

Prevalence and factors associated with safe male circumcision among Makerere University undergraduate students, Kampala - Uganda

Jean Nyamwiza (✉ nyamwizaj@gmail.com)

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

John Mukisa

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Jerry Ictho

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Ronald Ssenyonga

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Annet Nalutaaya

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Ismael Kawooya

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Temper Benjamin

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Joanita Nagendo

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Angella Musewa

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Sam Ali

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Emmanuel Lako Ernesto Loro

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Bekiita Bosco Agaba

National Disease Control Department, Ministry of Health

Mpungu Steven Kiwuwa

Department of Pediatrics and Child Health, College of Health Sciences, Makerere University

Joan N. Kalyango

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University

Charles Karamagi

Clinical Epidemiology Unit, School of Medicine, College of Health Sciences, Makerere University/Department of Pediatrics and Child Health, College of Health Sciences, Makerere University

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Abstract

Background Safe male circumcision (SMC) is currently recognized as a preventive strategy in reducing the risk of HIV; however, the prevalence of circumcised men in Uganda is still quite low at 26%. This study aimed to determine the prevalence and factors associated with SMC and among Makerere University undergraduate students, in Kampala Uganda. **Methods** We conducted a cross-sectional study among 602 participants selected using multistage probability sampling strategy. Pretested semi-structured questionnaires and focus group discussions were used to collect data. Quantitative data were analyzed with Stata 12.0, the prevalence ratio and p-values were calculated. Possible interactions and confounding variables were assessed with the Poisson regression model while qualitative data was analyzed with content analysis. **Results** The overall prevalence of safe male circumcision among male undergraduates was 58.3% (95% CI: 54.37 – 62.24). Factors associated with SMC prevalence included: safety of SMC procedure (Prevalence Ratio (PR) = 1.13, 95% Confidence Interval (CI): 1.03 – 1.25) and friendly health workers (PR = 0.78, 95% CI: 0.74 – 0.83). The perceived benefits of SMC included hygiene (86.5%, n = 521), reduced risk of HIV transmission (4.5%, n = 26) and reduced risk of penile cancer (45.7%, n = 275) while, the perceived barrier was pain (10.1%, n = 61). The students perceived that SMC recipient's first sexual partner post-procedure should not be his girlfriend. Most participants in all the focus group discussions perceived SMC increases sexual pleasure. **Conclusion** The overall self-reported SMC success rate among participants was high, along with the safety of SMC services and friendly health workers as important factors among male students. There is a need for continuous sensitization campaigns and communication strategies to address beliefs about SMC, some related misconceptions, and barriers so as to increase its prevalence.

Background

Globally, there were 36.7 million people living with HIV and over 1.8 million new infections reported by the end of 2016[1]. Sub-Saharan Africa (SSA) remains the most severely affected, with nearly 1 in every 25 adults (4.2%) living with HIV, accounting for nearly two-thirds of the people living with HIV (PLHIV) worldwide[1]. In Uganda, the prevalence of HIV is at 7.3% and the overall HIV prevalence in males is at 6.1%[2].

One of the strategies in HIV prevention is safe male circumcision (SMC). Safe male circumcision is the surgical removal of the foreskin of the penis and is practiced around the world for medical, religious, and cultural reasons [3]. Studies have shown 60% reduction in Human Immunodeficiency Virus (HIV) with circumcision [4]. Based on clinical trials, in 2007, the World Health Organization (WHO) recommended the inclusion of male circumcision (MC) in HIV prevention programs, especially in countries with generalized heterosexual HIV epidemics, high HIV prevalence, and low prevalence of MC [5]. Male Circumcision has many health benefits such as preventing penile cancer, cervical cancer in women, HIV and other sexually transmitted infections[4].

Young people aged 15–24 years (where most university students fall) are at a high risk of contracting HIV which may be in part attributed to engagement in risky sexual behaviors [6]. A survey among students from six universities in Uganda showed that condom use was generally low at 51% [7], this even further reduced to 46% [7] among students who take alcohol. This report also showed that about 17% of students had multiple sexual partners, 8% had cross-generational relationships and 18% had Sexually Transmitted Diseases (STDs) related complaints[7]. This clearly shows that university students are at great risk of Sexually Transmitted Infections (STIs) and HIV/AIDS. Although Uganda has had several strategies to reduce HIV and the most recent one being SMC, only 26% of men circumcised since the Ministry of Health (MoH) adopted the strategy in 2010. This proportion is still way below the 80% target set by MoH of men aged 15–49 years who should be circumcised by 2015[8]. Religious practices might limit prevalence of SMC for example, 85% of people in Uganda are Christians[9]. The proportion of university students up taking these SMC services is unknown and the factors affecting the prevalence are unknown. We hence conducted this study to determine the factors associated with the prevalence of Safe Male Circumcision among undergraduate students in Makerere University.

Methods

Study design and Setting

This was a cross-sectional study with quantitative and qualitative data collection methods from January to March 2016. The study was conducted at Makerere University main campus in Kampala, Uganda. The campus is located approximately 2.5 kilometers (1.6 mi), by road, north of Kampala's central business. The university is involved in teaching, training, and research in both undergraduate and postgraduate courses leading to awards. The university has nine constituent colleges and one school of law which offer not only day but also evening and external study programmes to a student body of about 35,000 undergraduates and 3,000 postgraduates (both Ugandan and foreign). The University offers circumcision services at the university hospital. The University was chosen because it's the oldest and largest public university in Uganda.

Study Participants

The study comprised of both circumcised and uncircumcised male Makerere University third-year undergraduate students at the Kampala campus who gave written informed consent.

Sampling and Sample Size

The sample size was estimated using modified Kish Leslie (1965) formula [10] using 26.3% as the prevalence of SMC among youth in Uganda[2]. A design effect of two [11] was used to adjust the calculated sample size of 596 to 656 to take care of the clustering effect of the participants. We selected participants using multistage sampling procedure with two stages. In stage one, five colleges were purposively sampled from the 10 colleges at the university. These included College of Engineering, Art and Design, College of Education and External Studies, College of Humanities and Social Science, College

of Business, Administration and Management and College of Computing and Information Science. In stage two, two-degree programs were randomly selected from each of the 5 colleges using computer-generated random numbers and the sample size was allocated to each program proportional to the number of third-year male students per program. A list of third-year males of the selected degree programs was obtained from the college registrars (only students on day program were considered) and these formed the sampling frame. The students were assigned numbers from 1 to 1061 and using a random number generator, 656 participants were selected from the entire list.

Quantitative Data Collection

A pretested self-administered semi-structured questionnaire with closed and open-ended questions was used to collect data from the participants. The questionnaire had different sections on demographic characteristics, Awareness about SMC, Community, Health facility factors and SMC prevalence. "SMC prevalence was defined as a self-reported circumcision from any health facility at the time of the study"[12]. Some questions in the questionnaire were adapted from a study on utilization of SMC in fishing communities [13]. Arrangements were made with lecturers together with the help of class representatives in visiting their lecture rooms while students were in class either before or after the lecture. During each session, a brief introduction to the study was given by the principal investigator, and the sampled students were after invited to remain behind. After consenting (written) to participate, all subjects were given the questionnaires including additional information on how to respond to the questions.

Qualitative Data Collection

The qualitative study was carried out to explain the quantitative findings and explore issues regarding cultural perceptions and beliefs with regard to SMC prevalence. Participants for Focus Group Discussions (FGDs) were purposively sampled. Students with a high level of social contacts like class representatives and student leaders were identified to participate in the FGDs and they helped in identifying the other participants to join the FGD. Four Focus Group Discussions (two for males and two for females) were held, moderated by a trained interviewer using a topic guide.

Quantitative Data Analysis

Quantitative data was entered in Epi-data version 3.1 and analyzed in Stata version 12.0. Data were adjusted for clustering at the college level. Prevalence of safe male circumcision (SMC) was reported as the proportion of students circumcised at the health facility. To identify the factors associated with prevalence of SMC, we carried out modified Poisson regression model with robust standard errors reporting prevalence ratios (PR). We performed bivariate analysis and all the variables, with $p < 0.20$ were subjected to multivariate analysis; possible interactions and confounding were assessed.

Qualitative Data Analysis

All audio recordings obtained from the FGDs were transcribed verbatim and analyzed using content analysis. We triangulated the findings from quantitative and qualitative results.

Results

Description of the study population

A total of 602 participants both circumcised and uncircumcised were enrolled into the study. The mean age of participants was 23 years. Out of the 602 participants (91.4%), 550/602 were from non-circumcising tribes and (8.6%) 52/602 were from circumcising tribes. The majority of the participants were Ugandans (96.2%) 579/60. (Table 1)

Prevalence of SMC

The overall prevalence of safe male circumcision among Makerere University third-year students after adjusting for clustering was (58.3%, 351/602) as reflected in table 2.

The perceived benefits of safe male circumcision given by the participants were hygiene 86.5% and reduced risk of penile cancer 45.7%. The details are reflected in table 3.

The perceived barriers to safe male circumcision were pain 61(10.1%) and longtime of healing (4–6 weeks) 46 (7.6%). Details on the perceived barriers are reflected in table 4.

From the qualitative data, the FGDs revealed that reduced chances of contracting STDs like gonorrhoea, HIV, and syphilis, hygiene, increased sexual satisfaction and reduced risk of penile cancer as benefits of SMC. These were supported by quotes from FGDs.

“When a man is not circumcised the germs enter and hide there but when he is circumcised the whole thing is clean and then the hygiene is maintained”, (Female FGD 1).

The FGDs revealed that the barriers to SMC prevalence were fear of pain, long time of healing hence missing classes, culture, and religion.

These were supported by quotes from the participants. *“Circumcision is only for Moslems some Christians will not like to go for circumcision because they do not belong to the Moslem family” (Male FGD 2).*

A participant shared her view in regard to the long healing period following circumcision.

“ Some peers say that the wound will take time to heal after circumcision that’s why they do not go for circumcision” (Female FGD 1).

At bivariate analysis, prevalence of SMC was associated with the safety of SMC procedure (PR 1.22, 95% CI, 1.01–1.36) and peer encouragement (PR 1.10, 95% CI 1.02–1.18). Other factors that were significantly

associated with SMC prevalence are reflected in table 5.

From the Focus Group Discussions, some participants cited peer pressure as one of the factors for SMC prevalence. One of the participants explained that:

“Peer pressure like from their fellow friends who have circumcised they can talk good things and they encourage others to go there and have a circumcision” (Female FGD1).

Some participants cited fear of knowing HIV status as a challenge to up taking SMC services. This was exemplified by one of the participants that: *“very many people will stay away from circumcision because people fear to test for HIV when you ask others they say no I don’t want to know my serostatus and doesn’t want the embarrassment” (Male FGD 2).*

At multivariate analysis, prevalence of safe male circumcision was independently associated with the safety of SMC procedure 1.13 (95% CI, 1.03–1.25) and health workers attitude in particular friendly health workers 0.78, (95% CI, 0.74–0.83) (table 6).

Perceptions on Safe Male Circumcision

The study revealed various perceptions and beliefs on SMC. These were: sleeping with a woman immediately after being circumcised, the fate of the foreskin, whites transmit diseases through circumcision, perceived sexual pleasure and circumcision is held for religious purposes. Generally, in all the FGDS conducted, the ladies were more concerned about health and sanitation than the men. Men were more concerned about group identity and pain but, there was more agreement on sexual pleasure.

Sleeping with a woman immediately after being circumcised

The participants reported a belief that SMC recipient’s first sexual partner post-procedure should not be his girlfriend. This was supported by the quote below:

“When you get circumcised you have to sleep with somebody outside the house who is not your girlfriend so you don’t stand a risk of separating with her; actually, some guys say that they go on the streets and pick up some sluts. “personally when I got circumcised I did not even sleep with my girlfriend, because of that thing of after six weeks, I had to look for someone on the streets because I never wanted to risk and lose my true girlfriend.” when you sleep with your girlfriend she will be yearning for men all the time not only you but also other men and will also be a prostitute”,(Male FGD 2).

The fate of the foreskin

A participant offered his opinion on what happens to the foreskin and why this might deter some from receiving SMC:

“I have heard about what they use those foreskins for when you get an accident and maybe you are bruised, they can use the foreskin to replace it so me I am really confused about the real intention of

circumcision", (Male FGD 2).

In addition, another participant shared her opinion that:

"My male friend told me that circumcision is the work of the whites after removing the foreskin the whites take them", (Female FGD 2).

Circumcision is held for religious purposes

Some of the participants in the FGDs offered their opinions on religion where one of them explained that:

"circumcision is basically done for religion like they said Amin's plan was to make people circumcise in the bid to fulfill that some people in future will turn to Moslem and therefore it is better for them to circumcise when it is still early like at 8yrs when they plan to make Uganda an Islamic state so it is being fulfilled such that in future by the time they say that we are changing to Moslem all of us will be circumcised", (Male FGD 1).

Perceived Sexual Pleasure

Most participants in all the FGDs perceived that SMC increases sexual pleasure. This was exemplified by one of the participants that:

"Circumcision increases the satisfaction to the partner when having sex. When you circumcise you are most sexually active and you increase your libido", (Male FGD 1).

One of the participants shared his experience on sexual pleasure: *"the joy we used to have with my girlfriend while having sex before circumcision increased after circumcising"* (Male FGD 2).

Several female participants mentioned that *"circumcised men are too active during sex; they are hot in bed and take long to finish"* (Female FGD 1). However, there was some inconsistency where a participant in one of the FGDs cited that: *"Circumcision reduces on urge for sex so you don't have to erect anyhow"* (Male FGD 1).

Discussion

We found that the overall prevalence of safe male circumcision (SMC) among Makerere university students Kampala campus was 58.3%. Those who were circumcised while at the university were 41.9%; however, this was below the 80% target set by the Ministry of Health of men aged 15–49 years who should be circumcised[8]. The overall prevalence of self-reported safe male circumcision established in this study is higher than that reported in previous studies [14], [15]. A similar study conducted in Zimbabwe among men aged 18–49 years, the prevalence of self-reported voluntary medical male circumcision was 15.3% [14], another study conducted in Zambia among youth voluntary medical male circumcision prevalence was 16.5% [15] while in Kenya among the youth, prevalence of SMC was 59.9% [16] which was closest to the prevalence established in this study. The prevalence in this study is still

higher than that reported in the general population of Uganda that stood at 26% by the time of the study[2]. The overall finding in this study may be explained based on the fact that our study was conducted among students from an institution of higher learning where students have access advantage to a wide range of educational information including sensitizations and campaigns compared to ordinary individuals in a community.

Improved penile hygiene, reduced risk of penile cancer, increased sexual pleasure and reduced risk of contracting STDs/STIs were the most expressed reasons for SMC prevalence. The percentage of reduced HIV was low meaning they are still ignorant about the fact that safe male circumcision can reduce the chances of HIV infection. This was surprising given the abundant scientific evidence from both observational and interventional studies demonstrating that male circumcision significantly reduces men's risk of becoming infected with HIV through heterosexual sex. These findings are consistent with the study conducted in Zambia among males aged 18 years and above where the majority of the respondents expressed that male circumcision helps enhance hygiene [17]. A similar study among university students in Zimbabwe reported the reasons for SMC as reduced penile cancer, hygienic reasons and a protection measure for HIV prevention [18]. The focus group discussions also revealed that increased sexual pleasure reduced penile cancer, hygienic reasons and reduced risk of acquiring HIV as reasons for up taking safe male circumcision. Similar findings were also reported in a study of motivators and barriers to Voluntary Medical Male Circumcision (VMMC) in Lesotho among men between 18–49 years [19], in Uganda among the fishing communities [20] and among men in Kenya [21].

The barriers to prevalence of SMC were fear of pain, long time of healing (4–6 weeks), long time before resumption of sex. Similar findings were reported among youth in three rural districts of Mukono, Wakiso, and Kiboga where participants cited fear of pain as a barrier to SMC prevalence [22]. However, other studies reported higher figures for fear of pain. In Zambia among youth and Zimbabwe among men aged between 18 and 49 years [14, 15]. This was also reflected in the focus group discussions which showed fear of pain, long time of healing hence missing classes, culture, and religion as barriers to SMC prevalence. The fear of pain, culture, and religion have also been universally cited as barriers in Kenya [21] and Lesotho[19]. Interventions to promote SMC need to center on the fact that SMC is a minor operation, which is not painful as it is performed under local anesthesia.

The health facility factor that was significantly associated with prevalence of SMC services in this study was the safety of the procedure. Participants that perceived SMC services are safe were 13% more likely to take up SMC services. The findings were similar to a study conducted in Uganda among men in the fishing communities where health workers were perceived by the respondents to be trained hence able to offer high-quality SMC services compared to traditional and religious forms of circumcision. Training of health workers in SMC provision increases the safety of the SMC procedure because of reduced complications like bleeding and post-surgical procedures[13]. In a study conducted in Kenya, most participants perceived safety of the SMC procedure, it is safe to be circumcised by medical personnel in a properly equipped hospital facility [21].The findings were also consistent with a study conducted in Kenya that found proper training of health workers in SMC provided them experience that reduces post-surgical

complications among male circumcision clients [23]. Participants with access to friendly health workers were 0.78 times as likely to have SMC as compared to those without access to friendly health workers. In contrast, other studies have documented that friendly health workers create confidence and attract more youth to have SMC services [13]. In our study, the contrary finding may be explained that probably those subjects who were not circumcised (or circumcised as infants) had no opportunity to observe how friendly the health workers were, so responded “neither friendly nor rude”. Our findings showed that tribe was not significantly associated with SMC prevalence. Similar findings were found in a study conducted among the fishing communities in Uganda [13]. Our findings also showed that non-circumcising religions were 93% less likely to take up SMC services than circumcising religions. This was in tandem with other studies conducted in Uganda among the fishing communities [13] and in Zambia among men aged 18 years and above [17] where religion was not found to be a significant factor.

The belief that impacts SMC prevalence is the perception that after circumcision, a man’s first partner should not be his girlfriend or wife. A similar perception was found among the fishing community on Lake Victoria in Uganda [20], and in South Africa [24]. Policy makers and implementers need to develop communication strategies to oppose such beliefs which increase risky sexual behaviors. There was a perception that the foreskins are sold abroad or used for accident victims. In a similar situation among the fishing communities on Lake Victoria, Uganda, a participant reported that the foreskins are sold abroad to make women’s creams [20]. Policy implementers need to put more focus on these misconceptions by discussing openly the fate of the foreskin. The perception of sexual pleasure was mentioned in all FGDs as a reason for acceptance of safe male circumcision. Most female participants mentioned that circumcised men are too active during sex. Similar perceptions about the effects of SMC on sexual pleasure were documented by a number of studies [20, 25, 26].

This study had some limitations. It is important to note that this being a cross-sectional study, causality could not be assessed and it was prone to many biases. The interview schedule was a self-report and no clinical examination was done during the study to confirm circumcision status however we tried to minimize bias by using verification questions. Some students may have sought male circumcision in other locations like traditional. Random error was minimized by using a large sample size however purposive sampling procedure may have introduced the random error which could have affected precision giving us wide confidence intervals. Selection bias which may have arisen from the way participants were sampled was minimized by recruiting participants from different colleges. Misclassification bias was minimized by using pretested questionnaire before data collection and using verification questions for self-reported SMC. Confounding was minimized by use of regression methods although there remains a possibility of residual confounding.

Conclusions

The overall prevalence of Safe male circumcision was high. Safety of safe male circumcision services and friendly health workers were important factors in the prevalence of safe male circumcision among Makerere University male undergraduate students.

The benefits of safe male circumcision were hygiene, reduced risk of penile cancer, increased sexual pleasure, and the barriers were pain, long time of healing, and long time before resumption of sex. Very few participants perceived that SMC reduces the risk of acquiring HIV infection. There is a need for continuous campaigns, sensitization and communication strategies to address beliefs about SMC, misconceptions, and barriers in order to increase its prevalence.

Abbreviations

SMC: Safe Male Circumcision; *CEU*: Clinical Epidemiology Unit; *PR*: Prevalence Ratios; *CI*: Confidence interval; *MC*: Male Circumcision; *MoH*: Ministry of Health; *PLHIV*: People Living with HIV; *FGDs*: Focus Group Discussions, *SOMREC*: School of Medicine Research Ethics Committee; *UNCST*: Uganda National Council for Science and Technology; *VMMC*: Voluntary Medical Male Circumcision

Declarations

Ethics approval and consent to participate

Approval to carry out the study was obtained from Makerere University Clinical Epidemiology Unit (CEU), Makerere University School of Medicine Research and Ethics Committee (SOMREC), Uganda National Council for Science and Technology (UNSCT). All prospective participants provided informed consent (written for the quantitative study and oral for the qualitative study). The study data were kept confidential (we used identification numbers instead of their names).

Consent for Publication

Not applicable.

Availability of Data Materials

Data cannot be shared because relevant approvals from the institutions that participated are not in place.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

JN participated in the conception, design, study implementation, statistical analysis, interpretation of data and drafting of the manuscript. JM, JI, RS, AN, IK, BT, JN, AM, SA and EEL participated in polishing the study design, analysis and interpretation of data and reviewing the manuscript. BBA, MSK, JNK and

CK participated in study conception, design and critically reviewing the manuscript for important intellectual content. All authors read and approved the final manuscript.

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Tables

Table 1: Social - demographic characteristics of Makerere University male undergraduate students, Kampala, 2016

Characteristic (N=602)	Number	Percentage (%)
Age		
21-25	557	92.5
≥ 26	45	7.5
Mean Age (SD)		23 (2.4)
Religion		
Protestant	227	37.7
Catholic	206	34.2
Born again	97	16.1
Moslem	51	8.5
SDA	15	2.5
Others*	6	1.0
Nationality		
Ugandans	579	96.2
Non-Ugandans	23	3.8
Tribe		
Non-Circumcising tribes	550	91.4
Circumcising tribes	52	8.6
Course		
B. Arts in Education	26	4.3
B. Business Statistics	100	16.6
Science in Education	46	7.6
B. Information Technology	70	11.6
B. Social Work & Social Administration	27	4.5
B. Civil Engineering	56	9.3
B. Computer Science	54	8.9
B. Mechanical Engineering	28	4.6
B. Social Sciences	101	16.8

*Others include Jehovah’s Witness, Pagan, Atheist, Deist and African Traditionalist. ** Non-Circumcising tribes to mention but a few include; Banyankole, Baganda, Acholi, and Itesots.

Table 2: Prevalence and factors associated with Safe Male Circumcision among Makerere University male undergraduate students, Kampala, 2016

Variable	Circumcised (N=602)	Prevalence (%)	95%, CI
Safe male circumcision			
Overall prevalence	351	58.3	54.37 – 62.24
Current age of participants			
21-25	328	54.5	50.51 – 58.46
≥26	23	3.8	2.3– 5.4
Age at circumcision			
≤14 years	99	16.4	13.48 – 19.41
15- 24	252	41.9	37.91 – 45.80
Religion			
Non-Circumcising religions	326	53.9	50.00 – 57.97
Circumcising religion	25	4.2	2.55 – 5.75
Nationality			
Ugandans	333	55.1	51.18 – 59.12
Non - Ugandans	18	2.9	1.62 – 4.35
Tribes			
Non – Circumcising tribes	322	53.3	49.34 – 57.31
Circumcising tribes	29	4.8	3.11 – 6.53

Table 3: Perceived benefits of SMC Prevalence among Makerere University male undergraduates, Kampala, 2016

Variable	Number (N=602)	Percentage (%)
Hygiene	521	(86.5)
Reduced risk of penile cancer	275	(45.7)
Increased sexual pleasure	120	(22.2)
Reduced Risk of HIV Transmission	26	(4.5%)

*The reasons were assessed using multiple choice questions

Table 4: Perceived barriers to SMC prevalence among Makerere University male undergraduates, Kampala, 2016

Variable	Number (N=602)	Percentage (%)
Pain	61	(10.1)
Long time of healing (4-6wks)	46	(7.6)
Long time before resumption of sex (4-6wks)	33	(5.5%)

*The reasons were assessed using multiple choice questions

Table 5: Bivariate analysis of factors associated with SMC prevalence among Makerere University male undergraduate students, Kampala, 2016

Variables	SMC Prevalence		PR (95%CI)	p-value
	Yes n (%)	No n (%)		
Age				
21 – 25	328 (58.89)	229 (41.11)	1	
≥26	23 (51.11)	22 (48.89)	1.06 (0.97 – 1.15)	0.2
Religion				
Circumcising religion	25 (49.02)	26 (50.98)	1	
Non-circumcising religions	326 (59.17)	225 (40.83)	0.93 (0.83 – 1.04)	0.207
Tribe				
Circumcising tribes	29 (55.77)	23 (44.23)	1	
Non – circumcising tribes	322 (58.55)	228 (41.45)	0.98 (0.94 – 1.02)	0.387
Peer Encouragement				
Yes	287 (61.32)	181 (38.68)	1.10(1.02 – 1.18)	0.009
No	64 (47.76)	70 (52.24)	1	
Community Leader Encouragement				
Student leader	86 (57.33)	64 (42.67)	0.99 (0.91 – 1.08)	0.847
Church leader	56 (69.14)	25 (30.86)	0.91 (0.83 – 0.99)	0.045
Local leader	50 (56.82)	38 (43.18)	0.10 (0.90 – 1.11)	0.933
None	159 (56.18)	124 (43.82)	1	
Safety of SMC procedure				
Yes	335 (61.02)	154 (38.98)	1.22(1.01 – 1.36)	<0.001
No	16 (30.19)	37 (69.81)	1	
Privacy of SMC services				
Yes	315 (61.52)	197 (38.48)	1.53 (1.18 – 2.00)	0.001
No	36 (40.00)	54 (60.00)	1	

Health workers attitude*				
Friendly Health workers	197 (79.12)	52 (20.88)	1.82 (1.59 – 2.08)	<0.001
Rude Health workers	2 (66.67)	1 (33.33)	1.54(0.67 – 3.52)	0.311
Neither Friendly nor rude	152 (43.43)	198 (56.57)	1	

*The overall test for health workers attitude and community leader encouragement was < 0.001. * Non-Circumcising religions to mention but a few include Protestants, Catholics, Seventh Adventists and the Born Again.

Table 6: Multivariate analysis for factors associated with SMC prevalence among Makerere University male undergraduate students, Kampala, 2016

Variable	PR	95%, CI	P-Value
Safety of SMC procedure			
Yes	1.13	1.03 – 1.25	0.012
No	1.00		
Health workers attitude			
Friendly health workers	0.78	0.74 – 0.83	<0.001
Rude health workers	0.87	0.57 – 1.31	0.497
Neither friendly nor rude	1.00		

*The overall test for health workers attitude was <0.001

Supplementary Files

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