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PREVALENCE AND PREDICTORS OF UNCIRCUMCISED, KENYAN MEN'S DESIRE FOR CIRCUMCISION FOR THEIR INFANT SONS

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Abstract

Men are key decision makers for their son's circumcision, so understanding their attitudes and beliefs is important for assessing uptake of early infant male circumcision in countries in sub-Saharan Africa that have high HIV prevalence. We analyzed men's preferences for circumcising their sons using data from a population-representative survey of 1,501 uncircumcised Kenyan men aged 25–49 years. Most men (59%) reported they would “definitely” want their son circumcised when asked about a hypothetical scenario of having a son born in the year of the survey. However, only 25% reported a similar desire to become circumcised themselves. In multivariable Poisson regression models to estimate prevalence ratios, key predictors of the desire to circumcise their sons included knowledge that circumcision reduces HIV acquisition, having a supportive partner, discussing circumcision with the partner, altruism, and intention of the man to be circumcised himself. Focusing on the above partner dynamics likely has the greatest capacity to increase demand, since 55% had not talked to their partner about circumcision.

Keywords

HIV prevention; infant male circumcision; Kenya

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DISCLOSURES

Conflict of Interest: The authors declare that they have no conflict of interest.

COMPLIANCE WITH ETHICAL STANDARDS

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

INTRODUCTION

Male circumcision reduces the risk of HIV acquisition by 50–70% (1–3). Modeling suggests that with 80% uptake of male circumcision, HIV prevalence could be reduced by 45–67% in highly endemic countries, which is the equivalent of 50,000 less new infections per year in Kenya alone (4). Therefore the WHO and many ministries of health in sub-Saharan African countries have incorporated male circumcision into HIV prevention strategies (5, 6). Despite its benefits, uptake of adult voluntary male medical circumcision (VMMC) has been slow, reaching less than 50% of the 80% target in most of the highly endemic countries (7). Policymakers are now shifting their focus to infant male circumcision (IMC), which may be easier, safer, and cheaper (8, 9).

Given that most sexually active men in high HIV prevalence countries have not been circumcised, understanding their preferences for their son's circumcision is essential as countries consider implementing IMC programs. This population is particularly important since fathers are considered key decision makers for their son's circumcision (10–13). Historically, uncircumcised men are less likely than circumcised men to want their sons circumcised, though this attitude may be changing (13–16). Past studies of men's preferences for IMC have been limited by convenience sampling, small samples, and lack of inclusion or control for men's own circumcision status (14, 15, 17). Further, only one other study has been published since VMMC programs have become more prevalent, and it did not analyze fathers separately from the couples as a unit due to bias in recruitment of the fathers (16). Finally, most studies have calculated odds ratios, which overstate the measure of association especially for highly prevalent conditions over 10% (13, 14, 17–19).

Therefore, we examined data from a representative sample of uncircumcised men in a rural district in Kenya's Nyanza region to determine the prevalence of the preference for circumcising one's son and identify factors associated with this preference. The Luo ethnic group in the study region does not practice traditional circumcision, and VMMC programs have been available to adolescents and adults since 2008. We used a baseline questionnaire from a randomized clinical trial to assess men's attitudes and knowledge regarding IMC.

METHODS

Study Design and Population

The data for this study were derived from a survey administered during enrollment in a randomized clinical trial of compensation provision to increase uptake of VMMC among adult men (NCT01857700). The trial has been described in detail elsewhere (20). Briefly, it was conducted in the greater Nyando district within Kenya's Nyanza region. Seven of 76 sub-locations were chosen at random by selection probabilities proportional to the sub-locations population. From March 2013 to April 2013, trained research assistants conducted a census of the seven sub-locations to find all male household members between 25 and 49 years of age. A total of 3,717 men aged 25–49 years were listed. From June 22, 2013 to December 4, 2013, 3,333 of these men were randomly selected, and research assistants made home visits to assess for eligibility and enroll men in the study. 1,504 uncircumcised men met all eligibility criteria for the randomized trial: self-reported age was between 25 and 49

years, they self-reported to be uncircumcised, and they reported no intention to leave the study area in the next 3 months. In total, 1,829 of 3,333 men were excluded for the following reasons: 830 already circumcised, 410 moved since listing, 209 not found, 146 due to age or residence, 119 busy or refused, 26 dwelling not found, 17 mental or physical limitation, 14 deceased, 17 incomplete data, 41 other exclusions. A total of 3 men were excluded due to missing outcome data. Following informed consent, research assistants administered a baseline questionnaire in the local languages that was used for this secondary analysis; then participants were given information about male circumcision and subsequently randomized to four groups, with three of the groups receiving compensation if they underwent medical male circumcision at clinics in the study area.

Questionnaire Data

The main outcome for this cross-sectional sub-study was the response to one question from the baseline questionnaire: “if a son were born to you this year, how likely would you be to have him circumcised?” Participants responding definitely yes ($n=887$) were compared to those responding maybe ($n=518$), unlikely ($n=37$), definitely no ($n=26$), or don’t know ($n=33$) - combined into one “other” group ($n=614$). The justification for this categorization was that from the perspective of programs seeking to offer IMC services, it was most important to examine what distinguished men who definitely desired circumcision for their sons from other men.

Nineteen pre-specified variables were selected for analysis as predictors of the outcome. These included demographic factors as well as several variables that had a theoretical basis for potentially being associated with the main outcome. Demographic factors included age, education, religion, ethnicity, marital status, number of children, and daily earnings. Sexual factors included self-reported number of sexual partners and self-perceived risk of acquiring HIV. Circumcision factors included exposure to information about circumcision in the media, belief that circumcision is a safe procedure, knowledge that circumcision reduces HIV acquisition, belief that circumcision increases sexual pleasure for oneself, contact of similar age who has been circumcised. Decision-making factors included the participant’s belief that circumcision is a joint decision with one’s partner, if his partner was supportive of him being circumcised, feeling guilty if he infected his partner with HIV, his intention to get circumcised in the near future, and his level of altruism. Altruism was assessed by response to the following survey question: “Say you were given 100 shillings to spend as you wish, would you give any of it to somebody else?”

Statistical Analysis

Descriptive statistics for the overall sample were calculated using proportions for categorical variables and means with standard deviations for continuous variables. Bivariate analysis compared the above variables with the outcome, using Pearson’s chi-squared tests for the difference in proportions of categorical variables and student *t*-test for differences in means of continuous variables. A two-sided *P*-value <0.05 was considered statistically significant. As a secondary analysis, the study was powered for the primary hypothesis in the original study.

Prevalence ratios and 95% confidence intervals were determined using generalized linear models with a log link and Poisson distribution of residuals with robust variance estimators. Bivariate models were used for the unadjusted prevalence ratios. A multivariable model was built for the adjusted prevalence ratio excluding the following variables: marital status, number of children, religion, ethnicity, exposure to circumcision information, number of sexual partners, and self-perceived risk of HIV. Indicator variables were used to adjust for observer effects from the interviewers who administered the questionnaire. Marital status and number of children were collinear, so only progeny was used in the multivariate model. Religion, ethnicity, and exposure to information were excluded because of homogeneity within the categorical variable. Sexual partners and self-perceived risk of HIV were excluded, because they were not significant with $p\text{-value} > 0.2$ in bivariable analysis and had missing data, which did not lead to selection bias in exploratory analyses. All analyses were performed in Stata 14.1 (StataCorp, College Station, TX).

RESULTS

A total of 1,501 uncircumcised, Kenyan men were included in this analysis (Table I). The mean age was 34.4 years. All were from the traditionally non-circumcising Luo ethnic group, and 1,265 (84%) were married while 1,374 (92%) had at least one child. The mean number of children was 3.7. The majority did not consider themselves at high risk for acquiring HIV, and 85% had none or one sexual partners in the last year. As indicative of the increased focus on circumcision for HIV prevention in Kenya, all men had been exposed to information about male circumcision in the media. In addition, 1,425 (95%) thought the medical male circumcision procedure was safe; 1272 (85%) knew it could reduce the chance of acquiring HIV, and 394 (26%) thought it could improve a man's sexual pleasure. Most (62%) believed that adult male circumcision was a decision to be made jointly with one's partner, but 55% had not discussed it with their partner. Just 35% of men reported that their primary partner was supportive of circumcision. Only 25% reported an intention to "definitely" go for circumcision in the near future.

Overall 887 (59%) men reported that they desired circumcision for their son in the hypothetical scenario that a son was born to them this year. Among the demographic factors, men desiring circumcision for their son were more likely to be married, have children, and have above-median earnings (Table II). Circumcision preference did not appear to be associated with a generational effect, as measured by mean age in the two groups (34.5 v 34.2). Men's own sexual behavior based on number of partners or perception of being at high risk for HIV also were not associated with the frequency that they desired circumcision for their son.

The strongest predictor of the outcome was having the knowledge that circumcision reduces HIV acquisition (Table III; aPR 1.44 95% CI 1.23–1.69). Other factors that were associated with an increased prevalence of desiring circumcision for one's son were: intention for self to be circumcised (aPR 1.26 95% CI 1.16–1.37); belief that circumcision is a shared decision with one's partner (aPR 1.12 95% CI 1.01–1.23) and having a partner that supports the man becoming circumcised (aPR 1.19 95% CI 1.10–1.29). Altruism as measured by sharing money with another person was also a predictor (aPR 1.18 95% CI 1.06–1.32).

Feeling guilty if you gave your partner HIV was associated as well (aPR 1.24 95% CI 1.07–1.44).

Demographic factors, including age, education, having children, and earnings, did not affect men's interest in circumcising their sons. Interestingly, knowing someone close in age who was circumcised decreased the prevalence of the outcome on bivariable analysis (PR 0.88 95% CI 0.81–0.97), but in the multivariable model, there was no association (aPR 0.96 95% CI 0.87–1.05).

DISCUSSION

In this large, population representative sample of uncircumcised men ages 25 to 49 years in western Kenya with access to a mature national medical circumcision program, most uncircumcised men reported “definitely yes” that they would want circumcision for a son if born this year. But only a quarter of these uncircumcised men “definitely” intended to be circumcised themselves. This finding highlights the challenges facing adult voluntary male medical circumcision programs and underscores the potential benefits of focusing on infant medical circumcision to achieve the desired coverage of this protective procedure in high prevalence countries.

The proportion who reported favorable attitudes to infant circumcision in this study is consistent with estimates in previous studies, which found acceptability ranging from 50–90%; 59% is identical to the other recent study in Kenya (14–16, 21). Surprisingly, these numbers have not changed in over a decade, despite the widespread dissemination and availability of adult male circumcision (22). Perhaps attitudes have not changed since adult male circumcision information has been broadcasted widely but not information about infant circumcision. However, it may be that the men in our study are more opposed to IMC since they themselves have not been circumcised after many years of VMMC scale-up. Thus, the high acceptability of infant circumcision in our study population may suggest that the acceptability of infant circumcision among all adult men has actually risen.

Consistent with previous work, knowledge of circumcision's protective effect from acquiring HIV was one of the key factors associated with desiring circumcision for one's son. Penetration of this knowledge was high at 85% of this population, and 95% of the men thought that circumcision was safe. Thus, further education on the benefits and safety of the circumcision procedure alone is unlikely to significantly increase acceptability and demand for infant circumcision.

Partner dynamics – believing circumcision is a joint decision with one's partner and having a partner supportive of circumcision – were both independently associated with the preference for circumcision for one's son. Over half of the men had not talked to their partner about circumcision and in exploratory models, not having talked to one's partner had a similar effect on the outcome as having a neutral or unsupportive partner compared to having a partner that supports circumcision (data not shown). Other studies have reported the importance of partner communication and support to increase both VMCC and IMC (16, 23, 24). Given that a significant proportion of men had not discussed circumcision with their

partner, closing this gap through public health messaging and targeted interventions during the perinatal period may be an efficient way to increase the uptake of both VMCC and IMC.

Interestingly, over a quarter of the men in this study believed circumcision improved sexual pleasure. Removal of the nerve rich foreskin is thought to decrease penile sensation and has been one of the traditional arguments against circumcision (25). But some measures of sexual pleasure may increase after circumcision, as recently shown in sub-Saharan Africa and the Dominican Republic. The effect is likely because sexual pleasure is a multifaceted construct with biological, psychological, and cultural contributions (26, 27). These results suggest that adult men's attitudes towards IMC are likely to be shaped by their beliefs about what circumcision does to sexual pleasure.

Unlike previous studies, we measured both guilt and altruism and found that these individual attributes were independently associated with an increased preference for circumcision for one's son. This result is consistent with the notion that those men who would feel more guilt for infecting their partner with HIV or who are more altruistic towards their children and others are more likely to favor circumcision for their son – a father acting on what he believes is in the best interest of his son. Although guilt and altruism are also complex psychological and social phenomenon that may be difficult to modify, this result leads us to hypothesize that appealing to parents' altruism may be an effective form of messaging surrounding IMC.

Our study addresses only the intention to circumcise one's son; as a cross-sectional study, we do not have follow up to determine if the sons were circumcised. Most circumcision studies including the parent randomized trial of this study find a gap between desire and uptake – intention and practice – as is common in human behavioral change research. Despite this limitation, our results are still valid for describing the intention for infant circumcision, but it is not possible to draw conclusions about how many uncircumcised men would actually follow through with circumcising their sons. Future studies should focus on the uptake of infant circumcision over time.

Another limitation is that the baseline questionnaire did not specifically ask adult men about their preference for the age at which they would want their son circumcised. Our interpretation is that the men's responses are likely to be highly correlated with their preference for early infant circumcision, since the question specifically presented a scenario of a son being born “this year”. A recent study did show that the age range that parents prefer for their sons' circumcision varies widely (16). However our results are still valid for understanding men's preferences for their sons, and it is reasonable to interpret the main survey question as referring to infant circumcision.

Finally, we acknowledge that our measure of altruism was based on questions that presented participants with a hypothetical endowment, with the endowment amount itself not being very large relative to daily earnings. Since altruism measurement using experiments involving real endowments were well beyond the scope of the randomized trial that generated the data used in this study, there is a need for further research that includes

experimental measures of altruism and examines parental attitudes and behaviors regarding their children – particularly their decisions to circumcise their infant sons.

CONCLUSIONS

As countries consider whether to scale up IMC services and examine how to achieve high demand, this paper provides important insights for IMC programs. The majority (59%) of uncircumcised men in western Kenya want their sons circumcised, and it is widely accepted that male medical circumcision is safe and effective at reducing HIV acquisition. Partner dynamics – discussing circumcision with one's partner and having a partner supportive of circumcision – are key predictors of demand. Interventions that support discussions among partners should be developed, especially during the perinatal period. Finally, appealing to parents' altruism either in public health promotions or in doctor-patient communications may be an effective strategy to increase infant male circumcision and requires further exploration.

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Table I.

Characteristics of the 1501 subjects

Demographic Factors	N (%)	Missing
Mean age in years (SD)	34.4 (6.7)	0
Highest Education		0
Primary or less	897 (60)	
Secondary or more	604 (40)	
Religion		0
Roman Catholic	301 (20)	
Other Christian	1200 (80)	
Ethnicity: Luo	1498 (100)	0
Married		0
Yes	1265 (84)	
No	236 (16)	
Median number of children: 3.7		0
None	127 (9)	
Any	1374 (92)	
Median daily earnings (IQR)	400 (300–600)	0
Sexual Factors		
Partners in last year		14
0	92 (6)	
1	1179 (79)	
2	216 (14)	
Self-Perceived risk of HIV:		124
High or has HIV	465 (34)	
Other	912 (66)	
Circumcision Factors		
Exposed to circumcision information in the media		0
Yes	1497 (100)	
No	4 (0)	
Knowledge circumcision reduces HIV acquisition		2
Yes	1272 (85)	
No	227 (15)	
Belief procedure is safe		3
Yes	1425 (95)	
No	73 (5)	
Contact who is circumcised		0
Yes	502 (33)	
No	999 (67)	
Belief circumcision improves sexual pleasure for self		4

Demographic Factors	N (%)	Missing
Yes	394 (26)	
No	1103 (74)	
Decision Factors		
Circumcision decision-maker		21
Self	553 (37)	
Joint with Partner	927 (63)	
Partner's opinion on adult male circumcision		116
Supportive	488 (35)	
Unsupportive/neutral/not discussed	897 (65)	
Guilt if infected partner with HIV		0
Yes	1323 (88)	
No/unsure	178 (12)	
Altruistic: share lottery winnings		33
Yes	1,035 (71)	
No	433 (29)	
Intent to be circumcised in future		41
Definitely Yes	359 (25)	
Maybe	886 (61)	
No	215 (15)	

Table II.**Bivariate Analysis**

Variable	Circumcise Son: Yes	Circumcise Son: Other	P-value*
N (%)	887 (59)	614 (41)	
Median Age in years	34.5	34.2	0.342
Highest Education			0.05
Primary or less	512 (58)	385 (63)	
Secondary or more	375 (42)	229 (37)	
Religion			0.29
Roman Catholic	186 (21)	115 (19)	
Other	701 (79)	499 (81)	
Married			<0.01
Yes	769 (87)	496 (81)	
No	118 (13)	118 (19)	
Number of children			<0.02
0	62 (7)	65 (11)	
>=1	825 (93)	549 (89)	
Median Daily Earnings			<0.01
Below	428 (48)	340 (55)	
Above	459 (52)	274 (45)	
Partners in last year			0.32
0	49 (6)	43 (7)	
1	698 (79)	481 (80)	
2	135 (15)	81 (13)	
Self-perceived risk of HIV			0.31
High or HIV+	287 (35)	178 (32)	
Other	537 (65)	375 (68)	
Belief Circumcision is safe			<0.001
Yes	859 (97)	566 (93)	
No	28 (3)	45 (7)	
Contact who is circumcised			<0.01
Yes	273 (31)	229 (37)	
No	614 (69)	385 (63)	
Knowledge Circumcision Reduces HIV acquisition			<0.001
Yes	795 (90)	477 (78)	
No	91 (10)	136 (22)	
Belief Circumcision Improves Sex for Self			<0.001
Yes	287 (32)	107 (18)	
Other	599 (68)	504 (82)	

Variable	Circumcise Son: Yes	Circumcise Son: Other	P-value*
Circumcision Decision-maker			<0.001
Self	274 (31)	279 (47)	
Joint with Partner	607 (69)	320 (53)	
Partner's Opinion on Adult Male Circumcision			<0.001
Supportive	353 (43)	135 (24)	
Unsupportive/neutral/not discussed	473 (57)	424 (76)	
Guilt if infected partner with HIV:			<0.001
Yes	806 (91)	517 (84)	
No/Unsure	81 (9)	97 (16)	
Altruistic: share lottery winnings			<0.001
Yes	674 (77)	361 (61)	
No	199 (23)	234 (39)	
Intent to be circumcised in future			<0.001
Yes	291 (34)	68 (11)	
Maybe/No	574 (66)	527 (89)	

* Pearson's chi-squared test for categorical variables and T-test for continuous variables were used to compare the two circumcise son groups: yes and other.

Table III.

Unadjusted and Adjusted Prevalence Ratios Comparing Each Patient Characteristic with Desire to Have Son Circumcised

Characteristic	Unadjusted Prevalence Ratio (95% CI)	Adjusted Prevalence Ratio (95% CI)
Age (5 yr increase)	1.02 (0.98–1.05)	1.02 (0.99–1.06)
Secondary Education	1.09 (1.0–1.18)	1.06 (0.98–1.15)
Catholic	0.95 (0.85–1.05)	#
Married	1.22 (1.06–1.39)	#
Any Progeny	1.23 (1.02–1.48)	1.00 (0.84–1.19)
Earnings Above Median	1.12 (1.03–1.22)	0.99 (0.91–1.08)
Self-Reported High Risk/HIV	1.05 (0.96–1.15)	#
Knowledge Circumcision Reduces HIV	1.56 (1.32–1.84)	1.44 (1.23–1.69)
Belief Circumcision is Safe	1.57 (1.17–2.11)	1.25 (0.95–1.63)
Contact who is circumcised	0.88 (0.81–0.97)	0.96 (0.87–1.05)
Belief Circumcision Improves Sexual Pleasure	1.34 (1.24–1.45)	1.04 (0.96–1.14)
Shared Decision Making	1.32 (1.20–1.46)	1.12 (1.01–1.23)
Partner Supports Circumcision	1.37 (1.26–1.49)	1.19 (1.10–1.29)
Guilt if gave partner HIV	1.34 (1.13–1.58)	1.24 (1.07–1.44)
Altruistic: Share Money	1.42 (1.27–1.58)	1.18 (1.06–1.32)
Intent to get circumcised	1.55 (1.44–1.68)	1.26 (1.16–1.37)

Referent category implied from Table II (for example, primary or less is the referent for education compared to secondary or more)

Variables removed from final model (see text for details)