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Original Article

KNOWLEDGE AND ATTITUDE TOWARDS UPTAKE OF VASECTOMY AMONG MARRIED MEN AND WOMEN AT MUNUKI PAYAM HEALTH CENTER. A CROSS-SECTIONAL STUDY.

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Abstract.

Background.

Vasectomy is a safe, cheap, and easy method of contraception. However, its uptake in Burundi is low. Moreover, matters of family planning are packaged as a female responsibility rather than a male, and it is not clear what attitude and knowledge married men and women have towards vasectomy. This study aimed to assess the knowledge and attitude of married men and women towards vasectomy as well as demographic factors that influence vasectomy uptake.

Methodology.

A cross-sectional survey design was carried out utilizing a questionnaire. Stratified and simple random sampling was used. The sample size consisted of 234 respondents, with 142 male respondents and 92 female respondents. Descriptive statistics, independent T-test, and chi-square for assessing the association between variables using SPSS version 17 were used for data analysis.

Results.

Most of the respondents were male 60.6%, (57.3%) of respondents were less than 40 years old. 51.2% of respondents had good knowledge about vasectomy, Knowledge did not correlate with acceptance of vasectomy: 92.6% of respondents had good knowledge and 92.9% of those who had poor knowledge did not accept vasectomy (P=0.787). The overall attitude Mean score was 47.1% signifying a negative attitude towards vasectomy. 95.6% of respondents agreed that vasectomy was not acceptable in the South Sudanese culture. A significant association was noted between vasectomy acceptance and age (P=0.029) and the number of current children (P=0.012).

Conclusion.

Overall knowledge of married men and women about vasectomy was acceptable, attitude towards vasectomy was poor, and acceptance was low. Myths and misconceptions about vasectomy were noted.

Recommendation.

There is a need for greater awareness of vasectomy knowledge as a potential vehicle to affect attitude change towards vasectomy.

Keywords. *Vasectomy acceptance, Munuki Payam Health Center, Knowledge on vasectomy, Married men and women.*
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Background.

Vasectomy is a permanent contraceptive method that empowers men to take a central role in fertility control, providing lifelong protection against unintended pregnancies. It is a safe, affordable, and straightforward procedure with minimal postoperative complications (WHO, 2019). Various studies have highlighted the societal and economic benefits of vasectomy. For example, Ethiopia's high fertility rate of 5.6 has been partly attributed to limited awareness of long-acting family planning methods, including vasectomy (Alemayehu et al., 2012). Similarly, South Sudan faces demographic challenges, with one of Africa's highest fertility rates and limited vasectomy uptake.

Fertility trends further underscore the relevance of vasectomy in addressing population growth. In Burundi, fertility rates have gradually declined from 6.9 in 1987 to 5.5 between 2016 and 2017, though they remain high. In South Sudan, fertility rates vary by age, peaking at 261 per 1,000 women aged 25–29 before declining sharply thereafter (Ministry of Health, 2020). Studies suggest that fertility ideals in Africa are shaped by factors such as age, education, polygyny, and rural-urban residence. In South Sudan, men over 60 years favor larger families (seven children) compared to younger men under 30 (4.7 children). Rural men and those without formal education

also report higher ideal family sizes compared to their urban and educated counterparts (Westoff, 1991).

Despite the advantages of vasectomy, male involvement in family planning remains limited. Many men equate vasectomy with castration or believe it is painful and requires lengthy hospital stays, reflecting widespread misconceptions (Owopetu et al., 2014). Such knowledge deficits hinder the acceptance and adoption of vasectomy. Addressing these gaps is critical to promoting its uptake.

In South Sudan, vasectomy is offered free of charge in public and mission hospitals as part of the Ministry of Health's performance-based financing initiative. Facilities receive incentives of up to 60,000 francs for each procedure performed (Ministry of Health, 2020). Vasectomy is also cost-effective compared to other contraceptive methods. Estimates suggest that incorporating vasectomy into modern contraceptive use at a 5% prevalence rate could reduce the cost of couple protection from $5.17 to $3.99 annually (South Sudan FP2020, 2014). Moreover, vasectomy significantly enhances maternal and infant health by reducing unintended pregnancies, unsafe abortions, and maternal and infant deaths (South Sudan FP2020, 2014).

Globally, vasectomy accounts for only 2.4% of contraceptive use, with Africa showing the lowest uptake at less than 0.1% (WHO, 2012). For instance, the UK recorded 14,142 vasectomy procedures in 2012–2013 (NHS Contraceptive Services, 2014). In South Sudan, female sterilization rates surpass male vasectomy rates, with 2.1% of women over 45 undergoing tubal ligation compared to only 0.7% of men in the same age group. Factors such as misconceptions about vasectomy causing low libido or sexual dysfunction further deter its adoption (Kidzuga, 2012; Perry et al., 2016).

Religious and cultural influences also play significant roles in shaping attitudes toward vasectomy. In South Sudan, where 60% of the population identifies as Roman Catholic, the Church's conservative stance on contraception may affect acceptance (International Religious Freedom Report, 2015). Understanding these cultural and religious perspectives is essential for designing effective interventions.

To date, few studies have examined the factors influencing vasectomy uptake in South Sudan, including the perspectives of both men and women. While research in Kenya has explored male attitudes toward vasectomy, Burundi and South Sudan lack similar studies. Notably, women often influence their spouse's contraceptive choices. Studies show that while many women approve of male contraception, they may resist their partner undergoing a vasectomy (Bernard Utoo, 2010). This highlights the need for comprehensive research involving both genders to explore knowledge, attitudes, and socio-demographic factors influencing vasectomy acceptance.

Finally, South Sudan's vasectomy statistics reveal fluctuating trends, with annual procedures ranging from 317 to 955 between 2015 and 2018 (Government of South Sudan, 2020). This inconsistency underscores the need for further investigation into the factors affecting vasectomy adoption and the knowledge and attitudes surrounding it. This study aims to fill these gaps by assessing the perspectives of married men and women on vasectomy while considering socio-cultural and demographic factors.

Methodology.

Research Design.

This study deployed a cross-sectional descriptive survey in which the interviewer-administered questionnaire was utilized. This study design is used to gather data that relates to a given phenomenon and to bring to light ―what exists‖ in correlation with conditions or variables of a specific situation. According to USC Libraries (2018), cross-sectional study design provides a clear snapshot of the outcome and the characteristics associated with it, at a specific point in time.

The aim of this study was the assess the level of knowledge of married men and women as well as their attitudes regarding vasectomy and socio-demographic factors that influence vasectomy acceptance in Munuki Health Center in Juba South Sudan.

Study Area.

This study was conducted in Munuki Payam Health Center located at the periphery of Payam in the central Equatorial State in the Capital city of Juba. The area is estimated with a population of 998,547. The community coverage area is 108 kilometers square. It has a patient coverage of about 46,137 people. (Minister of Health Central Equatorial State South Sudan, 2020).

On-the-ground data suggests their monthly outpatient and inpatient patients are seen to be around 4100, making a total average of around 48.100 patients seen within a year. This site was chosen because it is in the rural part of Juba where the vast majority of the South Sudanese population resides and where there is evidence of high fertility rates. Thus, it constitutes a suitable site to conduct this study. In addition to this, it is a site that the researcher is familiar with and that facilitates ease of data collection. The Health center usually represents the community. The researcher chose to conduct the research in this health center as it is frequented by the population that constituted the

researcher's interest. Moreover, the researcher did not seek to go into households as this research was not aiming at attaining couples' views and conducting interviews among couples could be a potential for increased bias (desirability bias especially). By targeting married men and women who were coming for routine outpatient visits, the researcher saw it fit because he would get unbiased views from the married women and the married men apart and thus have a less biased sample of respondents.

Study population.

Before defining the population of the study, it is relevant to have a clear definition of what a population is. According to Polit and Beck, (2008), a population constitutes the total of cases that interest the individual carrying the research. Equally, the study population can be defined as a clearly defined group with specific characteristics. This group can comprise individuals, materials, or a sequence of events (LoBiondo and Haber, 2002). In this study, the researcher is, of course, interested in people as a population.

When conducting research, defining a population is relevant, but more appropriate is the definition of an accessible population. Pilot and Beck (2008) have a concise way of defining this concept whereby they state that the accessible population constitutes a sum of cases that fit a certain criterion pre-established by the researcher and are available as respondents accessible to the researcher.

In this research, the accessible population was married men and women who visited the outpatient department of Munuki Health Center. The respondents were aged between 18 years and 45 years for the women, had to be married, and were from different denominations and social backgrounds. The married men recruited for this study were aged between 22 years old and 65 years old, and from different denominations and backgrounds (educated, non-educated, Catholics, protestants).

Sampling Procedure.

In quantitative research, sampling is paramount in the sense that it is impossible for the whole population because of financial constraints and time factors. Because of this specific reason, a representation of the population must be brought out and it constitutes the core of the research. The results found can be considered as accurate and generalizable to the community of the study (Polit and Beck, 2008).

The procedure of sampling can be divided into two entities: non-probability and probability techniques of sampling. In probability sampling, each member gets an equal opportunity to be drafted in the sample. As for non-probability sampling technique, elements are selected based on methods that are not random. For this specific reason, there is a potential for bias and inaccurate and sometimes nongeneralizable findings.

Even with such limitations, it is important to note that most researchers conducted in the field of medicine use this technique mainly due to its simplicity. In this study, however, married men and women were selected by probability sampling following proper stratification and then simple random selection in each stratum.

Sample Size.

This total population size was 85 subjected to an online tool of sample size generation, and it gave a sample of 73 respondents. The tool used took a confidence level of 95% with a 5% margin of error to generate such a sample size (Survey Monkey, 2019). The sample size obtained using this online module tool for sample size generation follows the table for determining sample size from a given population as described by the NEA Research Bulletin (1960, page 99).

Table 1: showing sample size determination.

Category	Population	Sample Size	Sampling Technique.
Nurses	20	15	Simple Random
Doctors	2	2	Purposive
Patients	50	45	Simple Random
Clinical officers	8	8	Purposive
Cleaner	5	3	Simple Random
Total	**85**	**73**	

Data collection instruments.

The data collection instrument that was utilized was a questionnaire. The questionnaire was designed from two other tools from similar studies that had been validated. Attitudinal as well as knowledge-related questions were derived from these two studies and were adapted to the

context on the ground after (Sezer, 2017; Onasoga et al., 2013).

The second study from which the questionnaire was derived is a study conducted in Nigeria, and it was looking at the attitude and knowledge of men on vasectomy. The study was published in 2013 in International Research Journals. The tool used in this study was validated after extensive literature research on vasectomy and family planning (Onasoga et al., 2013)

Permission was requested from the authors before the questionnaire was finalized. They granted permission for modification of the questionnaire to fit the context of this study. The questionnaire contains three main sections.

The first section of the questionnaire is the respondents 'background information: age, gender, marital status (married for this study), number of children, years in marriage, religion, and level of education to mention just a few. These were the independent variables. The second part of the questionnaire deals with questions related to the level of knowledge on vasectomy and covers questions like: is vasectomy a contraceptive method, what type of family planning method is vasectomy, after a vasectomy procedure a man loses his sexual urge and desire for sexual activity, just to mention a few. Eight questions were assessing the level of knowledge on vasectomy. The questions were formulated to allow the respondent to answer ―yes‖ or ―no‖ or choose one variable that the respondent felt was right. The author then assessed the provided answers and classified them as correct and incorrect as a means of assessing the level of knowledge. The third part or section of the questionnaire had 14 attitudinal questions that were designed to assess the attitudes of men and women regarding vasectomy. They touched on religion, culture, and sexuality, to assess attitudes.

Attitudinal statements were assessed and measured through a Likert scale tool that contained five items (5= Strongly agree, 4= agree, 3= uncertain, 2= disagree and 1= strongly disagree. Four statements among the 14 carried a positive connotation in regards to vasectomy and ten were worded negatively or carried a negative connotation in regards to vasectomy. The statements that were worded positively were scored in the following manner: from strongly agree (5 points) to strongly disagree (1 point). Statements that were worded negatively were scored in a reverse manner, meaning that if a respondent strongly agreed with a negative statement, they scored less than if they disagreed. This reflected a negative attitude towards vasectomy. On the other hand, respondents who agreed with positive statements in regards to vasectomy had a higher score reflecting a positive attitude. The researcher took a cut-off of 50%. A total attitudinal score of less than 50% was considered as a negative attitude reflection of married men and women towards vasectomy while an above 50% score reflected a positive attitude.

Validity and Reliability of the Research Instruments.

Validity is a key component of research. It represents the ability of research findings to be replicated and generalized in other similar research contexts. Validity correlates to the ability of the research instrument to truly measure that which it sets to measure (Oso and Onen, 2009). The interview guide tool was designed by incorporating questions and statements from validated questionnaires in two other studies similar to this one:

The first tool used in this study for attitudinal assessment was adapted from a Turkish study that dealt with opinions and attitudes about the vasectomy of married couples living in Turkey. This questionnaire was designed and validated in Turkey after deep and rich research in the field (Altay & Gonener, 2009; Anderson et al., 2010; Dahal et al., 2008; Eisenberg et al., 2009; Odu, Jadunola & Parakoyi, 2005; Tuloro et al., 2006). Also, five experts in the fields of Nursing, Sociology, and anthropology developed, reviewed, and revised the tool for content validity.

The other tool in this study from which knowledge and attitude questions were derived is a knowledge and attitude questionnaire from a study conducted in Nigeria. The questionnaire was put together by a team of experts and was validated in 2013 (Onasoga, 2013).

This tool was pre-tested in other studies especially a study conducted in Rwanda by (Ntakarutimana et. al, 2019).

To ensure validity in the context of this study, these steps were initiated and taken:

The elements figured in the questionnaire were selected after obtaining expert consultation. The first expert was a medical doctor who worked in the sector of reproductive health at the South Sudanese Ministry of Health and who also had a Master's degree in Epidemiology. The questionnaire also was submitted to the research supervisors: one a family physician with a background in research and the other one a General surgeon who is well conversant with research. The questionnaire was pretested and piloted on a sample of 20 respondents: 10 married men and 10 married women. They were not included in the final report of the study to prevent the risk of bias. Feedback from the pilot participants was obtained on questions they believed were either ambiguous or redundant and those that were not clear. Following the feedback obtained, in conjunction with the research supervisors, some adjustments were made to the questionnaire after agreement from both the researcher and the research supervisors. Cronbach alpha was calculated and was 0.8 and it showed the internal consistency of the tool.

The tool was translated into Arabic, which is the national language of South Sudan together with English.

Data Collection Procedure.

The proposal obtained ethical clearance from Team University. The South Sudan National Ethics Committee also approved the proposal. Representatives of the satellite health center of Munuki and Munuki Health Center were approached, and written authorization to carry out the pilot study and collect the data was obtained.

The researcher recruited one assistant, explained the core goals of the study, and trained to collect data through the questionnaire that was translated into Arabic. A trained linguist proofread the translated questionnaire before it was finalized.

Patients who fit the inclusion criteria (married men and women) were identified at the first point, which is the registration point for outpatient services. At the registration area, all files had the following labels:

Age of the patient

Gender of the patient: this was marked on the top cover of the file

Marital status: participants, of course, were married men and women. It was confirmed that they were all married by asking them about their marital status. While we could not fully verify the claim, we believed their word and took it as it was.

The religious affiliation (Catholics, Protestants, and other non-Catholic and non-protestants denominations if available).

A recruited Nurse in the registration area was assigned to help in this process of identification. The target was a minimum of 40 married men and women from the ages of 18 years to 45 for the women and from 21 years to 65 for the men; which were the criteria that fulfilled the stratification criteria. Being a well-grounded facility, the average number of visits per day in the outpatient department was about 98 adults. This target of 40 respondents was grouped according to religious affiliation, and gender and 12 were selected randomly from each stratum: that is 6 participants from the catholic group among which 4 were males and two females, 5 participants from the protestant group among which three were male and two females and when available a male or a female participant from the other religious affiliation. After stratification, the first male participant in the Catholic group was selected randomly until all four were interviewed, and the same process was done for the two women by random selection. The same process was done for the other religion categories until 12 participants were interviewed within a day of data collection. The Selected respondents have explained the objectives of the research and written, and well-explained consent was obtained before administering the questionnaire.

Consenting subjects of the research were taken in private rooms that were allocated for the study. All data collected on the day of collection of data was kept in allocated files and kept in secure draws to which only the researcher had access. In addition to this, the same collected data was put in an electronic database by the researcher and was accessible only to the researcher. Data collection took about two and a half months: from the beginning of February to mid-April 2020.

Data Analysis.

Bowling and Ebrahim (2006), in their handbook of research methods, state that statistical analysis permits making inferences that are numerical in nature to the larger population from which the sample came. Quantitative data requires statistical analysis (Beck, 2008).

Data obtained from the questionnaire was analyzed in correlation to the research respondents 'general characteristics: age, gender, level of education, religious affiliation, number of children, years in marriage, and number of desired children.

Assessment of knowledge about vasectomy was analyzed in a two-folded approach: For ease and convenience of analysis, married men's and married women's knowledge scores were classified into three groups based on the correct score on the eight knowledge questions. Responses to each question were ranked according to the following criteria:

Poor knowledge: Number of married men and women who had a percentage score of less than 50% correct answers on the eight questions asked on vasectomy. These were married men and women who scored from 0 to 3 out of 8 possible answers.

Good Knowledge: Number of married men and women who had a percentage score of equal or above 75 correct answers to the eight questions asked on vasectomy. These respondents had 6 to 8 out of 8 possible scores. iii.Fair Knowledge: Number of married men and women who had a percentage score going from 50 to less than 75% on the eight questions asked about vasectomy: That is to say that they had an absolute score ranging from 4 to 5 out of 8. This approach was adapted from a knowledge assessment tool by (Onasoga et al., 2013), and Tijani et al., 2013).

Secondly, knowledge scores were compared to demographics, and the researcher used parametric statistics involving a chi-square test to establish association significance between knowledge and the respondents 'demographics. A p-value of less than 0.05 was considered significant.

Attitude scores were compared with respondent 's general characteristics (gender, level of education, religious affiliation, number of children in the family, number of desired children, years in marriage, and age of the respondents) and are presented as averages. An independent-sample t-test was utilized to compare mean attitudinal scores with respondents 'demographics.

Socio-demographic factors that influence vasectomy were analyzed, and a comparison between them and vasectomy acceptance or refusal was made. A Chi-square test was used to establish the level of association.

Socio-demographic findings were presented with simple statistics with the use of percentages, frequencies, and tables. For a long time, debates on whether Likert data, which is ordinal data, can be analyzed using parametric statistics have been happening (Sullivan, 2013). An extensive literature review states that parametric tests not only can be used with ordinal data, such as data from Likert scales but also, parametric tests are generally more robust than nonparametric tests. The results were coded and interpreted using a computer software tool, SPSS version 17. Assessment of attitudinal data required the utilization of an independent student T-test to assess the association between different components of demographics. Knowledge scores were measured and presented as frequencies. Comparison of knowledge scores with respondent's socio-demographic factors was assessed using A chi-square test. All analyses and results were expressed at $p<0.05$. Data was written in text as prose and tables.

Ethical Considerations.

Before initiating the study, ethical approval was granted by the Institution Review Board (IRB) of the university. An information sheet was made available, and the respondents signed consent forms before being taken through the questionnaire. On the information sheet the following items were present: the right of the respondent to withdraw from the study at any time without any consequences imposed on them, the assurance that the questionnaire was anonymous and upon completion, was put in a sealed and safe box and retrieved only by the researcher for data analysis purposes. Authorization to conduct the study at Munuki Health Center was obtained. To ensure respect for persons, each participant in this study was encouraged to make their own decision as to whether they wanted to be part of this study. In addition to this, every participant before answering the questions explained the goal and objectives of the study to satisfaction and this led to consent giving.

In addition to this, this study did not aim to administer the questionnaire to respondents who were not in sound mind: mainly participants that were critically unwell and those who felt uncomfortable during the exercise of the research were provided a safe place to rest and recover and their responses were not considered in the analysis section of this research. In terms of beneficence, after the collection of data was done, each individual explained the correct answers to the knowledge questions and where there was lacking of knowledge, the researcher closed the gap by providing accurate information about vasectomy.

Finally, the principle of justice was achieved in this study in the sense that the participants in this study were not marginalized subjects moreover the questions that this research raises are questions that involve family planning and these are matters that are relevant to the community in general and also to the respondents of this research.

Results.

General and Demographic Information.

Table 2: indicates that, most of the respondents were male: 60.6%. In terms of age, the majority of the respondents were less than 40 years old (57.3%). For the religious affiliation, the majority of the respondents were of the catholic religion: 60.2% while in terms of the number of children, those who had less than five children were dominating the sample with 55.1%. In matters related to the level of education, most of the respondents had a primary level of education with 35%. In terms of years in marriage, 51.7% of the respondents had been married for less than ten years. Finally, 53.0% of respondents desired more than five children.

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Table 2: Socio-demographics (N=234).

Characteristic	Response	N	%
Age(years)	> 40 <40	100 134	42.7 57.3
Gender	Male	142	60.7
	Female	92	39.3
Religion	Catholics	141	60.3
	Protestants	81	34.6
	Muslims	12	5.1
Level of education	No formal ed	51	21.8
	Primary	82	35.0
	Secondary	53	22.6
	Tertiary	48	20.5
Years in marriage	≤ 10 years	121	51.7
	>10 years	113	48.3
Desired children	≤ 5 children	110	47.0
Current children	>5 children <5 >5	124 129 105	53.0 55.1 44.9

Table 3: Married Men Knowledge Scores (N: 142).

Questions/statement	Correct expected answer	Number Correct	Percentage Correct
Is Vasectomy expensive	False	91	64.08%
What kind of men should get a vasectomy	Any Man Desiring It	75	52.8%
Is vasectomy a contraceptive method	True	114	80.2%
If so, what Kind of contraceptive method is it?	Permanent	102	71.8%
Does vasectomy prevent sexually transmitted diseases?	False	112	78.8%
Does a man lose his sexual drive/libido after a vasectomy	False	66	46.4%
How is vasectomy performed	Surgery	103	72.5%
Can a man impregnate his partner after vasectomy	False	88	61.9%

Table 4: Married Women Knowledge on Vasectomy (N: 92).

Questions/statement	ect expected answer	Number Correct	ercentage Correct
Is Vasectomy expensive	False	61	63.3
What kind of men should get a vasectomy	Any Man Desiring It	37	40.2
Is vasectomy a contraceptive method	True	76	82.6
If so, what Kind of family planning method is it?	Permanent	68	73.9
Does vasectomy prevent sexually transmitted diseases?	False	49	53.2
Does a man lose his sexual drive/libido after a vasectomy	False	27	29.3
How is vasectomy performed	Surgery	57	55.4
Can one impregnate his partner after vasectomy	False	48	52.1

Table 3: In regards to married men knowledge on vasectomy, the question asking whether vasectomy was a family planning method received the highest percentage score (80.2%) while the lowest percentage score was observed on the question of whether a man loses his sexual drive after vasectomy with a percentage score of 46.4%.

Level of Knowledge among Married Men and Women towards Vasectomy.

Table 4: indicates that among the married women knowledge assessment on vasectomy, the question with the highest percentage score was the question asking whether vasectomy was a family planning method (82.6%). In contrast, the lowest percentage score was observed on the question of asking whether a man loses his sexual drive after vasectomy (29.3%).

In terms of classification of the level of knowledge, most of the respondents 'level of knowledge of vasectomy was good. (More than half of the participants, both married men and married women combined with a percentage of 52.1, those with poor knowledge were 36.3% while the respondents with fair knowledge on vasectomy were 11.5%.

Table 5: Overall Classification of Respondents Level of Knowledge (N: 234)

	Frequency	Percentage
Good Knowledge	122	52.1
Fair Knowledge	27	11.5
Poor Knowledge	85	36.3

Table 6: Comparison of Knowledge Scores on Vasectomy with Respondents Demographics (N: 234)

Variable		Good (%)	Fair (%)	Poor (%)	P-value
Gender	Male	82 (57.7)	16(11.2)	44 (30.9)	0.081
	Female	40 (43.4)	11(11.9)	41 (44.5)	
Level of education	No Ed Primary	12 (23.5) 24 (29.2)	7 (13.5) 12(14.6)	32 (62.7) 46 (56.09)	0.000
	Secondary	45 (84.9)	3 (5.6)	5 (9.4)	
	Tertiary	41 (85.4)	5 (10.4)	2 (4.1)	
Religion	Catholic	45 (32)	19(13.4)	77 (54.6)	0.061
	Protestant	70 (86.4)	5 (6.1)	6 (7.4)	0.000
	Muslim	7 (58.3)	3 (25)	2 (16.7)	
No. of Children	<Five >Five	76(58.9) 46 (43.8)	14 (10.8) 13 (12.3)	39 (30.2) 46 (43.8)	0.000*
Age	<40	50 (37.3)	19 (14.1)	65 (48.5)	0.000
	>40	72 (72)	8 (8)	20 (20)	
Desired Children	<Five >Five	74 (67.2) 48 (38.7)	7 (6.3) 20 (16.1)	29 (26.3) 56 (45.1)	0.000
Years in Marriage	<10 years >10 years	56 (46.2) 66 (58.4)	14 (11.5) 13 (11.5)	51(42.1) 34 (30.08)	0.136

Comparison of Knowledge Scores with Respondents Demographics.

Table 6: illustrates that in terms of knowledge scores based on gender, 82 married men out of 142 had a good level of knowledge representing 57.7%. Married women scored less on the category of good knowledge 40 out of 92, which corresponds to 43.4%. There was no positive association between Gender (married men and married women) and level of knowledge overall with a P-value of 0.081.

In terms of the level of education, married men and women who had a low level of education (meaning no education and primary education) had a high percentage on the poor spectrum of knowledge with 62.7% and 56.09% respectively. Those with a higher level of education (Secondary school education and tertiary) had a high score on the spectrum of good knowledge: 84.9 per cent which represents 45 respondents out of a total of 53 married men and women with a secondary level of education. 85.4% of respondents with a tertiary level of education had a good knowledge of vasectomy representing 41 respondents out of 48 respondents with tertiary education. There was a significant association between the level of education and knowledge on vasectomy with a p-value of <0.001.

In terms of religion, the results in the table indicate that protestant respondents were more knowledgeable about vasectomy. 70 out of the 81 respondents had good knowledge (that is 86.4%) compared to 58.3% and 32% of Muslim and Catholics respondents respectively. Catholic respondents had a higher percentage score on the poor knowledge spectrum (54.6% representing 77 respondents out of the 141) compared to Protestants and Muslims who had fewer respondents with poor knowledge: 6 out of 81 Protestant respondents representing 7.4% and 2 out of 12 Muslim respondents, representing 16.7%. There was a significant association between religion and the level of knowledge with a P-value of <0.001.

Concerning the comparison between the level of knowledge and the number of children, the findings in this

table show that there was no significant association between the level of knowledge and the number of current children. The P-value was 0.061. Nevertheless, those with less than five children were more knowledgeable than those with more than five children: 76 respondents versus 46 respondents of those with more than five children, representing 58.9% and 43.8% respectively.

In terms of age, the study found that those who were beyond 40 years were more knowledgeable than those who were less than 40 years with a significant P value of<0.001; that is 72% versus 37.3%.

In terms of knowledge scores in comparison with the number of desired children, respondents who desired less than five children were more knowledgeable about vasectomy than the respondents who desired more than five children: 67.2% versus 38.7%. The P-value was significant at <0.001.

Finally, concerning the years spent in marriage, the study did not find a significant difference between respondents who had been married for less than ten years and those who had been married for more in terms of their level of knowledge with a p-value of 0.136.Nevertheless, those who had been married for more than ten years had a higher score on the good knowledge spectrum than those with less than ten years in marriage: 58.4% representing 56 respondents out of 113 compared to 46.2% which represents 56 patients out of 121.

Table 6: Comparison of level of Knowledge with Vasectomy Acceptance (N 234).

Characteristics		**Not Accept**	**Accept**	**coc-value**
Knowledge on Vasectomy	Good Fair	113 (92.6%) 26 (96.2)	9(7.3%) 1 (3.7%)	0.787
	Poor	79 (92.9%)	6 (7.05%)	
	Total	218 **(93.1%)**	16 **(6.8%)**	

Comparison of Level of Knowledge and Vasectomy Acceptance.

Table 7: shows that the majority of respondents with good knowledge on vasectomy: 122 respondents did not have a strong association with acceptance of vasectomy. Among these, 92.6% did not accept vasectomy, while 7.3% accepted vasectomy. The trends are also observed for those with fair and poor knowledge with 96.2% of those with fair knowledge not accepting vasectomy and 92.9% of those with poor knowledge not accepting vasectomy as well. There was no significant positive association between the level of knowledge and vasectomy acceptance as the p-value is 0.787.

Table 8: Response numbers and frequencies for attitude scores (N 234)

Characteristics	Agree (4,5)	Uncertain (3)	Disagree (1,2)
Vasectomy is not acceptable in the Burundian culture	W 82 (89%) M 142(100%) T 224 (95.6%)	W 0 M 0 T 0	W 10 (10.8%) M 0 T 10 (4.2%)
Vasectomy results in loss of manhood status in the society	W 65 (70.6%) M 134 (94.3%) T 199 (85.04%)	W 4 (4.3%) M 3 (2.1%) T 7 (2.9%)	W 23 (25%) M 5 (3.5%) T 28 (11.9)
Men Should be responsible for contraception *	W 15 (16.2%) M 10 (7%) T 25 (10.6%)	W 1 (1.08%) M 5 (3.5%) T 6 (2.5%)	W 76 (82.6%) M 127 (89.4%) T 203 (86.7%)
Vasectomy makes men more promiscuous	W 71 (82.6%) M 121 (85.2%) T 192 (82.05%)	W 2 (4.3%) M 10 (7.0%) T 12 (5.1%)	W 19 (20.6) M 11 (7.7%) T 30 (12.8%)
Vasectomy is a safe method of family planning *	W 8 (8.6%) M 23 (16.1%) T 31 (13.2%)	W 8 (8.6%) M 5 (3.5%) T 13 (5.5%)	W 76 (82.6%) M 115 (80.9%) T 191 (81.6%)
It's against my religious belief for a man to practice vasectomy	W 76 (82.6%) M 135 (95.1%) T 211 (90.1%)	W 5 (5.4%) M 5 (3.5%) T 10 (4.2%)	W 11 (11.9%) M 2 (1.4%) T 13 (5.6%)
Vasectomy is castration and thus should be avoided	W 59 (64.1%) M 84 (59.1%) T 143 (61.1%)	W 10 (10.8%) M 3 (2.1%) T 13 (5.5%)	W 23 (25%) M 55 (38.7%) T 78 (33.4%)
Vasectomy should not be practiced because God is the one to decide the number of children	W 73 (79.3%) M 95 (66.9%) T 168 (71.7%)	W 0 M 9 (6.3%) T 9 (3.8%)	W 19 (20.6%) M 38 (26.7%) T 57 (24.3%)
Having a vasectomy make women unfaithful to their husbands	W 17 (18.4%) M 25 (17.6%) T 42 (17.9)	W 0 M 11 (7.7%) T 11 (4.7%)	W 75 (81.5%) M 105 (73.9%) T 180 (76.9%)
Information on vasectomy is not enough to allow adequate decision making *	W 75 (81.5%) M 112 (78.9%) T 187 (80%)	W 8 (8.6%) M 5 (3.5%) T 13 (5.5%)	W 9 (9.7%) M 25 (17.7%) T 36 (15.3%)
Vasectomy should only be done if someone has more than five children	W 33 (35.8%) M 104 (73.2%) 137 (58.5%)	W 9 (9.7%) M 3 (2.1%) T 12(5.1%)	W 50 (54.3%) M 35 (24.6%) T 85 (36.3%)
A man should have many children. Thus, vasectomy is prohibited/sin	W 42 (45.6%) M 80 (56.3%) T 122 (52.1%)	W 3 (3.2%) M 12 (8.4%) T 15 (6.4%)	W 47 (51.1%) M 50 (35.2%) T 97 (41.4%)
Tubal ligation is what should be done, not vasectomy	W 52 (56.5%) M 40 (28.1%) T 92 (39.3%)	W 0 M 16 (11.2%) T 16 (6.8%)	W 40 (43.4%) M 86 (60.5%) T 126 (53.8%)
Because vasectomy is irreversible, it constitutes a factor of consideration for adoption *	W 5 (5.4%) M 16 (11.2%) T 21 (8.9%)	W 1 (1.08%) M 0 T 1 (0.4%)	W 86 (93.4%) M 126 (88.7%) T 212 (90.5%)

5 = Strongly agree, 4 =Agree, 3 =Uncertain, 2 =Disagree, 1 =Strongly disagree
M: Married Men
W: Married Women.

Attitude Scores of Married Men and Women Towards Vasectomy.

Table 8: shows that the overall attitudinal mean score for all respondents in regards to vasectomy was 47.1%. The majority of respondents agreed with most negative statements towards vasectomy and disagreed with most positive statements towards vasectomy. 95.6% of respondents (224) agreed that vasectomy was not acceptable in the Burundian culture while 4.2%, representing ten respondents disagreed with this statement. 85.04% representing 199 respondents agreed that vasectomy resulted in the loss of manhood status in the society while 11.9% representing 28 respondents disagreed. 2.9% or seven respondents were uncertain about this statement.

In terms of male involvement in contraception, 10.6% of respondents agreed that men should be responsible for contraception, while 86.7% disagreed with this statement. 82.05% of respondents agreed that vasectomy makes men more promiscuous, and 12.08% of respondents disagreed to this statement.

In terms of safety of vasectomy, 13.2% of respondents agreed that vasectomy was a safe contraceptive method while 81.6% disagreed with this. In matters religion, 82.6% of the respondents agreed that is was against their religious beliefs for a man to practice or undergo a vasectomy. 5.6% disagreed to this statement, and 4.2% were uncertain. 61.1% of respondents agreed that vasectomy was castration and that it should be avoided while 33.4% of respondents and 5.5% disagreed and were uncertain respectively.

71.7% of respondents agreed that God should be the one to determine the number of children, and thus vasectomy should be avoided. 24.3% disagreed with this statement. In terms of availability of information on vasectomy, 80% of respondents agreed that information about vasectomy was not enough to allow adequate decision making about vasectomy while 15.3 % disagreed to this statement. 58.5% of respondents agreed that vasectomy should only be done if someone has more than five children, while 36.3% disagreed to this statement. Concerning the need for a man to have many children, 52.1% agreed that a man should have many children and 41.4% disagreed to this statement. In terms of tubal ligation being better than vasectomy, 39.3% agreed that tubal ligation should be done instead of vasectomy and 53.8% disagreed to this statement. Concerning the irreversibility of vasectomy, 8.9% of respondents agreed that because vasectomy is irreversible, this constitutes a factor for its adoption. 90.5% of respondents did not agree with this statement.

Vasectomy Acceptance.

In terms of vasectomy acceptance, a separate question from the knowledge questions was that of assessing vasectomy acceptance and was framed as follows: ―*Would you accept vasectomy as a family planning method*‖? This question was asked at the very last portion of attitudinal questions as a wrap up of the questionnaire. The majority of respondents were not in favor of accepting vasectomy with a refusal percentage of 93.2 which represents a total number of 218 respondents among the 234, making those who accepted vasectomy 6.8% representing 16 respondents among which 12 were male and four females.

Table 9: Comparison of respondent ‘s demographics with attitude scores (N=234; *p <0.05)

Characteristic	Response	N	Attitude mean score (%)	Std.Dev	P-Value.
	> 40 ≤40	100	0.464 (46.4) 0.476(47.6)	0.155 0.059	0.425
Gender	Male	142	0.448 (44.8)	0.115	0.000
	Female	92	0.506 (50.6)	0.095	
Religion 1	Catholics	141	0.475 (47.5)	0.058	0.262
	Protestants	81	0.492 (49.2)	0.155	
Religion 2	Catholics	141	0.475 (47.5)	0.058	0.000
	Muslims	12	0.276 (27.6)	0.007	
Number of kids	≤ 5 Kids	129	0.500 (50)	0.095	0.000
	>5 Kids	105	0.435 (43.5)	0.118	
Desired kids	≤ 5 Kids	110	0.484 (48.4)	0.127	0.093
	>5 Kids	124	0.459 (45.9)	0.093	
Years in Marriage	≤ 10 years	121	0.499 (49.9)	0.012	0.062
	>10 years	113	0.440 (44.0)	0.122	
Level of education 1	No education	51	0.522 (52.2)	0.059	0.003

	Primary	82	0.446 (44.6)	0.038	
Level of education 2	Secondary Tertiary	53 48	0.519 (51.9) 0.403 (40.3)	0.118 0.168	0.000

Comparison of attitude scores with Respondents Demographics.

Table 9: shows that there was a significant association between attitude mean scores towards vasectomy and the following demographics: level of education, religion, number of current children and gender.
Mean attitude score for females was 50.6% compared to 44.8% of male respondents with a P-value of <0.001.
In terms of religion, there was a significant association between attitude mean score for respondents of the Catholics faith and the Muslims (47.5 for Catholics versus 27.5% for the Muslims with a P-value of <0.001). There was no positive association between the attitude mean scores of Protestant respondents and Catholics.
In terms of the number of current children, the overall attitudinal mean score for those with less than five children was 50% compared to 43.5% of those with more than five children. The P-value was significant at <0.001
Concerning the level of education, there was a significant association in attitudinal mean scores for respondents with no formal education and those with primary education (52.1% and 44.6% respectively with a P-value of 0.003). The same was noticed between attitudinal mean scores of respondents with secondary education and tertiary education (51.9% and 40.3% respectively, with a P-value of <0.001).

Table 9: Comparison of Acceptance of vasectomy with respondents 'demographics (N: 234).

Characteristics		**Not Accept**	**Accept**	**P-Value**
Gender	Male	130(91.6%)	12(8.4%)	
	Female	88(95.7%)	4(4.3%)	**0.225**
Religion	Catholic	132(93.7%)	9(6.3%)	
	Protestant	74(91.3%)	7(8.7%)	**0.512**
	Muslim	12(100%)	0 (0%)	
Number of Children	<Five	124(96.9%)	4(3.1%)	***0.012**
	>Five	93(88.6%)	12(11.4%)	
Level of Education	No ED	51(100%)	(0%)	**0.061**
	Primary	77(93.9%)	5(6.1%)	
	Secondary	46(86.8%)	7(13.2%)	
	Tertiary	44(91.7%)	4(8.3%)	
Age	</=40	129(96.2%)	5(3.8%)	
	>40	89(89%)	11(11%)	
Desired Kids	Less than 5	105(95.4%)	5(4.5%)	***0.029**
	More than 5	113(91.1%)	11(8.9%)	
				0.191
Years in Marriage	Less than 10	114(94.2%)	7(5.7%)	
	More than 10	104(92.03%)	9(7.9%)	
				0.509

Comparison of Demographics with Vasectomy Uptake.

Table 10: shows that in terms of gender and vasectomy uptake, there was no significant association. 8.4% of male respondents would accept vasectomy compared to 4.3% of female respondents. This difference is not statistically significant, with a P-value of 0.225.
There was no significant association between religion and vasectomy uptake. 6.3% of Catholic respondents would adopt vasectomy compared to 8.7% of Protestants and 0% of Muslims. The P-value was 0.512. There was a significant association between age and vasectomy uptake. 3.8% of respondents aged less than 40 years would adopt vasectomy compared to 11% of those with more than five children who would accept vasectomy with a P-value of 0.029.
There was no significant difference between respondents who had been married for more than ten years and those who had been married for less than ten years in terms of

their acceptance of vasectomy: 7.9% and 5.7% would adopt vasectomy respectively.

No significant association was also noted for respondents who desired more than five children and those who desired less in terms of their acceptability of vasectomy: 8.9% versus 4.5% with a P-value of 0.191. In terms of the level of education and vasectomy uptake, there was no significant association. Respondents with no education would not adopt vasectomy, compared to 6.1% of those with primary education who would. 13.2% of those with secondary education and 8.3% of those with Tertiary education would adopt vasectomy. However, the P-value in this category is not significant: 0.061. Finally, there was a significant association between the number of children and vasectomy uptake with 3.1% of respondents with less than five children being favorable to vasectomy uptake compared to 11.4 of those with more than five children. The P-value was 0.012.

Discussion of results.

Knowledge of Married Men and Women towards the uptake of Vasectomy.

The objective primo of this study was to assess the level of knowledge of married men and women on vasectomy. This research found that most respondents had overall good knowledge of vasectomy however there were areas where their knowledge was scanty especially when asking specific questions about vasectomy. While the majority of the respondents knew that vasectomy was a family planning method, most of them did not know that a man did not lose his sexual drive after vasectomy. Only 46.4% of married men knew that a man does not lose his sexual drive and a meager 29.3% of married women. This points to the fact that while they knew that vasectomy was a contraceptive method, there was still a persistent of ignorance what the method confers. This could be further explained by the non-positive attitude that both married men and married women hold on this method. Similar findings in terms of knowledge were noted in other studies. For example, in a study conducted in Rwanda, the authors found that the majority of respondents were aware that vasectomy was a family planning method (about 80% of respondents) yet misconceptions about the procedure were noted (Ntakarutimana et al., 2019). It is possible that this knowledge gap noted in this study could stem from a culture that values having more children and thus there is no interest from men to get information about vasectomy or other methods of contraception.

This study also noted that the majority of respondents who were older (40 years and above) were more knowledgeable than young respondents. This finding was also noted in other studies. For example, in a study conducted in Nepal, 69% of male respondents who had moderate knowledge were older and had a tertiary level of education. My study noted that 72% of respondents who were 40 years old and above had good knowledge about vasectomy compared to 37.3% of respondents who were less than 40 years with a significant p-value of <0.001. In a study conducted in Rwanda, a neighboring country to South Sudan, it was noticed that the majority
of respondents who had good knowledge about vasectomy were older
(Ntakarutimana et al., 2019). The findings of my study seem to be in agreement with other studies. One of the reasons in my opinion that could explain this association of adequate knowledge with age could be that the more people age, the more the need for wanting to space births becomes felt in the sense that they are aware that every pregnancy comes with health-related risks. Moreover, there is a possibility that at an advanced age, people have already achieved their family size and are looking into ways to limit births.

However, not all studies agree with my findings. For instance, a study conducted in Nigeria revealed that the majority of men (62.5%) did not have adequate knowledge about vasectomy, showing that old age and adequate knowledge about vasectomy is not an absolute given.

My study found that the more the respondents were educated, the more
knowledgeable they were. For instance, the majority of respondents with a tertiary level of education (85.4%) had good knowledge, compared to 29.2% of respondents with a primary level of education. This finding was also noted in other studies in India (Nair et al., 2017) and in Nepal (Dayanand, 2014). In contrast to this finding that seems to be self-explanatory, some studies in Nigeria showed no association between the level of education and knowledge and attitude towards vasectomy (Onasonga et al., 2013) (owopetu et al., 2014). This finding is a testament that knowledge is not enough to affect a change of behavior and attitude regarding vasectomy. In other words, while a high level of education may be associated with an increased chance of knowing more about vasectomy, it is not necessarily associated with a good attitude towards vasectomy.

In addition to this, my study also noted that knowledge level did not have a positive association with acceptance of vasectomy since the vast majority of respondents who were knowledgeable and those who were not, were not in favor of accepting vasectomy. This finding is a strong testament that knowledge is not enough to bring about a change of attitude and behavior that could lead to vasectomy acceptance and adoption. However, a study conducted in

Rwanda revealed that about 63.5% of respondents would consider adopting vasectomy. While their finding contradicts the findings of this study, it is interesting to note that if Burundi puts much more effort into contraceptive campaigns that are not only championed by the government but also by the clergy and the society as a whole, attitude towards vasectomy could change as it was noted in Rwanda (Ntakarutimana et al., 2019).

One other factor that was noted in other studies to influence knowledge about vasectomy is religion. My study found that Catholic respondents were less knowledgeable than protestant respondents. (32% versus 86.4% with a significant p-value of <0.0001). This finding did not come as a surprise in the sense that the Catholic Church has radical stands against contraception that is not natural. It will not then be unreasonable to assume that Catholics would not draw attention to a method that seems to be against their core beliefs. In a Rwandan study by (Ntakarutimana et al., 2019), it was noted that 53.8% of Catholic respondents stated that their religion was against the practice of vasectomy and because of that, they could not adopt the method. This finding points out an important element that to affect change and promote vasectomy acceptance there is going to be a great need for the government to find ways to work with the clergy and find a middle ground. As things stand, negative attitudes towards vasectomy could partially find an explanation in religious factors.

The attitude of Married Men and Women towards the uptake of vasectomy.

On the second objective of this study which was to analyze the attitudes of married men and women toward vasectomy, this study found that the overall attitude score. (married men and women combined) was 47.1%, which is a reflection of an overall negative attitude towards vasectomy. One of the factors that have been identified to influence attitudes towards vasectomy is culture (Kidzuga 2012). This study found that 95.6% of respondents; that is 89% of women and 100% of men agreed that vasectomy was not acceptable in the South Sudanese culture. This finding could be further explained by the fact that children are considered as wealth and God‘s given gifts. Children are seen as an investment for the future as one proverb suggests: ―the greatest sorrow is to have no children to mourn for you. Thus, any measure that would come to block the ―blessings‖ is less likely to be acceptable. In a Turkish study assessing opinions and understanding of married couples towards vasectomy, most of the respondents were in agreement that vasectomy was not appropriate to the Turkish culture and was viewed as an imposition of the Western countries (Kisa, Zeyneloglu, and Delibas, 2013). This strong cultural belief that is against vasectomy could be one of the explanations for the low mean attitudinal average score. Culture is a strong component of the society. Results from my study and in correlation with other studies done in various parts of the world show that for vasectomy to be adopted, a deep understanding of cultural beliefs and norms that seem to be against contraception will need to be investigated as all the studies conducted on vasectomy, especially in the African setting have strongly suggested this to be o hindrance to implementation of vasectomy.

In addition to the cultural beliefs, this study also noted that 66.9% of men and 79.3% of women; that is 71.1% of all respondents agreed that God should be the only one determining the number of children pointing out that vasectomy would come to interfere with such a plan. This finds an explanation in the fact that South Sudanese beliefs insist on God being the decider of everything good or bad. Everything is determined or set in motion by the hands of ―God, the author of all things.

Still, in the same chain of thought, this study found that 90.1% of respondents that is 95.1% of male respondents and 82.6% of female respondents agreed that it was against their religious belief for a man to get a vasectomy. This shows that religion has a strong influence on vasectomy uptake. This finding is in agreement with Onasonga (2013), who found that religion influenced the attitude towards vasectomy to up to 72.1% of respondent’s similar findings were noted in a study conducted in Rwanda (Ntakarutimana et al, 2019). This being the case, the attitude towards vasectomy can ‘t change if there is no deep religious involvement in facilitating contraceptive measures. Rwanda has managed to reverse this tendency in the sense that church ministers are encouraged to talk about contraception in general and vasectomy, in particular, to help push the government's plan of limiting births (Ntakarutimana et al., 2019)

Another factor that has been associated with an overall negative attitude towards vasectomy is myths and misconceptions that are around this contraceptive method. In this study, 59.1% of married men and 64.1% of married women considered vasectomy as castration. This finding has also been noted in a good number of various studies (Tijani et al., 2013, Sezer, et al., 2017, Hyginus and Jamike, 2009, Oyamo, 2010, Onasoga, 2013). This widespread misconception could find an explanation in the fast widespread of misinformation as most men and women tend to get information from their friends and neighbors who are not well equipped nor knowledgeable enough to give accurate information on vasectomy as was noted in a Nigerian study (onasonga et al., 2013). Most married men and women do not get information from credible sources, but they get it from friends whose knowledge about

vasectomy is usually not adequate. In Rwanda, (Ntakarutimana et. al, 2019) found that 53.8% of respondents believed that vasectomy was the same thing as castration. Their findings emphasize the persistence of misconceptions about vasectomy. Moreover, the Catholic Church and Muslims' strict restriction of contraception could further explain why there might be rampant misconceptions about contraception and vasectomy in particular.

Concerning the number of children, the study found that respondents who had less than five children had an overall attitudinal mean score towards vasectomy, superior to those who had more than five children. (50% versus 43.5% with a P-value of <0.001). This finding could be explained by the fact that vasectomy could be seen as a tool that would prevent from having many children. Owoputu, Chuchwuma & Nwozichi, (2015) found that the need for more children was the major factor influencing vasectomy refusal. In addition to this, South Sudanese culture gives more value to having many children. This could explain why overall those who had more than five children had a lower mean attitudinal score towards vasectomy.

In terms of knowledge about vasectomy, and attitude towards it, while the majority of respondents knew that vasectomy was a family planning method, it was noted that only 13.2% of respondents agreed that it was a safe contraceptive method. These findings are different from the findings of a Turkish study that found that 81% of the respondents agreed that vasectomy was a safe method of contraception. This difference could be explained by the fact that the culture states to be against vasectomy, and religious beliefs are the same.

In terms of vasectomy consideration and adoption, 90.5% of respondents agreed that because vasectomy is irreversible, that constitutes a reason for not considering its adoption. This finding was also noted in a Nigerian study that compared attitudes and acceptance of vasectomy by married men and women. The study found that irreversibility was the highest reason for the negative attitude toward vasectomy and its refusal by married men and women (Tijani et al., 2013). In my opinion, I believe that this was a big issue because most respondents kept on saying that although it is good to limit births, there was great fear that the person who underwent vasectomy could desire more children in the future and would be unable to have them.

4.10.3 Socio-Demographic Factors that Influence Vasectomy Acceptance The ultimate goal of a study on understanding the knowledge and attitude of men and women towards vasectomy can ‘t be complete without examining the factors that play a role in either acceptance or refusal of vasectomy. This study has pointed out some of the factors that influence vasectomy acceptance: level of education, gender, religion, number of children, knowledge of vasectomy, number of desired children, age, and the number of years in marriage.

This study did not find a statistically significant association between the level of knowledge and vasectomy acceptance bringing out the idea that knowing much about vasectomy does not warranty acceptance and in parallel, knowing less about it does not warranty refusal. 100% of respondents with no formal education, 93.9% of respondents who had gone to primary school, 86.8 of those with secondary education, and 91.7% of those with tertiary education were not favorable to vasectomy acceptance. The p-value was 0.061. This finding was different from the findings of Tijani et al. (2013), who found that 49.1% of men and 19% of women with good knowledge of vasectomy would accept vasectomy. The percentage trend was down going as the level of knowledge went down with those who had poor knowledge of vasectomy being less susceptible to accepting it.

In terms of the level of education, while it was noted that those with a good level of education had good knowledge of vasectomy, it was also found that their level of education did not correlate with the level of acceptance of vasectomy. This is illustrated by the fact that 86.8% of those with secondary education and 91.7% of those with tertiary education would not accept vasectomy while they have good knowledge about it. The same trend was observed for those with no formal education and those with primary education. These findings are in agreement with the findings of Hyginus and Jamike (2009). They found in their study on the attitude of men in Nigeria to vasectomy that the increase in educational attainment does not lead to vasectomy acceptance. Hygenus and Jamike argued that attitude and culture are stronger than people‘s knowledge and that to affect change and acceptance of vasectomy; one needs to dive into religion, and culture, two entities that strongly antagonize vasectomy acceptance. Interestingly enough, (Ntakuritimana et al, 2019) in their study in Rwanda found that respondents with secondary education were three-fold more susceptible to accept vasectomy, than those with tertiary education four times more. Ntakarutimana and collaborators argued that the vast campaign initiated by the government in its quest to promote long-lasting contraceptive methods brought about change in the way of life of many Rwandans and the educated were at the forefront in helping close the knowledge gap that seemed to have a negative attitude on vasectomy. It would be a worthy venue to explore in South Sudan.

In matters of religion, this study found that there was no statistically significant association between religion and vasectomy acceptance. But it is of the essence to note that while the Catholic Church is strictly against vasectomy and

most protestant churches are liberal on the matter this study found that the percentage of vasectomy refusal based on religion was quite similar. 93.7% of Catholics, 91.3% of Protestants, and 100% of Muslims would not accept vasectomy. This shows that in a sense religion does influence strongly the decision to accept or refuse vasectomy as much as it influences attitudes toward vasectomy. A Turkish study (Kisa, Zeyneloglu, and Delibas, 2013) found that 2 out of 3 men believed that vasectomy was a sin and thus should not be adopted. A Nigeria study found that no single Muslim respondent would adopt vasectomy (Akpamu, Nwoke, Osifo, Igbinovia & Adisa, 2010). These findings are in agreement with the findings of this study. (Ntakarutimana et al, 2019) Had similar findings too. Kisa, Zeyneloglu, and Delibas, (2013) noted that most Muslim men were much afraid of the repercussions that they would have if they went against the teaching of Islam and accepted a method that the holy Quran condemned. This could be the same argument for the Muslims in this study.

However, our finding is different from the finding of Oyamo (2010) who noted in her study on the knowledge and attitude of men and women towards vasectomy that only 2.5% of participants said that religion influenced their decision on vasectomy. However, it is relevant to note that her study had more Protestants than Muslims and Catholics, and protestants are known to have less strict measures on contraception. Bakibinga et al., (2015) found that religion did not play a significant statistical importance in approval of family planning. These findings attest that religion is not an absolute antagonist of vasectomy and that if there is collaboration between the clergy and the government, maybe vasectomy could become readily acceptable by South Sudanese married men and women.

In terms of age and acceptance or refusal of vasectomy, this study found a significant association between the two. Respondents who were less than 40 years old were more likely to refuse vasectomy than those with more than 40 years. That is 99.2% versus 89% with a p-value of 0.029. These findings are different from the findings of Tijani et al., who found that age did not play a significant role in the predisposition of respondents towards vasectomy (P-value:0.602 for the males and 0.511 for the females). This finding could be explained by the fact that the more people age, the riskier it is to have children and thus there is an inclination towards contraceptive methods.

Conclusion.

The study found that the level of knowledge was predominantly good, with 52.1% of respondents having good knowledge of vasectomy. The study noted that the more educated the respondents were, the more they were knowledgeable about vasectomy. However, the acceptance of vasectomy was not correlated to the level of education, nor was it correlated to the knowledge about vasectomy.

Limitations of the Study.

This study was done in a health centre situated in the rural part of the capital city of South Sudan: Juba. It did not include samples taken from other facilities and thus, the views obtained from the interviews conducted, and the numerical data therein cannot be generalized as a reflection of all South Sudanese views or all people living in Juba.

This study was designed and carried out from a quantitative method approach. A complementary qualitative study mainly focusing on the attitude of both married men and women regarding vasectomy would shed light and give more strength and meaning to the numerical findings of this study.

Recommendation.

Health workers working in a family planning clinic should be actively encouraged to share information about vasectomy with their female and male clients and have if possible weekly vasectomy campaigns at their facility to decrease the knowledge gap.

Community Health workers should be trained in reaching out to their respective communities and sharing adequate and correct information about vasectomy to help narrow the myths around the procedure.

The government of South Sudan should put in place policies that teach about vasectomy to reach more people with the right information about vasectomy and help close the knowledge gap since the more people are knowledgeable, the more likely they will be to accept vasectomy.

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Availability of data.

Data used in this study is available upon request from the corresponding author.

List of abbreviations.

FHI: Family Health International
SPSS: Statistical Package for Social Sciences.

Ethical approval.

There are several ethical issues that a researcher must consider when designing research that utilizes participants. Ethics are moral standards that can be followed in situations where there can be potential harm or actual harm to an individual or a group. Awareness of ethical issues in research protects the integrity of the researcher and ensures honest research results. Some of the ethical issues related to both the researcher and the research subjects included avoiding plagiarism, misusing privileges, for example, using collected data to stigmatize or entrap somebody, and maintaining the confidentiality and privacy of the human subjects.

Informed consent.

The purpose and objectives of the study were explained to the participants, and they understood and voluntarily consented to participate in the study. The participants will benefit from improved wound management which will result in faster wound healing once the study recommendations have been implemented.

Authors contribution.

BA designed the study, conducted data collection, cleaned and analyzed data, and drafted the manuscript, MS supervised all stages of the study from conceptualization of the topic to manuscript writing and submission, and SK supported in study conceptualization general supervision and mentorship.

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Conflict of interest.

The authors declare no conflicting interest.

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