Correlates of family planning knowledge among people in fishing communities of Lake Victoria in Uganda

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Abstract

Background

Family planning (FP) is a key component in the conduct of HIV prevention trials and FP knowledge is a determinant of modern contraceptive use. Although fishing communities (FCs) participate in HIV prevention trials, knowledge about FP in this population is scarcely known. We determined correlates of FP knowledge in FCs of L. Victoria in Uganda to inform improvements in FP interventions in preparation for other HIV prevention trials.

Methods

We conducted a cross-sectional survey among participants aged 16-49 years in Kigungu and Nsazi FCs. A semi-structured questionnaire was administered to assess FP knowledge. A composite score with 5 parameters including; awareness about FP methods, knowledge about ideal number of children for a couple, knowledge about ideal birth spacing interval, knowledge about FP methods and their side effects and interval between the last 2 children was used to determine whether participant’s knowledge was or wasn’t satisfactory. Satisfactory FP knowledge was attributed to a score of ≥80% from the five parameters. We also conducted 10 in-depth interviews and 4 focus group discussions.

Results

Of the 1,410 screened participants, 95% were aware of at least one FP method while only 21% had satisfactory knowledge. Participants aged 30-39 years, those engaged in trade/business, housewives, those from Nsazi, the married or those who were divorced, separated or widowed were more likely to have satisfactory FP knowledge compared to those aged 16-29 years (aOR: 1.59 95% CI: 1.14-2.22), farmers (aOR: 3.14 95% CI: 1.21-8.17), and (aOR: 3.69 95% CI: 1.35-10.1), those from Kigungu (aOR: 1.58 95% CI: 1.09-2.30), those who were single (aOR: 6.96 95% CI: 3.42-14.13) or (aOR: 17.67 95% CI: 8.54-36.54). There were concerns about side effects and effectiveness of some modern FP methods. Misconceptions about effects of FP like sterility, cancers and foetal abnormalities were common. Cultural beliefs on contraception are key barriers to FP information.

Conclusion

People from FCs in Uganda are aware of FP but their knowledge is largely unsatisfactory. Concerns
about method safety, effectiveness of some methods, misconceptions and cultural barriers exist. A FP education tool tailored for a mobile, high risk and remote population is recommended to improve FP knowledge.

Background

According to the 2014 United Nations estimates, Uganda was among the forty most populous countries in the world and among the top ten in Africa[1]. The total population of Uganda was estimated at 37.7 million people according to the 2016/17 Uganda National Household Survey[2]. With a total fertility rate of 5.4 births per woman of reproductive age [3], the total population of Uganda is estimated to grow to 47 million by 2025 and up to 63 million people by 2030[4]. The high fertility rate could be explained by the fact that Ugandan women start bearing children at an early age and continue giving birth until late ages[5]. This poses challenges for safe motherhood and child survival as well as other development programmes aimed at improving the quality of life of the population at large.

Family planning use is one of the public health interventions that needs to be promoted in Uganda because it helps families to achieve a desired number of children and is instrumental in child spacing[6]. By preventing pregnancy, family planning reduces pregnancy-related health risks in women[7], infant mortality and prevents teenage pregnancies[8]. Condom use as a family planning method, helps to reduce the spread of HIV/AIDS and unintended pregnancies among women living with HIV thus reducing mother to child transmission of HIV[9]. Use of family planning empowers people economically and improves education and other social needs [10]. Family planning knowledge needs to be prioritized in resource limited countries as knowledge is a determinant of family planning use. While the contraceptive prevalence rate in Uganda is higher than in other East African countries like Kenya and Tanzania[11,12], inequities in family planning service coverage and use still exist in some sub-populations like the fishing communities in Uganda[13]. Fishing communities (FCs) in Uganda are a special population because they make a great contribution to food security, foreign exchange & local government revenue[14]. They contribute close to 30% of the countries’ gross domestic product[15]. Fishing communities have limited reproductive health and other social services and are densely populated [16–18]. Moreover, these fishing communities, which
are often referred to as landing sites, have a large presence of commercial sex workers (CSWs), high rates of transactional sex (i.e. sex for money, fish, or other goods) and elevated levels of alcohol consumption[19–21]. Because of their lifestyle, there exists a need to identify fertility support services and optimize family planning use in these communities. To date, the level of knowledge people in fishing communities have on family planning and its correlates are scanty known. Strategies that can improve provision and access to family planning services in these sub-populations need to be prioritized. If family planning use is to be optimized, satisfactory and accurate family planning knowledge in these hard to reach communities remains crucial[22–24]. The aim of this study was to establish the level and correlates of knowledge of family planning in fishing communities of Lake Victoria in Uganda and explore the underlying beliefs and influences to contraceptive method preferences.

Methods

**Study population and setting**

The study targeted a community wide resident population from Kigungu and Nsazi fishing communities. Kigungu is a landing site along the shores of Lake Victoria, approximately 45 minutes from Entebbe, which is a major town where the international airport is located. It is a rural community with a population of approximately 30,000 people. Many residents live in non-permanent housing structures made of wood and aluminium with poor sanitation and limited access to social services like health, electricity and clean water. Kigungu has one Health Centre III facility and a few private clinics where people access medical services. Health Centre III services include a maternity ward and outpatient services, including free HIV counselling and testing. They also offer male condoms, pills and Injectaplan®/Depo-Provera® for family planning. Community based non-governmental organizations provide sporadic HIV prevention and family planning outreaches. They offer some medical services that include information dissemination, treatment of minor illnesses, condom distribution, implant and IUD insertions and referrals to healthcare facilities for more comprehensive services. Less frequently, mobile HIV counselling and testing, reproductive health services and male circumcision services are offered in the community by health facility outreaches from non-
governmental organizations. Most of the characteristics of Kigungu described are similar to the context of other fishing communities in Uganda, including its rural setting and distance from health care services [25], its highly mobile population[26–28], and the presence of alcohol establishments and commercial sex workers [29] with an average number of 7 children per woman/household[30]. Nsazi Island lies on 7 square miles of land and is one of the Islands on Lake Victoria with a total population that oscillates between 5000-8000 due to fish seasonality. Majority of the residents are Ugandans while the rest coming from Rwanda, Tanzania, Democratic Republic of Congo, Kenya and Sudan. The island has three settlements; Kansambwe, Tabaliro, and Bugiri. It takes approximately two hours to travel by boat from Nsazi to the mainland of Ggaba, Kampala, or Kasenyi, Entebbe, landing sites costing about 15,000 Uganda shillings (approximately USD5) for a single trip.

The standard form of shelter on this Island are shanty structures made of papyrus and wood. The main source of income is fishing, for the men; transactions are often done in cash, spending on alcohol and commercial sex which is common[16,31] . Given the seasonal fishing cycles, some household occupants are short term or transitory based on the fish catch. Other common occupations include food vending, bar waiting and commercial sex in a less-formal manner as restaurant maids or employed in brothels. A few residents are involved in livestock rearing and farming at a subsistence level. Given the remoteness of this fishing community, access to health services is limited to a government health Centre II and private clinics usually manned by unqualified personnel. This makes it difficult for the residents to access sexual and reproductive health services or other health care services.

**Study design**

Between February 2017 and November 2018, we conducted a cross-sectional survey where we randomly screened participants aged 16 to 49 years from both Kigungu and Nsazi fishing communities. The two communities were purposively selected based on their location and size. Focus group discussion participants and in-depth interview respondents were also purposively selected.

**Study Data and Outcome**

Prior to commencement of the study, the study team were trained on the study and how to use the
data collection tools. The study was presented to community leaders and thereafter members in both communities were informed of the study through village-based community sensitization and mobilization seminars. Participants were invited to study hubs based in their communities where more study information was provided and study procedures conducted. Written informed consent was obtained from each participant prior to conducting any study related procedures. Data was collected on social demographic characteristics, family planning methods and other reproductive health aspects. Anonymized semi-structured questionnaires with questions on family planning methods and their side effects were administered to those who said they knew at least one family planning method. In the main study questionnaire, participants were asked if they knew of any family planning method. Those who were aware of any family planning method were asked to list, unprompted, which methods they knew, how the methods they knew worked and their effects. They were also asked the ideal number of children and ideal spacing interval. Women with more than 1 child were asked the interval between their last two children.

Our outcome of interest was satisfactory family planning knowledge. To establish whether the knowledge one had was or wasn’t satisfactory, a composite score similar to what was used in a study that assessed the effect of literacy on family planning practices among married women in India[32] was calculated based on 5 variables namely; 1) awareness about FP methods; 2) correct knowledge about ideal number of children for a couple ; 3) correct knowledge about ideal birth spacing interval; 4) interval between last 2 children being ≥2 years and 5) correct knowledge about FP methods and their side effects. Correct knowledge about family planning methods and their side effects constituted having a score of ≥50% from a set of 64 questions on different family planning methods namely; pills, injectable methods, implants, emergency contraceptive pills, intra-uterine device, vasectomy, tubal ligation, condoms, spermicides, diaphragm, lactation amenorrhea and fertility awareness-based methods. The final score was based on a cut-off of 80% from the five parameters mentioned above. Each of the 5 parameters contributed 20% of the final score. Participants who scored ≥80% had satisfactory knowledge while those who scored <80% had unsatisfactory knowledge.

In addition, we explored general FP understanding and assessed preferred family planning methods
through ten in-depth interviews (IDIs) and four focus group discussions (FGDs) stratified by age and sex, with 47 purposefully sampled participants using study guides. The FGDs and IDIs were conducted by experienced facilitators in either English or Luganda language. The study guides included semi-structured, open and close-ended questions aimed at getting information about participants’ knowledge of family planning, sociocultural beliefs and practices, perceptions of and attitudes to family planning use. Reasons that influence preference, and choices for methods were elicited. The FGDs and IDIs were conducted until saturation was reached and audio recorded. One FGD was not recorded due to technical difficulties. Two research assistants who were fluent in both English and Luganda took detailed notes during discussions and interviews. Data was transcribed verbatim in English. The discussions and interviews were conducted in a private environment and transcripts did not bear participant names. Final transcripts were stored securely on password-protected laptops and external drives. To identify participants, we worked in collaboration with a resident community mobilizer and the Beach Management Unit (BMU) at the landing site. The BMU is an elected organized group of local leaders at any fishing community that represents the interests of the community.

**Data management and analysis**

Data generated from questionnaires was coded and edited before entry into Microsoft Access. Data was reviewed for completeness and accuracy before analysis was done. Data was double entered in Microsoft Access, cleaned, and exported to STATA 15.0 (StataCorp, College Station, TX, USA) for analysis. We resolved discrepancies by checking the source documents for clarification. We obtained frequencies and percentages of demographic data stratified by participant sex and area of residence. We used logistic regression to determine factors associated with satisfactory family planning knowledge. At unadjusted analysis, factors for which the association attained statistical significance on log likelihood ratio test (LRT) of p<0.10 were selected for the multivariable logistic regression model. Factors were retained in the final multivariable logistics regression model if their inclusion did not make the fit of the model significantly worse at the 5% level on a likelihood ratio test (LRT). Models were adjusted to eliminate potential confounders in reference from findings of other family planning studies.[32-35]
With regards to the qualitative data, the primary author read all transcripts and listed key statements that emerged, ideas, opinions and attitudes expressed. This helped to identify preliminary thematic categories which constituted the coding schedule. Data from each source were coded by the first author and discussed with the second and last author. Data was then coded according to generated themes and topics, merged and analysed using a thematic approach[36], with support of NVivo-12 qualitative software. Participant quotes from some FGDs and IDIs have been used to present findings.

Results
A total of 1,410 participated in the study, majority (1143; 81%) of whom were from Kigungu (Table 1). The mean age was higher in Nsazi than in Kigungu and in both sites males were older. Majority of the men in Kigungu (338; 58%) and in Nsazi (97; 82%) were engaging in fishing or a fishing related activity. A small number (62; 4%) of the participants were students residing in Kigungu, the majority (39; 63%) of whom were males. Half (706; 50%) of them had attained only up to primary level of education with very few (106; 7%) in both villages reaching the tertiary education level, and more males attaining that level in both villages. Most (1,043; 74%) of the participants stayed over twelve months in the community. Majority (1,157; 82%) of the participants reported being in a sexual relationship even though just over a half (810; 58%) of the participants were married. In both villages, more than half of the male participants, Kigungu (297; 51%) and Nsazi (81; 68%), reported having multiple sexual partners in the past 12 months. Nearly all the participants indicated the ideal number of children for a couple as four or fewer children (1134; 80%) and the ideal spacing interval as 2 or more years (136; 97%).

Almost all (1,333; 95%) the participants were able to list without prompting at least one method of family planning (Table 2). Nineteen (1%) and 292 (22%) of the participants who knew at least one family planning method had correct or satisfactory family planning knowledge respectively. The short acting reversible methods (pills, injectable methods, condoms) were the most commonly known family planning methods (98%). 75% of the participants knowledgeable about family planning were aware of long acting reversible methods (implants and IUD/coil) while 10% were aware of permanent methods (vasectomy and bilateral tubal ligation) and 21% were aware of natural or traditional
Factors associated with satisfactory family planning knowledge were age, employment status, level of education, area of residence, marital status, having multiple sexual partners in past 12 months and currently being in a relationship (Table 3). After adjustment, participants aged 30-39 were more likely to have satisfactory family planning knowledge compared to those aged 16-29 years (aOR: 1.59; 95% CI: 1.14-2.22). An occupation in trade/business (aOR: 3.14; 95% CI: 1.21-8.17), or as a house wife (aOR: 3.69; 95%CI: 1.35-10.1) were better correlates of satisfactory knowledge as being a farmer. Participants who resided in Nsazi (the island site) were more likely to have satisfactory family planning knowledge (aOR: 1.58; 95%CI: 1.09-2.30) compared to those in Kigungu. Participants were also more likely to have satisfactory family planning knowledge if they were married (aOR: 6.96; 95% CI: 3.42-14.13) or if they were divorced, separated or widowed (aOR: 17.67; 95% CI: 8.54-36.54) compared to those who were single.

**Findings from the qualitative aspect of the study**

Four FGDs (One of female and one of male minors aged 16-17 years, one of female and one of male adults aged 25-49 years) each comprised of 8-11 members and ten one-on-one IDIs from significant members of the community including a community advisory board member, religious leader, political/local council leader, Commercial Sex Worker, Traditional Birth Attendant, Village Health Team member and some study participants were conducted in a total of 47 individuals. Each discussion or interview lasted approximately one hour. We identified four themes relevant to knowledge of family planning: 1) General community understanding and awareness of family planning, 2) Beliefs and Attitudes towards family planning, 3) Known sources of information on family planning with their related challenges and 4) perceived reasons for or choices of preferred methods.

**General community understanding and awareness of family planning**

The first theme which emerged revealed that the community members generally understood the concept of family planning and that they were all aware of at least one family planning method. The Methods that were mentioned included pills, injectable methods such as Depo-Provera® or
injectaplan®, condoms, implants, intra-uterine device, vasectomy, bilateral tubal ligation, withdrawal, calendar method, breast feeding and abstinence. Although the awareness of family planning methods was high, participants didn’t seem to know much about how and for how long most methods work. While some appreciated that family planning was for both limiting the number of births and allowing a good spacing interval between births, there were others who thought family planning may affect future fertility or even induce permanent sterility. A male respondent in an in-depth interview said, “The understanding of family planning in this community is that it is used to completely stop one from getting children and yet it should really be for spacing births. Majority think that when you use family planning you stop giving birth because your eggs get damaged.”

Like what was observed in the survey, most of the community members were mostly aware of modern family planning methods like pills, injectable hormonal methods, implants, intra-uterine devices and condoms. There were participants who knew about both modern and natural or traditional methods of family planning. They however mentioned the complexity of using the natural or traditional methods which they said were not reliable. Many of the participants knew that condoms can prevent both pregnancy and sexually transmitted diseases and commented that condoms were popular. They however said that using condoms consistently was difficult especially for the men who think that condoms interfere with sexual satisfaction. A few know that condoms are the only family planning method for men. There are others who said condoms were difficult to use in a married setting resulting in mistrust and misunderstandings in the home. Some expressed concerns about limited knowledge on condom use among the youth saying that the youth may be stigmatised and shy away from getting the required family planning knowledge before engaging in sexual activities. Some participants didn’t know about the female condom and the few who knew about it neither knew how it works nor where it can be accessed if one wanted to use it.

Some of the knowledge community members had about family planning was inaccurate. Although many have heard about injectable methods for females, there are those who said that they heard that men too have injectable hormonal methods of family planning. Some said that vasectomy can make a man fail to get an erection or release sexual fluids.
Like the female condom, some modern family planning methods were either not known or not mentioned at all by the focus group or interview participants such as the diaphragm, spermicides, dermal patch and others. Some participants mentioned ineffective methods such as use of herbs and remains of an umbilical cord to prevent conception. One in-depth interview participant who is a Traditional birth attendant and a Community health worker or Village health team member said, “….I also know some herbs that one can use if they don’t want to use those other family planning methods I have listed”. The use of herbs was attributed to low levels of education by some participants who doubted their effectiveness. The use of remains of an umbilical cord was cited by some as a medically unproven family planning method.

**Beliefs and Attitudes towards family planning**

It was noted that people had divergent beliefs and attitudes towards family planning. Although some were supportive of FP, negative and incorrect beliefs still exist concerning effects of family planning on women’s reproductive health and health in general. We observed that some participants believed that family planning can lead to sterility, cancer of the uterus, abnormal uterine masses and foetal abnormalities or disability. A participant from a focus group of males aged 16-17 years said, “people fear to use a coil [IUD] because they think it can cause cancer or lead to barreness”. Because the menstrual cycle changes in some women who are using family planning, some participants believe that women who miss their periods, a side effect to some methods of FP, end up getting uterine masses.

Side effects of some family planning methods were pointed out such as weight gain or loss, menstrual irregularities or excessive prolonged bleeding, loss of sexual desire and reduced vaginal secretions. Some said that prolonged bleeding, loss of sexual desire and reduced vaginal secretions interfere with sexual activities which later result into family disputes. A participant in a focus group of male minors said, “Family planning is a long term issue which requires one to decide on what to do during the long periods of ‘no sex’ depending on the methods of choice used; some family planning methods make women lose their sexual desire. Some men cannot do without sex for a long time and that creates problems in the family.”
There are still some who report that family planning causes congenital abnormalities or abnormal features in those children born to mothers using family planning. Some do not trust information on family planning because they think health workers promote family planning for monetary gains. Most of the participants think that family planning should be used by women and youth. They attribute this to the shift in gender roles where women in fishing communities bear the burden of fending for the homes and children. The youth are thought to have very little information on FP and yet they are reported to be mobile and promiscuous. A female participant in an in-depth interview said, "The men here tend to have many women. So if you get many children, you as the woman will suffer because you will bear the burden of feeding them, treating them and taking them to school. Our husbands these days neglect their roles of being heads of families. The women do everything. Because women are left to do everything, they end up engaging in other sexual relationships to get money." Another female participant who is also a community health worker said, "Women are the ones who should use family planning because women these days have responsibilities like looking for food to feed the children, taking the children for treatment when they fall sick, buying clothes and paying school fees".

Others say that because of their vulnerability, family planning should be a woman’s responsibility. There are some community members who believed that family planning was for educated people and yet they were concerned about the few educated people in fishing communities.

Men’s awareness of family planning was thought to be low compared to that of the women and some report shame in attending FP sessions. One participant in an in-depth interview said, "It is only a small number of men who have attended family planning sensitisation meetings. “The men feel ashamed to go with their wives to family planning sessions, they know it is a ‘woman’s thing’. Because of this, most of the men do not know much about family planning issues.”

It was observed that both men’s attitudes and their work schedules may hinder them from attending sensitization meetings.

Known sources of information on family planning and related challenges

Community members get information on family planning from various sources, some of which are
formal and trusted while others are informal and doubted. The formal sources of information on family planning include; health facilities (both governmental and non-governmental), private clinics and media (print, audio and visual). Some of the informal sources include places of worship (churches and mosques), peers, schools, health outreach sessions and village meetings. Regarding sensitization by health workers, the issue of language barrier was one that was mentioned as a challenge to awareness. Because fishing communities attract job-seekers from across Uganda, there are those who are disadvantaged when they go to health centres where the staff only know English and the village’s local language.

A new trend of using social media as a source of family planning knowledge was cited although it was thought to be limited to those with smart phones and computers with internet. One participant from a focus group of male minors said, "...only updated youth get information about family planning from social media. The reason is not many people are educated enough to use social media or afford it but a few are there".

Traditional “Aunties” were also known to provide information on family planning even though they were thought to lack formal training. In the Ugandan context, a traditional “Auntie” is a woman (usually advanced in age) who counsels other women on family issues and is entrusted by community members to do so based on her past experience.

Village Health Team members (VHTs) were noted to be another source of information, especially to those who are unable to access health centres due to long distances or stigma. These VHTs, however, were often reported as insufficient sources of family planning information. They refer those who require information on long term or permanent methods to big health centres.

**Perceived reasons for preferred methods.**

In these communities, different factors were reported to inform FP method choice. Some members said that some health facilities or clinics sell specific family planning methods and attendees get these methods if they can afford them. A participant from a focus group of female minors said, “If you go to the government health centres, it’s assumed that the medicines or services are free, but at times the health workers demand for some money before the services are provided. So if you have no
money, you are denied the service”.

Others attributed choice of methods to their availability, known side effects of the methods, health worker skills and behaviour, invasiveness of the methods and preference of spouse. A participant from a focus group of female minors said, “Some preferred family planning methods are not readily available at the health centres, and usually the health centres stock methods known to be demanded by most clients, who use the services. A client may want a tubal ligation but health centres cannot do it. They end up referring the client who may not even go where they are referred because they don’t have money for transport.”

Discussion

This study assessed correlates of family planning knowledge among fishing communities with the aim of informing improvements in family planning interventions in preparation for future HIV prevention trials. We found that many people living or working in fishing communities are aware of the concept of family planning but only very few have accurate knowledge about family planning methods, their side effects and how the side effects can be appropriately managed.

In our study, we were able to enrol similar numbers of men and women; most of the females were engaged in trade or business while most of the men were engaged in fishing or fishing related activities. We also found that many participants were having sexual relationships with more than half of the men engaging in multiple sexual partnerships. These findings are similar to those from previous studies conducted in the same population[16,25,37]. This kind of life style with ready availability of cash makes the fisher folk prone to commercial sexual relations which makes it crucial for them to have adequate family planning knowledge in order to use it whenever it is required.

We found that most participants were aware of at least one modern or traditional/natural family planning method, which is similar to what has been documented in the general population[3] and in other neighbouring countries[11,12]. However, less than a quarter of participants demonstrated satisfactory knowledge as we defined it. As countries aim to achieve good health for all, there are global and national efforts to increase awareness of family planning. Uganda through the Ministry of Health has supported many sexual and reproductive health campaigns across the country. There are
also other initiatives that have committed to improvement of family planning uptake through creating awareness of family planning benefits across the country which might explain the high levels of awareness on family planning in the fishing communities[38].

Although half of the participants had attained up to primary level of education in both villages, our findings show that majority of the participants were cognisant of the ideal spacing interval and the ideal number of children for a couple. Similar findings on awareness of ideal spacing interval and family size have been previously documented in a study that evaluated the impact of contraceptive education on contraceptive knowledge and decision making[39]. However, despite a high awareness of these aspects, there remains a gap in knowledge of how family planning methods work, what the actual adverse effects are and to what extent these adverse effects impact health. Accurate knowledge on the adverse effects of family planning can dispel myths about FP and improve its uptake. Use of simple reading materials with information on various FP methods, can help people in fishing communities to easily make an informed choice when they decide to use family planning.

Because of the high infection rates of HIV and other sexually transmitted diseases in these communities[40–42], condom use is important for more than just FP. While the male condom was popularly known, participants only had scanty knowledge about the female condom. Findings also showed that participants lacked correct knowledge on how the female condom works. To some, it was a new method that they first heard about in the group discussions. If women in fishing communities are equipped with knowledge on how to use the female condoms, they would be more empowered to manage and control their fertility. Accurate knowledge on the female condom will enable them leverage their choices and actions.

A systematic review evaluating contraceptive education interventions showed that a range of educational interventions can increase knowledge[39]. People in fishing communities still believe that herbs and remains of an umbilical cord are also family planning methods. This is contrary to what has been found in another study on family planning knowledge in Uganda[22]. People from fishing communities may require additional FP training to equip them with correct knowledge and help dispel myths.
Traders or business people and housewives were more likely to have satisfactory knowledge as compared to farmers. Traders or business people tend to have access to large sums of money and they frequently move to different places which compels them to engage in sexual activities[28]. Likewise participants residing in Nsazi were more likely to have satisfactory family planning knowledge compared to those residing in Kigungu. This could be explained by the fact that most of the residents in Nsazi are traders or business people since it is an island. Due to their mobile nature, it is likely that traders get access to more information elsewhere which may not be readily available locally.

Married people and housewives were more likely to have satisfactory FP knowledge compared to the single and farmers. It is presumed that married people and housewives get access to family planning information when they go for antenatal care during pregnancy and child birth which might explain these findings. But since the single and farmers also engage in sexual partnerships, it may be worthwhile to improve their FP knowledge.

Although some scholars have found that literacy may impact family planning knowledge in more literate populations[32], our findings didn’t really show that education level was a correlate of satisfactory FP knowledge. Nevertheless, since majority of the participants have a low education status which has been evidenced from other studies in the same population[20,43], it might be worthwhile to design family planning sensitization materials that are easy to understand by the majority. We envisage that visual aids may be useful in enhancing understanding.

Our findings also showed that older participants (30-39 years) were more likely to have satisfactory knowledge compared to those who were younger (16-29 years), which other family planning studies have also documented[22,24,32]. Because of the desire by younger participants to start their families, they may not be keen to know about family planning unlike older participants who may already have their desired number of children. It is important that even the younger individuals in fishing communities get to know how to limit and space births even as they start their families for good health outcomes. Moreover, teenage pregnancies are common in these communities[16] resulting into illegal abortions and other reproductive complications which underpins the importance
for satisfactory family planning knowledge in this age group. Youth friendly corners which are responsive to FP needs of the youth will benefit youth in fishing communities. They should be tailored to provide youth friendly services so as to eliminate stigma which is attributed to using family planning services by the youth. The language used should be packaged in such a way that it can interest the youth to read the education materials.

From qualitative data, men in fishing communities tended to have no interest in family planning issues and their knowledge about family planning was low perhaps indicating that family planning programs are experiencing challenges with targeting men. This is similar to what was observed in another study that explored contraceptive knowledge, perceptions and concerns among men in Uganda[35]. In another study by Tilahum and others it was shown that some men tended to dominate when it came to deciding on family matters and yet they were reluctant to get information about family planning[34]. The lifestyle of most men in fishing communities is such that majority have multiple sexual partners and have ready access to money from fish sells. They establish homes when they move from one fishing community to another in search for fish. Also culturally, men tend to desire to have many children as has been observed in our study and in other studies on family planning[6] because many children are associated with prestige, masculinity and respect in society[44]. All these make them prone to engaging in sexual relations that sometimes result into unwanted pregnancies. Having satisfactory knowledge about family planning and knowing when and how to use it is very crucial for the men in fishing communities. The male dominancy in sexual activities makes it an important target group for information or education campaigns on FP, available methods and benefits.

Misconceptions about effects of family planning were very common and extensive among people in fishing communities. Participants indicated that family planning leads to sterility, cancers, abnormal uterine masses and abnormalities in children. Although some of these misconceptions have been reported in other studies[22,45,46] as well, there is really no proof that they are related to use of family planning.

There is a belief that family planning is only for the educated which is contrary to what has been
reported in other studies on family planning where family planning is known to be for all regardless of one's education status[22,47]. On the other hand, the effects of family planning such as excessive bleeding, menstrual irregularities, loss of sexual desire and weight changes were reported like in other studies[22,34,39,48] however, the participants had no knowledge of how these can be managed. This might explain the negative attitude towards family planning which highlights an important gap in family planning messaging that could be filled by a more robust family planning education program for this population.

Contrary to what has been observed elsewhere, some women in fishing communities are taking on men’s roles when it comes to family matters[33]. In fishing communities, majority of the men tend to be mobile as they move between fishing communities searching for fish, staying for long durations away from their official homes[43]. So some women end up taking on the role of fending for the family[19]. This puts a big financial burden on these women which leads them to access family planning information.

Our study showed that residents of fishing communities get family planning information from various sources which include but are not limited to trained health workers, Village Health team members, social media, Traditional Birth attendants (TBAs), posters, school, places of worship, radios including community radios, Television and Traditional aunties (Sengas). Although some of the sources may be authentic with reliable information, some of these sources are very unreliable as has been proven by other studies[39]. The quality and accuracy of information from VHTs, TBAs and traditional aunties is questionable because these are not formally trained to disseminate health information.

Fishing communities in Uganda are characterised by their limited health care and other social services[37,41,42,49,50]. BothNsazi and Kigungu have one government health facility at health centre II/III level which provide reliable family planning information. They have few health workers and even the few were reported not to be skilled enough to provide information on surgical family planning methods because they do not offer these services. The non-governmental health facilities or research organizations tend to offer reliable information but haphazardly because of their fixed work schedules. Unlike governmental health facilities that operate for longer hours and almost on a daily
basis, the non-governmental facilities operate only on week days for a specified duration which makes it difficult for community members to access health services at any time. Because of a limited number of health facilities in these communities, there is an urgent need for capacity building in form of reproductive health infrastructure and human resource. Government’s continued guidance and support in ensuring a sizeable skilled force in these remotely located settings will be invaluable as we aim for attainment of the third Sustainable Development Goal, particularly in the fishing communities.

Village Health Team members (VHTs) and Traditional Birth attendants (TBAs) have been used to bridge the gap in delivery of health services to remote settings, The World Health Organization (WHO) states that VHTs should be the members of the communities where they work, should be selected by the communities, should be answerable to the communities for their activities, should be supported by the health system but not necessarily a part of its organization and have shorter training than professional health workers.

In Uganda, a VHT member is a permanent resident of a particular community, assigned by government/non-government organization who provides promotive, preventive, limited curative care, rehabilitative, palliative and referral services in relation to maternal, neonatal, child and adolescent health, family planning, nutrition, communicable and non-communicable diseases to his/her community and is held accountable for the non-performance of these services[51].

VHTs are a powerful health work force that promote and extend the reach of health services to the people in Uganda and other countries. They are cost effective and constitute a critical mass of health work force, hence they have the potential to contribute more in addressing complex reproductive health issues like family planning in fishing communities. TBAs on the other hand, are locally based and mostly old women who deliver mothers outside a formal health care setting. These are usually not formally trained but their expertise is built on experiences and what they have been trained to do by older TBAs. It is important, to recognise that VHTs and TBAs are existing sources of family planning knowledge in the hard to reach fishing communities and that they should be empowered with adequate and accurate knowledge. Since TBAs get in contact with women at delivery, they can educate the pregnant women on spacing of next child or contraception needs. Because of the
prevailing inadequate human resource in terms of number and expertise in these communities, VHTs and TBAs can be considered as family planning provision partners of less complex methods. Mainstreaming them in formal health systems may be beneficial to the fishing communities with limited health care services. Quality assurance mechanisms for these bodies however, will be needed for better outcomes.

Strengths And Limitations
The study was conducted in two fishing communities selected for their size and location. We observed a difference in knowledge across communities, suggesting that our data might not be fully generalizable to other communities on the lake or elsewhere. To gain greater insight into knowledge of FP, we employed both quantitative and qualitative methods.

Conclusion
Family planning knowledge remains a fundamental issue in HIV prevention research as it is a determinant of Family planning use. From this study, we conclude that almost all people in fishing communities are aware of the concept of family planning with a wide range of methods mentioned. However, individual’s knowledge on different family planning methods is largely unsatisfactory. Some still believe in ineffective or not scientifically proven family planning methods while incorrect myths about side effects still exist. The correlates of satisfactory FP knowledge were found to be a, occupation, residence and marital status. To improve family planning knowledge in fishing communities, continuous comprehensive education is urgently needed. Without adequate family planning knowledge, the reproductive health of people living in fishing communities will be jeopardised and their participation in future HIV prevention research will be challenging.

Abbreviations
AIDS: Acquired Immunodeficiency Syndrome; BMU: Beach Management; CI: Confidence Interval; CSWs: Commercial Sex Workers; FP: Family Planning; FCs: Fishing Communities; FGD: Focus Group Discussion; HIV: Human Immunodeficiency Virus; IAVI: International AIDS Vaccine Initiative; IDI: In-depth interview; STI: Sexually Transmitted Infection; TBA: Traditional Birth attendant; US: United States; VHTs: Village Health Team members; WHO: World Health Organization

Declarations
Ethics approval and consent to participate

The study was approved by the Uganda Virus Research Institute- Research Ethics Committee (UVRI-REC, FWA number 00001354) and the Uganda National Council for Science and Technology (UNCST, FWA number 00001293). Permission to conduct the study, focus group discussions and in-depth interviews was also obtained from the local political leaders. Written consent was obtained from each participant prior to conducting any study procedures. Since all participants were aged 16 years and above, there was no written informed consent for participation in the study that was obtained from parents or guardians as is required where participants are children (under 16 years old). All participants were offered refreshments and reimbursed 5,000 Uganda shillings (approximately USD2) for transport, as is standard practice in similar research activities in Uganda.

Consent for publication

Not applicable.

Availability of data and Materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request. A full data set containing the data supporting the study findings in this article can also be obtained from the Program Data Manager, by email to: tnakaweesa@iavi.or.ug or information@iavi.or.ug.

Competing interests

The authors declare having no competing interests.

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Role of the funding source

IAVI contributed to study design, data interpretation, and review of the report. All other funders of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.
Author contributions

AN: Lead and corresponding author was the Principal Investigator; contributed to application for funding, design of the study, made administrative arrangements for the study, data management, wrote the initial draft, carried out statistical analysis and contributed to interpretation of the data. BK: Contributed to study coordination, reviewed the manuscript drafts and interpretation of the data. FM and SN: Contributed to study coordination, data collection, reviewed the manuscript drafts. GO: Contributed to data collection, reviewed the manuscript drafts. TN and JSK: Contributed to data management, interpretation of the data and reviewed the manuscript drafts. JN: Reviewed the manuscript drafts. OK: Contributed to statistical analysis, reviewed the manuscript drafts and interpreted the data. RKW and JPG: Contributed to supervision of the study activities, interpretation of the data and review of the manuscript drafts. JM, KC and MAP: Contributed to interpretation of the data and review of the manuscript drafts. All authors read and approved the final manuscript.

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**Tables**

**Table 1:** Socio-demographic profile of the participants in the cross sectional survey stratified by village and gender.

| Characteristic | Village and Sex Distributions n (%) |  |  |
|----------------|-------------------------------------|---|------------------|
|                | Total (N=1410)                      | Kigungu (n=1143) | Nsazi (n=267) |
|                | Male(9) Femal(64)                   | Male(9) Femal(48) |
| Mean Age(±sd)  | 27.5(7.2)                           | 28.4(7.6)       | 25.8(6.3) |
|                |                                    | 1               | 6.8          | 0.00       |
|                |                                    | 1               | 6.8          | <0.00      |
| Age group (Years) |                                    | 911(5) | 342(9) | 417(7) | 62(11) |
|                |                                    | 397(8) | 183(2) | 125(2) | 41(34) |
|                |                                    | 102(7) | 54(9)  | 22(4)  | 10(7)  |
| Age group (Years) |                                    | 0.01 | 0.11 | 0.03 | 0.4 |
| Tribe          |                                    | 631(4) | 266(6) | 246(4) | 41(5) |
|                |                                    | 129(9) | 61(11) |       | 17(14) |
|                |                                    | 96(7)  | 26(4)  | 45(8)  | 8(5) |
|                |                                    | 31(2)  | 9(2)   | 15(3)  | 4(3) |
|                |                                    | 123(9) | 61(11) |       | 10(7) |
| Occupation     |                                    | 400(2) | 164(2) | 155(2) | 39(3) |
|                |                                    | 8(8)   | 7(8)   |       | 42(28)|

| Occupation     | 0.00 |
|                | 0.01 |
|                | 0.01 |
|                | 0.01 |
|                | 0.01 |
|                | 0.01 |
|                | 0.01 |
|                | 0.01 |

- **Tribe**
  - Muganda
  - Munyankole
  - Musoga
  - Mukiga
  - Munyarwanda
  - Other▲

- **Occupation**
  - Farming
  - Fishing/Fishing related
  - Trade/business
  - Housewife
  - Student

- **P-value**
  - <0.00
  - <0.01
  - <0.02
  - <0.03
  - <0.04
  - <0.05

- **P-value**
  - <0.00
  - <0.01
  - <0.02
  - <0.03
  - <0.04
  - <0.05
|                          |     |     |     |     |     |     |
|--------------------------|-----|-----|-----|-----|-----|-----|
|                          | 2007| 2011| 2017| 2019| 8(7)|     |
| Otherβ                   | 30  | 5   | 2   |     |     |     |
|                          |     |     |     |     |     |     |
| Religion                 |     |     |     |     |     |     |
| Catholic                 | 590(4) | 246(4) | 232(4) | 40(33) | 72(48) |     |
| Protestant/Anglican      | 339(2) | 133(2) | 132(2) | 39(33) | 35(24) |     |
| Muslim                   | 238(1) | 108(1) | 74(13) | 25(21) | 31(21) |     |
| Other*                   | 243(1) | 92(16) | 126(2) | 15(13) |     | 10(7) |
| Highest Education level  | 0.002 | 0.11 | 0.001 | 0.002 | 0.80 |     |
| No formal education      | 82(6) | 33(6) | 37(7) | 3(2) | 9(6) |     |
| Primary level            | 706(5) | 277(4) | 277(4) | 65(55) | 87(59) |     |
| Secondary level          | 516(3) | 200(3) | 219(3) | 46(39) | 51(34) |     |
| Tertiary level           | 106(7) | 69(12) | 31(5) | 5(4) |     |     |
| Marital status           | <0.00 | 0.00 | <0.01 | 0.00 | 0.00 | <0.01 |
| Single                   | 343(2) | 188(3) | 113(2) | 28(24) |     |     |
| Married                  | 810(5) | 319(5) | 333(5) | 71(60) | 87(59) |     |
| Divorced/ Separated/ Widowed | 257(1) | 72(12) | 118(2) | 20(16) | 47(32) |     |
| Duration of stay         |     |     |     |     |     |     |
| < 12 Months              | 367(2) | 114(2) | 152(2) | 46(39) | 55(37) | 0.80 | <0.01 |
| ≥ 12 Months              | 1043(7) | 465(8) | 412(7) | 73(61) | 93(63) | 3 | 0.01 |
| Duration of stay         |     |     |     |     |     |     |
| Having multiple sexual partners in past 12 months |     |     |     |     |     |     |
| No(< 2 partners)         | 876(6) | 282(4) | 444(7) | 38(32) | 112(7) |     |
| Yes(≥ 2 partners)        | 534(3) | 297(5) | 120(2) | 81(68) | 36(24) | 0.01 | 0.06 |
| Ideal Number of children for a couple |     |     |     |     |     |     |
| Said ≤4 Children         | 1134(8) | 451(7) | 484(8) | 82(69) | 117(7) | 0.05 | 0.00 |
| Said >4 Children         | 276(2) | 128(2) | 80(14) | 37(31) | 31(21) | 9 | 7 |

Are you currently in a sexual relationship?
Table 2: Family Planning Knowledge (FPK) Classification

| Characteristic                      | Total (N=1410) | Kigungu (N=1143) | Nsazi (N=267) |
|-------------------------------------|----------------|------------------|---------------|
|                                    | (n, %)         | (n, %)           | (n, %)        |
| Aware of at least one FP method     | 1333(95)       | 1086(95)         | 247(93)       |
| Correct FP Knowledge*               | 19(1)          | 19(2)            | 0(0)          |
| Satisfactory FP Knowledge▲         | 292(22)        | 219(19)          | 73(27)        |
| Type of method known               | Total (N=1333) | Kigungu (N=1086) | Nsazi (N=247) |
| Short acting reversible methods     | 1304(98)       | 1064(98)         | 240(97)       |
| Long acting reversible method       | 997(75)        | 795(73)          | 202(82)       |
| Permanent methods                   | 131(10)        | 117(11)          | 14(6)         |
| Natural/ traditional Methods        | 285(21)        | 268(26)          | 17(7)         |

*Correct knowledge (having a ≥50% score of correct knowledge of family planning methods and their side effects), ▲satisfactory knowledge (attributed to a score of ≥80% from the five parameters)

Table 3: Correlates of Satisfactory Knowledge of Family planning in fishing communities of L. Victoria, Uganda

|                          | Total (N=1410) | Satisfactory Knowledge (N=292) |
|--------------------------|----------------|---------------------------------|
| col %                    | row %          | uOR                             | P- valu |
| 31                       | 31             | 31                              | 31      |
| Characteristic                  | n (%) | n (%) | 95%CI | value | aOR 95%CI | e |
|--------------------------------|-------|-------|-------|-------|-----------|---|
| **Age group (Years)**          |       |       |       |       |           |   |
| 16-29                          | 911(65) | 164(18) | Ref 1 | <0.00 | Ref 1.59(1.14-2.22) 0.07 |
| 30-39                          | 397(28) | 114(29) | -2.42 | 0.72(0.40-0.64) 0.33-0.1 |
| 40+                            | 102(7)  | 14(14)  | -1.31 | 1.25(1.25-1.25) 93 |
| **Tribe**                      |       |       |       | 0.718 |           |   |
| Muganda                        | 631(45) | 140(22) | Ref  | 0.88(0.55-0.92) 0.54 |
| Munyankole                     | 129(9)  | 26(20)  | -1.42 | 0.92(0.54-1.22) 0.53 |
| Musoga                         | 96(7)   | 20(21)  | -1.56 | 1.22(0.53-1.42) 0.44 |
| Mukiga                         | 31(2)   | 8(26)   | -2.79 | 0.72(0.44-1.42) 0.44 |
| Munyarwanda                    | 123(9)  | 21(17)  | -1.20 | 0.84(0.61-1.23) 0.61 |
| Other▲                         | 400(28) | 77(19)  | -1.14 | 1.41(0.53-0.76) 0.36 |
| **Occupation**                 |       |       |       | <0.00 |           |   |
| Farming                        | 36(3)  | 6(17)  | Ref  | 0.33(0.13-0.30) 0.11 |
| Fishing/Fishing related        | 514(3) | 32(6)  | -0.86 | 0.30(0.11-0.81) 18 |
| Trade/business                 | 370(2) | 137(37)| -7.24 | 4.84(1.88-3.69) 1.35 |
| House wife                     | 124(9) | 61(49) | -12.5 | 4.84(1.88-3.69) 1.35 |
| Otherβ                         | 366(2) | 56(15) | -2.27 | 1.41(0.53-0.76) 0.36 |
| **Highest Education level**   |       |       |       | <0.00 |           |   |
| No formal education            | 82(6)  | 27(33) | Ref  | 0.64(0.39-0.77) 0.43 |
| Primary level                  | 706(5) | 168(24)| -1.04 | 1.37(1.37-1.37) 69 |
| Secondary level                | 516(3) | 90(17) | -0.72 | 0.95(0.95-0.95) 32 |
| Tertiary level                 | 106(7) | 7(7)   | -0.35 | 0.72(0.72-0.72) 09 |
| **Religion**                   |       |       |       | 0.592 |           |   |
| Catholic                       | 590(4) | 131(22)| Ref  | 0.90(0.65-0.90) 0.65 |
| Protestant/Anglican            | 339(2) | 69(20) | -1.24 | 0.52(0.28-0.52) 0.28 |
| Muslim                         | 238(1) | 43(18) | -1.13 | 0.88(0.61-0.88) 0.61 |
| Other*                         | 243(1) | 49(20) | -1.28 | 0.88(0.61-0.88) 0.61 |
| Residence   | 1143(81)  | 219(19) | Ref | Ref | 1.59(1.17) | 1.58(1.09-2.30) | 0.004 |
|-------------|-----------|---------|-----|-----|------------|----------------|-------|
| Kigungu     | 267(19)   | 73(27)  | -2.16|     |            |                 |       |
|             |           |         |     |     |            |                 | <0.00 |
| Nsazi       |           |         |     |     |            |                 |       |
| Marital status| 342(24)  | 10(3)   | Ref | Ref | <0.001    |                 |       |
| Single      | 810(58)   | 193(24) | -20.0|     | 14.13(1)  |                 |       |
| Married     | 8(4)      | 257(18)|     |     | 17.6(8.94)| 17.67(8.54)    | <0.00 |
| Divorced/Separated/Widowed | 8(4)     | 89(35)  | -34.8|     | 36.54(2)  |                 |       |
| Duration of stay| 0.547    |         |     |     |            |                 |       |
| < 12 Months | 367(24)   | 72(20)  | Ref |     | 1.10(0.81)|                 |       |
| ≥ 12 Months | 1043(58)  | 220(21)| -1.47|     |            |                 |       |
| Having multiple sexual partners in past 12 months| <0.00 | 1 |  |  |  |  |  |
| No(< 2 partners) | 876(62)   | 222(25)| Ref | Ref | <0.001    |                 |       |
| Yes(≥ 2 partners) | 534(38)   | 70(13) | 0.44(0.33)|     | 0.41(0.29) |                 |       |
| Are you currently in a sexual relationship?| 0.004 | |  |  |  |  |  |
| No | 253(18)  | 36(14)  | Ref | Ref | 1.71(1.17)| 1.68(0.96-2.96)| 0.00  |
| Yes | 1157(82) | 256(22)| -2.50|     | 2.96(1)  |                 |       |

N=1410, uOR: Unadjusted odds ratio, aOR: Adjusted odds ratio; CI: Confidence interval, ▲
(Mugisu, Itesot, Non-Ugandan), β (Sex worker, Teacher, Security personnel and others), *
(Pentecostal/ Born again, Traditional African, No religion) uOR: unadjusted (univariate) odds ratio, aOR: Adjusted (multivariable analysis) odds ratio