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FACTORS INFLUENCING VOLUNTARY MEDICAL MALE CIRCUMCISION AMONG MEN AGED 18-50 YEARS IN KIBERA DIVISION

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ABSTRACT

Background: Voluntary Medical Male Circumcision (VMMC) is the surgical removal of all or part of the foreskin from the penis. It is done for medical reasons as it has been shown to reduce the risk of female to male transmission of HIV by up to 60%. It has also been associated with lower transmission of sexually transmitted infections. Voluntary Medical Male Circumcision services have been scaled up in countries with high prevalence, generalised heterosexual HIV epidemics and low rates of male circumcision. Kibera is inhabited by a multi-ethnic community with a sizeable number of un-circumcising ethnic groups.

Objectives: To determine the uptake of voluntary medical male circumcision among men in Kibera Division and to identify factors associated with circumcision preference.

Design: Descriptive cross-sectional study.

Setting: Kibera Division of Nairobi County.

Subjects: Simple random sampling was used to enrol 387 participants. A 42-item questionnaire was administered to the participants for determining the uptake of VMMC. It had three sub-sections: demographic characteristics, general knowledge about VMMC and AIDS and acceptability of VMMC, which collected data on the main outcome measures. Data captured was entered into EpiInfo and converted to Stata13 for validation and analysis. Bivariate statistics were generated for all the variables in accordance to the study questions. Categorical variables were analysed using chi-square tests, while the qualitative variables were analysed using the t-test. Multivariate logistic regression analysis was performed to identify factors associated with the acceptability of male circumcision.

Results: The study analysed data for a sample of 341 individuals whose mean age was 31 years (95% = 31+-9.1) and 62% were married. A total of 54% of the respondents had completed secondary and tertiary level of education. The level of understanding about VMMC was above average. Fifty nine percent of the respondents (95% CI = 0.54 - 0.64) knew about VMMC. Of these, 31% had obtained information about VMMC from TV and radio. The most frequently mentioned reason for undergoing VMMC was prevention of HIV and sexually transmitted infections. The level of uptake of VMMC was high at 75%. The study established that the preferred age group for circumcision was during adolescence. Using multivariate logistic regression, the factors associated with uptake of VMMC were education level, medical and hygiene reasons for VMMC. Barriers for uptake were cost, pain and long recovery period after the operation.

Conclusion: The uptake and acceptability of male circumcision is high among the general population in Kibera. Participant understanding of HIV and VMMC was also high. There is need for heightened awareness creation in educational institutes. This will specifically target young men before or shortly after their sexual debut when they may still be free of HIV and HSV-2 infections. Circumcision by medical providers should be increased in traditionally circumcising regions to reduce incidence of adverse events.

INTRODUCTION

Male circumcision involves surgically removing the foreskin, a loose fold of skin covering the head of the penis. It is one of the oldest and most common surgical procedures worldwide, and is undertaken for many reasons: religious, cultural, social and medical. Voluntary Medical Male Circumcision is done to adult males of ages 18 years to 50 years. It is aimed at preventing the transmission of HIV as it reduces the transmission by up to 60%.

Results from the three randomised trials conducted in Kenya, Uganda and South Africa established that there was a high association between getting circumcised and the reduction of HIV transmission by up to 60% (1, 2, 3). The studies established that male circumcision lowered transmission of viral sexually transmitted infections, including HIV, reduced the incidence of Herpes Simplex-2 infections in men by 28% (4) and it gave some protection against penile cancer in men (5) and cervical cancer in women. Factors attributable to high rates of not getting circumcised were not well understood despite the compelling evidence supporting circumcision as a preventive measure to reduce risk of HIV transmission. This study aims to focus on these factors in the area of the study.

Voluntary Medical Male Circumcision has been made part of HIV prevention programmes in regions with a generalised HIV epidemic and a low level of male circumcision (6). Since 2007, VMMC programmes started being implemented across eastern and southern Africa by the local governments with support from World Health Organization (WHO), Joint United Nations Programme on HIV/AIDS (UNAIDS) and Centres for Disease Control and Prevention. The aim is to reach 80% coverage in adult males residing in Africa by 2015 (7). Successful implementation will depend on the accessibility of commodities essential for VMMC programming and the appropriate allocation of resources to support the VMMC supply chain (8). A number of studies have been carried out to assess the acceptability of VMMC among either children or adults in sub-Saharan Africa. There is no information associated with the uptake of VMMC in Kibera Division. There is also no data on sexual behaviour change after VMMC for the male population in this region. This is because VMMC services are being rolled out in this region for the first time, targeting the uncircumcised males who hail from the un-circumcising ethnical groups. This will also be an entry-point for men to learn their HIV status, and therefore reduce the risk of infecting their sexual partners.

Successful completion of this study will help identify the factors that influence the uptake of VMMC so as to identify a better strategy to strengthen the

health system used in its delivery. The results will also be useful to policy makers in their policy formulation.

MATERIALS AND METHODS

Study design: The study was conducted in Kibera Division which is an administrative division of Nairobi West district. The targeted neighbourhoods were a number of villages namely; Kianda, Soweto East, Kisumu Ndogo, Gatwekera, Lindi, Laini Saba, Siranga, Makina and Mashimoni.

This was a descriptive cross sectional study that utilised a quantitative approach for data collection. The survey used simple random sampling in order to enrol participants into the survey.

Study population: All adult male residents within the selected villages were informed about the study and invited to participate during May to July 2013. The inclusion criteria for participation were: age between 18–50 years, male residents, and residence in the target villages at the time of the survey. The exclusion criteria were boys below 18 years and men above 50 years, those who refused to consent and individuals with hearing or speech disabilities. Approval for this study was obtained from the Ethics and Research Committee of Kenya Medical Research Institute.

A total of 387 participants were interviewed by use of a structured questionnaire for quantitative data. Sampling was done on repeated days until the desired number of respondents was achieved.

Data management: A 42-item questionnaire was used with the primary aim of determining uptake of VMMC. The questionnaire was in three sub-sections: demographic characteristics, general knowledge about VMMC and AIDS and acceptability of VMMC. Most primary outcome variables were assessed by asking Yes/No questions, such as "Are you able to determine when to go for VMMC?"

To assess knowledge about AIDS and male circumcision, we asked twelve questions, including four questions about general knowledge of AIDS such as the pathway of HIV transmission and methods of HIV prevention, and eight questions about VMMC including whether one could determine when to undergo the procedure. For AIDS knowledge we computed the average score among all interview subjects; each correct answer was given a score. Willingness to accept circumcision was assessed with the question "Do you want to be circumcised?", and the response categories were "definitely willing", "probably willing", "definitely not willing" and "probably not willing". For analysis, we dichotomised the groups of "definitely willing" and "probably willing" into a single variable of "willingness to accept MC", and the groups of "definitely not willing" and

“probably not willing” as “refusal to accept”. To assess reasons to accept or refuse circumcision, we also asked two open-ended questions, which enquired about the benefits and problems associated with VMMC.

Data analysis: The data captured was entered into EpiInfo and converted to Stata13 for validation and analysis. The data was stored in a laptop and backed up in a pen drive and cloud storage before analysis.

Descriptive statistics were generated for all the variables corresponding to specific questions in the survey. Categorical variables were analysed using chi-square tests. Multivariate logistic regression analysis was performed to identify factors associated with the acceptability of male circumcision. The variables that showed a statistically significant association ($P < 0.05$) with willingness to be circumcised in the bi-variate analyses were included in the model. The level of significance was determined at 15% with corresponding 85% confidence interval.

RESULTS

Demographics: The study population was predominantly youthful (mean age = 31 years, S.D. = 9.1, $n = 341$) and 62% were married. Our study had a high proportion of respondents in informal type of employment (77%). A total of 54% of the respondents had completed secondary and tertiary level of education and 91% of the respondents were Christians. Most of the respondents (86%) had sexual intercourse in the past three months. Of those, 34% used condoms consistently and 47% never used a condom.

Participant understanding of HIV and VMMC: The level of understanding about VMMC was above average. The majority of the respondents (59%) knew about VMMC. Of these, 31% had obtained information about VMMC from TV and radio. A total of 44% of the respondents reported that VMMC could be performed at any time once a person attained the age of circumcision. A total of 69% of the respondents reported that VMMC could not prevent HIV.

Prevention of HIV and sexually transmitted infections was the most frequently mentioned reason for undergoing VMMC. Majority of the respondents ($n = 248$) were aware that it was done voluntarily in a hospital through an operation.

Creation of awareness to the general public was

the most frequently mentioned measure that could improve roll out of VMMC services. This could be achieved through seminars, barazas, medical camps and advertising on banners, posters and mainstream media.

Unprotected sexual intercourse was the commonest method of HIV transmission that was mentioned by the respondents. Majority of the respondents (48%) reported using condoms for prevention of HIV transmission.

Uptake and Acceptability of VMMC: The level of uptake of VMMC was fairly high at 75%. Of those, 93% defined VMMC accurately. A total of 53% of the respondents reported that VMMC was done for medical reasons. Of the respondents who were not circumcised, 60% (68) reported that it was not practised in their culture. Fear of pain (18%) and time away from work (7%) were other reasons mentioned for not being circumcised.

Of those who were not circumcised, 45% (84) were not willing to be circumcised even with knowledge of VMMC. Many of them could not withstand the pain associated with circumcision (23%, $n = 78$).

A total of 84% (340) of the respondents reported that they were willing to have their sons circumcised if they had one. The most common reasons mentioned for this were the father wanted the son to be just like him and to avoid ridicule from his circumcised friends.

The study established that the preferred age group for circumcision was during adolescence. Reasons mentioned for circumcising adolescents were that the boy could make the decision for himself, understand the significance of the event, take care of the wound himself, heal faster than if done post-pubertal, and was most likely in the early stages of sexual activity.

Majority of the respondents would take their sons to a health facility for circumcision as they believed medical doctors were experienced, would use sterile equipment, able to minimise pain through anaesthesia and could deal with complications. Few participants preferred traditional circumcisers who would willingly maintain confidentiality.

Benefits of male circumcision that were reported included prevention of HIV and STIs and maintenance of hygiene. Negative consequences of male circumcision that were reported included excessive bleeding, pain, loss of penile sensitivity and long recovery period after operation.

Bivariate statistics

Table 1
Demographics and uptake of VMMC

Demographic	OR	95% CI	P value	Chi square	D.o.f
Age	0.64	0.62-0.66	0.018*	10.1062	3
Educational level	1.29	1.24-1.34	0.000*	18.4566	2
Marital status	0.87	0.83-0.91	0.064	5.5006	2
Religion	1.23	1.14-1.33	0.43	0.622	1
Formal employment	1.55	1.46-1.65	0.146	2.1178	1

*Significant at 5%

Table 1 represents bivariate analysis between demographic variables and uptake of VMMC. There was significant association between age (OR=0.64, CI=0.62-0.66, $p<0.001$) and educational level (OR=1.29, CI=1.24-1.34, $p<0.001$) of the respondents and uptake of VMMC. Being young was highly protective with uptake of VMMC. Having a higher level of education facilitated the uptake of VMMC; therefore, education level was a factor likely to influence the uptake of VMMC in the study region. It is important to note that the level of employment (OR=1.55, CI=1.46-1.65, $p<0.001$) had a multiplicative effect with the uptake of VMMC but it was not significant.

Table 2
Social variables and uptake of VMMC

Variable	OR	95% CI	P value	Chi square	D.o.f
Do you know about VMMC	0.9	0.85-0.96	0.001*	10.3506	1
Sexual intercourse in the last 3 months	2.82	2.61-3.04	0.348	0.8822	1
Frequency of condom use during intercourse	0.98	0.95-1.01	0.059	5.6599	2

*Significant at 5%

Table 2 represents the bivariate analysis between social variables and uptake of VMMC. Knowledge about VMMC (OR=0.9, CI=0.85-0.96, $p<0.001$) was significantly associated with uptake of VMMC. It reduced the resistance to uptake of VMMC.

Table 3
Reasons for VMMC and uptake of VMMC

Reason for VMMC	OR	95% CI	P value	Chi square	D.o.f
Medical	1.30	1.23-1.37	0.000*	15.773	1
Hygiene	3.25	3.06-3.47	0.000*	19.8071	1
Traditional	2.46	2.33-2.6	0.069	3.3057	1

*significant at 5%

Table 3 represents the bivariate analysis between reasons for VMMC and uptake of VMMC. Medical reasons for VMMC (OR=1.3, 95% CI=1.23-1.37, $p<0.001$) and hygiene reasons for VMMC (OR=3.25, 95% CI=3.06-3.47, $p<0.001$) increased the uptake of VMMC.

Chi-square tests of trend at a significance level of $p=0.15$ were used to test for basic characteristics

between dependent and independent variables. Variables that had a statistically significant association with being circumcised included education level, age, marital status, formal employment, being able to define VMMC, frequency of condom use during sexual intercourse, medical, hygiene and traditional reasons for male circumcision.

Binary logistic regression on facilitating factors to uptake of VMMC

Variable	aOR	95% CI	P value
Educational level	1.54	1.162-2.032	0.027
Medical reasons for VMMC	2.45	1.529-3.919	0.006
Hygiene reasons for VMMC	3.44	2.023-5.857	0.001

Several significant variables on bivariate analysis were subjected to binary logistic regression and these were; education level, age, being able to define VMMC, level of employment, marital status, frequency of condom use during sexual intercourse, traditional, medical and hygiene reasons for male circumcision. Educational level, Medical reasons for VMMC and Hygiene reasons for VMMC were positively associated with VMMC uptake. These were the main factors.

DISCUSSION

Our survey established there was a high level of VMMC acceptability in the study region (75%). This proportion is higher than the reported median acceptability rate (62%) in sub-Saharan Africa (9). The factors associated with uptake of VMMC included education level, medical and hygiene reasons for male circumcision. Majority of the respondents were born in rural areas but lived in the urban regions at the time of the study.

Young respondents below 30 years were more likely to have undergone VMMC as compared to those above 30 years. Moreover, they also paid more attention to their sexual hygiene and sexual health. These findings can be corroborated by finding from a study in the Dominican Republic (10).

Earlier investigations on the age of male circumcision and risk of prevalent HIV infection in rural Uganda reported that pre-pubertal circumcision was associated with reduced HIV risk, whereas circumcision after age 20 years was not significantly protective against HIV-1 infection. In addition, adult circumcision had higher risk of complications, was more painful and made one experience painful erections causing delays in healing (11).

Knowledge about HIV was a significant factor with uptake of VMMC. Majority of the respondents reported unprotected sexual intercourse was the main method of transmitting HIV. Methods of HIV prevention that were reported included abstinence, faithfulness and using condoms.

We established that frequency of condom use during sexual intercourse was significantly associated with uptake of VMMC upon bivariate analysis. Respondents who never used a condom were less likely to undergo VMMC than those who used one consistently.

The majority of the respondents cited prevention of sexually transmitted diseases, including HIV, as a motivator for undergoing circumcision. These results are consistent with the study by Bailey et al among the Luo in Kenya (12).

The study established that many people from the study area felt that they had insufficient knowledge to make a decision about when best to circumcise. They preferred to obtain advice from clinical professionals in health institutions. This observation is supported by findings of studies in Kenya and Malawi (13, 11).

Cultural norms and traditions were viewed as central factors in acceptability of circumcision. Circumcision was associated with specific traditionally circumcising communities. However, in Kibera region, VMMC is not a universal practice; the population is cosmopolitan with substantial number from uncircumcising ethnic groups. An important conclusion reached by past studies was that circumcision was increasingly an issue of personal choice rather than ethnic identity (14, 15). Urbanisation, ethnic mixing, and exposure to other cultures and religions are conducive to higher acceptability of circumcision in traditionally non-circumcising ethnic groups.

In the logistic model, we established that respondents who had attained secondary and tertiary level of education were more likely to have been circumcised as compared to those who had only completed primary education level. This may be due to the fact that they were more knowledgeable about voluntary medical male circumcision and aware of the protection it confers against HIV. In addition, medical and hygiene reasons for male circumcision were significantly associated with uptake of VMMC.

Most of the respondents would circumcise a male child if this service were offered for free in the hospital. The preferred period for circumcision was adolescence. This bears a strong correlation with a survey in Denver, United States of America which established that the main correlate of circumcision status was circumcision status of the father, with 90% of circumcised fathers choosing to circumcise their sons during adolescence compared with 23% of non-circumcised fathers. The ages at which males become circumcised has an effect on how rapidly circumcision interventions may impact the HIV epidemic in any given area (13, 14, 15).

The most consistent barriers to uptake of VMMC were fear of pain, long recovery / healing period after

the operation and cost of time away from work. Where circumcision is the norm, families are expected to shoulder the circumcision expenses without worrying of the cost. In non-circumcising communities, there are always competing needs in terms of cost when time for circumcision comes. It is viewed as including not only the payment for the procedure, but also the opportunity costs of time away from work and other income generating activities. Cost as a primary consideration was shown dramatically by the pilot intervention in Siaya, Kenya, where men came in large numbers when the charges were lowered to \$1.45US (13). These results indicate that the true cost of the procedure will have to be supplemented to achieve significant uptake of VMMC.

The concerns for safety and pain were based on the perception that circumcision, as a surgical procedure, came with inherent risks. The concerns were also drawn from occasional press releases publicizing mutilations and deaths. Personal knowledge of neighbouring communities where traditional initiates withstand excruciating pain was also likely to influence preference of VMMC.

Sustained uptake of VMMC will require performance of the procedure with minimal adverse events. This can be achieved through proper training and supervision of practitioners, proper instrumentation and sterilization, complete instructions to patients, follow-up with patients, and over all attention to quality control (16).

We missed collecting information about the number of sexual partners in the current study, which could have important public health implications. It is not clear whether a high proportion of those who accepted VMMC are those who have multiple sex partners. Multiple sexual partners aggravate the HIV infection rate due to high-risk heterosexual behaviour. It is especially serious since majority of these multiple sexual partners are pregnant women and commercial sex workers.

Our study had several limitations. Those who participated in the study were perhaps more concerned about their health and more interested in the topic. Additionally, all data collected was based on self-reported behaviours and characteristics (for example, self-reported long foreskin) without clinical examination or other confirmation.

In conclusion, this study shows that the acceptability of male circumcision is high among the general population in Kibera. Level of education, medical and hygiene reasons for male circumcision were significantly associated with uptake of VMMC. Circumcision by medical providers should be increased in traditionally circumcising regions to reduce incidence of adverse events. Comprehensive messages about the prevention of HIV transmission should be provided at the time of circumcision.

In addition, our results suggest that circumcision programmes should specifically target younger men before or shortly after their sexual debut when they may still be free of HIV and HSV-2 infections.

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