

## **Abortion and its correlates among female fisher-folk along Lake Victoria in Uganda**

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## **Abstract**

### **Introduction**

In Uganda, people living in fishing communities tend to engage in high-risk sexual activity which leads to un-intended pregnancies that may end in abortions. Abortion has negative social, psychological and medical impacts. We determined frequency of abortion and its correlates among female fisher-folk along Lake Victoria in Uganda.

### **Methods**

A cross-sectional survey was conducted among women aged 15– 49 years from Kigungu and Nsazi fishing communities. Data were collected on socio-demographic characteristics, abortion and family planning use. Associations between abortion and participant characteristics were assessed using logistic regression models.

### **Results**

Of the 713 women interviewed, 36, 5% were pregnant and 247, 34.6 % were using contraception. Majority (600, 84.2%) of those interviewed reported ever being pregnant. Approximately 45% of the pregnancies were un-intended while a third of those who had ever been pregnant (195, 32.5%) reported having aborted before. Slightly over a third (247, 34.6%) reported currently using or ever using family planning. Women aged 30+ years were more likely to abort compared to those aged 15-29 years (aOR: 2.7; 95% CI: 1.23-5.91). Women who had living children were less likely to abort compared to those who didn't have any living child (aOR: 0.06; 95% CI: 0.01 – 0.17).

## **Conclusion**

The rate of abortion among female fisher-folk in Uganda is substantial. Family planning use is still low and un-intended pregnancies are common. Abortion risk increased with age of mother. Continuous behavioral change communication and optimization of family planning use for all women in their reproductive age are recommended to reduce abortions.

**Key words:** Abortion, Un-intended pregnancies, Family planning, fishing communities.

## **Introduction**

Abortion is one of the main contributors to the high maternal mortality in Uganda. An abortion rate of 39 per 1,000 women aged 15–49 years was reported in 2013 in Uganda representing approximately 314,300 abortions[1]. The Ugandan abortion rate was slightly higher than the estimated rate for the East African region at 34 per 1,000 women between 2010-2014[1]. This points to a critical need for strengthening the sexual and reproductive health systems and services in Uganda. In 2013, approximately 128,682 women were treated for abortion complications up from 110,000 in 2003 [2]. The injuries and illness resulting from unsafe abortion place a huge health care burden and remain a critical challenge for the Ugandan healthcare system which is already burdened with other morbidities.

Abortion in Uganda and many other countries in Africa is illegal unless performed by a licensed medical doctor in a situation where the woman's life is deemed to be at risk [3–7]. The 2012 Uganda national policy guidelines and service standards for sexual and reproductive health and rights permitted abortion under specific circumstances, including in cases of fetal anomaly, rape and incest[8]. Inconsistencies in the interpretation of the laws and policies on abortion by the law enforcement and the judicial system has led to uncertainties for women and the medical personnel to know when abortion is acceptable [9] and medical personnel are often reluctant to perform an abortion for any reason because of fear of the legal implications. Therefore, many abortions are self-induced and often conducted privately under unsafe conditions. Moreover, the stigma surrounding induced abortion makes it difficult for women to

report, making unsafe induced abortions hard to measure. Under-reporting abortion leads to missed mitigation opportunities[10].

In most low income countries, in addition to the illegality surrounding abortion, there is also lack of skilled medical personnel which leads many women who wish to terminate their pregnancies to seek services of unskilled medical personnel [5]. The risk of illness and death tends to be high when abortions are performed by unskilled personnel [11–13]. Unsafe abortion contributes to maternal morbidity and mortality even though it is preventable[14]. It is estimated that 128,682 women were treated for abortion complications in 2013 in Uganda[2]. Family planning use remains one of the cost effective public health intervention for preventing un-intended pregnancies[15]. Ugandan women experiencing abortions often report that their pregnancies are un-intended or undesired indicating an unmet need for family planning[16].

People living in fishing communities of Uganda are engaged in high sexual activity with multiple sexual partnerships even when their family planning use is low [17], predisposing them to un-intended pregnancies. These fishing communities are also characterized by limited access to healthcare services with few trained medical personnel[18,19]. This puts them at an increased risk of unsafe abortions and insufficient post abortion care which pose health risks and associated healthcare costs[20]. Measurement of abortion rates and associated factors in the hard to reach settings such as the fishing communities is essential in informing reproductive policies and programs that suit such unique settings. However, data on abortion rates in fishing communities are still few and the associated factors are not clearly understood. We set

out to determine the rate of abortion and its correlates among female fisher-folk along Lake Victoria in Uganda.

## **Methods**

### **Study design and Eligibility criteria**

Across-sectional survey was conducted in Kigungu landing site and Nsazi Island to establish baseline level of knowledge and family planning use[21,22]. Abortion and pregnancy history were assessed during the survey. The study communities were purposively selected based on their location (proximity to research center) and size (among the fishing communities on Lake Victoria, with >1,000 households). The sample size was determined using 1786 households that were on a household list which was previously generated during census of the fishing communities[23]. From the original list, 1452 eligible households were contacted. The study included females, resident for at least 6 months, aged 15 to 49 years, who consented to participate in the study.

### **Study population and setting**

Kigungu landing site is found in Entebbe Municipality, along the shores of Lake Victoria, Africa's biggest lake. It is situated in Wakiso District, approximately 37 kilometers (23 miles) from Kampala (Uganda's capital) and approximately 45 minutes' drive from the study clinic in Entebbe. It has a population of approximately 30,000 people. Kigungu has one health center III facility which runs a general outpatient clinic and a maternity ward. It provides basic preventive, curative and promotive care including a few family planning services. Residents normally go to Entebbe regional referral hospital which is approximately 30 minutes' drive from Kigungu landing site to seek for more

comprehensive health services. Nsazi Island is located in Mukono district. It's comprised of 7 square miles of land with a population ranging from 2,000 to 8,000 people depending on fish seasonality. Nsazi has one Health center II facility which runs an out-patient clinic, treats a few minor illnesses, and offers antenatal care and community outreach services.

Availability of family planning in both fishing communities is haphazard and limited to a few methods including male condoms, oral contraceptive pills and Depo provera or injectaplan. Periodically, non-governmental organizations offer long acting reversible methods including implants and Intra-uterine devices through outreach services. Permanent methods including vasectomy and bilateral tubal ligation are offered at the Entebbe regional referral hospital. The main economic activities in both communities include fishing and fishing related activities (jobs that support the fishing industry e.g. fish processing, drying and selling of fish), trading in other non-fish related commodities including commercial sex work, farming and other commercial activities.

### **Community mobilization**

The study was first presented to community leaders for their permission to conduct the study and support in mobilizing participants. Thereafter, members in both communities were informed of the study through community sensitization seminars. Participants were invited by the community mobilization team to study clinics based in their communities where more study information was provided, and data collected.

### **Key measurements**

The main outcome variable was self-reported history of ever having an abortion which was measured as a binary (Yes/No) variable. Abortion was defined as deliberate termination of a pregnancy. Participants were asked if they had ever been pregnant and if they had ever had an abortion. They were further asked if they had wanted to become pregnant then and if they currently wanted to become pregnant. Independent variables included social demographic characteristics, sexual behavior characteristics, family planning use and other reproductive health factors.

### **Data collection and quality control**

Semi-structured questionnaires were used to collect data using a team of 5 trained staff who had a scientific and research background. The study team was trained prior to commencement of the study on how to complete the study questionnaire. To ensure the quality and integrity of the data, the study questionnaires were pre-tested and piloted in a non-study site before the study was conducted. At the end of each day, verification of the data for completeness, accuracy and consistency was done.

### **Data management and analysis**

Data generated from questionnaires was reviewed before entry was done. Double data entry was done for validation purposes before analysis. Data was exported to STATA 15.0 software (StataCorp, College Station, TX, USA) for analysis. At univariate analysis, data were summarized into meaningful descriptive statistics such as means, medians or frequencies and appropriate proportions to present categorical variables. Independent variables were cross tabulated with the primary outcome variable to determine clinically relevant and/or statistically significant associations existed. Chi square tests and their



respective p-values were obtained to assess for the associations using  $p=0.05$  as a cut-off point for statistical significance. At multivariable level, logistic regression models were run to estimate the Adjusted Odds Ratios (AORs) and the 95% CIs of factors associated with abortion. Models were adjusted for potential confounders noted from findings of other studies such as social economic status, parity and from statistically significant ( $p<0.05$ ) covariates identified in bivariate analyses[24,25].

### **Ethical consideration**

The study was approved by the Uganda Virus Research Institute-Research Ethics Committee (UVRI-REC, GC/127/16/10/572) and the Uganda National Council for Science and Technology (UNCST, SS 4183). Written informed consent was obtained from all participants prior to conducting any study procedures. Pregnant women were referred for antenatal care.

## Results

**Table 1: Socio-demographic characteristics of the participants stratified by study site**

|                                | <b>Total</b> | <b>Kigungu</b> | <b>Nsazi</b>  | <b>P-value</b> |
|--------------------------------|--------------|----------------|---------------|----------------|
| <b>All Participants</b>        | N=713        | n=564 (79.1%)  | n=149 (20.9%) |                |
|                                |              | n (col %)      | n (col %)     |                |
| <b>Age (years)</b>             |              |                |               |                |
| Mean (SD)                      | 26.2(6.5)    |                |               |                |
| 15-29                          | 508 (71.2)   | 417 (73.9)     | 91 (61.1)     | 0.01           |
| 30-39                          | 173 (24.3)   | 125 (22.2)     | 48 (32.2)     |                |
| 40 +                           | 32 (4.5)     | 22 (3.9)       | 10 (6.7)      |                |
| <b>Tribe</b>                   |              |                |               |                |
| Non-Muganda                    | 389 (54.6)   | 318 (56.4)     | 71 (47.7)     | 0.06           |
| Muganda                        | 324 (45.4)   | 246 (43.6)     | 78 (52.3)     |                |
| <b>Occupation</b>              |              |                |               |                |
| No Job                         | 98 (13.7)    | 84 (14.9)      | 14 (9.4)      | <0.001         |
| Trade/Business                 | 340 (47.7)   | 278 (49.3)     | 62 (41.6)     |                |
| Fishing/Fish-related           | 80 (11.2)    | 42 (7.5)       | 38 (25.5)     |                |
| Housewife                      | 124 (17.4)   | 92 (16.3)      | 32 (21.5)     |                |
| Others                         | 71 (10.0)    | 68 (12.1)      | 3 (2.0)       |                |
| <b>Religion</b>                |              |                |               |                |
| Catholic                       | 304 (42.6)   | 232 (41.1)     | 72 (48.3)     | <0.001         |
| Protestant/ Anglican           | 167 (23.4)   | 132 (23.4)     | 35 (23.5)     |                |
| Muslim                         | 106 (14.9)   | 74 (13.1)      | 32 (21.5)     |                |
| Other                          | 136 (19.1)   | 126 (22.3)     | 10 (6.7)      |                |
| <b>Highest Education level</b> |              |                |               |                |
| Up to Primary level            | 411 (57.6)   | 314 (55.7)     | 97 (65.1)     | 0.04           |
| Post- Primary                  | 302 (42.4)   | 250 (44.3)     | 52 (34.9)     |                |
| <b>Marital status</b>          |              |                |               |                |
| Married                        | 420 (58.9)   | 333 (59)       | 87 (58.4)     | 0.89           |
| Not-Married                    | 293 (41.1)   | 231 (41)       | 62 (41.6)     |                |

From the original 1786 eligible households, we contacted 1452 to interview 713 females. Majority (564; 79%) of the participants were from Kigungu as shown in Table 1. For both communities, majority of the participants were aged 15-29 years (73.9% and 61.1% respectively) with women from Nsazi being older. Three hundred and forty women representing 47.7% of all the participants were engaging in trade or business which tends to be disguised commercial sex work. More than half of the women in both villages had attained up to primary level of education with Nsazi having the higher percentage of these. More than half of the participants in both villages reported being married. Many participant characteristics differed significantly by study community (Table 1).

**Table 2: Reproductive health outcomes of the participants stratified by study site**

|   | <b>Total (N=713)</b> | <b>Kigungu (n=564)</b> | <b>Nsazi (n=149)</b> | <b>P-value</b> |
|---|----------------------|------------------------|----------------------|----------------|
|   | <b>n (%)</b>         | <b>n (col %)</b>       | <b>n (col %)</b>     |                |
| <b>Ever been pregnant?</b>                        |                      |                        |                      |                |
| Yes   | 600 (84.2)           | 463 (82.1)             | 137 (92)             | 0.003          |
| No  | 113 (15.9)           | 101 (17.9)             | 12 (8)               |                |
| <b>Ever had an abortion before?</b>               |                      |                        |                      |                |
| Yes   | 195 (32.5)           | 144 (31.1)             | 51 (37.2)            | 0.18           |
| No  | 405 (67.5)           | 319 (68.9)             | 86 (62.8)            |                |
| <b>Wanted to become pregnant then</b>             |                      |                        |                      |                |
| Yes, right time                                   | 329 (54.8)           | 254 (54.9)             | 75 (54.7)            | <0.001         |
| Yes, but later                                    | 104 (17.3)           | 65 (14)                | 39 (28.5)            |                |
| Not at all  | 167 (27.8)           | 144 (31.1)             | 23 (16.8)            |                |
| <b>Currently want to become pregnant</b>          |                      |                        |                      |                |
| Yes, I want to become pregnant                    | 275 (45.8)           | 198 (42.8)             | 77 (56.2)            | 0.02           |
| I have mixed feelings about becoming pregnant +88 | 179 (29.8)           | 146 (31.5)             | 33 (24.1)            |                |
| I do not want to become pregnant                  | 146 (24.3)           | 119 (25.7)             | 27 (19.7)            |                |
| <b>Were you in school at time of pregnancy?</b>   |                      |                        |                      |                |
| No  | 399 (66.5)           | 303 (65.4)             | 96 (70.1)            | 0.34           |
| Yes   | 201 (33.5)           | 160 (34.6)             | 41 (29.9)            |                |
| <b>Aware of family planning</b>                   |                      |                        |                      |                |
| Yes   | 700 (98.2)           | 553 (98)               | 147 (98.7)           | 0.62           |
| No  | 13 (1.8)             | 11 (2)                 | 2 (1.3)              |                |
| <b>Use of a family planning method</b>            |                      |                        |                      |                |
| Yes   | 247 (34.6)           | 194 (34.4)             | 53 (35.6)            | 0.79           |
| No  | 466 (65.4)           | 370 (65.6)             | 96 (64.4)            |                |
| <b>Number of children living</b>                  |                      |                        |                      |                |
| No children                                       | 138 (19.4)           | 121 (21.5)             | 17 (11.4)            | <0.001         |
| One child   | 175 (24.5)           | 151 (26.8)             | 24 (16.1)            |                |
| Two children                                      | 141 (19.8)           | 106 (18.8)             | 35 (23.5)            |                |
| More than Two                                     | 259 (36.3)           | 186 (32.9)             | 73 (49)              |                |
| <b>Have children with current Sexual Partner</b>  |                      |                        |                      |                |
| No  | 285 (47.4)           | 211 (45.6)             | 74 (54)              | 0.08           |
| Yes   | 315 (52.6)           | 252 (54.4)             | 63 (46)              |                |

In this study, majority of the women (600; 84.2%) reported ever being pregnant with nearly everyone (137; 92%) from Nsazi reporting ever being pregnant (Table 2). A total of 195 women (32.5%) of all those who reported ever being pregnant reported that they had ever had an abortion. Although more than a half (329; 54.8%) of the women interviewed wanted to have children at the time of pregnancy, a few wanted to have children later (104; 17.3%) or not at all (167; 27.8%). It was also observed that slightly over a third (201; 33.5%) of the women got pregnant while in school. Almost everyone (700; 98.2%) knew about modern family planning methods that include condoms, pills, injectable hormones, Intra-uterine devices and implants. However, just over a third (247; 34.6%) of the women were using family planning. Majority of the women (575; 80.6%) reported having at least one living child with more than half of them (315; 52.6%) having children with their current sexual partners.

**Table 3: Abortion and its correlates among female fisher-folk along Lake Victoria in Uganda**

| Characteristics                       | Abortion<br>195 (27.3%) | Crude Odds Ratios (OR) &<br>95% CI |               |         | Adjusted Odds Ratios (AOR)<br>& 95%CI |           |         |
|---------------------------------------|-------------------------|------------------------------------|---------------|---------|---------------------------------------|-----------|---------|
|                                       |                         | OR                                 | 95% CI        | P-value | AOR                                   | 95% CI    | P-value |
| <b>Age (years)</b>                    |                         |                                    |               |         |                                       |           |         |
| 15-29                                 | 113(28.3)               | 1(Ref)                             |               |         |                                       |           |         |
| 30-39                                 | 65 (38.7)               | 1.60                               | 1.10-2.34     | 0.025   | 1.65                                  | 1.05-2.59 | 0.028   |
| 40+                                   | 17(53.1)                | 2.88                               | 1.39-5.96     | 0.015   | 2.70                                  | 1.23-5.91 | 0.013   |
| <b>Tribe</b>                          |                         |                                    |               |         |                                       |           |         |
| Non-Muganda                           | 100 (31%)               | 1 (Ref)                            |               |         |                                       |           |         |
| Muganda                               | 95 (34%)                | 1.15                               | (0.82 - 1.62) | 0.42    |                                       |           |         |
| <b>Occupation</b>                     |                         |                                    |               |         |                                       |           |         |
| No Job                                | 22 (28.2%)              | 1 (Ref)                            |               |         |                                       |           |         |
| Trade/Business                        | 33 (44%)                | 1.20                               | (0.69 - 2.09) | 0.52    |                                       |           |         |
| Fishing/Fish-related                  | 33 (71.7%)              | 2.00                               | (1.02 - 3.91) | 0.04    |                                       |           |         |
| Housewife                             | 33 (28%)                | 0.99                               | (0.52 - 1.87) | 0.97    |                                       |           |         |
| Others                                | 15 (5.3%)               | 1.41                               | (0.63 - 3.15) | 0.39    |                                       |           |         |
| <b>Religion</b>                       |                         |                                    |               |         |                                       |           |         |
| Protestant/ Anglican                  | 41 (28.9%)              | 1 (Ref)                            |               |         |                                       |           |         |
| Catholic                              | 90 (33.3%)              | 1.23                               | (0.79 - 1.92) | 0.36    |                                       |           |         |
| Muslim                                | 31 (33.7%)              | 1.25                               | (0.71 - 2.20) | 0.44    |                                       |           |         |
| Other                                 | 33 (34.4%)              | 1.29                               | (1.74 - 2.25) | 0.37    |                                       |           |         |
| <b>Highest Education level</b>        |                         |                                    |               |         |                                       |           |         |
| Post Primary                          | 78 (33.6%)              | 1 (Ref)                            |               |         |                                       |           |         |
| Up to Primary level                   | 117 (31.8%)             | 0.92                               | (0.65 - 1.31) | 0.64    |                                       |           |         |
| <b>Marital status</b>                 |                         |                                    |               |         |                                       |           |         |
| Married                               | 122 (31.6%)             | 1 (Ref)                            |               |         |                                       |           |         |
| Not-married                           | 73 (34.1%)              | 1.12                               | (0.79 - 1.59) | 0.53    |                                       |           |         |
| <b>Community</b>                      |                         |                                    |               |         |                                       |           |         |
| Nsazi                                 | 51 (37.2%)              | 1 (Ref)                            |               |         |                                       |           |         |
| Kigungu                               | 144 (31.1%)             | 1.31                               | (0.88 - 1.96) | 0.18    |                                       |           |         |
| <b>Wanted to become pregnant then</b> |                         |                                    |               |         |                                       |           |         |

|  |             |         |               |        |      |               |        |
|--|-------------|---------|---------------|--------|------|---------------|--------|
| Yes, right time                                  | 101 (30.7%) | 1 (Ref) |               |        |      |               |        |
| Yes, but later                                   | 34 (32.7%)  | 1.10    | (0.68 - 1.76) | 0.70   |      |               |        |
| Not at all                                       | 60 (75.9%)  | 1.27    | (0.85 - 1.88) | 0.24   |      |               |        |
| <b>Currently want to become pregnant</b>         |             |         |               |        |      |               |        |
| Yes, I want to become pregnant                   | 82 (29.8%)  | 1 (Ref) |               |        |      |               |        |
| I have mixed feelings about becoming pregnant    | 59 (64.8%)  | 1.16    | (0.77 - 1.73) | 0.48   |      |               |        |
| I do not want to become pregnant                 | 54 (36.7%)  | 1.38    | (0.90 - 2.11) | 0.14   |      |               |        |
| <b>Were you in school at time of pregnancy?</b>  |             |         |               |        |      |               |        |
| No   | 128 (32%)   | 1 (Ref) |               |        |      |               |        |
| Yes  | 67 (33.5%)  | 1.06    | (0.74 - 1.52) | 0.76   |      |               |        |
| <b>Aware of family planning</b>                  |             |         |               |        |      |               |        |
| Yes  | 193 (32.5%) | 1 (Ref) |               |        |      |               |        |
| No   | 2 (28.6%)   | 0.83    | (0.16 - 4.31) | 0.82   |      |               |        |
| <b>Use of a family planning method</b>           |             |         |               |        |      |               |        |
| Yes  | 68 (29.7%)  | 1 (Ref) |               |        |      |               |        |
| No   | 127 (34.2%) | 1.23    | (0.86 - 1.76) | 0.24   |      |               |        |
| <b>Number of children living</b>                 |             |         |               |        |      |               |        |
| No children                                      | 21 (67.7%)  | 1 (Ref) |               |        |      |               |        |
| One child  | 35 (19.6%)  | 0.05    | (0.02 - 0.15) | <0.001 | 0.06 | (0.01 - 0.17) | <0.001 |
| Two children                                     | 46 (30.5%)  | 0.09    | (0.03 - 0.28) | <0.001 | 0.09 | (0.03 - 0.31) | <0.001 |
| More than Two                                    | 93 (38.9%)  | 0.11    | (0.04 - 0.32) | <0.001 | 0.10 | (0.03 - 0.31) | <0.001 |
| <b>Have children with current sexual partner</b> |             |         |               |        |      |               |        |
| No   | 109 (38.2%) | 1 (Ref) |               |        |      |               |        |
| Yes  | 86 (27.3%)  | 0.61    | (0.43 - 0.86) | 0.004  | 0.72 | (0.49 - 1.04) | 0.08   |

After adjustment, women aged 30+ years were more likely to have reported an abortion compared to those aged 15-29 years (ages 30-39: aOR: 1.65; 95% CI: 1.05-2.59 and ages 40+: aOR: 2.7; 95% CI: 1.23-5.91). Women who had living children were less likely to abort than those who didn't have any living child (one living child; aOR: 0.06; 95% CI: 0.01 – 0.17, more than one living child; aOR: 0.09; 95% CI: 0.03 -0.31). Although not statistically significant after adjustment, women who had children with their current sexual partners were less likely to abort. Occupation, education level and religion were not statistically significantly associated with abortion.



## Discussion

This study aimed at establishing the rate of abortion and its correlates among female fisher-folk along Lake Victoria in Uganda. The rate of abortion was found to be relatively high compared to that in the general population[2]. This could be explained by the high sexual activity and low condom use in fishing communities which leads to many unintended pregnancies. In the current study, almost half of the women who had previously conceived, alluded to wrong timing implying that their pregnancies were unintended. While many unintended pregnancies end in live births, the likelihood of abortions as a result of unintended pregnancies is high. From this study, almost two thirds of the abortions occurred among women with unintended pregnancies. Social and economic challenges are some of the reasons why women with unintended pregnancies abort[26,27] . Women in fishing communities tend to experience an early sexual debut which exposes them to pregnancies early in life before they are economically able to manage them[28,29]. So, many of these pregnancies will most likely end in abortion.

The prevalence of abortion was strongly related to the level of education of the respondents elsewhere with prevalence increasing with increasing levels of education[30]. Our findings were not consistent with these findings. Because majority of the study participants had low education levels with very few studying beyond primary level, it is possible that this precluded positive associations of abortion with education.

Many fishing communities lack adequate schools and as such people in these communities may not have the opportunity to have 'sex education', putting them at risk to prematurely engage in unprotected sexual activities [22]. While some women in these

communities may intend to avoid pregnancy, many end up failing due to lack of knowledge on safe behavior and birth control [31–33].

In Uganda generally, according to recent UNICEF findings, 40% of girls are coerced into marriage with much older men before the age of 18 years and 10% marry before their 15<sup>th</sup> birthday[34]. Some families will marry off their daughters at a young age to receive a dowry or bride price which is a monetary gift from the groom's family[35]. Although child marriages were not specifically assessed in the current study, this practice may put young women and adolescent girls at risk for pregnancy earlier than they perhaps may have otherwise anticipated. There remains an urgent need to introduce sex education even among those who do not get formal education to ensure good health and wellbeing of all women living in fishing communities.

Another explanation for the high abortion rates could be the lack of access of family planning services. It was observed that there were a few available family planning methods or options in the fishing communities. Unmet need for modern family planning, that is, the number of women who want to avoid a pregnancy, but are either not practicing contraception or are using a less effective traditional method[35] remains a big challenge in Africa. In Uganda, 40% married women and almost half of sexually active women of reproductive age have an unmet need and unsatisfied demand for family planning[36]. Previously published work from this study has reported that unmet need for family planning is even higher in fishing communities due to various socio-medical, cultural and structural barriers[22]. This makes women fisher-folk prone to unintended pregnancies and sexually transmitted infections (STIs) such as HIV[37].

Meeting the female fisher-folk's contraceptive needs could be a critical strategy to avoiding un-intended pregnancies and controlling the spread of STIs.

Essential health care is limited and skilled personnel are few in most remote areas in Uganda. Therefore, morbidity due to various disease conditions including unsafe abortion is prevalent in Uganda[38]. Fishing communities may be experiencing higher rates of morbidity due to unsafe abortion because of their inadequate health facilities and lack of enough skilled medical personnel. High levels of abortion morbidity have serious consequences not only on the health and life of women, but also on their finances, their children's health and wellbeing[39–41]. Expanding and improving the quality of post abortion care services to treat the often serious health complications resulting from unsafe abortion remains critical. Infrastructural upgrade and deployment of skilled medical personnel in such remote areas may be helpful in reducing maternal morbidity or mortality that may result from unsafe abortions. NGO services reduce the economic burden women may face as extra costs are incurred when they move from their primary resident communities to go to the referral hospitals to access family planning services. It might be worthwhile to make the outreach services that are offered by NGOs more frequent to ensure a constant supply of family planning methods.

In this study, abortions were more likely to occur among older women compared to the younger ones. This is contrary to findings from other studies where younger girls were more likely to abort compared to older women[42–44]. Our findings though show a similar trend with findings from general population cohort, between 1996 and 2013, where women aged 15-49 years were interviewed on their pregnancy outcome in the past 12 months[45] . In this study, abortion risk increased with age of mother. As

previously reported, women in fishing communities tend to have an early sexual debut which exposes them to a long reproductive window. So, they tend to have many children or big family sizes as they grow older. These big family sizes eventually become economically and socially demanding. Some women are involved in multiple sexual partnerships and may end up getting children from different men which may be undesirable. At times, they may not be able to tell the responsible father when they conceive, so such pregnancies end in abortion[46]. Also because they have already proved their fertility, they may find it easier to make a decision to abort which may not be the case for younger women who have no children or those that are just starting a family.

The high HIV infection rates among women in fishing communities may be another contributing factor[18,47]. There is a concern of HIV transmission to her child for an HIV infected woman. Though we did not collect HIV test data in this study, or ask about how HIV may figure into pregnancy decisions, the risk of transmission and challenges of raising a child with HIV may certainly weigh on some women when deciding about pregnancy. It may be helpful to encourage all pregnant women to attend antenatal care services for early detection of HIV and prevention of mother to child transmission of HIV. This could allay fears of delivering HIV infected children and reduce the number of HIV infected women that may resort to abortion.

Our study also showed that women who had living children were less likely to abort compared to those who didn't have any living child. This is contrary to findings from other studies where having children was significantly associated with abortion[48,49]. In these studies, the desire to stop or postpone childbearing and economic constraints

were thought to explain high rates of abortion among multiparous women. In Uganda, data shows that adolescent and young adults are more at risk of un-intended pregnancies[16] and most of them abort out of fear of getting children they are not ready to raise. Adolescents are unlikely to use a contraceptive the first time they have sex and are more likely than older women to experience a contraceptive failure[50].

Lastly, law enforcement against abortion in Uganda is still weak. Because of this, termination of a pregnancy through abortion becomes easy to implement[1]. It will be necessary to strengthen the enforcement of laws against abortion across the country. It's also important to clarify Uganda's abortion laws and policies and raise awareness of the content among the medical community, the judicial system and women across the country. That way, the medical personnel and pregnant women will know when it is acceptable to conduct an abortion and thereby reduce self-induced unsterile abortions that tend to be fatal. Additionally, to promote safe motherhood in this and other similar settings, sensitization on the dangers of abortion should be emphasized.

## **Conclusion**

Abortion among female fisher-folk is high and un-intended pregnancies are common. Moreover, the proportion using family planning is still low. Continuous behavioral change communication and sex education are inevitable for all women in their reproductive age because of the high sexual activity in this population. To lower the incidence of un-intended pregnancy and potential subsequent abortions in this community, family planning use needs to be optimized. Continuous supply of family planning services in fishing communities should be made possible to reduce the unmet need for family planning. A wide range of contraceptive methods should be available to

enable women choose the best methods for themselves and to switch methods when desired. In addition, the ministry of health should allocate more resources to sexual and reproductive health services while prioritizing marginalized areas with abstract reproductive health services. Introduction of youth-friendly family planning services could improve family planning knowledge and use among the youth where unprotected sex seems to be common. It is also necessary to address the reproductive health needs of the elderly fisher-folk and increase their awareness's about the dangers of abortion while enabling them achieve their desired fertility.

### **Study limitations**

Being a cross sectional study design, casual inference is limited. Also, since the study relied on the participants' self-report, there could have been potential for recall bias about the history related to abortion. Non-response and concealment of sensitive information as would be expected from questions about one's sexual practices (particularly illegal ones) was a concern that we attempted to address with a larger study sample size. The research team was also trained on how to ask sensitive questions as best as possible. We attempted to control for potential confounders of known factors in the multivariable analysis, however it was clear that many factors varied by study community, and we may not have captured data on all confounders. To adequately assess perceptions about self-induced abortions and attitudes towards abortions, further research involving qualitative data collection methods is recommended.

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