Factors associated with use of long-acting reversible contraception among female sex workers operating in Gulu district, Northern Uganda – a cross-sectional study

Simple Ouma (✉ oumas@tasouganda.org)

Department of Research, The AIDS Support Organization (TASO)

Nazarius Mbona Tumwesigye

Department of Epidemiology and Biostatistics, School of Public Health, College of Health Sciences, Makerere University

Catherine Abbo

Department of Psychiatry, School of Medicine, College of Health Sciences, Makerere University

Rawlance Ndejjo

Department of Disease Control and Environmental Health, School of Public Health, College of Health Sciences, Makerere University

Research Article

Keywords: Long-acting reversible contraception (LARC), female sex workers, prevalence, Gulu district, Northern Uganda

Posted Date: February 25th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-275872/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Long-acting reversible contraception (LARC) are the most effective and reliable contraceptives for female sex workers (FSWs) and require periodic users' involvement only at the time of application or re-application. However, information on LARC use among FSWs in Uganda is scarce. To fill this gap, we determined the prevalence of LARC use among FSWs and examined factors associated with LARC use among FSWs operating in Gulu district, Northern Uganda.

Methods: Across-sectional study was conducted among 300 FSWs aged 18 years and above and operating in Gulu district. Semi-structured questionnaires were used to measure factors associated with the use of LARC: intrauterine device (IUD), Implants, and injectables. Data analyses were conducted using STATA 14.0 and restricted to 280 non-gravid adult FSWs aged 18-49 years who were not on permanent contraception method. To examine factors associated with LARC use, prevalence ratios (PR) with robust standard errors were computed using Poisson regression.

Results: Among the participants, the mean age (SD, range) was 26.5 (5.9, 18 - 45) years, 53.2% never married, 66.1% reported consistent condom use independent of LARC, 58.9% had unintended pregnancy during a lifetime, 48.6% had at least one unintended pregnancy during sex work, and 37.4% had at least one induced abortion. The prevalence of LARC use was 58.6%; the majority were using Implants (48.2%), followed by injectables (42.7%), and IUDs (9.1%). Independent factors associated with LARC use included: longer duration of sex work [$\geq$ two years] (adjusted PR=1.44, 95% CI: 1.03-2.02), higher parity [$\geq$ two] (adjusted PR=1.13, 95% CI: 1.02-1.26), history of unintended pregnancy during sex work (adjusted PR=1.24 CI: 1.01-1.51), and being a brothel/lodge-based FSWs (adjusted PR=1.28, 95% CI: 1.01-1.63).

Conclusions: There is a big gap in LARC use with only 58.6% of FSWs using LARC. LARC use was associated with longer duration of sex work, higher parity, history of sex work-related unintended pregnancy, and being a brothel/lodge-based FSW. Therefore, interventions to improve LARC use should intensively target the newly recruited FSWs, FSWs with low parity, and FSWs not based in brothels or lodges.

Background

In 2019, 218 million women of reproductive age in low- and middle-income countries (LMICs) had an unmet need for modern contraception (1). Almost half (49%) of all the pregnancies among women in LMICs were unintended resulting in several negative impacts on maternal and child health (1). A meta-analysis indicates minority groups like female sex workers (FSWs) are at greater risk of unmet need for contraception and unintended pregnancy due to a high frequency of intercourse, the high number of sexual partners, and the high level of stigmatization from the community and health care workers (2). Furthermore, the incidence of unintended pregnancy among FSWs in LMICs is as high as 27.1 per 100 person-years (2). This is due to the low uptake of reproductive health services like the long-acting reversible contraception (LARC) among FSWs in the LMICs (3).

In Uganda, there is sub-optimal uptake of LARC [Injectables (20.7%), Implants (6.0%), and intrauterine device (IUD) (1.1%)] among women of reproductive age (4). FSWs who desire future pregnancy should be provided with LARC but factors affecting utilising LARC among FSWs in the country remain understudied. Nevertheless, the high unmet need for modern contraception (39.0%) among women of reproductive age in Gulu district (4) is an indication that the family planning indicators may be worse among FSWs in the region. Moreover, FSWs in Uganda were noted to have high rates of unplanned pregnancies (5–8) and post-abortion complications (8–10). These further suggest a big gap in LARC use among FSWs and threaten future fertility of FSWs who still desire to have children (11).

Majority of the key population programs in LMICs target HIV services with little attention and resources accorded to the sexual reproductive health of FSWs (12–15). Subsequently, HIV preventive packages like condoms have seen a drastic improvement in availability and coverage. Condom use protects against both sexually transmitted infections and unintended pregnancies. However, because of its relatively lower effectiveness, inconsistent use, and breakage, condom use alone does not provide complete protection against unintended pregnancies among the FSWs (13–19). On the other hand, LARC are well known to be effective, completely reversible, more cost-effective to other reversible methods and extremely reliable methods of contraception especially for FSWs since they all require users' involvement only periodically at the time of application or re-application (20–24).

Despite the many circumferential evidence of suboptimal use of LARC among FSWs in Uganda, not much is known about factors that may influence the use of LARC in this population, especially among FSWs operating in Gulu district. Closing this gap is very crucial for improving LARC uptake (25) in order to prevent unplanned pregnancies among FSWs that may results in unsafe abortion and its complication. The current study aimed at determining factors associated with LARC use among FSWs in the Gulu district in order to generate evidence needed by the ministry of health and development partners to inform appropriate interventions to promote LARC use among FSWs.

Methods

The aim, design, and setting of the study

The aim of this study was to determine the prevalence of LARC use among FSWs and examined factors associated with LARC use among FSWs operating in Gulu district, Northern Uganda. To achieved the study, aim, we conducted a cross-sectional study among non-gravid adult FSWs of reproductive age (18-49 years) who were operating in Gulu district, Northern Uganda. Gulu district is located in Northern Uganda. More than 80% of the inhabitants of Gulu districts are low-income earners who practice subsistence farming (26). The district has an estimated 1425 FSWs (27) living and working mainly within Gulu municipality. Unpublished program data showed that more than 1300 fully mapped-out FSWs receive HIV treatment or HIV preventive services from TASO Gulu.

Sample size and sampling

Cross-sectional data were collected among 300 FSWs between March and June 2020 and data analysis was restricted to 280 FSWs of reproductive age (18-49 years) who were not pregnant and not on permanent contraception [bilateral tubal ligation (BTL)] at the time of the survey. The sample size was determined using the Cochran [1963,1975] (28) formula as part of a project that studied depression among FSWs in Gulu district and presented elsewhere (29). Study participants were randomly selected from an updated database of FSWs at TASO Gulu.

Data collection

Data was collected on socio-demographic characteristics, sex work-related characteristics, obstetric history, utilization of modern contraceptives, HIV status, and condom use through face-to-face interviews using a pre-tested semi-structured questionnaire. The questionnaire was developed in English language and translated into Acholi language, the predominant local language in Gulu. The first author and a trained female research assistant collected data in either Acholi or English language guided by the participant's literacy level and preference.

Data management and statistical analysis

Data were entered and cleaned using EPI INFO 7 and exported to STATA 14.0 for analysis. Univariate results were reported using frequencies with corresponding proportions or means with standard deviations (SD) as appropriate. To examine the associations between LARC use and independent variables, prevalence ratios (PR) were obtained using bivariate and multivariable Poisson regression with robust variances as the outcome variable was highly prevalent (>10%) since odds ratios tend to overestimate the effect size in such instances (30,31). Results were presented using unadjusted and adjusted PR respectively along with their corresponding 95% confidence intervals (CI) and *p*-values. From bivariate analyses, statistically significant independent variables ($p < 0.05$) were checked for multicollinearity using Pearson correlation (*r*) analysis and variables were considered multicollinear if $r \geq 0.4$. Finally, all the eligible variables were included in the multivariable analysis with a stepwise backward elimination technique until a final “best fit” model was derived. Finally, predictors from both bivariate and multivariate analyses whose CI did not include the null value (1.0) were considered statistically significant.

Results

Socio-demographic, obstetric, and sex work-related characteristics of participants

Among the 380 selected participants, 302 were successfully traced, 300 consented, 280 were considered at the analysis stage since 20 participants were ineligible for final analyses: 17 were pregnant, two were on permanent contraception using BTL, and one was menopausal. The mean age of the participants was (SD, range) 26.5 ($\pm$ 5.9, 18–45) years, more than two-thirds (67.9%) were below 30 years of age, 60.7% had primary or no education, almost one-third (31.6%) of the participants had an average monthly income within the first income quartile (<\$28), 53.2% never married, 92.6% had at least one previous pregnancy,

and 48.9% had at least one unintended pregnancy during sex work, 95.4% used condoms during their last sexual encounters, but only two-thirds (66.1%) reported using condoms consistently (Table 1).

Table 1: Demographic and reproductive health characteristics of the participants

Characteristic	Number (N.)	Percentage (%)
Age (in completed years)		
<30	190	67.9
≥30	90	32.1
Education Level		
≤Primary education	170	60.7
>Primary education	110	39.3
Marital Status		
Never married	149	53.2
Cohabiting/Married	36	12.9
Divorced	75	26.8
Widowed	20	7.1
Parity		
0-1	120	42.9
2+	160	57.1
History of unintended pregnancy during sex work		
No	144	51.4
Yes	136	48.6
Had at least one unintended pregnancy in her lifetime		
No	115	41.1
Yes	165	58.9
Had at least one induced abortion		
No	176	63.1
Yes	103	36.9
Had post-abortion care		
No	233	83.2
Yes	47	16.8
Duration as a sex worker (completed years)		
≤1	57	20.4
2+	223	79.6
Average monthly income (£)		
1 st Quartile (< 28)	88	31.6
2 nd Quartile (28- 54)	74	26.5
3 rd Quartile (55- 95)	52	18.6
4 th Quartile (> 95)	65	23.3
Used condoms consistently		
No	95	33.9
Yes	185	66.1
Work from lodges/brothel		
No	91	32.5
Yes	189	67.5
Raped during sex work		
No	221	78.9
Yes	59	21.1
HIV-positive		
No	164	58.8

LARC use among FSWs in Gulu district

Fifty-eight-point six percent (58.6%) of the study participants were using LARC. The most commonly LARC method used by the study participants was the Implants (48.2%) and IUD (9.1%) was the least commonly used LARC (*Figure 1*).

Factors associated with LARC use among FSWs in Gulu district

Results from bivariate analyses revealed that several factors had significant positive associations with LARC use. These factors were older age ($p = 0.048$), higher parity [$\geq$ two] ($p = 0.001$), being married/cohabiting ($p = 0.021$), history of induced abortions ($p = 0.011$), history of post-abortion care ($p < 0.001$), history of lifetime unplanned pregnancy ($p = 0.002$), history of unplanned pregnancy during sex work ($p = 0.003$), longer duration (≥ 2 years) of sex work ($p < 0.001$), higher monthly income falling within 4th quartile ($p = 0.044$), mobile sex work ($p = 0.023$), living with HIV ($p = 0.027$), and being a brothel/lodge-based sex work ($p = 0.004$).

At multivariable level, independent factors associated with LARC use among FSWs in Gulu district were: longer duration of sex work [$\geq$ two years] (adjusted PR = 1.44, 95% CI: 1.03–2.02), higher parity [$\geq$ two] (adjusted PR = 1.13, 95% CI: 1.02–1.26), history of unintended pregnancy during sex work (adjusted PR = 1.24 CI: 1.01–1.51), and being a brothel/lodge-based sex worker (adjusted PR = 1.28, 95% CI: 1.01–1.63) (Table 2).

Table 2
Factors associated with the LARC use among FSWs in Gulu district

Factor	Use contraception		Unadjusted PR	Adjusted PR
	Yes	No	(95%CI)	(95%CI)
	N (%)	N (%)	Bivariate Model	Multivariable Model
Age (years)				
< 30	104(54.7)	86(45.3)	1.00	–
≥ 30	60(66.7)	30(33.3)	1.22(1.002–1.48) *	–
Marital status				
Single	80(53.7)	69(46.3)	1.00	–
Married/cohabiting	26(72.2)	10(27.8)	1.35(1.05–1.73) *	–
Divorced	48(64.0)	27(36.6)	1.19(0.95–1.49)	–
Widow	10(50.0)	10(50.0)	0.93(0.59–1.48)	–
Parity				
0–1	64(53.3)	56(46.7)	1.00	1.00
2+	52(32.5)	108(67.5)	1.45(1.16–1.80) **	1.13(1.02–1.26) *
Ever had at least one induced abortion				
No	93(52.8)	83(47.2)	1.00	–
Yes	70(68.0)	33(32.0)	1.29(1.06–1.56) *	–
Had post-abortion care				
No	127(54.5)	106(45.5)	1.00	–
Yes	37(78.7)	10(21.3)	1.44(1.19–1.75) ***	–
Ever had one or more unintended pregnancies				
No	54(47.0.2)	61(53.0)	1.00	–
Yes	110(66.7)	55(33.3)	1.42(1.14–1.77) **	–

Factor	Use contraception		Unadjusted PR	Adjusted PR
	Yes No		(95%CI)	(95%CI)
	N (%)	N (%)	Bivariate Model	Multivariable Model
Unintended pregnancy during sex work				
No	72(50.0)	72(50.0)	1.00	1.00
Yes	92(67.7)	44(32.3)	1.35(1.11–1.65) **	1.24(1.01–1.51) *
Duration of sex work				
≤ 1 year	22(38.6)	35(61.4)	1.00	1.00
2 + years	142(63.7)	81(36.3)	1.65(1.17–2.32) **	1.44(1.03–2.02) *
Average monthly income				
Lower quartile	44(50.0)	44(50.0)	1.00	–
2nd quartile	42(56.8)	32(43.2)	1.14(0.85–1.52)	–
3rd quartile	34(65.4)	18(34.6)	1.31(0.98–1.74)	–
Upper quartile	43(66.1)	22(33.9)	1.32(1.01–1.74) *	–
Nature of sex work				
Urban only	69(51.9)	64(48.1)	1.00	–
Rural only	10(55.6)	8(44.4)	1.07(0.69–1.67)	–
Mobile	85(65.9)	44(34.1)	1.27(1.03–1.56) **	–
HIV-status				
HIV-Negative	87(53.0)	77(47.0)	1.00	–
HIV-Positive	76(66.1)	39(33.9)	1.25(1.03–1.51) *	–
Lodges/Brothels-based				
No	41(45.0)	50(55.0)	1.00	–
Yes	123(65.1)	66(34.9)	1.44(1.12–1.86) **	1.28(1.01–1.63) *

Factor	Use contraception		Unadjusted PR	Adjusted PR
	Yes	No	(95%CI)	(95%CI)
	N (%)	N (%)	Bivariate Model	Multivariable Model
* = p < 0.05, ** = p < 0.01, *** = p < 0.001				

It should be noted that older age, marital status, history of induced abortions, and lifetime history of unplanned pregnancy showed significant associations with LARC use at bivariate levels but lost statistical significances at multivariable. This is because both age ($r = 0.44$) and marital status ($r = 0.42$) were moderately correlated with parity. Meanwhile, history of induced abortions ($r = 0.60$) and lifetime history of unplanned pregnancy ($r = 0.78$) showed moderate-to-strong correlation with history of unplanned pregnancy during sex work.

Discussion

This study examined the use of LARC among FSWs in Gulu, a district in Northern Uganda. Less than two-thirds (58.6%) of FSWs were using LARC. Among the LARC users, the majority were either on Implants (48.2%) or injectables (42.7%) and only (9.1%) were on IUDs. Independent factors associated with utilization of LARC included: longer duration of sex work ($\geq$ two years), and higher parity ($\geq$ two), history of unintended pregnancy during sex work, and being a brothel/lodge-based sex worker.

In this current study, the prevalence of LARC stood at 58.6%. Compared to the current study, higher proportion of FSWs were found to be using LARC in Zambia [66.6%], Kenya [64.6%], and Ethiopia [69.2%] (32–34). The current level of use of LARC is sub-optimal yet only two-thirds of FSWs were consistently using condoms. Many women in this region avoid using LARC because of their desire to have medium to large numbers of children (35). Therefore, many FSWs tend to depend on condoms even though literature showed that within just one month, nearly half (47.5%) of FSWs experience condom failure (36) which exposes them to the risk of unintended pregnancy in case they were not on the more reliable and effective LARC. Among the users of LARC, the majority were on Implant (48.2%) and injectables (42.7%). This is in agreement with the trend in the utilisation of LARC among general population of women of reproductive age in Northern Uganda whereby Injectables and Implants were also found to be the commonest LARC methods (35).

Secondly, LARC use was 28% higher among brothel-/lodge-based FSWs compared to their counterparts who were not brothel/lodge-based. Previous HIV prevention programs targeting commercial sex workers in developing countries showed that FSWs in brothels/lodges were more likely to use LARC due to the high level of organization and easier access to health care services (37). Besides, participants who had worked longer as a sex worker (two or more years) had a 44% increase in the utilization of modern contraceptives compared to their counterparts who had been a sex worker for periods of less than two

years. This finding is however contrary to observations in China and Russia indicating that longer duration of sex work did not affect the use of LARC (16,17). Whereas access to modern contraceptives is not limited in China and Russia, in Northern Uganda, access to modern contraceptives is a challenge especially for the new FSWs who also tend to be younger in age and thus face parental and societal restriction from accessing family planning methods. In fact, in this study, we found that those who had had two or more children had a higher prevalence of LARC use. Chinese and Russian FSWs could have a higher level of LARC awareness, better attitude towards LARC use, and desire of smaller numbers of children like the one child policy in China which could explain the lack of effect of sex work duration on LARC use.

We also found that LARC use was associated with a history of unintended pregnancy. This could further explain the higher use among older women. Those who had ever had unintended pregnancy during sex work were 24% more likely to use LARC compared to their colleagues who never experience unwanted pregnancy during sex work. Further analysis revealed that FSWs who experienced unintended pregnancy during sex work were more likely to terminate their pregnancies ($p < 0.001$). A similar observation was made elsewhere (10). FSWs with unintended pregnancy during sex work and terminated their pregnancies are more likely to use LARC (16). The increased likelihood of LARC use among FSWs with induced abortion is because women who ever had induced abortion may use LARC to avoid the previous bad experience of pregnancy (38,39).

Lastly, FSWs with higher parity [$\geq$ two] had a significant increase (22%) in LARC use compared to their counterparts who had one or no previous pregnancy. Similar findings where lower parity negatively affected LARC use were reported among FSWs in Swaziland (13), India (40), and Tanzania (41). Besides, majority of women (93.4%) in Northern Uganda desire three or more children (35). Therefore, this desire to give birth to more children among the nulliparous and low parity FSWs, made them less likely to use LARC compared to their high parity counterparts. This highlights the need for further sensitization and improvement in the ease of access to LARC, especially among the newer and nulliparous FSWs.

Strengths and limitations of this study

This study provides the evidence needed by health care systems to strengthen family planning policies and practices that would increase the accessibility and uptake of LARC among FSWs. Likewise, unlike most previous studies on FSWs that used non-probability sampling methods, we utilised a simple random sampling technique to select our participants providing more generalizable findings for this group of FSWs and those from similar settings.

The study was cross-sectional and only elicited associations but not causations between LARC use and the various factors investigated. Also, the information collected may have been influenced by recall bias since we asked FSWs about to recall their personal experience. However, most of the information asked were for events within two weeks prior to data collection and thus the possibility for recall bias was reduced. Besides, we collected some sensitive information relating to sex work that might have been difficult to answer and could have resulted in information bias. However, the participants had friendly

interview experience with the PI and the female research assistant who had developed close working relationships with the FSWs while providing HIV care, treatment and prevention services to the FSWs in region. Therefore, chances of information bias were greatly reduced

Conclusions

There is a considerable gap in the use of LARC since only less than six in ten FSWs were using LARC. LARC use was associated with: longer duration of sex work, higher parity, history of sex work-related unintended pregnancy, and being a brothel/lodge-based FSW. Therefore, interventions to improve LARC use should intensively target the younger or newly recruited FSWs while the FSWs who do not work in organized places like brothels and lodges.

Abbreviations

CI: Confidence Interval, FSWs: Female Sex Workers, HIV: Human Immunodeficiency Virus, LARC: Long-Acting Reversible Contraception, LMICs: Low- and middle- income countries, PR: Prevalence Ratio, SD: Standard Deviation, TASO: The AIDS Support Organization.

Declarations

Ethics approval and consent to participate

We obtained ethical clearance for this study from the Makerere University School of Public Health Higher Degrees, Research, and Ethics Committee. Each participant provided written informed consent. We maintained participants' privacy and confidentiality throughout the different processes of participant's enrollment into the study and data collection and analysis.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request to oumasimple@gmail.com.

Competing interests

The authors declare that they have no competing interests.

Funding

None.

Author contributions

SO, conceived and designed the study, collected and entered data, conducted data analysis, interpreted the findings, and wrote the first draft of the manuscript. NMT, AC, and RN conceived the study, supported data analysis, interpretation of results, and critically reviewed the draft manuscript. All authors read and approved the final manuscript for publication.

Acknowledgments

We acknowledge Prof. Christopher Garimoi Orach, Prof. Fred Nuwaha, and Assoc. Prof. Noah Kiwanuka from Makerere University School of Public Health for their insightful contributions to our study designs. We acknowledge The AIDS Support Organization (TASO)- TASO Gulu for access to their up-to-date database of FSWs in Gulu district. We acknowledge Ms. Ajwang Brenda for her role as a research assistant for this study. We acknowledge the study participants and the peers of FSWs whose ideas and expertise informed the design and conduct of this study.

References

1. Elizabeth A. Sully, Biddlecom A, Jacqueline E. Darroch TR, Ashford LS, Naomi Lince-Deroche LF, Murro R. Adding it up: Investing in sexual and reproductive health 2019, New York: Guttmacher Institute, 2020, [https:// www.guttmacher.org/report/adding-it-up- investing-in-sexual-reproductive-health-2019](https://www.guttmacher.org/report/adding-it-up-investing-in-sexual-reproductive-health-2019). 2020.
2. Ampt FH, Willenberg L, Agius PA, Chersich M, Luchters S, Lim MSC. Incidence of unintended pregnancy among female sex workers in low- income and middle-income countries: a systematic review and meta-analysis. *BMJ Open*. 2018;8(e021779):1–18.
3. Lafort Y, Greener R, Roy A, Greener L, Ombidi W, Lessitala F, et al. Sexual and reproductive health services utilization by female sex workers is context-specific: results from a cross-sectional survey in India, Kenya, Mozambique and South Africa. *Reprod Health*. 2017;14(1):1–10.
4. Uganda Bureau of Statistics Kampala, Uganda and The DHS program ICF Rockville, Maryland U. Uganda Demographic and Health Survey 2016. 2018.
5. Bukenya JN, Wanyenze RK, Barrett G, Hall J, Makumbi F, Guwatudde D. Contraceptive use, prevalence and predictors of pregnancy planning among female sex workers in Uganda: A cross sectional study. *BMC Pregnancy Childbirth*. 2019;19(1):1–11.
6. Duff P, Muzaaya G, Muldoon K, Dobrer S, Akello M, Birungi J, et al. High rates of Unintended Pregnancies among Young Women Sex Workers in Conflict-affected Northern Uganda: The Social Contexts of Brothels / Lodges and Substance Use. *Africa J Reprod Heal*. 2017;21(2):64–72.
7. Erickson M, Goldenberg SM, Ajok M, Muldoon KA, Muzaaya G, Shannon K. Structural determinants of dual contraceptive use among female sex workers in Gulu, northern Uganda. *Int J Gynecol Obstet*. 2015 Oct 1;131(1):91–5.

8. Hladik W, Baughman AL, Serwadda D, Tappero JW, Kwezi R, Nakato ND, et al. Burden and characteristics of HIV infection among female sex workers in Kampala, Uganda - A respondent-driven sampling survey. *BMC Public Health*. 2017;17(1):1–12.
9. Delvaux T, Crabbé F, Seng S, Laga M. The need for family planning and safe abortion services among women sex workers seeking STI care in Cambodia. *Reprod Health Matters*. 2003;11(21):88–95.
10. Schwartz S, Papworth E, Thiam-Niangoin M, Abo K, Drame F, Diouf D, et al. An urgent need for integration of family planning services into HIV care: The high burden of unplanned pregnancy, termination of pregnancy, and limited contraception use among female sex workers in Côte d'Ivoire. *J Acquir Immune Defic Syndr*. 2015;68:S91–8.
11. Yam EA, Sultana N, Hossain T, Zieman B, Roy S, Yasmin R, et al. Reproductive health and desire for children among young female sex workers in Bangladesh brothels. *Health Care Women Int*. 2019;40(7–9):981–94.
12. Ministry of Health- Uganda. Consolidated Guidelines on the prevention and treatment of HIV and AIDS in Uganda. Kampala; 2018. 327 p.
13. Yam EA, Mnisi Z, Mabuza X, Kennedy C, Kerrigan D, Tsui A, et al. Use of dual protection among female sex workers in Swaziland. *Int Perspect Sex Reprod Health*. 2013;39(2):69–78.
14. Morineau G, Neilsen G, Heng S, Phimpachan C, Mustikawati DE. Falling through the cracks: Contraceptive needs of female sex workers in Cambodia and Laos. *Contraception*. 2011;84(2):194–8.
15. Bowring AL, Schwartz S, Lyons C, Rao A, Olawore O, Njindam IM, et al. Unmet Need for Family Planning and Experience of Unintended Pregnancy Among Female Sex Workers in Urban Cameroon: Results From a National Cross-Sectional Study. *Glob Heal Sci Pract*. 2020;8(1):82–99.
16. Decker MR, Yam EA, Wirtz AL, Baral SD, Peryshkina A, Mogilnyi V, et al. Induced abortion, contraceptive use, and dual protection among female sex workers in Moscow, Russia. *Int J Gynecol Obstet*. 2013;120(1):27–31.
17. Lim MSC, Zhang XD, Kennedy E, Li Y, Yang Y, Li L, et al. Sexual and reproductive health knowledge, contraception uptake, and factors associated with unmet need for modern contraception among adolescent female sex workers in China. *PLoS One*. 2015;10(1):1–17.
18. Vlassoff M, Mugisha F, Sundaram A, Bankole A, Singh S, Amany L, et al. The health system cost of post-abortion care in Uganda. *Health Policy Plan*. 2014;29(1):56–66.
19. Yokoe R, Rowe R, Choudhury SS, Rani A, Zahir F, Nair M. Unsafe abortion and abortion-related death among 1.8 million women in India. *BMJ Glob Heal*. 2019;4(3):1–13.
20. Halpern V, Stalter RM, Owen DH, Dorflinger LJ, Lendvay A, Rademacher KH. Towards the development of a longer-acting injectable contraceptive: Past research and current trends. *Contraception*. 2015;92(1):3–9.
21. Benagiano G, Gabelnick H, Brosens I. Long-acting hormonal contraception. *Women's Heal*. 2015;11(6):749–57.

22. Stoddard A, McNicholas C, Peipert JF. Efficacy and safety of long-acting reversible contraception. *Drugs*. 2011;71(8):969–80.
23. Health NCC for W and C. Long-acting Reversible Contraception: The Effective and Appropriate Use of Long-Acting Reversible Contraception. RCOG Press. NICE; 2005.
24. Mavranouzouli I, Wilkinson C. Long-acting reversible contraceptives: Not only effective, but also a cost-effective option for the National Health Service. *J Fam Plan Reprod Heal Care*. 2006;32(1):3–5.
25. Mazza D, Bateson D, Frearson M, Goldstone P, Kovacs G, Baber R. Current barriers and potential strategies to increase the use of long-acting reversible contraception (LARC) to reduce the rate of unintended pregnancies in Australia: An expert roundtable discussion. *Aust New Zeal J Obstet Gynaecol*. 2017;57(2):206–12.
26. Gulu District. The Republic of Uganda: Gulu district Local government Report. Gulu; 2013.
27. Apodaca K, Doshi RH, Ogwal M, Kiyangi H, Aluzimbi G, Musinguzi G, et al. Capture-Recapture Among Men Who Have Sex With Men and Among Female Sex Workers in 11 Towns in Uganda. *JMIR Public Heal Surveill*. 2019;5(2):e12316.
28. Isreal GD. Determining Sample Size. Vol. PEOD6, Determining Sample Size. 1992. p. 1–3.
29. Ouma S, Nazarius MT, Rawlance N, Abbo C. Prevalence and factors associated with major depression among female sex workers in post-conflict Gulu district: a Cross-Sectional Study. *BMC Public Health*. 2020;Preprint:1–16.
30. Barros AJD, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: An empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol*. 2003;3:1–13.
31. Schmidt CO, Kohlmann T. When to use the odds ratio or the relative risk ? *Int J Public Heal*. 2008;53:165–7.
32. Yam EA, Okal J, Musyoki H, Muraguri N, Tun W, Sheehy M, et al. Kenyan female sex workers' use of female-controlled nonbarrier modern contraception: do they use condoms less consistently? *Contraception*. 2016;93(3):222–5.
33. Alemayehu M, Yohannes G, Damte A, Fantahun A, Gebrekirstos K. Prevalence and predictors of sexual violence among commercial sex workers in Northern Ethiopia. *Reprod Health*. 2015;12(47):1–7.
34. Michael M, Ortblad KF, Mwale M, Chongo S, Kanchele C, Kamungoma N, et al. Contraceptive use and unplanned pregnancy among female sex workers in Zambia. *Contraception*. 2017;96:196–202.
35. Ouma S, Turyasima M, Acca H, Nabbale F, Obita KO, Rama M, et al. Obstacles to family planning use among rural women in Atiak Health Center IV, Amuru District, northern Uganda. *East Afr Med J*. 2015;92(8):394–400.
36. Yam EA, Mnisi Z, Maziya S, Kennedy C, Baral S. Use of emergency contraceptive pills among female sex workers in Swaziland. *J Fam Plan Reprod Heal Care*. 2014;40(2):102–7.

37. Overs C. An analysis of HIV prevention programming to prevent HIV transmission during commercial sex in developing countries. Sex Workers Part of The Solution. 2002.

38. Ministry of Health. Roadmap for Accelerating the Reduction of Maternal and Neonatal Mortality and Morbidity in Uganda. 2007.

39. WHO. Family Planning: A Global handbook for Provider. 2018th ed. Geneva; 2018.

40. Reed E, Erausquin JT, Biradavolu M, Servin AE, Blankenship KM. Non-barrier contraceptive use and relation to condom use behaviour by partner type among female sex workers in Andhra Pradesh, India. J Fam Plan Reprod Heal Care. 2017;43(1):60–6.

41. Mbita G, Mwanamsangu A, Plotkin M, Casalini C, Shao A, Lija G, et al. Consistent Condom Use and Dual Protection Among Female Sex Workers: Surveillance Findings from a Large-Scale, Community-Based Combination HIV Prevention Program in Tanzania. AIDS Behav. 2020;24(3):802–11.

Figures

Figure 1