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Use of postpartum intrauterine contraceptive device among women in northern Uganda: A cross-sectional study

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Abstract

Introduction: The aim of this study was to determine the prevalence and factors associated with postpartum intrauterine contraceptive device use among postpartum mothers in Lira district, northern Uganda.

Methods: We designed a cross-sectional study among postpartum mothers with the outcome as postpartum intrauterine contraceptive device use defined as the insertion of an intrauterine contraceptive device within 10 min to 48 h following placental delivery. Data were collected using a researcher-administered structured questionnaire. We descriptively summarized numerical data using the mean and the standard deviation and categorical data using frequency and percentages. We performed bivariate analysis using either the χ^2 test or Fisher's exact test, and determined factors associated with the outcome using binary logistic regression analysis at a 5% level of statistical significance. We reported the results as adjusted odds ratio (aOR) and 95% confidence interval (CI).

Results: Of 384 postpartum women studied, 37 (9.6%) had used a postpartum intrauterine contraceptive device and the associated factors included maternal age <35 years with an aOR of 0.12 (95% CI: 0.02, 0.72), parity ≥3 with aOR of 4.25 (95% CI: 1.79, 11.03), at least secondary level of education with aOR of 0.27 (95% CI: 0.07, 0.92) and knowledge of adverse effects of a postpartum intrauterine contraceptive device with aOR of 9.56 (95% CI: 4.13, 24.36).

Conclusions: The prevalence of postpartum intrauterine contraceptive device use is low in this setting. Interventions to improve the use of a postpartum intrauterine contraceptive device such as health education should target younger and multiparous women including those without adequate knowledge about it.

KEYWORDS

intrauterine contraceptive device, modern contraception, postpartum intrauterine contraceptive, Uganda

INTRODUCTION

Nonuse of contraceptives puts women at a higher risk for unsafe abortions, preventable maternal deaths related to childbirth and ultimately poor maternal and birth outcomes associated with short birth intervals.[1,2] Globally, 810 women die every day from preventable causes related to pregnancy and childbirth[3] and 94% of the deaths are in low- and middle-income countries.[3] The agenda of the Sustainable Development Goal is to lower the maternal mortality ratio to less than 70 deaths per 100 000 live births by 2030.[3] Accordingly, the use of modern contraceptives is imperative in improving maternal and newborn health.[4–6] Compared to traditional contraceptive methods like calendar, withdrawal (coitus interruptus) and lactational amenorrhea, modern hormonal contraceptives are highly effective in protecting against the risks of pregnancy.[7] However, modern hormonal contraceptives are associated with

changes in bleeding patterns in the first 3–6 months, namely, prolonged, heavy and irregular bleeding, including more cramps and pain during monthly menstruation periods.[8]

The maternal mortality ratio in developing countries is still high[9] partially due to the low uptake of modern contraceptives. For instance, the maternal mortality ratio in Uganda stands at 336 maternal deaths per 100 000 live births,[10] although the target is to reduce it to 227 maternal deaths per 100 000 live births.[11] A recent study reported that in developing countries,[12] increased use of contraceptives lowered maternal deaths by 40% within two decades due to reductions in the number of unintended pregnancies. Within the same period, contraceptive use prevented high-risk pregnancies in multiparous women and pregnancies that would have ended in unsafe abortion. The combined effect of prevention of high-risk pregnancies and pregnancies that would have ended in unsafe abortion led to a 26% decline in the maternal mortality ratio. Furthermore, it is also estimated that achieving the unmet need for contraception would result in an extra 30% reduction in maternal deaths.[12]

Concerning perinatal and child survival outcomes, the study showed that contraception increased interpregnancy intervals.[12] Therefore, the use of modern contraceptives like an intrauterine contraceptive device (IUCD) in preventing unintended pregnancies[13] and improving maternal and newborn health outcomes needs no emphasis.

Postpartum IUCD (PPIUCD), a long-acting, reversible contraceptive method is 99% effective in preventing unintended pregnancy[14] and is safe for breastfeeding women. It requires one-time insertion and lasts up to 12 years, with the added benefit of the immediate return of fertility upon removal.[14] However, the anecdotal observations show low use of PPIUCD among women in the Lira district in northern Uganda. Consequently, we examined the prevalence and factors associated with PPIUCD use among postpartum mothers (0–42 days) in this setting, and we described the reasons for the nonuse of PPIUCD. We hypothesize that the use of PPIUCD is associated with sociodemographic and health service-related factors.

MATERIALS AND METHODS

Study design, setting and reporting

We conducted a cross-sectional study in Abori cells (A and B) in Lira City in northern Uganda. Lira City is the administrative and commercial centre of the Lira district. A Cell is an administrative unit at the City level and is equivalent to a village at the district level. Lira district is ranked the 15th best-performing district out of 136 districts in Uganda. In 2021, available data show that about 6 out of 10 pregnant women in the district attended at least 4 antenatal care visits and 65.7% of all deliveries occurred in a health facility.[11] Within the Abori cells, there are two parish-level, faith-based health facilities owned by the Roman Catholic Church that provide outpatient, antenatal, intrapartum, postnatal and immunization services.

Study population and sampling

We studied postpartum women who had either a spontaneous vaginal delivery or caesarean section and were within 0–42 days following the delivery. We excluded those who had puerperal psychosis because they would not comprehend the study information and their inclusion would be unethical. We excluded those with a total hysterectomy since they would no longer conceive so a need for hormonal contraception does not exist. We obtained a list of all women (543 overall) who had delivered recently (0–42 days) from the local Village Health Team records. The list is routinely generated by the Village Health Team, the first level of health care in Uganda, to track fertility at the village level. The women's unique household numbers formed our sampling frame and a simple random sampling using the unique household numbers was performed in an Excel sheet to select the required number of women for the study. Each sampled woman was approached and informed consent was obtained before the data were collected. We planned to interview the next eligible household in case a woman declined to participate but none did so.

Measurements and data collection

Data were collected using a researcher-administered structured questionnaire between December 2021 and January 2022. The questionnaire consisted of four sections, namely, sociodemographic, contraceptive and health services-related factors, as well as IUCD use. The outcome variable was PPIUCD use measured by self-report, but all affirmative responses were verified using the medical records. The women were asked to state if they were currently using IUCD and the time of insertion. Women who reported an IUCD insertion within 10 min to 48 h after placental delivery were regarded as PPIUCD users and all the rest were considered PPIUCD nonusers. All the PPUICD users received the copper-bearing IUCD supplied by the Uganda Ministry of Health. We asked the women to mention their reasons for not using PPIUCD.

The independent variables included sociodemographic factors like age categorized as <35 versus ≥35, parity (<3 vs. ≥3), religion, namely, Catholic, Muslim, Anglican and others, level of education measured as none/or never been to school, reached/ended at primary or at least secondary, marital status measured as not employed versus employed whether self or formal, the desired number of children (<5 vs. ≥5), mode of delivery (spontaneous vaginal delivery vs. caesarean section) and place of delivery (health facility or home). Other independent variables included contraceptive and health service-related factors such as the decision-maker in the

family concerning contraceptive use (woman, man or both), knowledge of adverse effects of PPIUCD (yes or no), whether one's religious faith accepts the use of contraceptives (yes or no), whether the women had difficulties in accessing a health facility for contraceptives (yes or no), whether contraceptives were readily available at the health facilities (yes or no), the attitude of healthcare providers at the maternal and child health clinic (welcoming/positive vs. not welcoming/negative) and receipt of health education about IUCD at the most recent antenatal care visits (yes or no).

Sample size estimate

Using the Kish and Leslie formula, we estimated that 384 participants were needed. We assumed a 50% prevalence of PPIUCD use since no data from a previous study was available in the area, a 5% sampling error within a 95% confidence limit and a design effect of 1. We used OpenEpi, an online sample size calculator.

Data analysis

We descriptively summarized categorical variables like sex using frequencies and percentages. At the bivariate analysis level, we employed the χ^2 test to assess differences in PPIUCD use when the cell count was large (≥5), or else Fisher's exact test was used when the cell count was small (<5). Variables with a probability value less than 5% ($p < 0.05$) at the bivariate analysis level and those known to influence the outcome from the literature were included in the binary logistic regression analysis to determine the independently associated factors. We reported both unadjusted and adjusted odds ratios (aORs) with respective 95% confidence intervals (CIs). Overall analysis was performed in R version 4.0.2.

Quality control measures and ethical issues

We pretested the questionnaire outside the study area to assess its suitability in October 2021. We used the feedback from the pretesting to improve the clarity of the questions. Four research assistants, all trained in responsible conduct of research and the study protocol, collected the data. Filled questionnaires were reviewed in real time for completeness and accuracy. The data were entered in EpiData version 3.1 integrated with quality checks, namely, range and legal values, skips and alerts. Legal values are possible numbers permissible for data entry; range values are the minimum and maximum values for the legal values.

Ethical issues and study reporting

We received ethical approval from Clarke International University Research Ethics Committee (reference # CLARKE-2021-311). Administrative approval was obtained from the District Health Office, Lira City. Participants voluntarily gave written informed consent after explanations were provided regarding the purpose of the study, the data collection procedure and the rationale for participant selection. We allowed the participants to withdraw from the study at any time if they so wished. Reporting of the findings adhered to the Strengthening of the Reporting of Observational Studies in Epidemiology (STROBE) guideline for cross-sectional studies.

RESULTS

Participant characteristics and differences in PPIUCD use

Table 1 summarizes the characteristics of all 384 participants (100% response rate). The majority of the participants were aged 15–34 years, parity ≤2, Anglicans, had reached primary or at least secondary level of education and were unemployed. PPIUCD users were mainly aged ≥35 years (50.0%), parity ≥3 (19.1%), Anglican (13.2%) and had ended at the primary level of education (13.6%).

Time of IUCD insertion and prevalence of PPIUCD use

Table 2 presents the distribution of IUCD use and the prevalence of PPICUD use. Of 384 participants, 53 (13.8%) reported current IUCD use. Of the 53 participants, 16 (30.2%) had the IUCD inserted after 6 weeks, 10 (18.7%) immediately after placental delivery, 27 (50.9%) within 24–48 h of placental delivery and 16 (30.2%) after 6 weeks. Overall, 37 (9.6%) had used PPIUCD.

Reasons for nonuse of PPIUCD

The reasons for not using PPIUCD included: 73 (28.0%) stated it would cause infertility, 44 (16.9%) mentioned cancer, 97 (37.2%) reported damage to the womb/uterus, 6 (2.3%) stated it might get dislodged and move to the heart, another 6 (2.3%) were concerned of abortion, 28 (10.7%) reported interference with normal sexual intercourse and 7 (2.7%) had other reasons.

Factors associated with postpartum IUCD use at multivariable analysis

The unadjusted and adjusted analysis findings are shown in Table 1. In the unadjusted analysis, the variables associated with a more likelihood of PPIUCD use included parity ≥3, mode of delivery being caesarean section and knowledge of

TABLE 1 Participant characteristics and factors associated with PPIUCD use at the unadjusted and adjusted analyses.

Variables	Levels	Overall ($n = 384$)	PPIUCD use		Binary logistic regression analyses	
			No	Yes	Unadjusted analysis (OR, 95% CI)	Adjusted analysis (aOR, 95% CI)
Age group (years)	≥35	8 (2.1)	4 (50.0)	4 (50.0)	1	1
	<35	376 (97.9)	343 (91.2)	33 (8.8)	**0.10 (0.02, 0.42)**	**0.12 (0.02, 0.72)**
Parity	<3	231 (60.2)	223 (96.5)	8 (3.5)	1	1
	≥3	153 (39.8)	124 (81.0)	29 (19.0)	**6.52 (3.02,15.69)**	**4.25 (1.79, 11.03)**
Level of education	None	129 (33.6)	118 (91.5)	11 (8.5)	1	1
	Primary	11 (2.9)	10 (90.9)	1 (9.1)	1.04 (0.47, 2.43)	1.13 (0.45, 2.99)
	Secondary and beyond	159 (41.4)	138 (86.8)	21 (13.2)	**0.27 (0.09, 0.75)**	**0.27 (0.07, 0.92)**
Marital status	Single/never married	85 (22.1)	81 (95.3)	4 (4.7)	1	
	Married	76 (19.8)	66 (86.8)	10 (13.2)	1.32 (0.56, 3.65)	
	Separated	154 (40.1)	133 (86.4)	21 (13.6)	1.39 (0.19, 6.68)	
Employment status	None	154 (40.1)	148 (96.1)	6 (3.9)	1	
	Employed	77 (20.1)	71 (92.2)	6 (7.8)	1.33 (0.67, 2.64)	
Desired number of children	<5	125 (32.6)	109 (87.2)	16 (12.8)	1	1
	≥5	259 (67.4)	238 (91.9)	21 (8.1)	0.60 (0.30, 1.21)	0.69 (0.31, 1.58)
Mode of delivery	Spontaneous vaginal delivery	309 (80.5)	284 (91.9)	25 (8.1)	1	1
	Caesarean section	75 (19.5)	63 (84.0)	12 (16.0)	**2.16 (1.00, 4.46)**	1.92 (0.76, 4.73)
Place of delivery	Health facility	378 (98.4)	341 (90.2)	37 (9.8)		
	Home	6 (1.6)	6 (100.0)	0 (0.0)		
Decision-making regarding contraceptive use in the household	Woman	23 (6.0)	22 (95.7)	1 (4.3)	1	1
	Man	267 (69.5)	240 (89.9)	27 (10.1)	2.47 (0.49, 45.18)	
	Both	94 (24.5)	85 (90.4)	9 (9.6)	2.33 (0.41, 44.11)	
Knew the adverse effects of PPIUCD	No	254 (66.1)	245 (96.5)	9 (3.5)	1	1
	Yes	130 (33.9)	102 (78.5)	28 (21.5)	**7.47 (3.53, 17.31)**	**9.56 (4.13, 24.36)**
Religion accepts IUCD use	Yes	59 (15.4)	53 (89.8)	6 (10.2)	1	
	No	220 (57.3)	198 (90.0)	22 (10.0)	0.98 (0.40, 2.77)	
	Not known	105 (27.3)	96 (91.4)	9 (8.6)	0.83 (0.28, 2.59)	
Has difficult access to a health facility	Yes	151 (39.3)	136 (90.1)	15 (9.9)	1	1
	No	233 (60.7)	211 (90.6)	22 (9.4)	0.95 (0.48, 1.92)	0.64 (0.28, 1.47)
Availability of contraceptives at the health facility	Yes	158 (41.1)	141 (89.2)	17 (10.8)	1	
	No	226 (58.9)	206 (91.2)	20 (8.8)	0.81 (0.41, 1.61)	
Patient-reported attitudes of health workers	Welcoming	325 (84.6)	296 (91.1)	29 (8.9)	1	
	Not welcoming	59 (15.4)	51 (86.4)	8 (13.6)	1.60 (0.65, 3.55)	
Received health education on IUCD at the recent ANC visits.	Yes	110 (28.6)	98 (89.1)	12 (10.9)	1	
	No	274 (71.4)	249 (90.9)	25 (9.1)	0.82 (0.40, 1.75)	

Note: Bold indicates statistical significance.

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; OR, unadjusted odds ratio; PPIUCD, postpartum intrauterine contraceptive device.

TABLE 2 Time of IUCD insertion and prevalence of PPIUCD use.

Variable	Frequency	*N* (%)
The participant is using IUCD	No	331 (86.1)
	Yes	53 (13.8)
Time of insertion of IUCD ($n = 53$)	Immediately after delivery	10 (18.7)
	24–48 h after delivery	27 (50.9)
	After 6 weeks	16 (30.2)
Used PPIUCD	No	347 (90.1)
	Yes	37 (9.6)

Abbreviations: IUCD, intrauterine contraceptive device; PPIUCD, postpartum intrauterine contraceptive device.

adverse effects of PPIUCD. Age <35 years and at least a secondary level of education were associated with a lower likelihood of PPICD use. The rest of the variables did not show a statistically significant association with PPIUCD use.

In the adjusted analysis, PPIUCD use was more likely among women of parity ≥3 with an aOR of 4.25 (95% CI: 1.79, 11.03) and among those with knowledge of adverse effects of PPIUCD with an aOR of 9.56 (95% CI: 4.13, 24.36). Women aged <35 years compared to those aged ≤35 years were less likely to use PPIUCD with an aOR of 0.12 (9% CI: 0.02, 0.72). Women with at least a secondary level of education were less likely to use PPIUCD compared to those with no formal education with an aOR of 0.27 (95% CI: 0.07, 0.92).

DISCUSSION

We found less than 1 in 10 (9.6%) women use PPIUCD, which is lower than the prevalence of PPIUCD use at 16.3% reported in a previous study in Butambala district in eastern Uganda[15] and 40% in Nigeria.[16] The observed differences in the prevalence of PPIUCD use might be explained by the study setting. Our study was community-based while the previous studies were health facility-based. Prevalence estimates from health facility-based studies are usually higher than that from community-based studies due to systematic differences among the study population.[17] However, the low prevalence of PPIUCD use highlights a need to improve the use by tackling context-specific barriers.

Women aged <35 years are less likely to use PPIUCD compared to those aged ≥35 years. This is consistent with the findings of a previous study in Ethiopia.[18] Similarly, a previous health facility-based cross-sectional study reports that women aged <25 years have a lower intention to use PPIUCD.[19] However, the association between PPIUCD use and maternal age requires cautious interpretation as the women were undersampled, hence the conclusion should be limited. Relatedly, we found women with at least three children (multiparty) are more likely to use PPIUCD, which is consistent with the findings of previous studies conducted in Rwanda,[19,20] Ethiopia,[21,22] Nigeria[16] and elsewhere.[23] Both findings might be explained by a need to limit the number of children among women.

PPIUCD use is lower among women with at least a secondary level of education compared to those without any formal education. This finding agrees with the results of a previous study in Nigeria.[16] However, it contradicts the results of a previous study in Uganda,[15] and another study in Ethiopia,[22] which reports a higher PPIUCD use among women with primary or secondary levels of education.

Further analysis showed that the majority of women without any formal education and those who had ended at the level of primary education had three or more children on average compared to those who attained at least a secondary level of education. There is therefore a possibility of medical indication of PPIUCD among women with three or more children to prevent high-risk pregnancies and adverse birth outcomes. It is also possible that women with at least a secondary level of education are interested in using other types of contraceptives rather than PPIUCD.

We found women with knowledge of adverse effects associated with PPIUCD are more likely to use PPIUCD compared to those without the knowledge of adverse effects. Contraceptive-related side effects are a major concern among women as reported in this study (reasons for none use of PPICD). One study conducted in South Africa found the majority of women fear the pain associated with PPIUCD insertion and are concerned that PPIUCD interferes with normal sexual activity.[24] Sunanda and Sudha[25] contend that fear of pain, bleeding, development of cancer and increased body weight deter women from using IUCD. Similarly, these issues were raised as reasons for the nonuse of PPIUCD in this study. Our finding underscores the importance of providing women with sufficient, correct and consistent information about the risks and benefits of contraceptives to enable informed decision-making.

Study strengths and limitations

To the best of our knowledge, this is one of the first studies in the setting to research the use of PPIUCD. The prevalence of PPIUCD use is likely accurate since the study was community-based and self-reported PPIUCD use was verified by medical records. However, there are limitations. Age should have been meaningfully categorized based on biological or clinical relevance, but this was impossible as the data were collected on a categorical rather than numerical scale. So, further categorizations could not be performed.

Certain strata of participants were undersampled so the data should be cautiously interpreted. Here, we used the cell with a large size or count as the reference

category. All births are reported and recorded by Village Health Team members, but a few births might have not been reported and recorded. Recall bias regarding the time of PPIUCD insertion is another potential limitation, although we validated the responses using secondary questions. We did not collect data regarding specific obstacles to accessing PPIUCD. The lack of qualitative data to contextualize the quantitative findings is another limitation.

Conclusion and recommendations

The prevalence of PPIUCD use is low in our setting. Multiparous (≥3 children) women and those with knowledge about the adverse effects of PPIUCD are more likely to use PPIUCD, while younger (≥35 years) women and those with at least a secondary level of education have a lower likelihood of PPIUCD use. Interventions to improve PPIUCD use such as health education should target younger and multiparous women including those without adequate knowledge about PPIUCD.

AUTHOR CONTRIBUTIONS

Augustine Okullo: Conceptualization; data curation; formal analysis; methodology; project administration; resources; software; roles/writing—original draft; writing—review and editing. **Dinah Amongin**: Methodology; validation; visualization; roles/writing—original draft; writing—review and editing. **Jonathan Izudi**: Data curation; formal analysis; methodology; software; supervision; validation; visualization; roles/writing—original draft; writing—review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT

We received ethical approval from Clarke International University Research Ethics Committee (reference # CLARKE-2021-311).

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