

## Knowledge Levels of Male Circumcision among Pregnant Women at a Referral Health Institution: A Pilot Study

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### Abstract

Worldwide, 30% of all men, (665 million), are circumcised for various reasons including cultural, religious and medical reasons. This figure is too low, considering that it is projected that by the end of 2015 80% of all males should have been circumcised in order to reduce sexual transmission of HIV infection by 50% by 2025. Though prevalence of male circumcision is high in Jewish, Islamic and Muslim countries where it is about 98%, in some parts of the world, it is less than 5%. The purpose of this study was to assess the level of knowledge of medical benefits of male circumcision among pregnant women aged 18-35 years at Parirenyatwa Antenatal Clinic in Harare, Zimbabwe. The study was conducted with a convenience sample of 30 pregnant women. Data was collected from February to March 2013 using structured questionnaires. The health belief model was the guiding framework for the study. Permission to carry out the study was granted by the respective institutional review boards and all participants gave written consent. Data was analyzed using Microsoft Excel. Results indicated that 66.7% knew that male circumcision is a preventive method of HIV. Twenty five (83.3%) were aware that it was easier to be infected with HIV if he is not circumcised than when he is circumcised. Ten percent of the respondents demonstrated low knowledge of Voluntary Medical Male Circumcision while 53.3% had moderate knowledge and 36.7% had high levels of knowledge about VMMC. It follows from the study that women need to be actively involved in the VMMC programme.

**Keywords:** HIV prevention; Knowledge; Medical benefits; Voluntary medical male circumcision

### Introduction

Male circumcision began in ancient times and it was done mainly for ritual purposes. It has remained universal in some ethnic groups, including Muslims and Jews [1]. In the western African culture, ritualistic circumcision of male infants is more than 5,000 years old. In the 20th century, male circumcision was in-cooperated in the United States and in Canada after it was noted that reproductive diseases were less prevalent among Jewish populations. This association of sexually transmitted diseases was first observed in 1885 when results from a study comparing Jewish and non-Jewish populations indicated that 71% of patients with syphilis and other STIs were non-Jewish, as compared with 19% who were Jews [1]. Recently, after several studies it was noted that male circumcision has some medical benefits as reported in 1992 in South Africa during a meeting held by traditional healers and as well as in a study on male circumcision practices in Mwanza region. This subsequently resulted in scaling up of the procedure across several parts of the world, especially in many parts of Africa, including Zimbabwe, where male circumcision was not a common procedure. As HIV and AIDS continue to escalate, there have been recommendations for voluntary male circumcision as a preventive package in 2007 [2]. Women of child bearing age as sexual partners have considerable influence on male circumcision issues. Male circumcision was proved to reduce the risk of HIV infection, sexually transmitted diseases, penile and cervical cancers hence bears many medical benefits to both men and women.

### Methods

The study utilized a descriptive cross sectional design. The study was conducted at Parirenyatwa Antenatal Clinic in Harare, Zimbabwe. Permission to conduct the study was granted by the Joint University of Zimbabwe and Parirenyatwa Group of Hospitals research ethics committee. All participants gave written consent prior to participation in the study. Convenience sampling was used to recruit 30 pregnant women aged 18 to 35 years. Data was collected from February to March 2013 using an interview schedule following a structured questionnaire. The Health Belief Model was the guiding framework for the study. Interviews were conducted in a private room and each interview lasted about 20 minutes. Participants were assured of their anonymity. Code names instead of names were used to identify participants. Completed questionnaires were kept under lock and key and the researcher had sole access to them. Data was analyzed using Microsoft excel and was presented in tables and in text.

### Results

#### Sample demographics

The sample consisted of 30 women. Demographic characteristics of the participants are summarized in table 1. The mean age was 25.9 years (SD=4.5). Fifteen participants (50%) were aged between 25 and 29 years. All the participants had partners; 26 (86.7%) being married and 4 (13.3%) cohabiting. Education was rather negatively skewed. No one had been to school below secondary education. Eighteen (60%) of the participants had attained ordinary level. In terms of employment

11 (36.7%) were self-employed and 2 (6.6%) were casual workers. Ironically, 11 (36.7%) participants reported a monthly personal salary ranging between US\$301 and US\$500. Nine (30%) had a monthly income of up to US\$300.

Socio-demographic variable		Frequency	Percentage
Age (years)	18–19	3	10
	20–24	7	23.3
	25–29	15	50
	30–35	5	16.7
Marital status	Single	0	0
	Married	26	86.7
	Cohabiting	4	13.3
	Separated/divorced/widowed	0	0
Highest level of education	No education	0	0
	Primary level	0	0
	Ordinary level	18	60
	Advanced level	2	6.7
	Tertiary level	10	33.3
Employment status	Formally employed	8	26.7
	Self-employed	11	36.7
	Unemployed	9	30
	Casual worker	2	6.6
Monthly income	US \$300	9	30
	US\$301–US\$500	11	36.7
	US\$501–US\$700	6	20
	>US\$700	4	13.3

**Table 1:** Sample demographics (N=30).

Table 2 is a summary of the socio-demographic characteristics of the participants. The participants were neither Apostolic nor Muslim. Twenty (66.7%) were mainline Christians while 3 (10%) were affiliated to the African Traditional religion. The participants were either urban or peri-urban residence. Twenty three (76.7%) resided in urban areas. Of the 14 (46.7%) whose partners were circumcised 8 (57.1%) were already circumcised before current relationship while 6 (42.9%) were circumcised during the current relationship. Ten (33.3%) had no son and the same number, 10 (33.3%) had one son. No one among the participants had four or more sons. Data from ultrasonography results showed that 15 (50%) participants were expecting male children. Two (6.7%) had not done ultrasonography for prediction of child's sex and were not sure of the sex of their expected child.

Variable		Frequency	Percentage
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Religion	Christianity	20	66.7
	Protestant	7	23.3
	Apostolic	0	0
	Muslim	0	0
	African Traditional Religion	3	10
Residential area	Urban	23	76.7
	Peri-urban	7	23.3
	Rural	0	0
	Other	0	0
	Circumcision status of partner	Uncircumcised	16
Circumcised before current relationship		8	26.7
Circumcised during current relationship		6	20
Number of male children		0	10
	1	10	33.33
	2	9	30
	3	1	3.33
	≥ 4	0	0
Sex of expected child	Boy	15	50
	Girl	13	43.3
	Not sure	2	6.7

**Table 2:** Socio-demographic characteristics (N=30).

### Knowledge of male circumcision HIV prevention method

Table 3 illustrates the women's knowledge of VMMC. All the women had heard about the VMMC program. Twenty-seven (90%) participants gave the correct definition of VMMC. The remainder 3 (10%) either gave an incorrect definition or could not define VMMC at all. Eighteen (60%) participants did not know that after circumcision a man should abstain from sexual intercourse for at least 6 weeks. Fourteen (46.7%) participant were ignorant of the fact that after VMMC the glans penis becomes thick and hardened thereby reducing entry of HIV and sexually transmitted infections. Twenty-eight (93.3%) participants said that all circumcised men are HIV negative. When asked further about VMMC's defence against HIV infection, 22 (73.3%) knew that VMMC alone cannot render complete protection against HIV infection and 25 (83.3%) said that VMMC is not as effective as condom use alone in protection against HIV infection. As a result 28 (93.3%) were aware that circumcised men had to use condoms to enhance protection against sexually transmitted HIV infection.

Variable		Frequency	Percentages
Ever heard about VMMC?	Yes	30	100

	No	0	0
Knows the definition of VMMC	Yes	27	90
	No	3	10
Newly circumcised men should abstain from sex for at least 6 weeks	Yes	12	40
	No	18	60
VMMC reduces the risk of acquiring HIVinfection	Yes	20	66.7
	No	10	33.3
Foreskin increases risk to HIV infection	Yes	14	46.6
	No	16	53.4
Glans penis becomes hard and resistant to HIV and other STIs after VMMC	Yes	16	53.3
	No	14	46.7
All circumcised man are HIV negative	Yes	28	93.3
	No	2	6.7
VMMC does not offer 100% protection against HIV	Yes	22	73.3
	No	8	26.7
VMMC is not as effective as condom use alone at preventing HIV	Yes	25	83.3
	No	5	16.7
Circumcised men should use condoms correctly and consistently to prevent HIV infection	Yes	28	93.3
	No	2	6.7

**Table 3:** Women’s knowledge of VMMC (N=30).

The participants were not quite familiar with the benefits of VMMC with the secondary benefits of VMMC, apart from protection of HIV infection. The results are summarized in Table 4. Nineteen (63.3%) did not know that VMMC gives protection against STIs, the same proportion of participants, 19 (63.3%) did not know that it gives protection against penile cancer and 20 (66.7%) did not know that VMMC also gives men protection against urinary tract infections (UTIs). However, 29 (96.7%) asserted that circumcision improves penile hygiene. The participants were also asked about the implications and externalities of male circumcision on the female sexual partners. Twenty seven (90%) knew that female partners also benefited if their sexual partners were circumcised although 15 (50%) said that female sexual partners also had protection from HIV infection if their partners were circumcised. Ironically 21 (70%) of the participants were ignorant of the fact that, by reducing the odds of getting HIV infection in men, female partners automatically benefit from reduced incidence of HIV in the circumcised population. Twenty-four (80%) were aware that VMMC gave some protection of their female partners from

cervical cancer. Finally, 21 (70%) of the participants knew that if the circumcised male becomes infected with HIV, the female sexual partner can also acquire HIV from the circumcised partner.

Variable		Frequency (f)	Percentages (%)
Protects against STIs	Yes	11	36.7
	No	19	63.3
Protects against penile cancer	Yes	11	36.7
	No	19	63.3
Improves penile hygiene	Yes	29	96.7
	No	1	3.3
Protects against UTIs	Yes	10	33.3
	No	20	66.7
Women also benefit from circumcision of their partners	Yes	27	90
	No	3	10
Women are not afforded the same level of protection against HIV and other STIs as men through VMMC	Yes	15	50
	No	15	50
VMMC reduces their chances of being infected with HIV by reducing its prevalence among men	Yes	9	30
	No	21	70
Knows that a woman can acquire HIV infection from a circumcised HIV positive partner	Yes	21	70
	No	9	30
Knows that MC protects women against cervical cancer	Yes	24	80
	No	6	20

**Table 4:** Knowledge of other benefits of VMMC

### Women’s knowledge levels of medical benefits of male circumcision

Figure 1 illustrates knowledge levels of medical benefits of VMMC. The total scores were negatively skewed and ranged from 7 to 19 out of 20. The total scores were transformed to percentages by multiplying each total score by 5 and categorized into four knowledge levels namely the very low (0–24%), low (25–45%), moderate (50–70%) and high (7–100%). Hence, participants’ percentage knowledge level scores ranged between 35% and 95% (IQR=41.5%). The mean score was 67.5% (SD=3.6). No participant had very low levels of knowledge about VMMC and 16 (53.3%) had high levels of knowledge of VMMC while 16 (53.3%) had moderate level of knowledge about VMMC.

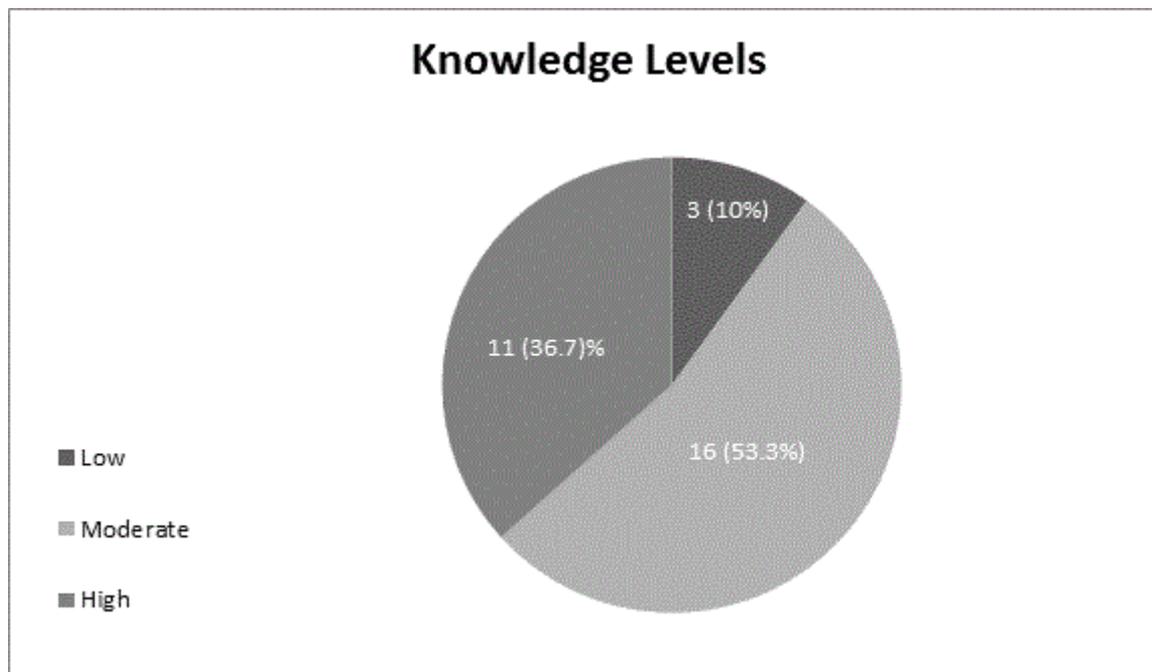


Figure 1: Transformed knowledge levels of women about VMMC (N=30).

## Discussion

### Sample demographics

Thirty study participants were women 18 to 35 years, with an average age of 25.4 years. Women 25-29 years constituted the modal group. Adolescent and young mothers were more willing to subscribe to VMMC on the basis of perceived benefits for their future whereas older women were a bit skeptical on the basis that they found no value addition of VMMC to their old spouses.

Overall, level of knowledge on VMMC was highly associated with the level of education. Those who had attained ordinary level education (46.7%) fell in the moderate knowledge level category whereas those with tertiary education constituted the majority of those with high level of knowledge. Higher education level was associated with readiness to accept VMMC for spouse and son(s). This can be explained by Emerson's notion that as one advance with education, his/her attitudes, skills, knowledge and reasoning capacity also improves.

Employment status had a bearing on the knowledge levels on VMMC. About 26.7% were formally employed with 36.7% and 30% self-employed and unemployed respectively. The self-employed and had an average monthly income more than that of the formally employed. Those who had higher monthly incomes had higher levels of knowledge as compared to those who had low monthly incomes. This clearly points out that socioeconomic status is linked to one's access to information, especially in this era of technological advancement. High socioeconomic status increases access to information through various media such as televisions and newspapers thereby increasing knowledge levels.

Religion was not a significant predictor of knowledge on VMMC. This is atypical in the Zimbabwean context where religion often plays a major role in determining access and utilization of medical care and services. Conservative apostolic groups shun modern medicine and never step their foot at a medical institution. One would expect to see variations on knowledge and access when compared with liberal religious groups. The findings could be explained by the disproportional representation of religious groups in the sample which was dominated by Protestants.

All of the participants were residents of Harare Province with 76.7% and 23.3% staying in the urban and peri-urban area respectively. There was no meaningful variation of knowledge levels between those who were staying in the urban area and in the peri-urban areas. Owing to the geographical location of the participants, there was little or no cultural and traditional diversity among the participants, contrary to a similar research study done by Roger Shapiro et al in 2001 in which the participants were from various ethnic and geographic locations throughout Botswana.

The study found no difference in knowledge on VMCC between participants with circumcised partners and those whose partners were uncircumcised. However, those who had partners who were circumcised when they were already in their relationship had higher knowledge levels as compared to those who got into relationship with partners who were already circumcised. This is in line with the dictates of the health belief model that knowledge does not necessarily translate into behaviour change. Behaviour change is a function of a multiplicity of other factors such as perceived susceptibility and perceived severity.

The average knowledge score of those who had at least one male child was slightly higher (66.5%) as compared to those who had no male children (68.5%). This is attributable to the prior experiences of those who had male children when they were exposed to neonatal

circumcision discussions pertaining to their new-borns. However, the knowledge scores were not directly proportional to the number of male children the participants had and there was no difference in knowledge scores of those who expected male infants and those who expected female infants.

### Women's knowledge level of medical benefits of VMMC

VMMC has been proved to be highly efficacious in reducing the risk of infection with several STIs, including HIV among circumcised heterosexual men [3]. It is of great importance to ensure that women also acknowledge this fact if high prevalence of VMMC among various populations is to be realized.

This study found that women's awareness of the VMMC procedure was very high, as 100% of the participants responded that they had heard about VMMC and 90% of them knew the correct definition of VMMC. This level of awareness was higher than the one reported by a study by the Women's HIV Prevention Tracking Project, in which 79% of 494 women interviewed in Kenya, Namibia, South Africa, Swaziland and Uganda were aware of the of the VMMC program. This increased level of awareness of VMMC procedure can be attributed to recent increase in awareness campaigns aimed at scaling up male circumcision prevalence. However, this finding may not be true to rural populations which are not exposed to mass media (e.g., newspapers, radio) at the same level with urban populations (Zimbabwe Central Statistical Office 2007).

This study revealed a moderate level of knowledge (67.5%) of medical benefits of VMMC among married women in Harare. However, another study done in Zimbabwe in 2011 to assess prevalence and factors associated with knowledge and uptake of VMMC found that knowledge of VMMC and its benefits was poor, even though attitudes were favorable. Sixty percent of women interviewed indicated that they would want their partners to be circumcised [4]. In his study, Mhangara in 2011 [5] also concluded that the level of knowledge on VMMC and its benefits was very low (37%). The difference in knowledge levels found by this study and that documented by various researchers could be attributed to difference in periods of time when the research studies were conducted. Dube, January and Shamu in 2006, Kebaabetswe et al. in 2003, Halperin et al. in 2005 [6,7] conducted their studies prior to recommendations of voluntary medical male circumcision (VMMC) as part of comprehensive HIV prevention package at an international expert consultation held in Switzerland in 2007 (WHO, 2007). Zimbabwe and other countries improved remarkably in embracing VMMC program following this recommendation. Technological advancement could also be the contributory to higher knowledge levels. The difference can also be attributed to the difference in the study site and characteristics of the participants. For example, Mhangara in 2011 [5] conducted his study at a plantation in a rural area and used both men and women as participants, while this study incorporated pregnant women living in urban area of Harare Province.

### Knowledge of male circumcision as HIV prevention method

Women's knowledge of the association of VMMC and HIV infection was very high. For example, 66.7% of the participants knew that VMMC reduces the risk of acquiring HIV infection. WHiTP in 2010 also reported high knowledge level on the issue of VMMC and HIV. Their survey study revealed that majority of women interviewed (72%) understood correctly that VMMC is partially protective to men. A

study by Arnott and Kehler in 2010 [8] echoed the same findings as knowledge of male circumcision as an HIV prevention strategy was high among the participants. However other studies reported low levels of knowledge of VMMC as a strategy for HIV prevention. According to Dube, January and Shamu, in 2006 [6], only 35% knew that VMMC is partially protective against acquisition of HIV infection. Study by Mwiinga Kalonga in 2010 revealed that 40.0% of the participants acknowledged that VMMC reduces risk of getting HIV/AIDS. Fritz et al in 2000 also noted poor knowledge in their study as only 6.7% of the 89 participants mentioned that VMMC is protective against HIV. These differences can be explained by the reasons highlighted earlier that are inclusive of study population and setting and changes in technology. Ministry of Health and Child Welfare together with several other private players and musicians recently embarked on massive mass media campaigns through newspapers, radio and televisions advocating for safe VMMC for HIV prevention. Thus there has been a gradual increase in knowledge of VMMC as part of HIV prevention package.

It is worrisome that only 40% of participants knew that newly circumcised men should abstain from sex for at least six weeks. This figure is less than 63% that was reported by Arnott and Kehler in 2010 [8] in their survey on women in Kwazulu Natal and Eastern Cape. WHiTP in 2010 reported that 58% of women in their survey in five countries understood well that absolute abstinence from sexual intercourse during wound healing period is critically important if best outcomes are to be realized. This difference in findings may have emanated from the difference in the instrument used in this study and those which were used by WHiTP in 2010 and Arnott and Kehler in 2010 [6]. In their surveys, participants who knew that newly circumcised men should abstain from sex during wound healing answered that question correctly even though they were not sure about the length of the healing period. However some participants in this study who knew that newly circumcised men should abstain from sex during wound healing but were not sure about the length of the healing period. Most participants gave wrong answers simply because the instrument specified a two week long wound healing period which was wrong.

#### iv. Women's Knowledge of Other Medical Benefits of Male Circumcision,

Majority of participants (96.7%) in this study believed that MC improves penile hygiene and protects men from physical problems involving the tight foreskin such as phimosis and paraphimosis. Similarly, Terthu in 2010 found that majority of men (79.7%) in her study associated male circumcision with improved penile hygiene, and as well as diminished risk of acquiring STIs. According to Terthu in 2010 these findings also concur with those of other studies that were done in South Africa and Botswana [7].

Similarly, in studies that were conducted in Zambia by Mwiinga in 2010 and in Zimbabwe by Mhangara in 2011 [5] only 39.7% and 30.9% (respectively) of the participants knew that VMMC reduces chances of getting other STIs. The women's knowledge of the association of VMMC and penile cancer or UTIs was very low in this study and the researchers could not retrieve studies that looked specifically at women's knowledge of the association of MC and penile cancer or UTIs. This may be due to the fact that HIV has by far more severe devastating effects and has a higher prevalence as compared to penile cancer and UTIs hence many communication strategies aimed at scaling up prevalence of VMMC are being focused mainly on raising

awareness of VMMC as part of comprehensive HIV prevention package.

### Knowledge of medical benefits of VMMC to women

The majority of women in this study (90%) were aware of the fact that medical benefits of circumcision to their partners also extends to them and 80% of the participants knew that MC confers the protection against cervical cancer. Similar findings were reported by Layer et.al, in 2013 [9] in Iringa, Tanzania and Lanham et al in 2012 [10] in Nyanza province, Kenya. Participants who were married were twice likely to be more aware of the benefits of VMMC a means to prevent cervical cancer as compared to those who were cohabiting. Seventy percent of the participants were not aware that MC reduces their chances of being infected with HIV by reducing its prevalence among men. Fifty percent thought that they are afforded the same level of protection and thirty percent thought that a woman cannot acquire HIV infection from a circumcised HIV positive partner.

Similar findings were also reported by WHiTP, in 2010 in their survey involving five African countries in which only 40% of the women interviewed believed that MC is protective for them. To make it even worse, some of them thought that they are directly protected and others did not know how. According to Layer et al in 2013 [9], many participants in their study in Tanzania believed that women were directly protected against HIV from circumcised HIV-positive men. Terthu in 2010 also reported the same findings in Zambia. According to Terthu in 2010, Mattson et al. in 2005 and Lagardeet al. in 2003 also reported similar findings in Kenya and South Africa, respectively.

Lack of factual knowledge regarding the mechanism of protection conferred to women by VMMC as reported by this study and several other studies can be attributed to the way the information about VMMC and HIV is being disseminated. Most communication strategies aimed at increasing community awareness of VMMC are targeting mainly men and women are being left out. As a result of that most women believe that VMMC is a 'men's thing' and are reluctant in acquiring knowledge on how they also benefit and how they can be involved

In this study, the participants perceived a number of medical benefits of male circumcision. Most of the participants believed that VMMC reduces the risk of acquiring HIV infection (66.7%) and other STIS (36.7%), protects men against penile cancer (36.7%), improves penile hygiene and reduces the risk of developing physical problems involving the tight prepuce (96.7%). Majority of the participants (80%) believed that they are protected from cervical cancer. HBM predicts that if individuals believe MC can reduce the threat of HIV infection, they are likely to adopt and advocate for it.

However, the results revealed that some participants perceive themselves as less susceptible to HIV infection if their counter partners are circumcised even if they don't use condoms properly and consistently (6.7%) and even if they are HIV-positive (30%). HBM predicts that women should perceive themselves to be highly susceptible to HIV infection even if their counter partners are circumcised for them to adopt and advocate for MC in order to reduce the risk of getting HIV infection.

### Limitations of the Study

However there were some limitations which were associated with the study instrument. Firstly, the only one indigenous, formal term for

MC (*kuchecheudzwa*) which was used in the Shona scheduled interview was uncommon. However, the researcher included a description to clarify that term – 'meaning the removal of the foreskin on man's private part (penis), which was well understood by participants. Secondly, self-reports on circumcision status of the counter partners could not be validated hence they could not be relied on since it could lead to misclassification of MC status. However, the researcher assured the participants about the confidentiality of their information and encouraged them to be honest.

Some of the limitations were related to convenience sampling method which was adopted by the researchers. Convenience sampling is the selection of the most readily accessible members of the target population to be research participants in a study. In this study the participants were restricted to 18–35 years old, thus women who were not within this age range were not represented. Thus this undermined the sample's representativeness of the target population. Furthermore, the findings are drawn from a small sample of 30 participants who were from a limited geographical area and this could limit the researcher's ability to generalize findings beyond the actual sample. This could be the reason why the effects of culture and religion on knowledge of VMMC were overshadowed. These are known to be strong predictors of knowledge and utilization of VMMC from other similar studies regionally and globally.

### Conclusion

The majority of the participants (53.3%) had moderate knowledge on VMMC benefits whereas 36.7% and 10% had high and low knowledge levels respectively. The study revealed a gap in detailed, accurate and factual knowledge on other medical benefits of VMMC. Intensive education and awareness through all forms of mass media communication is critical to ensure saturation coverage. Engaging in penetrative sex during the wound healing period after circumcision may cause increased exposure to infection and this can be addressed through appropriate counseling on the abstinence period. Correct and consistent messaging is essential to correct myths and misconceptions around the benefits of VMMC. Health service providers must influence women to contribute tremendously towards VMMC and must ensure that VMMC as HIV preventive measure is used appropriately and ethically to do more good than harm and as well as to improve sexual and reproductive health of both men and women.

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