P \leq 0.005$ ). Among the 44 (20%) students who reported non-condom use, majority (25, 56.8% and 27, 61.4%) scored low on perceived confidence to discuss and negotiate condom use respectively. Furthermore, among the 176 (80%) that reported condom use, majority (154, 87.5%, 137, 77.8%, and 137, 77.8%) believed they can purchase a condom, can help a partner put on a condom, and withhold sex if partner declines condom use respectively. Most of the students (171, 97.2%) who used a condom also had intention to negotiate condom use. Other factors, age, self-perceived health risks and duration in a relationship show no significant statistical association.

Variable	Yes N (%)	No N (%)	p-value
<b>Age</b>			0.199
≤ 21.8 years	99 (82.5)	21 (17.5)	
≥ 21.8 years	77 (77)	23 (23)	
<b>Perceived confidence to discuss condom use</b>			0.011
≤ Mean (13.65)	64 (71.9)	25 (28.1)	
≥ Mean (13.65)	112 (85.5)	19 (14.5)	
<b>Self-perceived health risks of unsafe sex</b>			0.206
≤ Mean (24.54)	39 (75)	13 (25)	
≥ Mean (24.54)	136(81.4)	32 (18.6)	
<b>Perceived confidence to negotiate condom use with a male partner</b>			0.0001
≤ Mean (13.73)	55 (67)	27 (33)	
≥ Mean (13.73)	121 (87.7)	17 (12.3)	
<b>Duration in a relationship</b>			0.177
≤ 17.67	97 (82.9)	20 (17.1)	
≥ 17.67	73 (76.8)	22 (23.2)	
<b>purchase a condom</b>			0.008
Yes	154 (83.2)	31 (16.8)	
No	22 (62.9)	13 (37.1)	
<b>support a partner put on a condom</b>			0.002
Yes	137 (85.1)	24 (14.9)	
No	39 (66.1)	20 (33.9)	
<b>Withholding sex if partner declines condom use</b>			0.0000
Yes	137 (86.7)	21 (13.3)	
No	39 (62.9)	23 (37.1)	
<b>Intention to negotiate condom use</b>			0.005
Yes	171 (97.2)	38 (86.4)	
No	5 (2.8)	6 (13.6)	

\*Statistically significant variables at  $P < 0.05$

**Table 3:** Association between condom use at last vaginal intercourse and other independent variables (N = 220)

Table 4 shows the binary logistic regression of the predictors of condom use. The predictors for condom use among the students were; perceived confidence to negotiate condom use (adjusted odds ratio 0.385 [aOR]; 95% confidence interval [CI]: 0.185 – 0.801,



$P \leq 0.011$ ), withholding sex if partner declines condom use (aOR 0.371; 95% CI 0.177 – 0.775;  $P \leq 0.008$ ) and intention to negotiate condom use (aOR 0.212; 95% CI 0.056 – 0.811;  $P \leq 0.023$ ).

Variable	Odds ratio 95% CI	P-value	Adjusted Odds ratio 95%CI	P-value
Perceived confidence to discuss condom use	0.43 (.222 - .849)	0.015	1.200 (.477 – 3.021)	0.699
Perceived Confidence to negotiate condom use with a male partner	0.286(.144 - .568)	0.000	.385 (.185-.801)	0.011
Purchase a condom	2.935 (1.337-6.447)	0.007	.598 (.243- 1.475)	0.265
Refusal of intercourse if partner declines condom use	0.260 (.130 - .518)	0.000	.371 (.177 – .775)	0.008
Intention to negotiate condom use	0.147 (.040 - .548)	0.004	.212 (.056 - .811)	0.023

\*Statistically significant variables at  $P < 0.05$

**Table 4:** Predictors of intention to negotiate for condom use

## Discussion

This study focused on identifying predictors of condom use at recent sexual activity among female university students in Uganda. Our findings show that among the sexually active students, 8 in 10 reported condom use at recent vaginal intercourse with 14% reporting multiple sexual partners. These findings are higher compared to findings from the Ugandan DHS, 2016, where only 21% of women aged 15-49 years reported using a condom at last sexual intercourse and only 2% reporting having more than two or more sexual partners [27]. Condom use was found to be high (80%) compared to those reported in a Tanzanian study of 24.3% among university female students [2]. The findings were however more similar to those of a study in Ethiopia that reported a high prevalence of 69.1% among university students [1].

High levels of condom use among participants compared to the general population could be explained by the difference in social-economic status, career aspirations and expectations. University students may be more empowered to demand for safe sex than women in the general population. It is possible that students conceptualize the risks of unsafe sex better in the context of their future life goals. Also the condom mass media promotion campaigns that are urban centered could too explain the variance. The high incidence of multiple sexual partners could be attributed to sex for survival and adolescence among the study participants compared to the general population. The predictors for condom use among the students were; perceived confidence to negotiate condom use, withholding sex if partner decline condom use and intention to negotiate condom use.

In this study, 87.7% of the students who scored high on perceived confidence to negotiate condom use reported using a condom at last sexual intercourse. Confidence to negotiate condom use increased the likelihood of condom use by 38.5%. The finding supports current literature that suggests condom negotiation as a key factor in condom use [25,28,29]. The high prevalence of confidence to negotiate condom use could be attributed to their education status and awareness of unsafe sex-related risks. Most (81.4%) students scored high on perception that unsafe sex poses health risks. Risk perception is widely documented in the literature as a factor that influences health behavior intentions and condom use [30,31]. The observation that risk perception was not predictive of condom use, suggests that condom promotion programs and research should focus on condom negotiation strategies.

Also significant was withholding sex if partner declined condom use. A total of 87% of the students who reported condom use believed that they could withhold sex. Withholding sex was associated with 37% likelihood of condom use. Studies have documented withholding sex as one of the condom negotiation strategies among women [28,32]. Studies among college students in the western world have established that use of condom negotiation strategies like withholding sex was a key important predictor of condom use [28]. Not much is documented about condom negotiation strategies among women in Uganda. Thus there is need to explore and promote condom negotiation strategies in similar settings in Uganda.

In this study, 97% of the students who reported having intentions to negotiate condom use used condom during the last sexual intercourse. Among the participants, intention to negotiate condom use increased the likelihood of condom use by 21%. This finding is similar to those reported in a Botswana study that showed participants who planned to use a condom were less likely to report condom use [33]. Similar findings have been established by psychosocial and behavior research that have documented intention as a strong predictor of actual behavior [34,35]. Researchers suggest that duration and commitment in the relationship is predictive of condom, in our study there was no relationship between duration in a relationship and condom use [29,36,37]. The mean duration in the relationship was 17.7 months. This could be attributed to high perceived health risks associated with unsafe sex among the participants. Most of the students (81.4%) scored high on perceived health risks. It is possible that these relationships were considered unstable especially given the cultural context that approves marriage as the acceptable stable relationship.

The findings of this study support the theorization that confidence to negotiate condom use, and condom use negotiation strategies like withholding sex, and having intentions to negotiate condom use increase the likelihood of condom use among young people. To improve condom use among young people, especially females programs should explore and empower students on strategies to negotiate condom use.

For this study, the limitations were related to the design and representativeness. The participants were recruited from only four halls of residence and as such may not be representative of the whole university as some students reside in their homes. The study design was cross-sectional, and the findings could differ over a period of time. A longitudinal prospective study with a larger sample could provide a more complete understanding of the predictors of condom use.

However, our findings do support the model that confidence to negotiate condom use, use of condom negotiation strategies like withholding sex, and having intentions to negotiate condom use increases the chances of condom use University female students. HIV & unwanted pregnancy campaigns should in addition to increasing risk perception empower students with strategies to negotiate for condom use.

## Conclusion

The predictors of condom use were; confidence to negotiate condom use, use of condom negotiation strategies like withholding sex, and having intentions to negotiate condom use. The findings of this study have important implications for research and development of effective HIV and unwanted pregnancy prevention campaigns among students in higher institutions of learning. The prevention campaigns should in addition to raising risk perception about the risks associated with unsafe sex empower female students to negotiate condom use. To adopt culturally appropriate condom negotiation strategies, studies to evaluate the strategies are needed in Uganda.

## Declarations

### Ethical Approval and Consent to participate

This study was reviewed and received ethical approval by Makerere University School of Health Sciences Institutional Review Board (MakSHS-IRB), reference number SHSRECREP 2017-029. Permission to conduct the study was granted by Makerere University administration. Written informed consent was obtained from all the study participants.

### Authors' Contribution

Richard Muhindo and Sanyu Betty conceived the research idea and study design. Sanyu Betty & Joyce Nankumbi Okonya coordinated the data collection. Muhindo Richard performed the statistical analysis, and all the authors participated in the drafting of the paper.

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