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Original Research Article

Correlates of Uptake of Voluntary Medical Male Circumcision among Young Adults in Zimbabwe

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ABSTRACT

Zimbabwe is among the top five high HIV burden countries and has adopted voluntary medical male circumcision (VMCC) as an intervention to reduce the incidence of HIV. Manicaland province which started the VMCC programme in 2009 only managed to achieve 8958(70%) minimum target for the year despite increased demand creation efforts.

The current study sought to identify factors determining uptake of Voluntary Medical Male Circumcision for HIV prevention among males aged 15 to 29 years in Manicaland province 2014. A 1:1 unmatched case- control study was conducted using systematically sampled 95 cases and 95 controls. Participant circumcision status was confirmed by a nurse trained in VMCC. Data was collected through interview schedules and key informant interviews of health workers involved in VMMC. Factors influencing uptake of VMMC in Manicaland were prior knowledge on the benefits of Medical Male circumcision (AOR=2.91: 95% CI=1.48 - 5.71: *p*=0.002) and staying within 15 kilometers from a circumcising Centre (AOR=3.37: 95% CI= 1.59 - 7.12: p=0.002). Fear of surgical complications, pain, infection, bleeding and other complications (AOR=0.43: 95% CI=0.22 - 0.84: p=0.013) and fear of HIV test before the procedure (AOR=0.41: 95% CI=0.19 - 0.87: p=0.02) were found to be barriers to uptake of VMMC.The study concludes that knowledge on benefits of MC and male circumcision reduces men's exposure to HIV infection and distance to male circumcision Centre was within 15 kilometers radius from place of residence facilitates the uptake of VMMC. Distance may impede or enhance utilization of a health service. The further a client is away from a service, the less the utilization of the service. Fear of surgical complications and fear of HIV test before the operation were found to be the barrier to uptake of VMMC. This is because that most of the people they are not aware of their HIV status and Zimbabwe is still struggling to increase HIV testing and counselling coverage both in rural areas and urban areas. Therefore there is need for task shifting, demand creation in VMMC and reduce indirect sources of fears of being diagnosed as HIV positive.

Key words: Case control, Correlates, Uptake, Voluntary medical male circumcision (VMMC), Zimbabwe.

INTRODUCTION

Male circumcision is surgical removal of the foreskin - the retractable fold of tissue that covers the head of the penis. Recently, three randomized control trials have found that medical male circumcision reduces the likelihood of contracting HIV for men by up to 60 percent (Auvert, Taljaard, Lagarde, Sobngwi-Tambekou, Sitta, & Puren, 2005; Bailey, and Muga, 2007; Gray, 2007). Given these findings, in 2007 the WHO and UNAIDS officially recommended voluntary medical male circumcision (VMMC) as an important HIV prevention strategy and called for scale-up in 14 high priority countries in Eastern and

Southern Africa (WHO, 2007). The most recent simulations suggest that scaling up medical male circumcision to 80 percent coverage in priority countries could avert approximately 22 percent HIV infections through 2025, resulting in a net savings of US$16.51 billion (Njeuhmeli, Emmanuel, Forsythe, 2011).

The effectiveness of scaling-up male circumcision in Eastern and Southern Africa depends not only on the overall demand, but also on the HIV risk profiles of men who select into circumcision. In particular, the benefit of male circumcision is greatest among men who are most at risk of HIV infection; circumcising these men first or at a faster rate maximizes the overall public health benefit of circumcision scale-up. Contrary if those who are least at risk of HIV infection take-up circumcision, current cost-effectiveness estimates will have overestimated the true benefits of scale-up.

MATERIALS AND METHODS

The research was carried out through an unmatched case-control study. A Case was any male aged 15 to 29 years residing in Manicaland province circumcised for HIV prevention purpose between 15 January 2014 to 29 March 2014 confirmed by a qualified nurse. On the other hand, a Control was an uncircumcised male aged 15 to 29 years confirmed by qualified nurse and residing in Manicaland province during data collection period. A sample of 95 cases and 95 controls was chosen through systematic sampling using the male circumcision register as the sampling frame. The sample was calculated based on a study in Uganda where 19.6% of the controls and 40.4% of the cases cited religion as a factor that hinders uptake of male circumcision (Wilcken et al. 2010). The sample size calculation was based on a statistical power of 0.8, a margin of error of 0.05 and anticipated refusal rate of 10%. Permission to carry out the study was granted by the Provincial Medical Director Manicaland province and Africa University Research Ethics Committee. Participants were also asked for informed consent before interviews. Data was collected through an interviewer-administered questionnaire and key informant interviews. The key informants were the District Medical officers, Provincial STI/HIV Focal person, District Nursing officers, District Environmental health officers, District Health promotion officers, District Pharmacists, District health information officers and Male circumcision team leaders in Manicaland province. The outcome variable was the uptake of Voluntary Medical Male circumcision by males aged 15 to 29 years for HIV prevention purposes.

RESULTS

Demographic characteristics

Table 1: Demographic characteristics of study participants

Variable	Cases Frequency (%)	Controls Frequency (%)	P values
Age			
15 to 19 years	74 (77.9)	58 (61.1)	0.01
>20 years	21 (22.1)	37 (29.5)	
Religion			
Christians	88 (92.6)	90 (94.7)	0.55
African Traditional	7 (7.4)	5 (5.3)	
Level of education			
Primary	5 (5.3)	2 (2.1)	
Secondary	90 (94.8)	93 (97.9)	0.02
Place of residence			
Urban	20(21.1)	9 (9.5)	
Rural	75(78.9)	86 (90.5)	0.03

Of the respondents 74 (77.9%) of the cases were between the age group of 15 to 19 years and 58 (61.1%) of the controls were aged from 15 to 19 years of age. Eighty eight (92.6%) of the cases were Christians while ninety (94.7%) of the

controls were also Christians. The majority 89 (93.7%) of the cases and 93 (97.9%) of the controls had attained secondary level. Five (5.3%) of the cases had only attained primary level of education while all of the controls had attained secondary and tertiary level of education. From the respondents only one (1.1%) of the cases had attained tertiary level of education while 2 (2.1%) of the controls had reported to have attained tertiary level of education. Seventy five (78.9%) of the cases were from rural areas and 86 (90.5%) of controls had indicated that they are from rural health centres. Demographic characteristics of the respondents are summarized in table 1 below.

Demographic factors associated with uptake of Male Circumcision

The following factors were found to be statisticaly significant correlates of uptake of male circumcision: being in the age group of 15 to 19 years (OR=2.25: 95% CI= 1.19-4.25), living in the urban residence (OR= 2.55: 95% CI=1.09-5.93) and distance to MC centre was within 15 km from their homesteads (OR=3.88; 95% CI=1.95-7.70). The demographic predictors of male circumcision uptake are shown in table 2 below.

Table 2: Socio-demographic factors associated with uptake of Voluntary Medical male circumcision (VMMC)

Variable	Cases	Control	Odds ratio	95%Confidence interval
Age group				
15 to 19 years	74	58	2.25	1.19 - 4.25
20 to 29 years	21	37		
Place of residence				
Urban	20	9	2.55	1.09 -5.93
Rural	75	86		
Level of education				
Primary	5	0		
Secondary/ Tertiary	90	95	-	-
Distance to MC centre within 15 km				
Yes	80	55	3.88	1.95 – 7.70
No	15	40		

Best Age for male circumcision

Respondents were asked to provide their views regarding the best age at which to be circumcised. Thirty seven (38.9%) of cases had an opinion that the best age for male circumcision is 14 to 19 years while 30 (31.6%) of the controls have the same sentiments with the cases. Thirty five (36.8%) of the cases had an opinion that the best age for male circumcision is between 7 to 13 years and 23.2% of the controls also suggest the best age for circumcision is between 7 to 13 years of age. Twelve (12.6%) of the cases had an opinion that the age between 2 to 6 years is the best age for male circumcision while 8 (8.4%) of the controls had the same opinion with cases. Two (2.1%) of the cases suggest that male circumcision should be done to males above the age of 20 years and 3 (3.2%) of the controls had an opinion that the best age for circumcision is above 20 years of age. About 5 (5.3%) of cases and 15 (15.8%) of controls favoured circumcision at birth. Four (4.2%) of the cases were not sure on the best age of male circumcision as compared to 3 (3.2%) of the controls who were not sure on the best age for male circumcision. Lastly 2 (2.1%) of the cases suggested that no one should be circumcised and 14 (14.7%) of cases had an opinion that no one should be circumcised.

Regarding decision making, 63 (66.3%) of the cases and 73 (76.8%) of controls regard themselves as the primary decision maker for their own circumcision. Fathers were regarded as the primary decision maker by 14 (14.7%) of the cases and 8 (8.4%) of the controls. Eight (8.4%) of cases and 1 (1.1%) of controls regard their mothers as the primary decision maker. Four (4.2%) of cases and 4 (4.2%) of controls regard their grandmother as the primary decision maker while 2 (2.1%) of the cases and 1 (1.1%) of controls regarded their grandfather as the primary decision maker. The remaining 4 (4.2%) of cases and 8 (8.4%) of controls had indicated other guardians as the primary decision maker for them to be circumcised.

The association between primary decision maker and uptake of male circumcision

The researcher went on to analyse the association between the primary decision maker regarding male circumcision and uptake of voluntary medical male circumcision in Manicaland province and

most of the study participants regard themselves as primary decision marker (OR=1.59: 95% CI=1.01 -2.69) and this was significantly associated with uptake of voluntary medical male circumcision.

Knowledge and attitudes of cases and controls towards male circumcision

In addition to personal views with regard to circumcision status, knowledge of and attitude towards Male Circumcision were also explored in this study. Sixty three (66.3%) of cases and 44 (46.3%) of controls got enough health information regarding male circumcision from different sources. The study participants were further asked the benefits of male circumcision and the following were the responses: Seventy four (77, 9%) of cases and 44(46, 3%) of controls knew the benefits of male circumcision. Forty two (44.2%) of the cases were aware of the risk related to male circumcision while thirty seven (38.9%) of controls were also aware of the risk related to male circumcision. The respondents were asked if they know that male circumcision can help to reduce men's exposure to HIV infection and 81 (85.3%) of the cases answered yes against 59 (62.1%) of controls. Eighty one (85.3%) of cases were aware of the location of voluntary medical male circumcision in Manicaland province where 64 (67.4%) of controls were aware of the location for voluntary medical male circumcision in the province. Eighty (84.2%) of cases cited that the distance of male circumcision centre was within 15 kilometres from their homesteads versus 55 (57.9%) of the controls. Fifty six (58.9%) of cases had positive attitude towards voluntary medical male circumcision while twenty five of the controls had positive attitude towards voluntary medical male circumcision.

Knowledge and attitudes associated with uptake of Voluntary Medical Male Circumcision in Manicaland province.

Knowledge and attitudes factors associated with uptake of Voluntary Medical Male circumcision in Manicaland province (Table 3) include: Knowledge on the benefits of Male circumcision (OR=3.62: 95% CI= 1.95 - 6.74), had enough information on male circumcision from different sources (OR=2.28: 95% CI=1.27 - 4.10), male circumcision reduces men's exposure to HIV infection (OR=3.53: 95% CI=1.75 – 7.13), Knowledge on the location of Male circumcision in Manicaland province (OR=2.80: 95% CI=1.38 - 5.71) and positive attitude towards MC (OR= 4.02: 95% CI= 2.18 - 7.42). Knowledge on the risk related to male circumcision (OR= 1.24: 95% CI=0.70 - 2.21) was not statistically significant with uptake of male circumcision.

Table 3: Participant's knowledge and attitudes towards Voluntary Medical Male Circumcision (MC)

Variable	Cases	Control	Odds ratio	95% Confidence interval
Benefits of MC				
Yes	74	44	3.62	1.95 – 6.74
No	21	51		
MC reduces Men's exposure to HIV.				
Yes	81	59	3.53	1.75 - 7.13
No	14	36		
Risks related to MC				
Yes	42	37	1.24	0.70 – 2.21
No	53	58		
Enough information on MC.				
Yes	63	44	2.28	1.27 – 4.10
No	31	51		
Yes	81	64	2.80	1.38 – 5.71
No	14	31		

Reasons circumcision associated with uptake of Voluntary medical male circumcision

The reasons for undergoing medical male circumcision which were statistically significantly associated with uptake of Voluntary medical male circumcision are as follows: Male circumcision protects from Sexual transmitted infections and HIV (OR = 4.85 95% CI= 2.57 - 9.12), Male circumcision is necessary for keeping genital hygiene (OR = 2.83 95% CI = 1.54 - 5.17) and male circumcision should be done for personal hygiene (OR = 1.98: 95% CI = 1.09 - 3.60). Male circumcision should be performed for cultural reasons (OR = 0.82: 95% CI = 0.40 - 1.68), male circumcision should be performed for religious reasons (OR = 0.82:95% CI = 0.41 - 1.66), male circumcision enhance sexual pleasure (OR = 1.78: 95% CI = 0.91 - 3.52) and partner

encouragement (OR = 0.55: 95% CI = 0.27 - 1.14) were not statistically associated with uptake of voluntary medical male circumcision in Manicaland province. Table 4 shows the association between reasons for undergoing medical male circumcision and uptake of voluntary medical male circumcision.

Table 4: Reasons circumcision associated with uptake of Voluntary medical male circumcision

Variable	Cases	Control	Odds ratio	95% Confidence interval
MC protects from STI and HIV				
Yes	70	40	4.85	2.57 - 9.12
No	25	45		
Genital hygiene				
Yes	69	46	2.82	1.54 – 5.17
No	26	44		
Sexual pleasure				
Yes	28	18	1.78	0.91- 3.52
No	67	87		
Culture				
Yes	17	20	0.82	0.40 -1.68
No	78	75		
Religion				
Yes	1	21	0.82	0.41 – 1.66
No	8	74		
Personal hygiene				
Yes	77	53	1.98	1.09 – 3.60
No	80	42		
Partner Encouragement				
Yes	15	24	0.55	0.27 – 1.14
No	80	71		

Barriers to Voluntary Medical Male circumcision in Manicaland province

A number of factors were found to be barriers to the uptake of VMMC. Fear of surgical operation, pain, infection, bleeding and other complications was cited by 46 (48.4%) of the cases and also it was cited by 64 (67.4%) of the controls as an obstacle to uptake of voluntary medical male circumcision. Thirty six (37.9%) of the cases had cited that circumcision wound will take too long to heal, while 60 (63.2%) of the controls had also indicated that they fear circumcision wound will take too long to heal. Thirty five (36.8%) of the cases had indicated that circumcision was not accepted in their culture versus 51 (53.7%) of the controls who cited that circumcision was not accepted in their culture as barrier to uptake of voluntary medical male circumcision in Manicaland province. Religion was also cited by 26 (27.4%) of the cases and 45 (47.4%) of the controls as the barrier to uptake of voluntary medical male circumcision. Thirty five (36.8%) of the cases had indicated that their partner doesn't like circumcised men, while 43 (45.3%) of the controls had the same sentiments with the cases. Thirty five (36.8%) of cases cited fear and discrimination as the barrier to voluntary medical male circumcision versus 49 (51.6%) of the controls who also fear to be stigmatised and discriminated after male circumcision. Twenty seven (28.4%) of the cases had indicated that they don't have time to go for voluntary medical male circumcision and 50 (52.6%) of the controls had also cited that they don't have time to go for male circumcision.

Nineteen (20.0%) of the cases indicated that time to wait before sex resumption is too long, while 37 (38.9%) of the controls had cited that time to wait is too long before sex resumption. Fifteen (15.8%) of the cases had cited that they were afraid of being tested for HIV before the procedure, while 34 (35.8) of the controls had reported that they were afraid of being tested for HIV before the procedure. Thirty one (32.6%) of the cases had indicated that they heard that women do not like circumcised men versus 36 (37.9%) of the controls who had the same feeling with the cases. Thirty one (32.6%) of the cases and 32 (33.7%) of the controls cited that health workers had a negative attitudes towards clients. Thirty one (32.6%) of the cases cited that they heard that circumcision reduces sexual feelings versus 36 (37.9%) of the controls who cited that they also heard that male circumcision reduces sexual feelings. Thirty (31.6%) of the cases and 45 (47.4%) of the controls had indicated that the Male circumcision centre was very far away from their homesteads.

Barriers to voluntary medical male circumcision included fear of surgical operation, pain, infection, bleeding and other complications (OR=0.45: 95% CI= 0.25-0.82), Circumcision wound will take long time to heal (OR=0.36: 95% CI=0.19-0.64), Circumcision is not cultural accepted (OR=0.50: 95% CI=0.28-0.90:), religion (OR=0.48: 95% CI= 0.23-0.77), fear of

stigma and discrimination (OR=0.55: 95% CI=0.31-0.98), Time to go for male circumcision (OR=0.36: 95% CI=0.19-0.65), fear of HIV test before the operation (OR=0.34: 95% CI=0.17-0.67) and Long distance to the health facility (OR=0.51: 95% CI=0.28-0.92). The barriers that were not statistically significantly are as follows: Partner doesn't like circumcised men (OR=1.42: 95% CI=0.79-2.53), Long time to wait before sex resumption (OR=0.56: 95% CI=0.31-1.04), women don't like circumcised men (OR=0.79: 95% CI=0.44 - 1.44). Negative health care worker attitude towards clients (OR=0.95: 95% CI=0.52 - 1.74) and Male circumcision reduces sexual feelings (OR=0.79: 95% CI=0.43-1.44). Table 5 summarizes the barriers to voluntary medical male circumcision.

Table 5: Barriers to uptake of Voluntary Medical Male circumcision

Variable	Cases	Control	Odds ratio	95% Confidence interval
Surgical complications and pain				
Yes	46	64	0.45	0.25 – 0.82
No	49	31		
Wound healing takes long				
Yes	36	60	0.36	0.20 – 0.64
No	39	35		
Culture				
Yes	35	51	0.50	0.28 – 0.90
No	60	44		
Religion				
Yes	26	45	0.42	0.23 – 0.77
No	69	50		
Partner-does not like circumcised men				
Yes	60	52	1.42	0.79 – 2.53
No	35	43		
Fear of Stigma and discrimination				
Yes	35	49	0.55	0.31 – 0.98
No	60	46		
No time to go for MC				
Yes	27	50	0.36	0.20 – 0.65
No	68	45		
Long time to wait before sex resumption				
Yes	26	38	0.56	0.31 – 1.04
No	69	57		
Fear of HIV test				
Yes	15	34	0.34	0.17 – 0.67
No	80	61		
Women don't like circumcised men				
Yes	31	36	0.79	0.44 – 1.44
No	64	39		
Negative Health care worker attitude				
Yes	31	32	0.95	0.52 – 1.74
No	64	63		
MC reduces sexual Feelings				
Yes	31	36	0.79	0.43 – 1.44
No	64	59		
Homestead far away From MC centre				
Yes	30	45	0.51	0.28 – 0.93
No	65	50		

The association between knowledge on male circumcision reduces exposure to HIV infection and uptake of voluntary medical male circumcision stratified by knowledge on the location of male circumcision in Manicaland province was done and the following are the results obtained: know the location of MC centre (OR=6.02: 95% CI=2.26 - 16.08), don't know the location of MC centre (OR=0.63: 95% CI =0.18 - 2.18), Crude OR=3.25 and MH =3.23. Therefore the association between knowledge on male circumcision reduces men's exposure to HIV infection and uptake of voluntary medical male circumcision was modified by knowledge on the location of male circumcision centres for both cases and controls. Those who had been circumcised were 6.02 times more likely to know the location of male circumcision centres in Manicaland province.

Multivariate Analysis

A multivariate logistic regression model for facilitators and barriers to male circumcision was built to predict uptake of voluntary medical male circumcision. In the final model selected for facilitating factors and barriers for voluntary medical male circumcision, the following facilitating factors were associated with uptake of voluntary medical male circumcision: Knowledge on the benefits of male circumcision (AOR=2.91: 95% CI=1.48 - 5.71: p=0.002) and distance to male circumcision Centre was within 15 kilometers radius from place of residence (AOR=3.37: 95% CI= 1.59-7.12: p=0.002). The following barriers were all associated with uptake of voluntary medical male circumcision: Fear of surgical complications, pain, infection, bleeding and other complications (AOR=0.43: 95% CI=0.22-0.84: p=0.013) and fear of HIV test before the procedure (AOR=0.41: 95% CI=0.19-0.87: p=0.02). Table 6 shows independent factors associated with uptake of VMMC.

Table 6: Independent facilitating factors and barriers to uptake of VMMC

Term	Odds Ratio	95%	C.I.	Coefficient	S. E.	P-Value
Knowledge on benefits of MC (Yes/No)	2.9112	1.4849	5.7075	1.0686	0.3435	0.0019
Distance to MC Centre is within 15 km radius(Yes/No)	3.3676	1.5920	7.1237	1.2142	0.3823	0.0015
Fear of surgical complications and pain (Yes/No)	0.4293	0.2200	0.8375	-0.8457	0.3410	0.0131
Fear of HIV test before the procedure (Yes/No)	0.4101	0.1938	0.8679	-0.8913	0.3825	0.0198
CONSTANT	*	*	*	-0.8192	0.3933	0.0373

Key informants

Key informants were held with District Medical Officers, District nursing officers, District health promotion officers, District environmental health officers, Provincial HIV/STI coordinator, and male circumcision team leaders. Of the thirteen key informants interviewed 8 were male circumcision team leaders. All eight male circumcision team leaders were trained in male circumcision except the District Medical officers, district nursing officers, District health promotion officers, district environmental health officers who had been sensitised on male circumcision programme. All thirteen key informants agreed that there is staff shortages for the programme especially doctors to perform the operations. All the key informants indicated that they had adequate surgical equipment for the programme. Two out of thirteen key informants indicated shortage of transport for the programme. Eight male circumcision team leaders indicated that there is need for training of nurses to perform male circumcision surgical operations in the case of absence of the medical doctor or to reduce doctor to client ratio. Ten out of thirteen key informants cited low uptake of male circumcision among primary schools, in rural areas and among males aged twenty years and above. One team leader had indicated in adequate health education to clients evidenced by one client who uses ammonium nitrate instead of salt for quick wound healing. Shortage of medical doctors is another challenge encountered by all the seven districts where the programme will be halted in the absence of medical doctors. Seven out of thirteen key informants had cited religion and culture as a major reason for low uptake of male circumcision in rural areas. Two key informants indicated fear of surgical complications as another major reason for low uptake of male circumcision among primary schools. Six of the thirteen key informants had indicated that fear of HIV test before the operation is a major reason for low uptake of Voluntary medical male circumcision in the province. Eleven out of thirteen key informants indicated poor demand creation efforts in rural areas as a major reason for low uptake of the programme.

DISCUSSION

Sociodemographic characteristics

The study focused on the contribution of the following sociodemographic variables in determining access and utilisation of voluntary medical male circumcision:

Place of residence and age at circumcision

Urban residence was associated with uptake of voluntary medical male circumcision in Manicaland province due to demand creation activities through multi media campaigns, bill boards and road shows at market places other than in rural areas where most of the people have no access to multimedia campaigns and bill boards. This is in agreement with findings by Wambura et al, (2011) on Acceptability of medical male circumcision in the traditionally circumcising communities in Northern Tanzania which revealed that uptake of medical male circumcision was significantly associated with urban residence. Being in the age group of 15 to 19 years of age was significantly associated with uptake of voluntary medical male circumcision and low uptake of voluntary medical male circumcision was found among males age 20 years and above. This is because most of MC clients were coming from schools. In a similar study by Lissouba et al (2011) on Adult male circumcision as an intervention against HIV: An operational

study of uptake in a South African community found out that self-reported uncircumcised men were more likely to be aged 27 or older (AOR = 1.72; 95% CI: 1.15 to 2.56) and these findings are similar with study in Botswana where 55% of respondents favoured circumcision in infancy and early childhood (Kebaabetswe et al, 2003)

Distance to Male Circumcision Centre

Residing within 15 km radius was associated with uptake of VMMC. Distance to health facility has also an effect on utilization of VMMC services, people must have the means and knowledge of getting to those services and makes use of them. Income, a regular source of care, travel and waiting times are some of the measures that can also be important. For example accessing a service may be facilitated or hindered by the location and physical distance of the service from the client. Distance may impede or enhance utilization of a health service. The further a client is away from a service, the less the utilization of the service. Even at the service location, the bureaucracy of the process may encourage or discourage a client to use a service. Lack of efficient transport may impede the utilization of VMMC services, the clients resorting to walking or bicycle rides where possible

Primary decision marker regarding male circumcision

The study revealed that the participants were predominantly primary decision makers with regards to medical male circumcision and 77.9% of the cases were adolescents aged 15 to 19 years. In Zimbabwe adolescents are allowed to consent themselves to undergo medical male circumcision at the age of 18 years and this might be a barrier to uptake of VMMC since many adolescents will be willing to undergo male circumcision but they have to obtain consent from their parents first who may refuse. This concurs with a study in Botswana where the majority of adolescents and parents indicated that the boys should be the principal decision makers regarding their circumcision; however household disagreement on this issue was common. Among 221 responding adolescents and parents pairs, 40% disagreed on who should be making the decision. The majority of adolescent boys and slight majority of parents preferred that the boy make the final decision (Jayeoba et al, 2012). Decreasing the age of consent from 18 years and above to 16 years and above will increase the male circumcision coverage. Findings of this study revealed that a significant proportion of primary decision makers were mothers and this is a contrasting finding to a study by Pan et al in 2012 where a significantly higher proportion of fathers compared to mothers agreed to circumcise their newborn sons (40.8% vs. 26.2%; χ^2 = 12.853, p = 0.008). For those who agreed to EIMC, 66.7% regarded the father to have the final say. Further research is necessary to determine knowledge, attitude and practices among females towards uptake of voluntary of medical male circumcision.

The level of education was not associated with uptake of voluntary medical male circumcision among males aged 15 to 29 years. The literacy rate in Zimbabwe is above 89% therefore it might be impossible to determine an association between level of education and uptake of male circumcision. The results are contrary to the findings by Wambura et al (2011) on Acceptability of medical male circumcision in the traditionally circumcising communities in Northern Tanzania found out that preference for pre-pubertal circumcision in the medical setting was significantly associated with above primary school education.

Culture

Lack of circumcision was mentioned as an element of the ethnic identity of those who do not circumcise traditionally. However, remaining with one's foreskin is not considered crucial to one's own ethnic identity. In this study culture was found to be a significant barrier to uptake of voluntary medical male circumcision for HIV prevention purpose because most of people in Manicaland province come from

non-circumcising communities. They reported that male circumcision is not cultural accepted in their community and it is only practiced by the minority group called *Varemba* and some of them fear to be named as Muslims after undergoing male circumcision. Findings of this study are similar with a study conducted in rural Uganda by Wilcken et al 2010 on male circumcision for HIV prevention awareness among young people and adults where two thirds of the uncircumcised male participants reported cultural reasons for not being circumcised. Furthermore a study by Lissouba et al.2011 on Adult male circumcision as an intervention against HIV found out that the reasons for not being circumcised as Adult Male Circumcision was not being part of one's culture (12.6%; 95%CI: 10.3% to 15.2%). Findings by Lissouba et al (2011) on uptake of Male circumcision in South African community self-reported uncircumcised men were more often from Zulu (traditionally non-circumcising) than Sotho (traditionally circumcising). Interestingly on another side this is against studies in many African societies and among certain ethnic groups where male circumcision was carried out for cultural reasons, as an initiation rituals and a rite of passage from childhood into manhood (Bottoman, et al .2009; Grant et al. 2004). In New Guinea men agreed that allowing the blood to flow when the foreskin is cut is important in their culture/custom (Maclaren et al 2013).

Religion

The results of this study show that religion was a barrier to uptake of voluntary medical male circumcision. Since male circumcision is mostly practiced by Muslims, in Zimbabwe most of the people are Christians and from this study neither of the cases nor were controls Muslims. On another note Manicaland province is dominated by members of the *John Marange* apostolic sect who does not utilize health facilities for any other health condition and these people constitute a larger percentage. Special designed communication packages targeting religious sects should be developed and increase in advocacy activities targeting church leaders would be required. It is also considered fundamental to some minority Christian and animist sects, religious reasons (19.6% vs. 40.4%; $p = 0.028$) was also cited as reasons for not being circumcised (Lissouba et al. 2011). Findings of this study are contrary to the study Tarimo et al (2012) in Tanzania on the perceptions on male circumcision as a preventive measure against HIV infection and considerations in scaling up of the services where individuals' beliefs towards male circumcision were tied to religious rituals. Christians referred to documentations regarding circumcision in the Holy Scriptures. They emphasized that after eight days Jesus was circumcised, and that it would be good to adhere to this ritual of circumcising boys while they are still young. Similarly, the Muslims emphasized that uncircumcised men cannot participate in mosque services or in burial ceremonies. They added that for the true Muslims, circumcision is compulsory.

Benefits of Male Circumcision

Knowledge on the benefits of male circumcision was found to be significantly associated with uptake of voluntary medical male circumcision for HIV prevention purpose. People need to be empowered with information for them to make informed decision and appropriate action towards their health status. They also need information to weigh the benefits of a new innovation and the risk of the innovation. Continued health education sessions regarding benefits of medical male circumcision may yield good results for the programme. Similar study Daniel et al 2005 on Acceptability of Adult Male Circumcision for Sexually Transmitted Disease and HIV Prevention in Zimbabwe where circumcised men were more likely to state positive benefits of male circumcision. In response to the question "If you are uncircumcised, would you like to be circumcised if this practice is confirmed to reduce the risk of contracting HIV or STIs

and if it is performed safely and affordably 45% answered yes. Similarly a significant increase in acceptability of Male Circumcision in Botswana has been shown after short brief informational sessions on the advantages of circumcision (Kebaabetswe et al, 2003) indicating health education programme could have major influence in uptake of Male Circumcision.

Male circumcision reduce men's exposure to STI including HIV infection

Male circumcision reduce men's exposure to STIs including HIV infection was found to be significantly associated uptake of voluntary medical male circumcision. The study participants said that male circumcision had been practiced in Zimbabwe for cultural and religious reasons and they were not willing to be circumcised, but they opt for MC after having information that it reduces exposure to HIV by 60%. This is in agreement with a study on foreskin cutting beliefs and practices and the acceptability of male circumcision for HIV prevention in Papua New Guinea where almost all men and three-quarters of women (74%) stated they would remove the foreskin of their male child if it reduced the risk of HIV infection, and even higher proportions if it had an overall health benefit. Most uncut men and longitudinal cut men stated they would remove their foreskin or its remnant part, if it reduced the risk of HIV infection or if it had an overall health benefit (Maclaren et al, 2013). Therefore there is need to increase health education sessions on HIV protection among male circumcision objectors.

Positive attitude

Positive attitude towards male circumcision was associated with uptake of voluntary medical male circumcision. The results are consistency with a cross-sectional study conducted by Kebaabetswe et al (2003) to determine the acceptability of MC in Botswana revealed that MC appears to be highly acceptable. Among 238 uncircumcised men surveyed 145 (61%) stated that they would definitely or probably get circumcised themselves if it were offered free of charge and in a hospital setting; the response increased to 192 (81%) after five minutes informational session. A similar survey conducted on acceptability of adolescent male circumcision and their parents in two large villages of Botswana, showed high acceptability rate of 75% (Jayeoba et al, 2012).

Sexual enhancement

Findings of this study show that sexual enhancement was not associated with uptake of male circumcision for HIV prevention purpose. Zimbabwe is traditionally non male circumcision country unlike other countries where MC is performed for sexual enhancement purpose. Most of the clients were not aware about that MC enhances sexual pleasure and they were still in need to experiment about this. This is contrary to findings from participants in many studies believed that circumcision enhances sexual pleasure (Bailey et al 2002; Lagarde et al 2003; Lukobo and Bailey 2007; Ngalande et al 2006). Other authors cited that circumcised men experience greater sexual pleasure (Young et al, 2012 and Maclaren et al, 2013). The findings are also contrary to a study by Wilcken et al 2010 also found out that enhanced sexual pleasure was also mentioned, but with no differences between adults and youth. Male participants considered enhanced sexual pleasure twice as often a reason to circumcise than females.

Genital hygiene

Improved genital hygiene was significantly associated with uptake of voluntary medical male circumcision in Manicaland province this is because most of the promotional messages that has been channeled through radios, televisions, posters, pamphlets, road shows and bill boards had point out genital hygiene as one of the major benefits of medical male circumcision. Furthermore the slogan for medical male circumcision is *get in to smart be circumcised today*. This is consistent with other authors who cited that improved genital hygiene is something that is almost universally equated with MC in both

traditionally circumcising and non-circumcising communities in Africa (Westercamp & Bailey 2007; Rain-Taljaard et al, 2003), circumcised males find it easy to maintain penile hygiene (Bailey et al, 2002; Ngalande et al, 2006) and ease of maintaining proper penile hygiene proved a major factor in women's acceptability of circumcision (Bailey et al, 2002). Similar study by Wilcken et al 2010 found out that adults mentioned improved hygiene as a reason for Male Circumcision significantly more often than youths who thought that cultural reasons were less important and this was also in agreement with a study by Daniel et al 2005 found out that twenty-three men spoke more generally about circumcision promoting hygiene/sexual cleanliness.

Barriers to Male Circumcision

Fear of surgical complications

Fear of surgical complications, pain, bleeding and other complications found to be a significant barrier to uptake of voluntary medical male circumcision in Manicaland province. Two key informants indicated fear of surgical complications as another major reason for low uptake of male circumcision among primary schools where primary school children refuse to undergo male circumcision after noticing complications of male circumcision. This is in consistence with findings from South African community where pain was cited as the major barrier to uptake of male circumcision (Lissouba et al, 2011). In another study conducted in Botswana out of the 86 participants who initially responded that they would definitely not or probably not circumcise a male child, 35% listed pain among their reasons as a barrier for circumcision (Kebaabetswe et al, 2003). In another study by Wilcken et al (2010) on Male circumcision for HIV prevention a cross-sectional study on awareness among young people and adults in rural Uganda found out fear of complications as a barrier to Male circumcision.

Delayed wound healing

Findings of this study revealed that delayed wound healing is a barrier to uptake of male circumcision in Manicaland province. Clients need proper counseling and adequate health education concerning wound healing and management because some of the clients may fear to be circumcised after witnessing others who have undergone male circumcision struggling with wound healing. This is in consistency with a study conducted in Kisumu, Kenya identified the perception of long healing period following circumcision procedure as barriers to circumcision (Westercamp et al,2012)). Delayed wound healing and prolonged time away from work are common barriers of MC uptake among men (Herman-Roloff et al, 2011)

Timing

Time to go for Voluntary Medical male circumcision was a significant barrier to uptake of voluntary medical male circumcision in the province. Initially the Male circumcision programme used to be done during school holidays and public holidays where most of the people will have time to go for VMMC but the programme is now ongoing. Therefore some of the clients preferred the programme should be done over the school holidays since most of the clients were coming from schools. Long distance to male circumcision center was also found to be a barrier to uptake of voluntary medical male circumcision. This is consistency with findings from Kgalagardi South, Mahalapye, and Ngami East, treatment centres where clients travelling long distances. There were long queues and long waiting periods which discouraged potential circumcision clients. Public transport was erratic and cumbersome in some areas. When transport was poor, coming back after failed attempt became an even more remote option. In addition to that participants also called for Voluntary medical male circumcision services to be brought nearer to the people (Sabone et al, 2013).

Fear of HIV test

Fear of HIV test before the operation was also found to be significant barrier associated to uptake of VMMC. This is because that most of the people they are not aware of their HIV status and Zimbabwe is still struggling to increase HIV testing and counselling coverage both in rural areas and urban areas. Findings of this study was consistency with a study in Uganda on Contextual Barriers and Motivators to Adult Male Medical Circumcision in Rakai, Uganda were both MMC acceptors and decliners raised HTC as a barrier to circumcision, but decliners raised it as a barrier more than acceptors. Echoing comments made in almost all focus groups with decliners, one interview participant explained, you have to get your blood tested to establish whether you are positive or negative for HIV. It is one other important issue that they fear a lot.

Health systems related factors

Findings of this study shows that shortage of clinicians to perform surgical male circumcision found to be a barrier to uptake of male circumcision. In Zimbabwe there is shortage of medical doctors and these are there ones who are performing surgical male circumcision from all the seven districts. These doctors are also responsible for other duties at their respective hospitals. This has also resulted in some of the districts halted the male circumcision programme due to absence of medical doctors. There is need for training of nurses to perform surgical male circumcision. This is consistent with other author who cited shortage of personnel as a barrier to uptake of male circumcision (Sabone et al, 2013).

Study limitations

The main limitation of this study was possibility of bias because of the retrospective nature of the data collection. In fact, some epidemiologists have argued that case-control studies are not well suited for detecting weak associations-odds ratios less than 1.5 because of the likelihood of bias (Austin, 1994). Although bias is unlikely to be entirely accountable for a strong association, it may entirely account for a weak association. In addition, because case-control studies rely on retrospective data collection, it is difficult to infer temporal relationship between independent variable and outcome variable .Case control study is labeled as "dirty" in part because of their potential for selection bias, due to the use of an incorrect control group. We were also unable to assess the attitude and practices of females towards uptake of Voluntary Medical Male circumcision

RECOMMENDATIONS

There is need for short course trainings of nurses or other clinicians on surgical male circumcision to cover shortage of doctors and also to reduce doctor to client ratio. Similarly, the government can consider increasing in number of male circumcision outreach sites. Increasing demand for VMMC services in remote areas by designing innovative target specific communication strategies especially for conservative religious groups will increase coverage and uptake. The government can also consider a policy shift or review regarding the age of consent for medical male circumcision to shift from 18 years and above to 16 years and above. There is need for further research on knowledge, attitudes and practices among females towards uptake of Voluntary Medical Male Circumcision.

CONCLUSION

The main aim of this study was to identify factors determining uptake of voluntary medical male circumcision for HIV prevention among males aged 15 to 29 years in Manicaland province. A case control study design was chosen by the researcher to find solutions to the problem identified. The researcher made use of a sample of 95 cases and 95 controls. Data was collected by using an interviewer administered questionnaire. The researcher used Epi info 7 version for data analysis.

The findings reveal that having knowledge of the HIV-protection, benefits of MC, had enough information on male circumcision, genital hygiene, positive attitudes towards male circumcision, being an urban residence, being in the 15 to 19 years age group, MC centre is within 15 km from homestead and knowledge on Male circumcision sites were found to be driving forces for males aged 15 to 29 years to undergo Voluntary Medical Male Circumcision for HIV prevention in Manicaland province. Other factors such as level of education, risk associated with Male circumcision, partner support, enhancement of sexual pleasure were not significantly associated with uptake of voluntary medical male circumcision for HIV prevention

Fear of surgical complications, pain, bleeding and other complications, being in the age group of 20 to 24 years, delayed wound healing, stigma and discrimination, no time to go for male circumcision, Culture, religion, fear of HIV test before the operation, travelled long distance to male circumcision centres and shortage of doctors were found to be the major barriers to uptake of voluntary medical male circumcision for HIV prevention. Partners do not like circumcised men, long time to wait before sex resumption, negative health care worker attitude towards clients and Male circumcision reduces sexual feelings were no associated with uptake of voluntary medical male circumcision in Manicaland province.

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