Determinants of Long-Acting Reversible Contraceptive Utilization among Women at Jinja Regional Referral Hospital's Family Planning Clinic

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ABSTRACT

This study aimed to assess the factors associated with the utilization of LARCM among women attending a family planning clinic at Jinja Regional Referral Hospital. A cross-sectional descriptive study design was used for this study. The data were collected using a structured questionnaire in an exit interview of clients who had come to Jinja Regional Referral Hospital for family planning services after obtaining consent. Collected data was entered and analyzed in the computer using IBM SPSS version 25. Chi-squared analysis was done to determine the factors associated with LARCM utilization. Results were represented in tables and charts for descriptive analysis. A total of 272 women were included in this study, of which 67.6% (n=184) were aged 26 to 35 years, and the overall mean (±SD) age was 27.5 (±4.5) years. 74.3% (n=202) were married and 69.9% (n=190) were rural dwellers. A few of the participants (20.2%, n=55) were currently using LARCM. Of the 55 participants who were using LARC methods, the majority (34, 61.8%) were using implants, while the rest (21, 38.2%) were using IUCD. Significant factors were a woman's age of ≤25 years (X2=72.43; P=<0.001), urban residence (X2=16.69; P=<0.001), being married (X2=25.19; P=<0.001), business occupation (X2=99.22; P=<0.001), Catholic religion (X2=61.38; P=<0.001), mother's age at the first delivery of 18-24 years (X2=24.61; P=<0.001), the reproductive intention of spacing (X2=50.81; P=<0.001), never wanted the last pregnancy (X2=14.72; P=<0.001), hospital as the source of FP information (X2=66.82; P=<0.001), partner influence on FP (X2=16.69; P=<0.001), FP counseling during ANC (X2=42.01; P=<0.001), receiving contraceptives from the hospital (X2=151.61; P=<0.001), and receiving contraceptive services from the doctor (X2=226.13; P=<0.001). LARCM use was low and was associated with younger maternal age, urban residence, being married, business occupation, mother's age at first delivery, desire for child spacing, partner influence on FP, and FP counseling during ANC. Therefore, FP education about the benefits of LARCM should be enhanced by health providers and media.

Keywords: LARCM, Unintended pregnancy, Family planning clinic, Woman, ANC.

INTRODUCTION

Family planning allows people to attain their desired number of children and determine the spacing of pregnancies[1, 2]. It is achieved through the use of modern contraceptive methods and the treatment of infertility (World Health Organization [3, 4]. Modern contraceptive methods are divided into three categories: Long-acting reversible methods (LARCM) like IUCD and implants; permanent contraceptive methods (tubal ligation & vasectomy); and short-term contraceptive methods (oral pill, injectable, male & female condoms, foam tablet & cervical cap [5]. Because of their long-lasting protection and reversibility, reversible long-term contraceptives are effective contraceptive methods appropriate for women wishing to limit childbearing, as well as spacing births, thus potentially playing an enormous role in reducing maternal mortality [5]. Globally, 214 million women of reproductive age in developing countries who want to avoid pregnancy are not using a modern contraceptive method [6]. This unmet need for contraception is too high, and variation in different regions is observed [7]. This inequity is fueled by both a growing population and a shortage of family planning services. In Africa, 24.2% of women of reproductive age have an unmet need for modern contraception. In Asia, Latin America, and the Caribbean – regions with relatively high contraceptive prevalence – the levels of unmet need for family planning are 10.2% and 10.7%, respectively [8]

Unintended pregnancy remains an alarming global public health problem with its subsequent socioeconomic impact on individuals, families, and

society [9]. Though there is considerable variation in the prevalence of unintended pregnancy across regions, the global burden is very high (44% in 2014) [10] and responsible for 27% of maternal deaths [11]. Different cross-sectional studies around the globe noted that there has been a high prevalence of unintended pregnancy, for example, 69% in Malawi [12], 27% in Canada [13], and 44% in Botswana [14], highlighting the need for effective contraceptive utilization [14].

The 2012 Uganda Demographic and Health Survey (UDHS) report showed that there was a 28% and 32% unmet need for family planning among married and unmarried sexually active women, respectively [15]. Evidence suggests that women who have more than 4 children are at increased risk of maternal mortality [16]. By reducing rates of unintended pregnancies, family planning also reduces the need for unsafe abortion [16]. The Uganda Ministry of Health and private partners campaign for the use of long-acting; however, the contraceptive method mix is dominated by short-term methods like pills and injectables [17]. There are no studies that have examined the factors contributing to long-acting contraception methods utilization in the study area. The present study was intended to contribute to bridging the information gap and subsequently the coverage of long-acting reversible contraceptive method utilization in the local setting.

Family planning is essential in the effort to reduce the fertility rate and the consequential maternal mortality and morbidity, as well as contributing to improvement in infant welfare [18]. Notably, Uganda's maternal mortality ratio (MMR) stands at 336 per 100,000 live births, which is among the highest in the world [15]. According to population projections, the Ugandan population is projected to explode to 130 million by 2050 from the already high 44.27 million people [19]. This will further strain reproductive health services and increase the unmet need for contraception. Over time, the use of LARCMs has not kept pace with that of short-acting methods such as oral contraceptives (pills) and injectables. Data from demographic and health surveys show that the proportion of women currently using LARCMs is significantly lower than the proportion using short-acting methods [15]. The latter are unreliable with both high failure and discontinuation rates [20]. However, the reasons responsible for this low uptake of long-acting contraceptive methods remain unidentified.

METHODOLOGY

Study Design
A cross-sectional descriptive study design was used.

Area of Study
The study was conducted in Jinja Regional Referral Hospital, commonly known as Jinja Hospital, in the city of Jinja, in the Eastern Region of Uganda. It is the largest hospital in eastern Uganda, with a bed capacity of 600, although many more patients are admitted. The hospital is located in the center of Jinja, not far from the Source of the Nile. It serves as the Regional Referral Hospital for the districts of Bugiri, Iganga, Jinja, Kaliro, Kamuli, Luuka, Mayuge, Namayingo, Kayunga, and parts of Buikwe. The hospital is approximately 84 kilometers (52 mi) east of Mulago National Referral Hospital. The coordinates of Jinja Regional Referral Hospital are 00°25'52.0"N, 33°12'18.0"E (Latitude: 0.431111; Longitude: 33.205000).

Study Population
The study included women attending family planning clinics during the study period.

Inclusion Criteria
 Women who are aged 15-49 years.
- Willing to participate.

Exclusion Criteria
- Not willing to participate in the survey.
- Below 15 years and/or above 49 years.

Sample Size Determination
The sample size will be determined using Kish's formula [21].

Sampling Technique
The study used consecutive sampling where each woman that came and agreed to participate was enrolled.

Data Collection Methods
The data was collected using a structured questionnaire in an exit interview of clients who came to Jinja Regional Referral Hospital for family planning services. Participants were requested to provide written, informed consent before data was collected. The questionnaire was designed to obtain information on the socio-demographic characteristics of contraceptive users, as well as ascertain their reproductive history, utilization of modern contraceptive family planning, and factors affecting LARC methods. The questionnaire was prepared in English and was translated into Lusoga during data collection for those who did not understand English well.

Data Processing and Analysis
Collected data was entered into the computer and analyzed using IBM SPSS version 25. Categorical variables were represented in a table of frequencies for descriptive statistics. A Chi-square test was computed to test for the factors influencing the utilization of LARCMs. The point for statistical implication was a p-value of <0.05.

Quality Control
The questionnaire for data collection was pre-tested to ensure that questions were clear and allowed the gathering of information needed for the study.

Questions that showed ambiguity during pre-testing were revisited and modified as required.

Ethical Considerations

Approval was sought from Kampala International University Western Campus Faculty of Clinical Medicine in the form of an introduction letter after the approval of the proposal. Written and verbal consent was sought from the respondents before they participated in the study.

RESULTS

Socio-demographic characteristics of study participants

A total of 272 women of reproductive age were included in this study with a response rate of 100%. Of these, 67.6% (n=184) of participants were aged 26 to 35 years, and the overall mean [±SD] age of participants was 27.5 (± 4.5) years. 74.3. % (n=202) participants were married and 69.9% (n=190) were rural dwellers. 20.6% (n=56) of participants had never attended formal education. (Table 1).

Table 1: Socio-demographic characteristics of study participants

Characteristics	Frequency (N=272)	Per cent
Age (years)		
≤25	68	25.0
26-35	184	67.6
>35	20	7.4
Residence		
Urban	82	30.1
Rural	190	69.9
Marital status		
Married	202	74.3
Single	32	11.8
Divorced	27	9.9
Widow	11	4.0
Education level		
Non	56	20.6
Primary	120	44.1
Secondary	42	15.4
Tertiary	54	19.9
Occupation		
Peasant farmer	132	48.5
Business	91	33.5
Employed	33	12.1
Student	16	5.9
Religion		
Catholic	106	39.0
Protestant	54	19.9
Muslim	33	12.1
Others (Pentecostal, SDA)	79	29.0

Reproductive characteristics of study participants

Table 2 below shows the reproductive characteristics of the participants. 159 (58.5%) participants had a history of 2-4 pregnancies with 154 (56.6%) being multiparous mothers. A significant number (28.3%, n=77) had their first pregnancy below 18 years. The majority of the participants had no history of abortion (89.3%, n=243) and wanted their last pregnancy (70.2%, n=191).

Table 2: Reproductive characteristics of study participants

Characteristics	Frequency	Per cent
Gravidity 0		
1	48	17.6
2-4	159	58.5
≥5	50	18.4
Parity 0 (Nullipara)		
1 (Primipara)	58	21.3
2-4 (Multipara)	154	56.6
≥5 (Grand multipara)	40	14.7
History of abortion Yes		
No	243	89.3
History of child death Yes		
No	266	97.8
Mother's age at first pregnancy <18 years		
18-24	114	41.9
≥25	81	29.8
Reproductive intention Want to have a child soon		
Want to spice	108	39.7
Want to limit	82	30.1
Undecided	28	10.3
I wanted the status of the last pregnancy Yes		
No	81	29.8

Prevalence of long-acting reversible contraceptive methods (LARCM)

Figure 1 below shows that only a few of the participants (20.2%, n=55) were currently using long-acting reversible contraceptives compared to the majority (79.8%, n=217) who were using short term modern contraceptive methods.
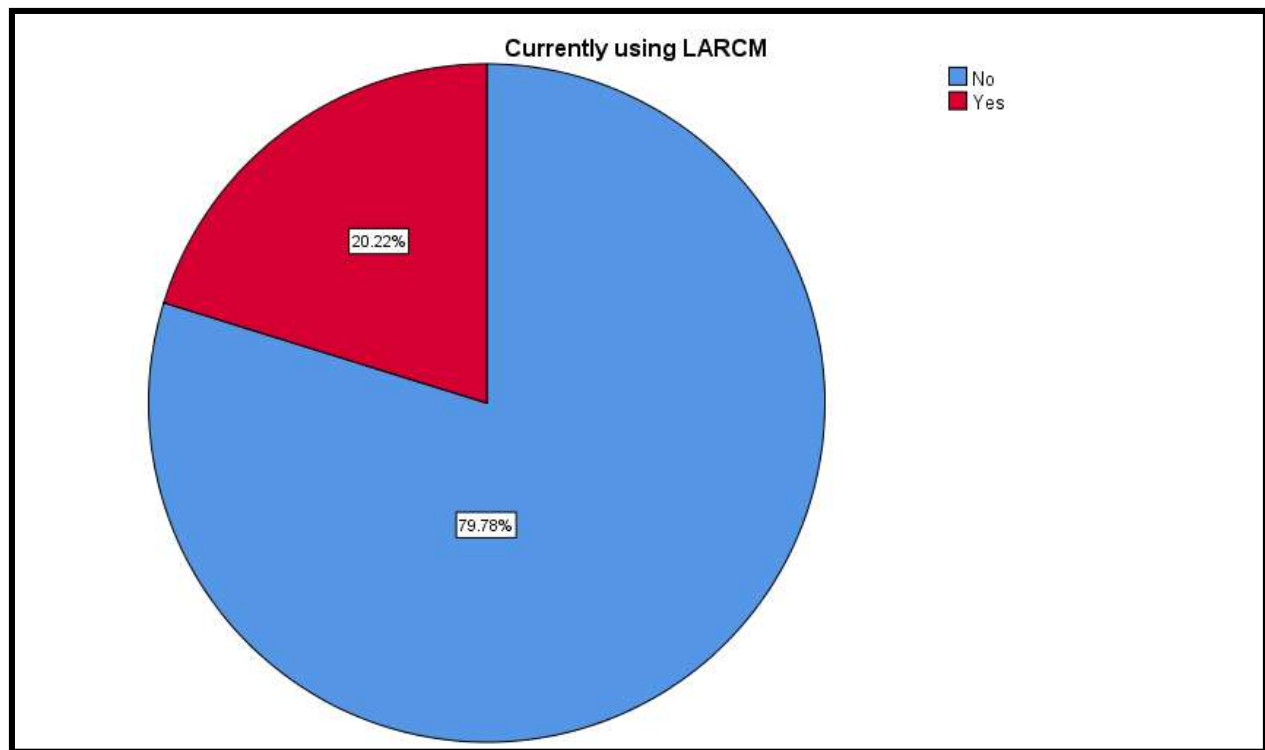
Figure 1: Prevalence of long-acting reversible contraceptive methods (LARCM)

Current LARC method used

Of the 55 participants who were using LARC methods, the majority 34 (61.8%) were using implants while the rest 21 (38.2%) were using IUCD. Figure 2.
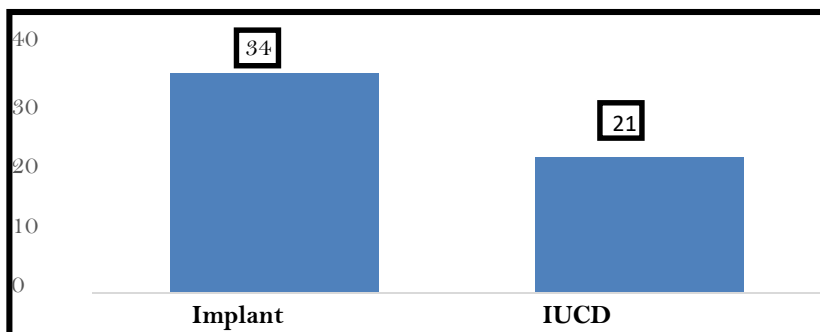

Figure 2: Current LARC method used

Factors associated with LARCM utilization

Sociodemographic factors associated with LARCM utilization

Table 4 below shows a Chi-squared analysis of sociodemographic factors associated with LARCM use. Factors which were found to be significant were; woman's age of ≤25 years (X^2=72.43; P=<0.001), urban residence (X^2=16.69; P=<0.001), being married (X^2=25.19; P=<0.001), business occupation (X^2=99.22; P=<0.001) and Catholic religion (X^2=61.38; P=<0.001).

Table 3: Sociodemographic factors associated with LARCM utilization

Variables	Currently using LARCM		Chi-square (X^2)	P-value
	No	**Yes**		
Age (years) ≤25	30 (13.8%)	38 (69.1%)	72.43	<0.001
26-35	167 (77.0%)	17 (30.9%)		
>35	20 (9.2%)	0 (0.0%)		
Residence Urban	53 (24.4%)	29 (52.7%)	16.69	<0.001
Rural	164 (75.6%)	26 (47.3%)		
Marital status Married	164 (75.6%)	38 (69.1%)	25.19	<0.001
Single	16 (7.4%)	16 (29.1%)		
Divorced	26 (12.0%)	1 (1.8%)		
Widow	11 (5.1%)	0 (0.0%)		
Education level Non	48 (22.1%)	8 (14.5%)	5.65	0.130
Primary	88 (40.6%)	32 (58.2%)		
Secondary	36 (16.6%)	6 (10.9%)		
Tertiary	45 (20.7%)	9 (16.4%)		
Occupation Peasant farmer	131 (60.4%)	1 (1.8%)	99.22	<0.001
Business	58 (26.7%)	33 (60.0%)		
Employed	27 (12.4%)	6 (10.9%)		
Student	1 (0.5%)	15 (27.3%)		
Religion Catholic	64 (29.5%)	42 (76.4%)	61.38	<0.001
Protestant	53 (24.4%)	1 (1.8%)		
Muslim	21 (9.7%)	12 (21.8%)		
Others (Pentecostal, SDA)	79 (36.4%)	0 (0.0%)		

Individual factors associated with LARCM utilization

Factors which were found to be significant are; the mother's age at the first delivery of 18-24 years (X^2=24.61; P=<0.001), the reproductive intention of spacing (X^2=50.81; P=<0.001), never wanting the last pregnancy (X^2=14.72; P=<0.001), Hospital as the source of FP information (X^2=66.82; P=<0.001), partner influence on FP (X^2=16.69; P=<0.001), FP counseling during ANC (X^2=42.01; P=<0.001), receiving contraceptives from hospital (X^2=151.61; P=<0.001) and receiving contraceptive services from the doctor (X^2=226.13; P=<0.001). Table 4.

Table 4: Individual factors associated with LARCM utilization

Variables	Currently using LARCM		Chi-square (X^2)	P-value
	No	**Yes**		
Gravidity			3.07	0.071
0	5 (2.3%)	10 (18.2%)		
1	29 (13.4%)	19 (34.5%)		
2-4	139 (64.1%)	20 (36.4%)		
>5	44 (20.3%)	6 (10.9%)		
Parity			3.82	0.060
0 (Nullipara)	10 (4.6%)	10 (18.2%)		
1 (Primipara)	33 (15.2%)	25 (45.5%)		
2-4 (Multipara)	140 (64.5%)	14 (25.5%)		
>5 (Grand multipara)	34 (15.7%)	6 (10.9%)		
History of abortion			2.35	0.125
Yes	20 (9.2%)	9 (16.4%)		
No	197 (90.8%)	46 (83.6%)		
History of child death			1.56	0.212
Yes	6 (2.8%)	0 (0.0%)		
No	211 (97.2%)	55 (100%)		
Mother's age at first delivery			24.61	<0.001
<18 years	76 (35.0%)	1 (1.8%)		
18-24	80 (36.9%)	34 (61.8%)		
>25	61 (28.1%)	20 (36.4%)		
Reproductive intention			50.81	<0.001
Want to have a child soon	28 (12.9%)	26 (47.3%)		
Want to space	81 (37.3%)	27 (49.1%)		
Want to limit	80 (36.9%)	2 (3.6%)		
Undecided	28 (12.9%)	0 (0.0%)		
I wanted the status of the last preg Nancy			14.72	<0.001
Yes	164 (75.6%)	27 (49.1%)		
No	53 (24.4%)	28 (50.9%)		

Table 4. (Continuation)
Knowledge about FP

			2.33	0.127
Adequate	82 (37.8%)	27 (49.1%)		
Inadequate	135 (62.2%)	28 (50.9%)		
Source of FP information Neighbours and friends			66.82	<0.001
	11 (5.1%)	0 (0.0%)		
Health facility	45 (20.7%)	43 (78.2%)		
VHTs	11 (5.1%)	0 (0.0%)		
Media (TV/Radio)	150 (69.1%)	12 (21.8%)		
Experienced side effects Yes			3.37	0.066
	81 (37.3%)	28 (50.9%)		
No	136 (62.7%)	27 (49.1%)		
Partner influence on FP use			16.69	<0.001
Yes	53 (24.4%)	29 (52.7%)		
No	164 (75.6%)	26 (47.3%)		
Discuss FP with partner			3.61	0.065
Yes	137 (63.1%)	27 (49.1%)		
No	80 (36.9%)	28 (50.9%)		
FP counselling during ANC			42.01	<0.001
Yes	109 (50.2%)	54 (98.2%)		
No	108 (49.8%)	1 (1.8%)		
Sources of contraceptives			151.61	<0.001
Hospital	28 (12.9%)	54 (98.2%)		
Health Centre	54 (24.9%)	1 (1.8%)		
Private clinic	54 (24.9%)	0 (0.0%)		
Pharmacy	81 (37.3%)	0 (0.0%)		
Ever failed to get contraceptiv Es			4.09	0.063
Yes	162 (74.7%)	29 (52.7%)		
No	55 (25.3%)	26 (47.3%)		
FP services provider Nurse			226.13	<0.001
	161 (74.2%)	0 (0.0%)		
Midwife	53 (24.4%)	5 (9.1%)		
Doctor	3 (1.4%)	50 (90.9%)		

DISCUSSION

Utilization of Long-Acting Reversible Contraceptive Methods

In this study, the utilization of LARCM was low at 20.2%. This is comparable to the findings of a study at Mbarara University Teaching Hospital, which reported that LARC was used by 23% of the participants in their study [20]. The agreement in findings could be because both studies were done in regional referral hospitals and are likely to attract women of similar characteristics. However, it is higher than the Ugandan national prevalence of 4.1% [15] and that of a study in Nepal [22, 23], which found a 4.7% LARC utilization rate. The difference in the prevalence of LARC utilization between this study and the aforementioned studies could have resulted from sample size differences, where the aforementioned studies were national-level studies with a larger sample size while this study was done in one hospital with a sample size of just 270 participants.

Factors Associated with Utilization of Long-Acting Reversible Contraceptive Methods

In this study, women aged ≤25 years, urban residence, being married, having a business occupation, following the Catholic religion, mother's age at first delivery of 18-24 years, reproductive intention of spacing, never wanting the last pregnancy, hospital as the source of FP information, partner influence on FP, FP counseling during ANC, receiving contraceptives from the hospital, and receiving contraceptive services from the doctor were associated with LARCM utilization. In this study, younger women were more likely to use LARCM compared to older women. The majority of women who were using LARCM in this study (69.1%) were aged ≤25 years. However, this finding contradicts the findings of the study in South Africa [24] and Kenya [25]. In both studies, LARCM utilization was higher in older women above 30 years. The low utilization of LARCM among older women in this study could be related to bad experiences from previous FP methods.

In this study, participants who were urban dwellers were found to use LARCs more often than those who resided in rural settings. This finding is consistent with studies conducted in Cameroon [26], Uganda [27], and Ghana [28], in which women who utilized LARCM were urban residents. In the Ugandan context, many urban dwellers are wealthy, relatively educated, and have easier access to media and information, which could lead to a well-informed understanding of the available contraceptive methods and thus, the use of LARCM. However, a study conducted in Tanzania showed that women in rural settings were positive towards implant use [29]. Differences in patterns of LARCM use between this study and the Tanzanian study can be explained by differences in the study population and setting. Therefore, it would be of paramount importance for policymakers and health planners to focus on strategies that would increase access to LARCM in rural communities, which will enhance their utilization.

Regarding marital status, women who were married were more likely to use LARCM compared to those women who were not currently married. This finding is consistent with the studies conducted in the East African countries of Burundi, Kenya, Rwanda, Tanzania, and Uganda [30] and Ethiopia [31]. However, it contradicts the other studies conducted in sub-Saharan Africa [32]. Unlike unmarried women who may be comfortable using short-acting methods like pills or condoms, married women need a more reliable method, especially for child spacing, which explains the higher prevalence of LARCM among married women in this study.

This study also found that participants who indicated doing business as their occupation were more likely to use LARCM than their counterparts who either had formal employment or were peasant farmers or students. This finding is consistent with studies set in Australia [33] and Botswana [14], in which business occupation was highly associated with LARCM utilization. Women in business may be highly motivated to utilize a very effective method of contraception since they are always busy in their businesses and may not want to get pregnant frequently, which can disrupt their business performance. This was also observed in a study conducted in Malawi [12], in which women who were doing business were more likely to choose an IUCD or an implant than women who were peasant farmers. It would be good for health managers to work on the creation of public awareness about the effectiveness of LARCs in preventing unintended pregnancy so that other women like those in informal employment can utilize them.

In this study, women who wanted to space their birth were more likely to use LARCM than those who wanted to have a child very soon. This finding is in agreement with the results of a study that took place in Canada[13], Botswana [14], Burkina Faso, Ethiopia, and Nigeria [16], in which LARCM were mainly used by women who had children and did not

wish to have any more soon. One of the most important benefits of LARCM is their long duration of use once they are placed. For this reason, more women who want to space their children may tend to utilize LARCM, which is long-term, effective, and reversible. As such, LARCM may be used as a replacement for surgical sterilization, and because of their ease of reversibility, they may help women avoid post-sterilization regret. In the present study, the wanted 'status' of the last pregnancy was found to affect LARC use. 50.9% of women who utilized LARCs never wanted their last pregnancy. This is similar to studies done elsewhere, which showed that women who never wanted their last pregnancy were more likely to use LARCM[20]. LARCM are highly effective in preventing unwanted pregnancy with great convenience, fewer side effects, and less cost than short-acting contraceptive methods [34]. In this study, the source of family planning information, FP counseling during ANC, and contraceptive providers were found to be significantly associated with the utilization of LARCM. Clients advised by healthcare professionals were more likely to use LARCM than those who chose by themselves or by friends. Similarly, having had counseling during ANC increased the likelihood of LARCM utilization.

The study findings further show that where the Doctor was the provider of the FP, there was a high chance (90.9%) that the woman would use LARCM. This finding is consistent with that of a study done in Cameroon, which showed that professional training and experience of the provider were significantly associated with LARCM use [26]. Another study conducted in Eastern Ethiopia found that discussions with healthcare providers about long-acting contraceptive methods positively affected LARCM utilization [35]. Moreover, a Nigerian study showed that providers' lack of confidence and support for LARCM insertion hurt LARCM use [24]. Providers have a responsibility to clearly communicate and support their clients to choose the method which best fits their personal circumstance.

Furthermore, this study found the influence of the male partner to be associated with LARCM utilization. This finding is inconsistent with studies conducted in Kenya [25] and Cameroon [26] where partner influence did not play a role in LARCM use. Moreover, another study in Ghana showed that women who selected their contraceptive method alone were more likely to use LARCM as compared to those who decided jointly with their partners [28]. With the increased call for male involvement in maternal and child health services, it is paramount that a woman seeks a partner's opinion if the desired contraceptive goal is to be achieved.

Unlike previous studies which found no association between religion and LARCM use [31], this study found that being Catholic has increased chances (76.4%) of utilizing LARCM. The higher LARCM utilization among Catholics could have resulted from the fact that they were the majority in the study. A similar study on a larger population is recommended to explore the effect of religion on LARC use.

CONCLUSION

The utilization of LARCM was low in this study (20.2%) and its use was associated with younger age, urban residence, being married, business occupation, Catholic religion, mother's age at first delivery, desire for child spacing, never wanting the last pregnancy, Hospital as the source of FP information, partner influence on FP, FP counselling during ANC, and receiving contraceptive services from the doctor.

REFERENCES

1. Ekorinyang, R. Utilization of contraceptives by persons living with HIV in Eastern Uganda: a cross sectional study. Reproductive Health, 2015; 12, 40. https://doi.org/10.1186/s12978-015-0030-y
2. Ouma, S., Turyasima, M., Acca, H., Nabbale, F., Obita, K.O., Rama, M., Adong, C.C., Openy, A., Beatrice, M.O., Odongo-Aginya, E.I., & Awor, S. Obstacles to Family Planning Use Among Rural Women in Atiak Health Center Iv, Amuru District, Northern Uganda. East Afr Med J., 2015; 92, 394–400.
3. Aderemi-Williams, R.I., Razaq, A.R., Abah, I.O., Opanuga, O.O., & Akanmu, A.S. Adolescents and Young Adults Knowledge, Adherence and Experiences While on Antiretroviral Therapy in a Tertiary Hospital in Lagos, Nigeria: A Mixed-Method Study. J Int Assoc Provid AIDS Care., 2021; 20.
4. https://doi.org/10.1177/23259582211062754
5. Ibeziako, O. J. Natural Family Planning, An Option in Reproductive Healthcare: A Qualitative Study on Clinicians' Perceptions. The Linacre Quarterly, 2022; 89, 298. https://doi.org/10.1177/00243639221078070
6. Olubodun, T., Balogun, M.R., & Ogunsilu, E.A. Awareness and Practice of Family Planning among Women Residing in Two Rural Communities in Ogun State, South West Nigeria.

Ann Afr Med., 2020; 19, 246–251. https://doi.org/10.4103/aam.aam_62_19

7. Adding It Up: Investing in Contraception and Maternal and Newborn Health, 2017, https://www.guttmacher.org/fact-sheet/adding-it-up-contraception-mnh-2017

8. Schrumpf, L.A., Stephens, M.J., Nsarko, N.E., Akosah, E., Baumgartner, J.N., Ohemeng-Dapaah, S., & Watt, M.H. Side effect concerns and their impact on women's uptake of modern family planning methods in rural Ghana: a mixed methods study. BMC Womens Health, 2020; 20, 57. https://doi.org/10.1186/s12905-020-0885-0

9. Ali, M., Folz, R., & Farron, M. Expanding choice and access in contraception: an assessment of intrauterine contraception policies in low and middle-income countries. BMC Public Health, 2019; 19, 1707. https://doi.org/10.1186/s12889-019-8080-7

10. Yazdkhasti, M., Pourreza, A., Pirak, A., & Abdi, F. Unintended Pregnancy and Its Adverse Social and Economic Consequences on Health System: A Narrative Review Article. Iran J Public Health., 2015; 44, 12–21.

11. Gelagay, A.A., Koye, D.N., & Yeshita, H.Y. Factors affecting long acting and permanent contraceptive methods utilization among HIV positive married women attending care at ART clinics in Northwest Ethiopia. Archives of Public Health, 2018; 76, 47. https://doi.org/10.1186/s13690-018-0294-0

12. Blumenthal, P.D., Voedisch, A., & Gemzell-Danielsson, K. Strategies to prevent unintended pregnancy: increasing use of long-acting reversible contraception. Human Reproduction Update, 2011; 17, 121–137. https://doi.org/10.1093/humupd/dmq026

13. Haddad, L.B., Feldacker, C., Jamieson, D.J., Tweya, H., Cwiak, C., Chaweza, T., Mlundira, L., Chiwoko, J., Samala, B., Kachale, F., Bryant, A.G., Hosseinipour, M.C., Stuart, G.S., Hoffman, I., & Phiri, S. Pregnancy Prevention and Condom Use Practices among HIV-Infected Women on Antiretroviral Therapy Seeking Family Planning in Lilongwe, Malawi. PLOS ONE, 2015; 10, e0121039. https://doi.org/10.1371/journal.pone.0121039

14. Oulman, E., Kim, T.H.M., Yunis, K., & Tamim, H. Prevalence and predictors of unintended pregnancy among women: an analysis of the Canadian Maternity Experiences Survey. BMC Pregnancy and Childbirth, 2015; 15, 260. https://doi.org/10.1186/s12884-015-0663-4

15. Mayondi, G.K., Wirth, K., Morroni, C., Moyo, S., Ajibola, G., Diseko, M., Sakoi, M., Magetse, J.D., Moabi, K., Leidner, J., Makhema, J., Kammerer, B., & Lockman, S. Unintended pregnancy, contraceptive use, and childbearing desires among HIV-infected and HIV-uninfected women in Botswana: across-sectional study. BMC Public Health, 2015; 16, 44. https://doi.org/10.1186/s12889-015-2498-3

16. UBOS, U.B. of S.-, International, I.C.F.: Uganda Demographic and Health Survey 2011. (2012)

17. Hounton, S., Barros, A.J.D., Amouzou, A., Shiferaw, S., Maïga, A., Akinyemi, A., Friedman, H., & Koroma, D. Patterns and trends of contraceptive use among sexually active adolescents in Burkina Faso, Ethiopia, and Nigeria: evidence from cross-sectional studies. Glob Health Action, 2015; 8, 29737. https://doi.org/10.3402/gha.v8.29737

18. Asiimwe, J.B., Ndugga, P., Mushomi, J., & Manyenye Ntozi, J.P. Factors associated with modern contraceptive use among young and older women in Uganda; a comparative analysis. BMC Public Health, 2014; 14, 926. https://doi.org/10.1186/1471-2458-14-926

19. Kabagenyi, A., Habaasa, G., & Rutaremwa, G. Low Contraceptive Use among Young Females in Uganda: Does Birth History and Age at Birth have an Influence? Analysis of 2011 Demographic and Health Survey. Journal of Reproductive Health and Contraception, 2016; 1.

20. Population estimates and projections | DataBank, https://databank.worldbank.org/source/population-estimates-and-projections

21. Tibaijuka, L., Odongo, R., Welikhe, E., Mukisa, W., Kugonza, L., Busingye, I., Nabukalu, P., Ngonzi, J., Asiimwe, S.B., & Bajunirwe, F. Factors influencing use of long-acting versus short-acting contraceptive methods among reproductive-age women in a resource-limited setting. BMC Womens Health, 2017; 17, 25. https://doi.org/10.1186/s12905-017-0382-2

22. Rutterford, C., Copas, A., & Eldridge, S. Methods for sample size determination in cluster randomized trials. Int J Epidemiol., 2015; 44, 1051–1067. https://doi.org/10.1093/ije/dyv113

23. Bhandari, J., Thada, P.K., & DeVos, E. Typhoid Fever. In: StatPearls [Internet]. StatPearls Publishing (2022)

24. Bhandari, R., Pokhrel, K.N., Gabrielle, N., & Amatya, A. Long-acting reversible contraception use and associated factors among married women of reproductive age in Nepal. PLoS ONE, 2019; 14,

e0214590.
https://doi.org/10.1371/journal.pone.0214590

25. Hlongwa, M., Mutambo, C., & Hlongwana, K. In fact, that's when I stopped using contraception': a qualitative study exploring women's experiences of using contraceptive methods in KwaZulu-Natal, South Africa. BMJ Open, 2023; 13, e063034. https://doi.org/10.1136/bmjopen-2022-063034

26. Jalang'o, R., Thuita, F., Barasa, S.O., & Njoroge, P. Determinants of contraceptive use among postpartum women in a county hospital in rural KENYA. BMC Public Health, 2017; 17, 604. https://doi.org/10.1186/s12889-017-4510-6

27. Ajong, A.B., Njotang, P.N., Yakum, M.N., Essi, M.J., Essiben, F., Eko, F.E., Kenfack, B., & Mbu, E.R. Determinants of unmet need for family planning among women in Urban Cameroon: a cross sectional survey in the Biyem-Assi Health District, Yaoundé. BMC Womens Health, 2016; 16, 4. https://doi.org/10.1186/s12905-016-0283-9

28. Sileo, K.M., Wanyenze, R.K., Lule, H., & Kiene, S.M. Determinants of family planning service uptake and use of contraceptives among postpartum women in rural Uganda. Int J Public Health., 2015; 60, 987–997. https://doi.org/10.1007/s00038-015-0683-x

29. Eliason, S., Awoonor-Williams, J.K., Eliason, C., Novignon, J., Nonvignon, J., & Aikins, M. Determinants of modern family planning use among women of reproductive age in the Nkwanta district of Ghana: a case–control study. Reproductive Health, 2014; 11, 65. https://doi.org/10.1186/1742-4755-11-65

30. Keogh, S.C., Urassa, M., Kumogola, Y., Kalongoji, S., Kimaro, D., & Zaba, B. Postpartum Contraception in Northern Tanzania: Patterns of Use, Relationship to Antenatal Intentions, and Impact of Antenatal Counseling. Studies in Family Planning, 2015; 46, 405–422. https://doi.org/10.1111/j.1728-4465.2015.00040.x

31. Bakibinga, P., Matanda, D.J., Ayiko, R., Rujumba, J., Muiruri, C., Amendah, D., & Atela, M. Pregnancy history and current use of contraception among women of reproductive age in Burundi, Kenya, Rwanda, Tanzania and Uganda: analysis of demographic and health survey data. BMJ Open, 2016; 6, e009991. https://doi.org/10.1136/bmjopen-2015-009991

32. Victoria, N. Prevalence and Factors Influencing Utilization of Modern Contraceptives Among Women of Reproductive Age in Jinja Town from January to March 2018.

33. Hubacher, D., Spector, H., Monteith, C., Chen, P.-L., & Hart, C. Long-acting reversible contraceptive acceptability and unintended pregnancy among women presenting for short-acting methods: a randomized patient preference trial. Am J Obstet Gynecol., 2017; 216, 101–109. https://doi.org/10.1016/j.ajog.2016.08.033

34. 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 N Z J Obstet Gynaecol., 2017; 57, 206–212. https://doi.org/10.1111/ajo.12587

35. Sedgh, G., Ashford, L.S., & Hussain, R. Unmet Need for Contraception in Developing Countries: Examining Women's Reasons for Not Using a Method, 2016.

36. Alemayehu, M., Lemma, H., Abrha, K., Adama, Y., Fisseha, G., Yebyo, H., Gebeye, E., Negash, K., Yousuf, J., Fantu, T., Gebregzabher, T., & Medhanyie, A.A. Family planning use and associated factors among pastoralist community of afar region, eastern Ethiopia. BMC Women's Health, 2016; 16, 39. https://doi.org/10.1186/s12905-016-0321-7