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Vasectomy is Family Planning: Factors Affecting Uptake Among Men in Eastern Province of Rwanda

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Abstract

Background
Vasectomy is the only permanent method of male contraception. It is safer, cheaper, and easier to provide than female sterilisation. Men typically take a vocal role as decision-makers in Africa, yet it is women who take family planning (FP) action.
Objective
To assess the knowledge and attitude of men toward vasectomy as a method of FP in the Eastern Province of Rwanda.
Methods
A cross-sectional design, and systematic sampling of every other household was used in a selected area. The sample size was 390 men and a valid questionnaire was used to collect data. Data analysis included descriptive and inferential statistics.
Results
Sociodemographic characteristics affecting vasectomy included education ($p < 0.001$), religion ($p < 0.001$), and the number of sexual partners ($p = 0.018$). Knowledge scores ranged from 58.4% to 82.6%. Many participants agreed that men should take part in FP (78.7%), and use vasectomy as an FP method (77.2%).
Conclusion
Men scored over 50% on vasectomy knowledge items, though many erroneously believed misconceptions. Misinformation is a barrier to vasectomy uptake, and greater awareness of vasectomy knowledge is needed to change attitudes and increase acceptance. Rwandan families and communities could greatly benefit from men's active role in family planning.

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Keywords: Vasectomy, family planning, contraception, men, sub-Sahara Africa

Background

Vasectomy rates are currently 2.4% worldwide, indicating a very low uptake of the only long-acting method of male contraception.[1] Men typically take a vocal role as decision-makers in low-to-middle income countries (LMIC), including family planning (FP) decisions. Yet it is the women who are more likely to take action,[2] as the tubal ligation rate is 19.2%.[3] In high-income countries, such as Canada, the United Kingdom, New Zealand, and the United States, about 20% of families rely on vasectomy for FP.[3] More husbands could take an active role in FP as the vasectomy is safer, less expensive, and more efficacious than tubal ligation;[4]however, targeting men in LMIC has been challenging.[3]

The Rwandan Ministry of Health (MOH) published the Fourth Health Sector Strategic Plan (HSSP4) for 2018-2024, reaffirming priorities to meet the Sustainable Development Goals (SDGs),[5] including increased development and slower population growth. One of the two HSSP4 key FP innovations is to "Introduce a community peer education system to promote the continued use of long-acting and permanent methods of FP services."[5,p30] A 40% uptake of modern FP methods over the last decade has likely contributed to lowering the maternal mortality rate by avoiding unwanted pregnancies and abortions.[6] However, in 2015, over 40% of women of childbearing age in sub-Saharan Africa (SSA) wanted to avoid a pregnancy, but only half (55 million) were able to obtain FP services. [7] In SSA, women at about the age of 33 years begin to crossover from wanting to space their births to wanting to limit their births.[8]

Currently, men's FP options are limited to condoms, withdrawal, and vasectomy,[4] and the latter has been known as an indicator of men's FP contribution to the family.[9] One of Rwanda's HSSP4 strategies is to increase the uptake of long-term FP methods and services with targeted promotional activities, including a male commitment to using FP services.

A ten-year review (2005-2015) by Shattuck and colleagues[10] synthesised the facilitating factors and barriers of vasectomy, and concluded that men and women have a knowledge deficit that affects their attitude toward vasectomy and consequently uptake. Couples selecting vasectomy are typically married, over the age of 30 years, with four or more children, and a history of contraceptive use.[10] Studies published since 2016 support Shattuck's findings of inadequate knowledge or negative attitude, and misinformation.[11–16] Both men and women have misconceptions about what happens post-vasectomy, and some of the more popular myths include: a man becomes physically and psychologically weaker, with diminished sex-drive, and vasectomy is a form of castration.[10]

Vasectomy is a permanent FP method, with a failure rate of less than 1%.[4] The procedure is done on an out-patient basis and takes about 20-minutes with local anaesthesia.[17] For the first week after the procedure, men need to avoid strenuous activities and sexual relations. In the second week, men can resume normal activities and sexual relations using a second contraceptive method. At three months, a negative sperm count of 0 at the clinic confirms that no other contraceptive device is needed before, during, or after sexual activity.[4,17]

Most FP programs worldwide target women around the perinatal period, such as during antepartum or postpartum visits; whereas men's healthcare is less cyclical and more likely related to a need for episodic treatment. Still, among men and women the literature identifies significant gaps in knowledge and common negative attitudes and myths about male contraception. In SSA, men are typically the decision-makers, but most are unaware of the facts related to vasectomy. The gap in knowledge necessitates further research to examine the knowledge and attitudes towards vasectomy among Rwandan men. Men's engagement in FP would assist with the unmet FP needs and reduce preventable maternal deaths.[2] The study aimed to assess the knowledge and attitudes of men towards vasectomy in the Eastern Province in Rwanda.

Methods

Design

This study was a descriptive cross-sectional design to assess men's knowledge and attitude towards vasectomy in a community setting. The study was conducted at 390 households in the Rwamagana District in the Eastern Province of Rwanda from 15 February to 20 April 2017.

Participants' recruitment

The sampling frame consisted of 149,214 men from Rwamagana District during the data collection period. The district is composed of 14 sectors and 82 cells among which seven sectors were systematically selected. The Yamane formula was used to determine the sample size, with a 95% confidence interval and 0.05 margin of error which resulted in a sample size of 384 men. Six more men were added to round up to 390 men. A list of the households within those sectors was obtained from the district office, and a systematic sampling method was used to select every other household. All men aged 22 to 67 years who agreed to participate in the study were included.

Measures

This study used a self-administered questionnaire to collect the data. Published by Onasoga and colleagues (2013), the questionnaire evaluated men's knowledge and attitudes towards vasectomy in Nigeria.[18] Dr Onasoga granted permission to use the instrument. [18] The questionnaire was slightly modified to fit the Rwandan context. A question on the ethnic background was removed. The statement 'I do not know' was added as a third option to the 'yes' or 'no' response questions. The questionnaire was offered in both Kinyarwanda and English. The investigator used classmates as peer reviewers to assess the feasibility of the questionnaire. A Cronbach's alpha of 0.8 indicated the internal consistency of the instrument.

The questionnaire consisted of three sections with a total of 38 items:
Section 1: Socio-demographic characteristics included age, education, religion, marital status, type of marriage, year's married, number of sexual partners, number of children, occupation, and average daily income (10 items). All ten items were measured in frequencies (table 1).

Section 2: Vasectomy knowledge was comprised of three parts (9 items). Part one consisted one general knowledge question about the types of male FP methods (figure 1). Part two consisted of one question about the sources of vasectomy information (figure 2). Part three consisted of seven specific vasectomy knowledge questions (figure 3), and response options included: Yes, No, and Do not know. Each correct knowledge response for part three was given one point, whereas a wrong answer or did not know a zero. All nine knowledge items were measured and displayed as frequencies.

Section 3: Attitude towards vasectomy was comprised of two parts (19 items). Part one consisted of 10 questions on men's attitude toward vasectomy (table 2). Responses were measured using a four-point Likert scale, where by participants were asked to indicate their degree of agreement ranging from strongly disagree, disagree, agree, to strongly agree. This instrument had no neutral point; therefore the participant had to declare whether there was agreement or disagreement with the statement.

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The attitude was defined as either positive (vasectomy would be acceptable FP method) or negative attitude (vasectomy would not be acceptable FP method). An agreement with items 1-6 indicated a negative attitude; for example, the statement, "it is against my cultural belief for a man to practice vasectomy." Whereas agreement with items 7-10 showed a positive attitude to vasectomy; for example, "a vasectomy is an effective method of FP." Frequencies were calculated based on the participants' responses, ranging from strongly disagree to strongly agree. Responses were scored and presented as frequencies. Part two consisted of nine questions on factors influencing men's attitudes towards vasectomy in the community (figure 4), and indicated a Yes or No response, and reported and displayed as frequencies.

Data collection

The investigator recruited three research assistants (RAs) to help with data collection. All had a background in nursing science and FP work experience and were briefed on the research project and the importance of confidentiality. Data collection occurred in the afternoon as most men were home at that time. If a man in the inclusion criteria was not home, the investigator or RA went to the next household on the list. Men that were home were invited to participate, given details about the study and signed the consent form. The questionnaire typically took about 20 minutes to complete. Assistance was also provided to complete the form, and in that case, it took longer. All completed questionnaires were collected and coded by the investigator.

Data analysis

Both descriptive and inferential statistics were used to analyse the data. Men's knowledge of vasectomy, informational source, and attitude towards vasectomy were reported and displayed as frequencies. A chi-square test (χ^2) or Fisher Exact test was used to measure associations between sociodemographic characteristics (categorical variables), and knowledge/attitude of vasectomy (numerical variable). Multivariate logistic regression analysis was used to evaluate the relationship between predictor variables (independent variables) and the odds (odds ratio) of influencing the outcome of vasectomy (dependent variable). Statistical significance was defined as a p-value of ≤ 0.05. Analyses were conducted using SPSS version 20.

Ethical considerations

Approval was obtained from the University of Rwanda College of Medicine and Health Sciences, Institutional Review Board. Ethical approval was also received from the Rwamagana District, and all participants signed consent prior to data collection.

Results

Findings of the study show that the majority of participants were aged from 31 to 39 years (43.1%), educated at the primary level (42.3%), and with a Catholic affiliation (58.7%) (table 1). The majority were married (77.7%), for a duration of fewer than five years (37.0%), and with 1-3 children (51.5%).

Table 1. Sociodemographic Characteristics (n=390)

Sociodemographics	n(%)
Age (years)	
22-30	86(22.1)
31-39	168(43.1)
40-48	93(23.8)
49-57	35(9.0)
58-67	8(2.0)
Education	
None	48(12.3)
Primary	165(42.3)
Secondary	120(30.8)
University	57(14.6)
Religion	
Catholic	229(58.7)
Islam	26 (6.7)
Protestant	97(24.9)
Adventist	12(3.1)
Jehovah	3(0.8)
Pentecost	22(5.6)
None	1(0.3)
Marital status	
Single	85(21.8)
Divorced or widower	2(0.6)
Married	303(77.7)
Marriage type	
Monogamy	298(95.5)
Polygamy	14(3.6)
Years married	
< 5	112(37.0)
6-10	81(16.7)
11-15	46(15.2)
16-20	22(7.3)
>25	42(14.0)
Number of sexual partner/s	
One	306(78.5)
Multiple	22(5.6)
No sexual partner	62(15.9)
Number of children	
None	72(18.5)
1-3	201(51.5)
4-6	97(24.9)
≥ 7	20(5.1)
Occupation	
Farmer and cultivator	213(54.62)
Cultivator	48(12.31)
Civil servant	81(20.77)
Business activities	41(10.51)
Student	7(1.8)
Average income Rwf/day	
< 1000	266(68.2)
1000-4999	97(24.9)
5000-9999	22(5.6)
>10,000	5(1.3)

General knowledge on vasectomy

Participants were asked to identify what male FP methods they know. The majority knew about either condoms and vasectomy (31.8%) or condoms (19.8%) (figure 1). The 'other' category (8.2%) consisted of abstinence (1.8%), withdrawal (1.8%), vasectomy and withdrawal (1.5%), and condoms and withdrawal (3.1%).

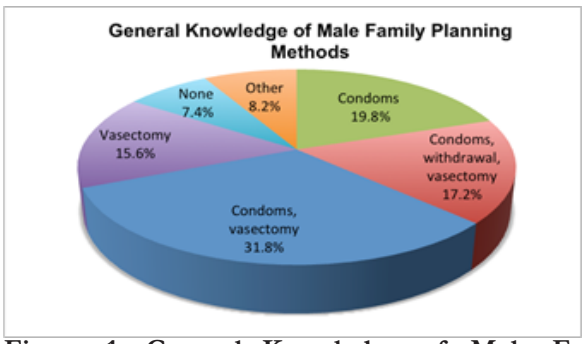

Figure 1. General Knowledge of Male Family Planning Methods

Participants were asked where they heard about male FP methods, and the majority responded at the health centre (91.2%) (figure 2). A limited number (9.9%) obtained information from private clinics.

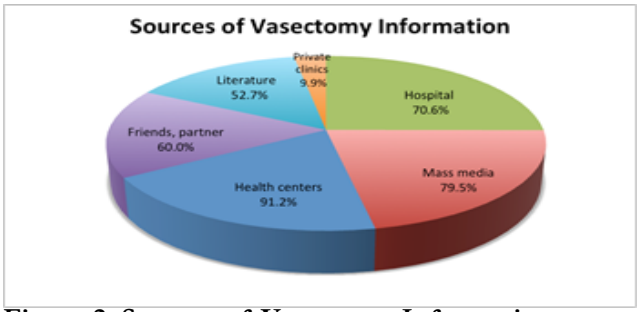

Figure 2. Sources of Vasectomy Information

The majority knew that vasectomy was a form of FP (71.2%), a permanent FP method (73.0%), and postvasectomy pregnancy was unlikely (82.6%) (figure 3). The majority also knew that post-vasectomy ejaculate does not contain sperm (58.4%), does not cause loss of sexual urge (65.2%), does not prevent sexually transmitted illness (STI) (82.6%), or increase risk of prostate cancer (60.3%).

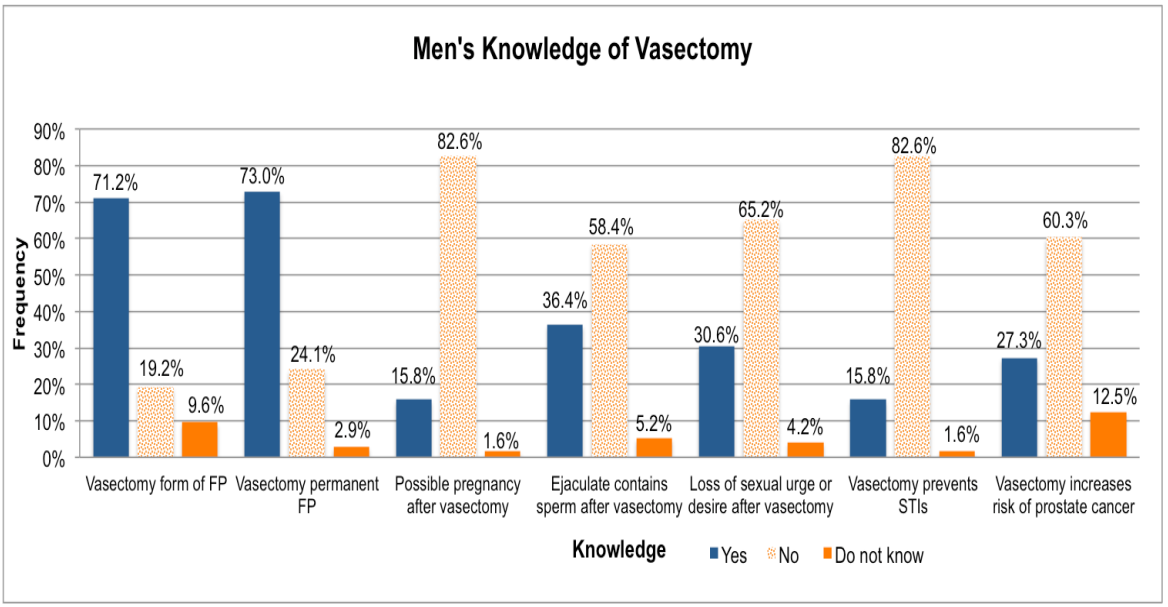

Figure 3. Men's Knowledge of Vasectomy

There was a strong agreement by participants that men should take part in FP (37.9%), approve of vasectomy as an FP method (37.7%), and should be the decision-makers of FP methods (33.3%) (table 2). There was strong disagreement that they would carry out vasectomy (32.5%), vasectomy is an effective FP method (25.2%), and vasectomy makes men more promiscuous (24.7%).

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Table 2. Men's Attitude Toward Vasectomy

Attitude to vasectomy	Strongly Disagree n (%)	Disagree n (%)	Agree n (%)	Strongly Agree n (%)
1. Vasectomy to any man is like castration and should not be done.	67(17.4)	99(25.7)	13(29.4)	106(27.5)
2. It is against my cultural belief for a man to practice vasectomy.	89(23.1)	91(23.6)	92(23.9)	113(29.4)
3. It is against my religious belief for a man to practice vasectomy.	87(22.6)	91(23.6)	116(30.1)	91(23.6)
4. A vasectomy makes men more promiscuous.	95(24.7)	153(39.7)	86(22.3)	51(13.2)
5. Men should be the primary decision-maker on FP method.	37(9.5)	42(10.8)	181(46.4)	130(33.3)
6. Permanent sterilization should be only for females.	87(22.6)	141(36.6)	107(27.8)	50(13.0)
7. Vasectomy is effective FP method.	97(25.2)	108(28.1)	112(29.1)	68(17.7)
8. Men should take part in FP.	21 (5.4)	62(15.9)	159(40.8)	148(37.9)
9. I approve the use of vasectomy as FP method.	22 (5.7)	66(17.1)	152 (39.5)	145(37.7)
10. I will carry out vasectomy.	125(32.5)	118(30.6)	94 (24.4)	48(12.5)

Factors influencing men's attitude towards vasectomy in the community indicated the majority had ignorance or lack of accurate information about vasectomy (54.8%), though view it as culturally acceptable (51.7%) (figure 4). Nearly a third (31.9%) believed the healthcare providers (HCPs) attitude had some influence.

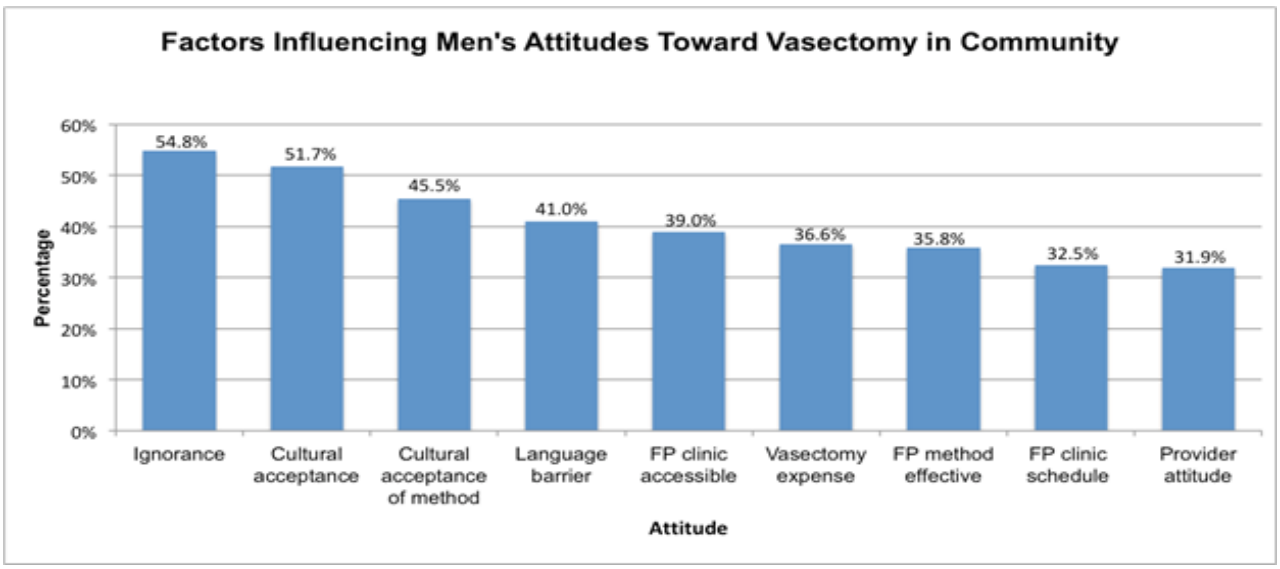

Figure 4. Factors Influencing Men's Attitudes Toward Vasectomy in the Community

The findings indicated that the independent variables of education, religious affiliation, and the number of sexual partners had a significant association with knowledge of vasectomy (table 3). The findings revealed that the misconception "a man loses sexual urge or desire for sexual activity" after vasectomy was five times higher among Protestants ($p<0.021$), three times higher among Catholics ($p=0.021$), and men with no education ($p=0.033$), and twice as high among men with primary education ($p=0.004$).

Table 3. Factors Influencing Men's Knowledge Towards Vasectomy

	OR	95% CI	p
Education			
None	0.15	0.07-0.82	<0.001
Primary	0.23	0.08-0.94	<0.001
Religion			
Catholic	0.45	0.09-0.92	<0.001
Protestant	0.39	0.08-0.84	<0.001
After vasectomy, a man loses sexual urge or desire for sexual activity			
Education			
None	3.96	4.76-6.86	0.033
Primary	2.06	3.17-5.86	0.004
Secondary	0.33	0.17-0.86	<0.001
University	0.23	0.27-0.96	<0.011
Religion			
Catholic	3.71	1.81-4.21	0.021
Protestant	5.39	4.42-8.49	<0.021
After a vasectomy, would a man be able to impregnate his partner?			
Sexual partners			
1-3	2.92	1.09-5.15	0.018
Sperm is ejaculated during sexual intercourse even after vasectomy			
Education			
University	0.19	0.08-0.57	0.002
Religion			
Islam	0.21	0.05-0.80	0.036
Vasectomy prevents sexually transmitted infection			
Education			
Secondary	0.46	0.06-0.99	<0.001
University	0.37	0.08-0.79	0.021

OR (Odds Ratio) > 1 = association
P value ≤ 0.05

Further significant findings indicated that education, religious affiliation, and the number of sexual partners were likewise associated with attitude toward vasectomy (table 4). Men with a university degree were five times more likely to indicate they would carry out vasectomy (p=0.045). Whereas men with multiple sexual partners were five times more likely to indicate that vasectomy was against their cultural belief (p=0.016), and those with a Protestant affiliation were three times more likely to indicate vasectomy was against their religious belief (p<0.001).

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Table 4. Factors Influencing Men's Attitude Towards Vasectomy

	OR	95%CI	p
Vasectomy to a man is castration and should not be done			
Education			
None	3.93	1.73-6.85	0.043
Primary	2.02	1.29-5.83	0.041
It is against my cultural belief for a man to practice vasectomy			
Number of sexual partners			
Multiple	5.68	2.41-9.46	0.016
It is against my religious belief for a man to practice vasectomy			
Religion			
Catholic	2.71	1.61-4.21	0.002
Protestant	3.34	2.44-6.44	<0.001
Men should be primary decision-maker of FP			
Education			
Secondary	2.14	1.65-6.29	<0.011
University	3.46	2.24-8.45	0.014
Vasectomy is an effective form of FP			
Education			
Secondary	4.14	2.65-8.59	<0.001
University	6.46	3.55-11.35	0.044
Men should take part in FP			
Religion			
Catholic	0.11	0.03-0.82	0.012
Protestant	0.23	0.02-0.74	0.041
I approve the use of vasectomy as a FP method			
Religion			
Catholic	0.11	0.03-0.81	0.032
Protestant	0.22	0.02-0.99	0.021
Education			
Secondary	2.94	1.66-7.87	<0.0001
University	4.66	2.68-9.77	0.078
I will carry out vasectomy			
Religion			
Catholic	0.45	0.02-0.85	0.040
Education			
University	5.14	2.46-7.56	0.045

OR (Odds Ratio) > 1 = association
P value ≤ 0.05

Discussion

This descriptive cross-sectional study assessed men's knowledge and attitude towards vasectomy as a male family planning method in the Eastern Province of Rwanda. Our findings show that despite the recent dramatic increase in modern contraception use across the country, numerous significant associations indicated a lack of accurate knowledge and poor attitude towards vasectomy.

The majority (43.1%) of men were aged between 31 and 39 years, educated at the primary level (42.3%), with a Catholic affiliation (42.3%). Our predominate age range was similar to other studies in India,[12] Edo State in Nigeria,[18] and Ogun State in Nigeria,[19] when men were "in their prime."[18] In contrast, two other studies involving older men (40-49 years) in Rwanda,[20] and Nepal,[21] the men had good knowledge, positive attitude, and acceptance of vasectomy.[21] In Nepal, younger men (26-30 years) had poor knowledge, and

as expected, low demand for a vasectomy.[21] Hence, knowledge and attitude towards vasectomy appear to improve with age.

A significant association was revealed between a lower level of education and decreased knowledge. Participants with no education (OR 0.15, 95% CI: 0.07-0.82; p<0.0001) and primary education (OR 0.23, 95% CI: 0.08-0.94; p<0.0001) had lower knowledge levels than graduates from secondary school and university. As the level of attained education increased, so did the level of knowledge, similar to other studies in India[12] and Nepal.[21] The Nepal study [21] concluded that the higher the man's education, the more likely to be unbiased and amenable to FP information. In contrast, other studies appeared to show no association between education and knowledge level or attitude towards vasectomy.[18,19] Male staff at Novena University in Nigeria, with a mean age of 37 years, had a good knowledge, yet poor attitude of vasectomy. Therefore, good knowledge helps to increase the likelihood of vasectomy acceptance, but does not necessarily equate to a positive attitude to vasectomy.[14]

The predominant religious affiliation was Catholic (58.7%), followed by Protestant (24.9%) Islam (6.7%), and Pentecost (5.6%). These findings are similar to another study in Rwanda where 316 men who had undergone vasectomy self-reported that they associated with Catholicism (66%) or Protestantism (29%).[20] In our study, religion was significantly associated with lower knowledge of vasectomy, namely Catholic affiliation (OR 0.45, 95% CI: 0.09-0.92; p<0.001) and Protestant affiliation (OR 0.39, 95% CI: 0.08-0.84; p<0.001).

The majority of participants were married (77.7%), for less than five years (37%), and in a monogamous relationship (95.5%), with 1-3 children (51.5%). The number of desired children in SSA is becoming more influenced by the awareness of family size, costs and benefits of children, culture and religion, and the wife's occupation and income.[23] A local study reported that the three previous Rwanda Development Health Surveys (RDHS) revealed that if a family did not have a gender mix (e.g., all boys or all girls), they were more likely to want more than three children than a family who had lost a child, unless it meant the family was reverted to a single gender.[24] Currently, the fertility rate in Rwanda is 4.2,[2] and the national family size preference is three children.[2] Whereas in Nigeria, the maximum recommendation is four, though the desired size might be higher.[18]

The majority (54.62%) of participants were farmers or cultivators, with an average daily income of less than 1000 Rwandan francs (68.2%). Similarly, a study in Nigeria reported the majority with a similar daily income of 600-1000 naira, though they were students.[18] Whereas in two other studies, the men worked at academic institutions with higher incomes.[14,19] The farmers strongly agreed that FP is primarily the responsibility of women, as well as numerous misconceptions about vasectomy. Monthly income is an essential factor as it can be a financial restraint that affects education and FP choices.[21]

The findings of the general knowledge questions showed that a limited proportion (17.2%) knew that condoms, withdrawal, and vasectomy were the three FP methods for men. Whereas in Nigeria,[18] only 7.4% were aware of all three methods. The majority were aware that vasectomy was a form of FP (71.2%), a permanent method (73.0%), and post-vasectomy pregnancy was unlikely (82.6%). Other studies had similar results in India[12] and Nigeria.[18,19] In Nepal, 69% of men had moderate knowledge level; however, they were more likely to be older, college graduates, and post-vasectomy. [21] The Nepal study was similar to one in Rwanda, where older men had higher knowledge scores (mean 91%) post-vasectomy.[21] In contrast, a study in Edo State Nigeria revealed that the majority of men (62.5%) did not know about vasectomy.[18]

There were numerous misconceptions related to the physiological and psychological effects of vasectomy. Over a third (36.4%) erroneously thought that sperm was ejaculated post-vasectomy, though more than half (58.4%) answered correctly that there was no sperm ejaculated (after about three months post-vasectomy). Statistical analysis showed that university educated (OR 0.19, 95% CI: 0.08-0.57; p=0.002), or followers of Islamic religion (OR 0.21, 95% CI: 0.05-0.80; p=0.036) were aware that sperm was not ejaculated post-vasectomy. Findings in our study were similar to a Nigerian study.[18]

Nearly one third (30.6%) of participants erroneously thought that a man could lose sexual urge and desire post-vasectomy, which was significantly associated with education and religion. Those with no education were nearly four times more likely (OR 3.96, 95% CI: 4.76-6.86; p=0.033) and those with primary education were two times more likely (OR 2.06, 95% CI: 3.17-5.86; p=0.004) to believe this misinformation compared to secondary school or university graduates. Catholics were nearly four times more likely (OR 3.71, 95% CI:1.81-4.21; p<0.021), and Protestants over five times more likely (OR 5.39, 95% CI: 4.42-8.49; p<0.021), to believe this misinformation, compared to other religious affiliations. In contrast, the majority of men in other studies did not think vasectomy decreased sexual urge.[12,18,24] The male hormone testosterone is not affected during the vasectomy procedure, whereas a man's decreased libido may be related to medications (ace inhibitors or beta blockers to lower blood pressure), chronic disease, depression, low self-esteem, ageing, stress, too little or too much exercise, alcohol, and drug use.[17]

A limited proportion (15.8%) erroneously thought that a vasectomy prevents STIs, indicating the majority (82.6%)

were aware this was not true, which was statistically significant. Participants with secondary (OR 0.46, 95% CI: 0.06-0.99; p<0.001) or university education (OR 0.37, 95% CI: 0.08-0.79; p=0.021) knew that this statement was not correct as opposed to those with primary or no education. Similar results were found in other studies.[12,18,19] Condoms are the only effective male contraceptive to prevent STIs.[4,17]

The majority (60.3%) believed that vasectomy does not cause prostate cancer, while over a quarter (27.3%) thought that it did. There was no statistical association. Our findings are similar to a Nigerian study,[18] and a recent meta-analysis [25] revealed there was no statistical relationship between vasectomy and high-grade, advanced-stage, or terminal prostate cancer.

The majority of participants had heard about vasectomy at public health centres (91.2%) and hospitals (70.6%), and through friends or partner (60%), and the mass media (79.5%), similar to other studies.[12,20,21] Community health workers (CHWs) in Rwanda also provide essential health information.[18,20] Men in Uganda,[16] appeared to rely almost entirely on information from their partners. Friends and family are typically accessible,[12,21] though not always a reliable source of evidence-based information.

Some studies emphasised the misinformation given by healthcare providers (HCPs) to clients, such as telling men they were likely to lose sexual identity, experience problems with ejaculation, and increased risk of prostate cancer.[20] HCPs can also transfer bias to the clients, whereby they may be prejudice against a particular method, e.g., vasectomy.[10] In Rwanda, numerous capacity-building projects over the last decade have trained HCPs to perform vasectomies in specific health facilities.[10] A study in Kenya [28]revealed that HCPs lacked capacity and current training and only 12.5% felt fully competent in their abilities to perform the procedure.

The findings in our study indicated that eight of the 10 statements on men's attitude towards vasectomy were statistically significant. Over three-quarters (78.7%) agreed that men should take part in FP, which was negatively associated with religion. Catholics and Protestants were significantly less likely to take part in FP, as Catholics (OR 0.11, 95% CI: 0.03-0.82; p =0.012) and Protestants (OR 0.23, 95% CI: 0.02-0.74: p=0.041), had a more negative attitude than other religions. Others had a positive attitude towards vasectomy.[12,13,21)

However, nearly half (46.8%) of participants agreed that vasectomy was an effective FP method. Those with secondary education were over four times more likely to view vasectomy as effective (OR 4.14, 95% CI: 2.65-8.59; p<0.001), and university educated were over six times more likely (OR 6.46, 95% CI: 3.55-11.35; p=0.044), than those with only primary or no education. Similarly, a study conducted in a Malaysian medical school,[13] demonstrated that as a student progressed through years of evidenced-based learning, their knowledge and attitude towards vasectomy became more positive, regardless of their traditional, cultural or religious views. Interestingly, for girls in SSA, for each additional year of primary and secondary education, their desired number of children is decreased by 0.11.[22]

The majority approved the use of vasectomy (77.2%) and agreed to carry out the procedure (63.1%), with both statements significantly associated with education and religion. Those with secondary education were nearly three times more likely to approve (OR 2.94, 95% CI: 1.66-7.87; p<0.0001). Those with a university education were over four times more likely to approve of vasectomy (OR 4.66, 95% CI: 2.68-9.77; p=0.078), or five times more likely to carry out the procedure (OR 5.14, 95% CI: 2.46-7.56; p=0.045). Conversely, those from the Catholic religion did not approve of vasectomy (OR 0.11, 95% CI: 0.03-0.81; p=0.032), and were less likely to have the procedure (OR 0.45, 95%CI: 0.02-0.85; p=0.040). Those from the Protestant religion also disapproved of vasectomy (OR 0.22, 95% CI: 0.02-0.99; p=0.021).

There are many reasons why men use vasectomy as an FP method. A cross-sectional descriptive study in Rwanda,[20] with a sample of over 300 husbands (post-vasectomy) and wives revealed the following reasons for vasectomy: finances (husbands 85%, wives 83%); achieved desired family size (husbands 66%, wives 64%); and wife's experience with contraceptive side effects (husbands 49%, wives 46%). Other factors indicated vasectomy was a low-risk procedure and it was permanent.[20] Men in Uganda,[16] Nigeria,[19] Rwanda,[10] and Ethiopia,[15] indicated the potential risk to the wife's health was a reason for a vasectomy.

Over half of participants (53.3%) agreed that it was against their cultural belief for a man to have a vasectomy, which was significantly associated with multiple sexual partners (OR 5.68, 95% CI: 2.41-9.46; p=0.016). Our study population included 3.6% supporting polygamy. Similarly, other studies site vasectomy aversion based on cultural beliefs.[10,18] Nearly two thirds (64.4%) disagreed that vasectomy made men more promiscuous, though these findings were not statistically significant. In contrast, other studies report that vasectomy is associated with infidelity.[29,30]

A significant number of men (56.9%) in this population erroneously associated castration with vasectomy. Significant associations were related to education; those with none were nearly four times more likely (OR 3.93, 95% CI: 1.73-6.85; p=0.043), or with primary education two times more likely (OR 2.02, 95% CI: 1.29-5.83: p=0.041) to believe this myth, compared to higher educated graduates. Our results are similar to findings from other studies.[11,19,27] Thus, this goes to show how much work there is to do to promote and

support vasectomy in the communities. It is a significant challenge, whereby men choose a condom - a far less effective FP method - over a vasectomy, despite a large family.[12,18]

The majority (53.8%) agreed that vasectomy was against their religious beliefs. Catholics were over twice as likely to support the statement (OR 2.71, 95% CI: 1.61-4.21; p<0.002), and Protestants three times (OR 3.34, 95% CI: 2.44-6.44; p<0.001), compared to other religions. Other studies had similar findings.[18,25] A review of the RDHS 2010 indicted Protestants in Rwanda were more likely than other religions to desire more than three children.[23] A study in Malaysia with 330 medical students,[13] revealed that men of Islamic religion had a positive attitude towards vasectomy (61.6%) and high acceptance (76.1%); Christians were positive (62.5%), and high acceptance (100%); Hindus had a positive attitude (66.6%) and high acceptance (66.6%), whereas Buddhism students were not positive (16.7%), though somewhat accepting of vasectomy (50%).[13]

Ignorance, culture, and religious factors had a negative influence on vasectomy.[18] Together these factors reveal societal norms and values that it is a "woman's place to plan for and take care of the family; therefore it should also be her duty to take adequate measures to prevent pregnancies."[18,p20] Indeed, many women shoulder the burden of FP for the family on their own, and at times with male resistance.[18] Cultural and gender norms often lead to a preference for female contraceptives and low acceptance of vasectomy,[10] referred to in India as "gender bias" towards the tubal ligation.[12] Women are "better suited" for sterilisation according to men in a study from India.[12]

In many African cultures, men are the decision-makers since they are the head of the family and financial providers.[31] Over three-quarters of men in this study (79.7%) agreed or strongly agreed they should be the primary decision-makers, including the FP method, which was statistically significant. Men with secondary education were twice as likely (OR 2.14, 95% CI: 1.65-6.29; p<0.011), or university educated three times as likely (OR 3.46, 95% CI: 2.24-8.45; p=0.014), to assume the decision-making role more than those with less education.

If men are the decision makers, are they adequately informed of the available FP options to plan for the family and help prevent pregnancy and pregnancy-related health problems for women? A woman may have experienced a dangerous pregnancy and birth, and future pregnancies may put her life in danger, whereby she may not be present to take care of existing children. The maternal mortality rate in Rwanda has decreased to 210 per 100,000 live births,[2] though the SDG is 70 per 100,000 live births by 2030,[2] so more work needs to be done in this area. For any society to effectively control the population, men need to utilise FP methods.[18]

In our study, the majority (59.2%) disagreed that permanent sterilisation should only be for females, though these findings were not statistically significant. A ten-year review[10] of couples who had chosen vasectomy, found that 66% of husbands and 73% of wives believed it was a suitable method for them.[20] A study in Nigeria indicated that women had a high approval (75.9%) of vasectomy for their husbands.[28] This male support is an essential factor, as women think men should actively participate in FP,[29] and some men seek their wife's approval for the procedure.[32] Two other studies in Rwanda support vasectomy. One showed that 49.4% of mothers 40-44 years did not want any more children.[20] The author of the second study stated that vasectomy should be considered a privilege as it allows couples to meet the national family size preference and bring a better life to the family and country.[27]

The November 2018 International Family Planning (ICFP2018) conference in Kigali with 4000 attendees discussed how investing in FP was "Investing for a Lifetime of Returns." Stop the old narrative – that FP is woman's business – challenged Rwanda's Prime Minister, Edouard Ngirente. "We all converge to the fact that quality family planning services are strong means of improving the lives of women, children, and families. Family planning is therefore not only a woman's issue, but it also involves men as well."[33]

There is a need to increase capacity at the health centre level and district-level so HCPs can provide accurate FP knowledge and services, in addition to adequate availability of equipment and supplies. Multidisciplinary teams involving local leaders, religious institutions, CHWs, and public and private institutions could increase support for HCPs and get more involved in sensitising communities in support of vasectomy. At the academic level, all health-related programs – medicine, nursing, midwifery, clinical officers, public health and others – need accurate knowledge, and practical skills if FP is within their scope of practice. Men's involvement in FP is needed for multiple reasons.

Limitations

The study focused on only seven sectors in the Rwamagana District of the Eastern Province, and therefore the findings are not generalizable to other parts of the country. Participants may have felt hurried to answer questions since the investigator was face-to-face with them in their homes. Participants may not have felt that they were able to give accurate and honest answers if a family member was present or that they knew the investigator had their information. The Likert scale used for assessing attitude may have caused distortion; participants may have agreed with statements as presented (acquiescence response bias); presented themselves in a positive light (social desirability bias), or avoided using strongly disagree or strongly agree with responses (central tendency bias).

Recommendations
There is a significant need for evidence-based information to be widely disseminated throughout the country on the benefits of vasectomy and to reduce misconceptions and rumours linked to the procedure. It is also recommended that faculty from the University of Rwanda Master's in Nursing collaborate with the Ministry of Health and Ministry of Education to design specific educational and sensitisation programs. Further research is needed to assess the knowledge and attitude of men, women, and HCPs towards vasectomy at the national level.

Conclusion

The findings reveal that men had heard about vasectomy from the health centres, hospitals, mass media, though only a third knew that vasectomy is a male FP method. Knowledge was positively associated with higher education and negatively associated with Catholic and Protestant religious affiliations. The men's attitude was significantly associated with misconceptions, erroneously relating vasectomy with decreased sexual ability and castration, which is not true. Three-quarters of the men believed they were the decision makers with FP, yet expected the wife to take the preventive action for the family. A multidisciplinary team approach is needed to involve HCPs, local leaders, religious institutions, CHWs, and universities to increase accurate knowledge and acceptance of vasectomy as a practical FP method.

References

1. Nations Unions. Trends in Contraceptive Use Worldwide. 2015.
2. Rwanda Development Health Survey. 2015. Available from: https://dhsprogram.com/pubs/pdf/FR259/FR259.pdf
3. Izugbara C. Myths and misconceptions stop African men from going for a vasectomy.
4. Viera AJ. UpToDate [Internet]. Available from: https://www.uptodate.com/contents/vasectomy
5. Ministry of Health Rwanda. Republic of Rwanda Ministry of Health, Fourth Health Sector July 2018 – June 2024. 2018;(July).
6. Ministry of Health Rwanda. Rwandans urged on early cancer detection. 2015; Available from: http://www.moh.gov.rw/index.php?id=34&tx_ttnews%5Btt_news%5D=145&cHash=e53a8ec14431a203a1ad46e66f4ec75b
7. Mate FT. Task Shifting on Provision of Contraceptives and Abortion Services in Maternal and Reproductive Health in Sub-Saharan Africa to achieve Universal Health Coverage: A Narrative Review. J Contracept Stud [Internet]. 2018;03(03):1–9.
8. Van Lith LM, Yahner M, Bakamjian L. Women's growing desire to limit births in sub-Saharan Africa: meeting the challenge. Glob Heal Sci Pract [Internet]. 2013;1(1):97–107. Available from: http://www.ghspjournal.org/cgi/doi/10.9745/GHSP-D-12-00036
9. Asare O, Otupiri E, Apenkwa J, Odotei-Adjei R. Perspectives of urban Ghanaian women on vasectomy. Reprod Health [Internet]. 2017;14(1):21. Available from: https://doi.org/10.1186/s12978-017-0286-5
10. Shattuck D, Perry B, Packer C, Chin Quee D. A Review of 10 Years of Vasectomy Programming and Research in Low-Resource Settings. Glob Heal Sci Pract [Internet]. 2016;4(4):647–60. Available from: http://www.ghspjournal.org/lookup/doi/10.9745/GHSP-D-16-00235
11. Appiah S, Agyen JK, Garti I, Menlah A. Married Men and Vasectomy: A Focused Group Study in an Urban Community in Ghana. SAGE Open Nurs [Internet]. 2018;4:237796081879038.
12. Nair GR, Wadke R, Relwani N, Mahadik V, Anjenaya S. Knowledge and attitude of married men towards vasectomy in an urban slum of Navi Mumbai. Int J Community Med Public Heal [Internet]. 2017;4(12):4563–8. Available from: http://www.ijcmph.com
13. Ohn Mar S, Ali O, Sandheep S, Husayni Z, Zuhri M. Attitudes towards vasectomy and its acceptance as a method of contraception among clinical-year medical students in a Malaysian private medical college. Singapore Med J. 2019;60(2):97-103.
14. Otovwe A, Okandeji-Barry OR. Knowledge and perception of vasectomy among male staffs of Novena University Ogume Delta State Nigeria. IOSR J Nurs Heal Sci [Internet]. 2018;7(1):2320–1940. Available from: www.iosrjournals.org
15. Temach AJ, Fekadu GA, Achamyeleh AA. Educational status as a determinant of men's knowledge about vasectomy in Dangila town administration, Amhara region, Northwest Ethiopia. Reprod Health [Internet]. 2017;14(1):54. Available from: https://doi.org/10.1186/s12978-017-0314-5
16. Thummalachetty N, Mathur S, Mullinax M, Decosta K, Nakyanjo N, Lutalo T, et al. Contraceptive knowledge, perceptions, and concerns among men in Uganda. BMC Public Health. 2017;17(1):1–9.
17. EnGender. EngenderHealth [Internet]. Available from: https://www.engenderhealth.org/pubs/family-planning/vasectomy/.
18. Onasonga OA, Edoni E, Ekiokenigha R, Ekanem J.

Knowledge and attitude of men towards vasectomy as a family planning method in Edo State, Nigeria. J Res Nurs Midwifery. 2013;2(1):13–21.

19. Owopetu C, Chukwuma S, Nwozichi C. Knowledge and attitude of men about vasectomy as a method of family planning among married men working in Babcock University, Ogun State, Nigeria. Int J Nurs Midwifery. 2014;7(3):30–5.

20. Shattuck D, Wesson J, Nsengiyumva T, Kagabo L, Bristow H, Zan T, et al. Who chooses vasectomy in Rwanda? Survey data from couples who chose vasectomy, 2010-2012. Contraception [Internet]. 2014;89(6):564–71. Available from: http://dx.doi.org/10.1016/j.contraception.2014.02.003

21. Dayanand G. An assessment of knowledge and attitude of vasectomy in adult males: a cross-sectional study from Pokhara, Western Nepal. Med Sci [Internet]. 2014;2014(4):164–70. Available from: http://dx.doi.org/10.29387/ms.2014.2.4.164-170

22. Ndjanmou TB. Women Education and Fertility in Sub-Saharan Africa: Channels and Influence of Education on Fertility. J Glob Econ. 2017;5(1):240.

23. Kabano IH, Broekhuis A, Hoolmijer P. Fertility decline in Rwanda: Is gender preference in the way? Int J Popul Res. 2013;2013:9.

24. Kabagenyi A, Jennings L, Reid A, Nalwadda G, Ntozi J, Atuyambe L. Barriers to male involvement in contraceptive uptake and reproductive health services: A qualitative study of men and women's perceptions in two rural districts in Uganda. Reprod Health [Internet]. 2014;11(1):1–9.

25. Bhindi B, Wallis CJD, Madhur N, et al. Vasectomy and ProstateCancer: The association between vasectomy and prostate cancer_Bhindi_2017. JAMA Intern Med. 2017;177(9):1273-1286.

26. Kidzuga ML. Factors influencing male attitudes towards vasectomy in Kilifi district, Kenya [Internet]. University of Nairobi; 2012. Available from: https://scholar-google-com.ezp2.lib.umn.edu/scholar.

27. Mukansoro O. Vasectomy acceptability within Rwandan Family Planning Policy. Thesis [Internet]. 2014;1–9. Available from: http://hdl.handle.net/123456789/186

28. Ikeako LC, Nnagbo JE, Umeh UA, Ezegwui HU, Chigbu CO, Ajah L, et al. Awareness and perception of vasectomy among antenatal women in a tertiary health facility in southeast Nigeria. Int J Reprod Contraception, Obstet Gynecol [Internet]. 2018;7(5):1706.

29. Tamunomie N, Vademene O, Walter O. Knowledge and attitude toward vasectomy among antenatal clinic attendees in a tertiary health facility in Nigeria. Sahel Med J [Internet]. 2016;19(4):201. Available from: http://www.smjonline.org/text.asp?2016/19/4/201/196363

30. Alemayehu M, Belachew T, Tilahun T. Factors associated with utilisation of long-acting and permanent contraceptive methods among married women of reproductive age in Mekelle town, Tigray Region, North Ethiopia. BMC Pregnancy Childbirth. 2012;12(1):6.

31. Habyarimana F, Ramroop S. The analysis of socio-economic and demographic factors associated with contraceptive use among married women of reproductive age in Rwanda. Open Public Health J [Internet]. 2018;11(1):348–59.

32. Tijani KH, Ojewola RW, Yahya GL, Oluwole AA, Odusanya B. Attitudes and acceptance of Nigerians towards vasectomy- A comparison of married men and women in Lagos. East Afr Med J. 2013;90(3):89–94.

33. Ngirente E. Family Planning is not just a woman's issue – PM Ngirente – KT PRESS. Available from: https://ktpress.rw/2018/11/family-planning-is-not-just-womans-issue-pm-ngirente/.