

Knowledge and Attitudes of Circumcision among Adult Male Clients Receiving Care in a Teaching Hospital in Kigali City, Rwanda

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Abstract

Background

Surgical male circumcision is one of the oldest and most frequently performed surgical procedures in the world. It reduces the risk of heterosexually acquired HIV infection by around 60%. Knowledge and Attitudes toward male circumcision are still a concern in Rwanda as male circumcision is not traditionally widespread in the country. This study assessed the knowledge and attitudes of male clients attending RMH regarding circumcision.

Methodology

A cross-sectional study design was used. Participants were 355 adult males and data was collected during 10 days. A structured questionnaire was used. Descriptive and analytical statistics were computed and OR, p values were presented in tables.

Results

The participants were sufficiently knowledgeable at 79.4% (n=282) and had positive attitudes at 57.7% (n=205) towards medical male circumcision(MMC). Private sector employees, method used for MMC, positive attitude, and proof of manhood were associated with knowledge with COR=0.291,(CI=0.095–0.891), p-value 0.031; COR=1.872, (CI=1.076–3.258], p-value 0.026; COR=0.492,(CI=0.255–0.767), p-value 0.004; COR=2.336,(CI=1.329–4.107) p-value 0.003 respectively. Community encouragement and knowledge were associated with attitude COR=1.680,(CI=1.025–2.753), p-value 0.040; COR=0.413,(CI=0.245–0.696), p-value 0.001 respectively.

Conclusion

Knowledge of male circumcision was sufficient and attitudes were positive. Generally, participants were highly motivated and knowledgeable about MMS.

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Keywords: Medical Male Circumcision, Knowledge, Attitudes, Rwanda Military Hospital

Background

Male circumcision involves the removal of the foreskin from the penis.[1] Surgical male circumcision(SMC) is one of the oldest and most frequently performed surgical procedures in the world.[2,3] Most anthropologists believe that the practice originated in Egypt over “15,000.” years ago and spread throughout different (heliolithic) cultures across the world. [4] Voluntary medical male circumcision (VMMC) is considered to provide men partial protection from HIV acquisition and should be understood as only one element of HIV prevention, it should not replace other existing biomedical and behavioral interventions and is basic in the prevention of STIs, UTIs, genital warts and cervical cancer.[5]

Globally, approximately 30–32% of men are circumcised for religious, cultural, medical, or parental choice reasons.[3] Knowledge and attitudes of the populations are different from country to country and from region to region.[6] Among the Jewish people, for example, male circumcision continues to be almost universally practiced and is included in their holy book (the Torah).[7] It is also practiced in all countries habited by the Muslims, globally.[7] Despite the widespread practice of male circumcision, knowledge levels and attitudes vary by regions, countries and populations.[8] For example, in some populations, male circumcision is viewed as a proof of maturity in man.[2,7] In other countries, like Poland, the practice is encouraged because of its public health benefit of decreasing the risk of getting sexually transmitted diseases, including HIV/AIDS.[9]

In countries in Africa, even though surgical male circumcision is an old procedure, there is also PrePex which is a nonsurgical circumcision device, developed to accelerate the scale-up of circumcision.[10] The WHO/UNAIDS recommends, that countries with a high HIV prevalence, low rates of male circumcision, and heterosexual epidemics should consider scaling up male circumcision as part of a comprehensive

HIV prevention package.[11] Based on the estimated proportion of circumcised men by WHO 70% of them are Muslims, in Africa, the frequency of MC ranges from less than 20% in some southern African countries to nearly universal in North and West Africa. [12] Voluntary medical male circumcision would not be well received by men in many regions of Africa, given the low prevalence of traditionally practiced circumcision,[10,13] and in some regions, PrePex is being practiced more than SMC and vice versa depending on the population’s knowledge. [14] VMMC is performed using either SMC or PrePex even though previously conducted studies indicated that device MMC was the preferred option for clinicians and that they would recommend it to others,[15] Healthcare providers considered SMC a time-consuming and riskier procedure than PrePex.[16] Knowledge and attitudes on PrePex indicate that the PrePex method is not suitable for all clients and when given a choice, not every client will choose PrePex over surgery.[17]

In Rwanda, there is a low prevalence of circumcised males as reported in a study conducted in Nyanza district with around 35.8%,[18] even though this was relatively higher than the whole country’s prevalence of 30% as reported by Rwanda Demographic and Health Survey of 2014/2015. The knowledge and attitudes (KA) of the population on MC is insufficient even though it has been practiced since long ago. In addition to SMC, the PrePex procedure has been introduced in Rwanda to achieve the goal of 80 % circumcised males in 13 countries located in sub-Saharan Africa, Rwanda included.[19] Previous studies conducted in Rwanda[8,14] have reported gaps in knowledge and negative perceptions about MMC and inappropriate post-circumcision sexual behaviors. The aim of this study was to assess the knowledge and attitudes of the male circumcision clients attending a public hospital in Kigali City on male circumcision with a view to providing information that can advise on strategies to increase the number of circumcised males in line with national and global goals.

Methods

Study design

This study used a descriptive cross-sectional design with quantitative methods to evaluate community knowledge and attitudes regarding male circumcision.

Study setting

The study was conducted at Rwanda Military Hospital (RMH). RMH is a referral and teaching hospital, located Kicukiro district, in the city of Kigali. This hospital has been accredited to be a center of excellence in PrePex in this region in addition to SMC which has been performed since long ago, it is a hospital with the capacity of receiving 300 outpatients and above per day and with great capacity in circumcising many clients per day using either PrePex or SMC.

Study population

The study population was males aged ≥ 21 years who were attending adult primary curative consultation in the Outpatient Department of Rwanda Military Hospital in Kigali City, during the month of September 20th to 30th 2018.

Sample size

The sample size was estimated using the formula that was developed by Kish Leslie,[20] which is:

$$n = Z^2 \cdot Q \cdot P / D^2$$

Where:

Z = standard normal variant corresponding to 95% confidence interval and is 1.96

P =Prevalence of circumcised males in Rwanda is 30%.[18]

D = the required precision of the estimate (0.05)

$$Q = (100-P) \%$$

$$n = (1.96)^2 \times 0.7 \times 0.3 / (0.05)^2 = 322.6944 = 323$$

people

For the study sample, the researcher added on 10 % non-response rate,[21] which made our sample size 355 participants.

Sampling strategy

A simple random sampling technique was used in selecting research participants,

where the investigator divided the sample size by ten to get the exact number of daily participants as data was collected during 10 working days (the data was collected from 20th to 30th September 2018).

Data collection tool

The tool for data collection was structured questionnaire. The tool was adopted from previously conducted studies on knowledge and attitude of male circumcision. [11,12,22] The adopted tool contextualized and validated by the principal investigator in collaboration with the co-investigators and other various research experts. The structured questionnaire consisted of three sections: The first section was about the sociodemographic characteristics of the study participants. The second section contained the questions related to knowledge of MMC and finally, section number three composed of questions on the attitude of male participants on MMC.

Data collection procedure

The study participants were sampled according to the sample size as calculated in the sample size calculation. The study participant ticked the right response on the questionnaire on each variable under investigation. Each questionnaire was given a code and the researcher made a list of participants' names corresponding to the codes to avoid using the same name or code twice. Before data collection, participants were explained about the research purpose and objectives and consented verbally and signed individual consent forms and thereafter given a self-administered questionnaire to fill. Data was collected during a two-week period.

Reliability and validity of instruments

The items or questions on the questionnaire had a logical connection with the study objectives since the questions were about knowledge and attitudes on circumcision and were described concerning the other previously conducted research on KA of male circumcision. All of these used tools justify the face validity of the used tool in this study. Concerning the content validity,

the item used in data collection was enough and appropriate to measure the KA of male circumcision. The structured questionnaire was a more relevant and adequate presentation in each section to evaluate the KA of MMC.

This instrument was checked with deep analysis by various experts in research including the research investigator and co-investigators for content validity. The researcher conducted a pilot study of 10 participants to test the instrument for validity and feasibility purposes. The internal consistency of the pilot study was measured and Cronbach’s alpha coefficient was 0.69 as a reliability factor.

Data analysis

The knowledge and attitudes towards MC were analyzed using SPSS statistics version 21.[18] Bivariate analysis was computed to obtain significant associations between socio-demographics and other variables on knowledge and attitude (KA) of participants. Chi-square test was performed to compare proportions. A bivariate binary logistic regression model was used to identify the independent predictors of the knowledge and attitude on circumcision. Clients’ knowledge were described as adequate, moderate, or inadequate, and on the attitudes of the study participants was described as positive or negative towards male circumcision. These were run against the independent variables and associations found if a p-value is less than or equal to 0.05 was considered as statistically significant. The researcher calculated p-value and odds ratios and their respective 95% confidence intervals (CI).

Ethical considerations

The study protocol was reviewed by the Institutional Review Board (IRB) of the College of Medicine and Health Sciences, University of Rwanda (No 343/CMHS IRB/2018). Thereafter, permission to collect data at the study site was provided by the RMH ethical committee Ref: RMH IRB/014/2018. Before data collection, the study participants were explained the research process and ethical issues in detail, and those who consented

to participate signed the consent forms and the participation in the study was fully voluntary. No name of the participant appeared on the questionnaire, only code was used to respect the principle of anonymity and data was always kept confidential and kept in a locked cupboard. The study did not cause any harm to the participants and the knowledge, attitudes did not have any impact on the services the client received either on circumcision services or primary curative consultation.

Results

Socio-demographic characteristics of participants

Table 1. Socio-demographic characteristics of participants (N=355)

Determinants	Frequency(n)	Percentage (%)
Age		
21-30 years	216	60.8
31-40 years	102	28.7
41-50 years	27	7.6
51 years and Above	10	2.8
Marital status		
Single	243	68.5
Married	98	27.6
Cohabitant	10	2.8
Divorced	4	1.1
Education level attended		
Did not attend	108	30.4
Primary school	187	52.7
Secondary	58	16.3
Tertiary level	2	0.6
Religion		
Catholic	250	70.4
Protestant	80	22.5
Others	25	7
Occupation		
Unemployed	140	39.4
Public servant	11	3.1
Private Employed	42	11.8
Agriculture	162	45.6
Distance to Health facility(Minutes)		
Less than 30	84	23.7
More than 30	253	71.3
I don’t know	18	5.1
Hygienic status per day		
2 or more time	99	27.9
Once a day	220	62
Sometimes	36	10.1
Total	355	100%

A total of 355 participants were interviewed (a response rate of 100%). Table 1 presents the characteristics of the participants. The majority, 60.8% (n=216), of respondents were between the age of 21-30; the majority 68.5% (n=243), were single. Just slightly more than half, 52.7% (n=187), reported that the highest level of education attained was primary school; 70, 4% (n=250) were Catholics. Slightly less than half, 45, 6% (n=182), reported that agriculture was their occupation. About a quarter, 71.3% (n=253), revealed that they lived at a distance above 30 minutes from healthcare facilities. The majority, 62% (n=220), reported good hygiene and were taking showers at least once daily (Table 1).

Knowledge of participants towards MMC

A great majority, 86.5% (n=307), disclosed that they have heard about MMC; 85.9% (n=305) reported that they prefer circumcision in childhood rather than at older age. Almost 96.6% (n=343) prefer to be circumcised by doctors or nurses and 98.3% (n=349) reported that the ideal place for circumcision is in a healthcare facility than any other place. Bleeding during surgical circumcision was reported to be the major risk at 66.8 % (n=237) and 58.9% (n=209) for both PrePex and SMC respectively. The culture was reported to have a positive influence on circumcision at 77.5% (n=275) and most participants reported that their female partner's influence on the decision to be circumcised was positive at 56.6 % (n=201) (Table 2). In summary, knowledge regarding circumcision was sufficient with 79.4% (n=282) compared to 20.6% of those with insufficient knowledge.

Table 2. Participants Knowledge towards MMC

Determinants	Frequency (n)	Percentage (%)
Visiting purpose		
Primary curative consultation	355	100
Ideal age for MC		
Childhood	305	85.9
Not in Childhood	50	14.1
Ideal person for MC		
Doctor/Nurse	343	96.6
Any other person	12	3.4
Risk of MMC		
Bleeding	21	5.9
Others	334	94.1
Risk of PrePex		
Bleeding	209	58.9
Others	146	41.1
Risk of SMC		
Bleeding	237	66.8
Others	118	33.2
Ideal place for MC		
Healthcare facility	349	98.3
Not in Health facility	6	1.7
Religion influence		
Positive	275	77.5
Negative	80	22.5
Heard about MMC		
Yes	307	86.5
No	48	13.5
Methods used for MC		
Yes	152	42.8
No	203	57.2
Cultural influence		
Positive	275	77.5
Negative	80	22.5
Partner influence		
Positive	201	56.6
Negative	154	43.4
Total	n=355	100%

Participants' Attitudes towards Medical Male Circumcision

Figure 1, presents the attitude of participants towards male circumcision. Slightly more than three-quarters of the respondents, 77.5 % (n=275) confirmed positive religious influence on circumcision; 63.9 % (n=227) reported that their partners were opposed to being circumcised.

More than half, 65.9% (n=234) believed that culture does not influence the MMC program. About a quarter, 27% (n=96), reported that the community was involved positively in male circumcision; 65.1 % (n=231) reported that circumcision does not prove manhood. In summary, positive attitudes towards circumcision were reported at 57.7% (n=205) compared to 42.3% with negative attitudes.

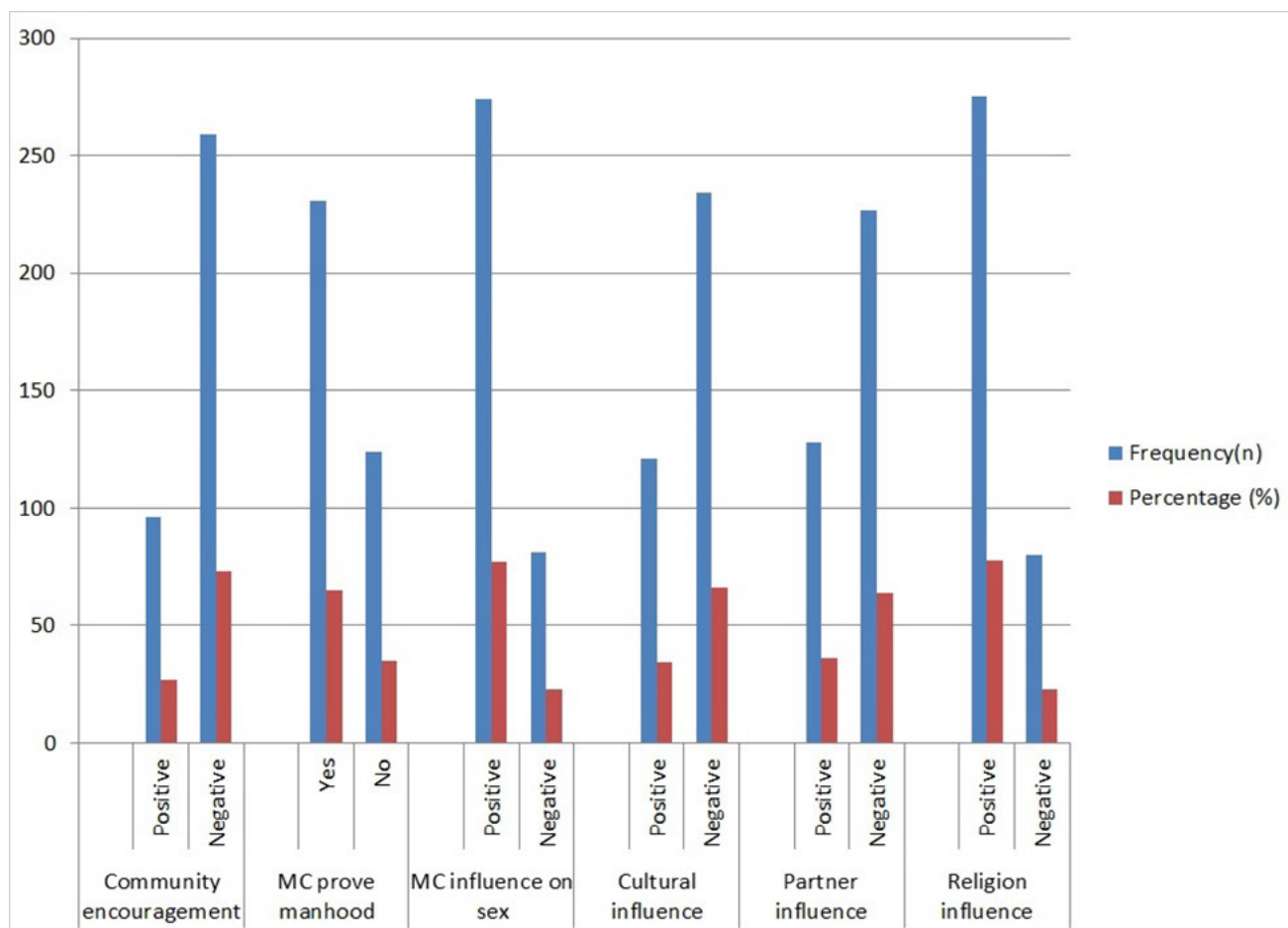


Figure 1. Participants attitude towards MMC

Bivariate analysis

Factors associated with circumcision knowledge

To assess the associations between the knowledge of the study participants and other variables, bivariate logistic regression was performed. Private servant as employment status was significantly negatively associated with knowledge of circumcision (COR=0.311, [CI=0.11–0.923] p=0.035; distance to healthcare facility of less than thirty minutes travel (COR=2.5,[CI=0.53–11.82] with p value 0.024 risk associated with PrePex, incomplete circumcision was negatively

associated with knowledge (COR=0.269, [CI=0.1–0.696]) and with p value 0.007 and medical male circumcision as a proof for manhood was positively associated with participants knowledge (COR=1.860, [CI=1.102–3.140]) with p-value of 0.02; and finally positive attitude was negatively associated with knowledge (COR=0.492,[CI=0.29–0.828]) with p-value 0.008 (Table 3).

Factors associated with circumcision attitudes

To assess the associations between the attitudes of study participants toward MMC with other variables, bivariate logistic regression was performed. The positive cultural influence was significantly negatively associated with MMC attitude (COR=0.570,[CI=0.372–0.874]) and with p value 0.01; community encouragement

on MMC (COR=1.539,[CI=0.961–2.466]) and with p value 0.073 and finally knowing MMC had a positive impact on MMC attitude (COR=0.492,[CI=0.292–0.828]) and with p value 0.008 and positive religious influence is 1.5 times more likely to have positive attitudes regarding circumcision than negative influence though the p value was not statistically significant (Table 3).

Table 3. Factors associated with circumcision knowledge and Factors associated with circumcision attitudes

A. Knowledge factors in bivariate analysis						
Determinants	Knowledge		COR	95% C.I. for OR		P value
	Sufficient	Insufficient		Lower	Upper	
Employment status						
Farmer/Agriculture	121	41	1			
Unemployed	115	25	0.642	0.37	1.122	0.120
Public servant	8	3	1.107	0.28	4.37	0.885
Private servant	38	4	0.311	0.11	0.923	0.035
Distance to HCF						
I don't know	16	2	1			
Less than 30 mins	64	20	2.5	0.53	11.82	0.024
More than 30 mins	202	51	2.02	0.45	9.068	0.359
Method used to perform MC						
No	168	35	1			
Yes	114	38	1.6	0.95	2.683	0.075
MC proves manhood						
No	192	39	1			
Yes	90	34	1.86	1.1	3.14	0.02
Attitude on MMC						
Negative	109	41	1			
Positive	173	32	0.492	0.29	0.828	0.008
B. Attitudes factors in bivariate analysis						
Determinants	Attitude		COR	95% C.I. for OR		P value
	Positive	Negative		Lower	Upper	
Religion influence						
Negative	53	27	1			
Positive	152	123	1.588	0.944	2.674	0.082
Cultural influence						
Negative	77	77	1			
Positive	128	73	0.570	0.372	0.874	0.01
Community encouragement on MC						
No	157	102	1			
Yes	48	48	1.539	0.961	2.466	0.073
Knowledge on MMC						
Insufficient	32	41	1			
Sufficient	173	109	0.492	0.292	0.828	0.008

Multivariate analysis

By plotting multivariate analysis between variables which were statistically significant in bivariate analysis against MMC; knowledge was statistically significant with the private servant as employment status with (COR=0.291, [CI=0.095–0.891] with a p value of 0.031; the method used to perform MMC with (COR=1.872, [CI=1.076–3.258] and p value 0.026; medical male circumcision as a proof for manhood with (COR=2.336, [CI=1.329–4.107]) and p value

of 0.003 and finally, positive attitude with COR=0.492, [CI=0.255–0.767]), p value 0.004. Regarding the attitude variables in multivariate analysis with MMC variables; knowledge of MMC had a positive impact on MMC attitude with (COR=0.413, [CI=0.245–0.696]), p value 0.001 and community encouragement on MMC with (COR=1.680, [CI=1.025–2.753]) and with p value 0.040 (Table 4).

4. Multivariate analysis

A. Multivariate analysis on knowledge of MC

Determinants	Knowledge		COR	95% C.I. for OR		P value
	Sufficient	Insufficient		Lower	Upper	
Employment status						
Farmer/Agriculture	121	41	1			
Unemployed	115	25	0.556	0.306	1.009	0.054
Public servant	8	3	1.058	0.242	4.622	0.941
Private servant	38	4	0.291	0.095	0.893	0.031
Method used to perform MC						
No	168	35	1			
Yes	114	38	1.872	1.076	3.258	0.026
MC prove manhood						
No	192	39	1			
Yes	90	34	2.336	1.329	4.107	0.003
Attitude on MMC						
Negative	109	41	1			
Positive	173	32	0.442	0.255	0.767	0.004

B. Multivariate analysis of attitude towards MC

Determinants	Attitude		COR	95% C.I. for OR		P value
	Positive	Negative		Lower	Upper	
Knowledge on MC						
Insufficient	32	41	1			
Sufficient	173	109	0.413	0.245	0.696	0.001
Community encouragement						
No	157	102	1			
Yes	48	48	1.680	1.025	2.753	0.040

Discussion

Knowledge of participants towards MMC

Medical Male circumcision(MMC) is a common procedure, that is highly prevalent in some regions of the world; however, due to religious customs, cultural; it is distributed differently throughout the world.[23] The overall purpose of this research was to assess the knowledge and attitudes of male clients towards circumcision at RMH. According to the study results, 86.5% were aware of the MMC procedure in spite that it is not commonly practiced and 100% of the participants were not circumcised. The results were similar to the study conducted in Botswana and Zimbabwe where the majority of the population was aware of circumcision and almost all male participants were not circumcised at the proportion of 97.9%.[24] Bleeding during circumcision was reported to be the major risk at 58.9 % and 66.8% for both PrePex and SMC respectively. Participants reported a preference for PrePex over SMC at a high proportion of 67.6%. This was also mentioned in a study recently conducted in South Africa with a proportion of 90 % of participants.[15]

In this study 85.9%(n=305) reported that circumcision should preferably performed in childhood rather than in adulthood, the result was the same as studies conducted in South Africa and Uganda,[9,11] culture was reported to have a positive influence on circumcision at 77.5% (n=275) and most participants reported that they were influenced positively by their female partners towards the decision to be circumcised at 56.6 %(n=201). The result was similar to that conducted in Uganda reporting that male circumcision was performed as a way of maintaining cultural identity and perpetuating the traditions,[3] and contrary to this in Zambia, the majority were single and did not influenced by their female sexual partner[25]. The participants reported that circumcision procedure should be performed by doctors or nurses at a proportion of 96.6%(n=343) and be performed at a healthcare facility at a proportion of 98.3%,

even though Rwanda was known to have traditional circumcision provider, the above results are showing how community trust health system and surgeons in particular to circumcise their children.[4,24] According to the results found, the summary level of knowledge of participants was sufficient with a proportion of 79.4%. The study results were encouraging considering non-circumcised communities, as even though the prevalence of circumcision is still low at around 31% compared to the global prevalence of around 37-39%.[9] Male populations have adequate knowledge and a stronger willingness to be circumcised. By performing bivariate and multivariate analysis circumcision knowledge was slightly associated and statistically significant with circumcision as a proof of manhood with (COR=1.860, [CI=1.102-3.140]) and p value of 0.02. All other variables were not significantly associated with the knowledge of participants towards circumcision.

To assess the associations between the knowledge of the study participants and other MMC variables; The researcher performed multivariate binary logistic regression analysis between variables which were statistically significant in bivariate analysis; and knowledge on MMC was associated with employment status in its category of private servant with (COR=0.0291, [CI=0.095-0.891] and p value of 0.031, similar results was found in a study conducted in Zimbabwe where younger employed participants expressed the effectiveness of MMC on prevention of HIV,[26] Method used to perform MMC with (COR=1.872, [CI=1.076-3.258] and p value 0.026; WHO emphasized the novel methods employed during SMC, noting how they overcame existing obstacles to services, increased acceptability, and addressed disparities in access and coverage,[27] Medical male circumcision as a proof for manhood was associated with participants knowledge (COR=2.336, [CI=1.329-4.107]) with p-value of 0.03, similar results was found in a study conducted in Lesotho where mainly male circumcision is

performed when the boys reach their adolescence according to their tradition,[28] And finally positive attitude with $COR=0.492$, $[CI=0.255-0.767]$, p value 0.004 and the same results was found in Aswatini where they reported that males had knowledge about MMC but attitude were negative towards VMMC.[22]

Attitudes of participants towards MMC

Among the major findings of this study, participants showed a high positive attitudes proportion of 57.7% compared to negative attitudes of 42.3% , the above-mentioned proportion is consistent with the findings by Westerkamp and Bailey,[24] this was encouraging as many studies conducted in Sub Saharan Africa reported negative attitudes resulted from being circumcised.[29] Results on the variables regarding attitudes on medical male circumcision revealed positive attitudes of most of the participants who reported that circumcision does not affect their sexual behavior negatively at a proportion of 77.2% .[4] By plotting multivariate analysis of attitude on MMC and other variables some variables were statistically significant including; community encouragement on MMC ($COR=1.680$, $[CI=1.025-2.753]$) with p value 0.040 , and similar results was found in a study conducted in SSA by WHO where they found community participation important in all aspect of the process of MMC whether traditional or medical,[30] And finally having knowledge on MMC had positive impact on MMC attitude ($COR=0.413$, $[CI=0.245-0.696]$) and with p value 0.001 , in the results of a study conducted in Rwanda, they reported that having sufficient knowledge would motivate males to have positive attitude like it's benefit against HIV/AIDS, penile hygiene but some others had negative attitude due to its effects on pain especially in younger adults less than 19 years old,[31] and in Tanzania, a study conducted in Njombe town council reported that Knowledge and attitude of its community were good in most of its community members.[32]

Limitations

This study had many limitations that need consideration, first of all, this study was conducted in one public area which is Rwanda Military Hospital, and even though it was a center of excellence for PrePex also it was being performed elsewhere as well as surgical male circumcision, the results may not be generalizable for the whole country. As data were collected in a center of excellence for medical male circumcision especially PrePex, meant that the investigators used key populations as the study participants, the third point is that the study needs to be complemented with qualitative research to have complete information on knowledge and attitudes of male clients towards circumcision.

Conclusion

All respondents were not circumcised and the majority were sufficiently knowledgeable towards medical male circumcision at a higher proportion and had positive attitudes towards circumcision. Circumcision as a proof of manhood was significantly associated with level of knowledge and self-employed participants were associated with positive attitudes of participated individuals. Most of the participants were willing to be circumcised and considered medical male circumcision as an important medical procedure. The majority of respondents preferred PrePex to Surgical male circumcision and would recommend the procedure to their friends.

Recommendations

The government of Rwanda should advocate the influence of the religion in favor of circumcision program but also, would suggest to initiate medical male circumcision in Rwandan culture as it is not traditionally practiced hence increasing the number of circumcised males in the community. In addition to this, the Ministry of Health should increase awareness and community mobilization on the issues regarding medical male circumcision to increase the uptake of VMMC which is still low in Rwanda.

Further studies with larger sample sizes and conducted in different parts of the country should be conducted to elaborate more variables associated with population knowledge and attitudes towards MC.

Conflict of interest

The author declares no conflict of interest.

Authors' contribution

IM, AN contributed to the conception, design, data analysis, and interpretation and writing of the manuscript.

AU, RR, Contributed to data analysis, interpretation, and writing manuscript

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