Immediate postpartum intrauterine contraceptive device utilization and associated factors among women who gave birth in public health facilities of Adama town, Ethiopia

Etenat Aemro¹, Meyrema Abdo², Alem Deksisa², Afework Alemayehu³, Teshale Mulatu³, Tahir Ahmed Hassen³, Alemayehu Molla⁴ and Kedir Teji Roba³

Abstract

Objectives: The evidence on utilization of immediate postpartum intrauterine contraceptive devices (IPPIUCDs) and its associated factors are limited in Ethiopia. Hence, this study intended to assess IPPIUCD utilization and related factors among women who gave birth in Adama town public hospitals, Ethiopia.

Method: A facility-based cross-sectional study was done among 493 postpartum mothers at selected government health facilities in Adama town from January 20 to February 20, 2021. All women who gave birth in selected government health facilities and within 48 h of postpartum were included in the study. Data were collected using an interviewer-administered questionnaire. Logistic regression models were used to identify the factors associated with IPPIUCD utilization. Adjusted odds ratios (AORs) with 95% confidence interval (CI) were calculated to measure the strength of association and statistical significance was declared at p < 0.05.

Result: In this study, 22.1% (95% CI: 17.3–25.2) of the mothers used IPPIUCDs within 48 h of giving birth. Having three or more children (AOR = 4.18, 95% CI: 1.79–9.79), having no desire to have another child (AOR = 3.9, 95% CI: 1.86–8.17), counseling after delivery (AOR = 3.1 95% CI: 1.52–6.34), and having good knowledge about PPIUCD (AOR = 3.82, 95% CI: 1.94–7.49) were significantly associated with IPPIUCD utilization.

Conclusion: The utilization of IPPIUCD in this study was low. Strategies to raise pregnant mothers’ awareness of IPPIUCD through mass media, and integrating standard counseling on immediate postpartum intrauterine device (IPPIUD) during antenatal care, and the immediate postpartum period are required to improve IPPIUD utilization.

Keywords

Utilization, postpartum intrauterine device, immediate postpartum contraceptive, Adama town, Ethiopia

Introduction

Family planning (FP) allows couples to achieve their desired number of children, and to decide the spacing of their pregnancies. It is a crucial life-saving intervention for mothers and their children. It can prevent more than 30% of maternal deaths and 10% of child death if pairs space their pregnancies more than 2 years apart. Postpartum FP refers to the method used to prevent unplanned pregnancy and closely spaced pregnancies through the first year after childbirth."
Postpartum FP reduces maternal mortality and morbidity by 75%, reduces unwanted and mistimed pregnancies by two-thirds, and reduces the risks of abortion by 73%.3,4 Evidence shows that 95% of postpartum women in resource-limited countries want to avoid pregnancy for at least 2 years, and nearly two-thirds of the women had an unmet need for FP services.5,6

The 2016 Ethiopia Demographic and Health Survey showed that, among postpartum women who did not intend to have children soon, only 23.7% used modern FP and 22% of children were born less than 2 years after their siblings.7

Postpartum FP intervention focused on long-acting reversible contraception plays a vital role in the spacing of pregnancies and improving maternal and newborn health.8 The use of long-term contraceptive methods reduces maternal deaths by 40%, infant mortality by 10%, and childhood mortality by 21%.9

Postpartum intrauterine contraceptive device (IPPIUCD) is a highly effective, reversible, and long-acting contraceptive with failure rates of less than 1% in the first year of use, and it does not affect breastfeeding.10 Immediate postpartum intrauterine device (IPPIUD) insertion can be done within 10 min after placental delivery and until 48 h of postpartum.11 Although the immediate IPPIUCD (IPPIUCD) is highly effective and safe for lactating mothers, only < 1% of postpartum women used it in Ethiopia.7 Numerous factors attributed to the non-use of IUCD in the immediate postpartum period: marital status, educational status, number of alive children, family size, husband approval, antenatal care (ANC) follow-up, place of delivery, and counseling during postnatal care (PNC) were some of the factors that affect IPPIUD utilization.12,13

The Ethiopian government had planned to increase the use of contraceptives among married women of the reproductive age group to 55% and decrease the unmet need to 10% by 2020.14 The national FP guideline recommends integrating FP counseling during ANC, immediately after delivery, and PNC services. Furthermore, FP counseling and services were being provided for the women at the community level by health extension workers.5,15 These health personnel provide injectable contraception and currently have begun to insert implants. Yet, the use of IPPIUCD is not well-practiced and almost absent from the contraceptive method mix. Although, copper-bearing IUCD (TCu-380A) is broadly available and freely offered in public healthcare facilities, it is still very much underutilized in Ethiopia. Understanding the factors that affect the utilization of IPPIUCD is therefore important in designing interventions aimed to improve IPPIUCD uptake. This study, therefore, aimed to determine the prevalence of immediate postpartum IUCD utilization and identify its associated factors among mothers who gave birth at Adama town public hospitals.

Materials and methods

Study area and period

This study was conducted in Adama town, Ethiopia. Adama town is located 99 km south-east of Addis Ababa, the capital of Ethiopia. According to national census of 2007, the town has a total population of 250,817 among which 125,449 were females.16 There was one government hospital, three private hospitals, seven government health centers, one private clinic, and two maternal health clinic, namely Marie stops clinic and Family Guidance Association of Ethiopia, in the town. The study was conducted from January 20 to February 20, 2021 in the selected public health facilities of Adama town, Ethiopia.

Study design and population

The facility-based cross-sectional study was conducted among all mothers who gave birth within the last 48 h in the selected public health facilities of Adama town during the study period. Mothers with serious mental health problem and critically diseased were excluded from the study.

Sample size and sampling techniques

The sample size was calculated using double proportion formula for factors associated with immediate postpartum IUCD utilization. Taking plan to have another child as exposure variable (21.1% among unexposed and 33.3% among exposed),17 confidence level of 95%, the margin of error 5%, the power 80%, and the ratio of exposed to unexposed 1:1, yields a sample size of 448. Considering a 10% non-response rate, the final sample size was 493. Simple random sampling was used to select five health facilities (one hospital and four health centers) among eight public health facilities in the study area. During the study period, a total of 977 deliveries were recorded at selected health facilities. Then the sample was proportionally allocated to each health facility based on their case flows. All mothers who gave birth at selected health facilities within the last 48 h during the data collection period were consecutively included in the study until the required sample was reached.

Data collection tool and procedure

The data collection tool was adapted from previous similar studies.18–26 Data were collected using a structured questionnaire through a face-to-face interview. The training was given to both data collectors and supervisors for 1 day. The tool was pre-tested on 5% of the sample size in different health centers which were not included in the actual study. Corrections and modifications were made based on the result of the pre-test. Each eligible woman was approached after delivery within 48 h of postpartum. The women were asked whether they had IUCD inserted following delivery and
cross checked from summary of their medical record. The data collection process was supervised on regular bases and checked for completeness.

**Statistical analysis**

Data were entered into Epi info version 7 and then exported to SPSS version 22 for further analysis. Descriptive statistics were computed to characterize the study participants by the study variables. Binary logistic regression was used to analyze the association between the independent and dependent variables. Hosmer and Lemeshow’s test for goodness of fit was used to assess whether the necessary assumptions were fulfilled. Those variables with a $p$ value of less than 0.25 ($p < 0.25$) in bivariate analysis were included in multivariable logistic regression to control possible confounders. Adjusted odds ratio (AOR) with a 95% confidence interval (CI) was used to present the association and the level of significance was declared at a $p$ value of less than 0.05. Accordingly, knowledge about PPIUCD, desire to have more children, ANC follow-up, partner support, number of alive children, educational status, attitude towards IUCD, gravidity, and counseling after delivery were selected as candidate variables in the bivariable logistic regression. However, after adjusting for other variables, knowledge about PPIUCD, desire to have more children, the number of alive children, and counseling after delivery remained significantly associated with immediate postpartum IUCD utilization in the multivariable model.

**Operational definitions**

**Immediate postpartum IUCD utilization:** It refers to the use of copper-bearing IUCD (TCu-380A) during the first 48 h after delivery.

**Knowledge on IUCD:** The woman was considered as having good knowledge if she answered equal to or above mean score of knowledge assessment questions and poor knowledge if she answered less than mean score of knowledge assessment questions.19

**Attitude toward IUCD:** The woman was categorized as having a positive attitude if she answered greater than the mean score of attitude questions and negative attitude if she scored less than the mean score of attitude questions.19

**Results**

**Sociodemographic characteristics of the participants**

A total of 488 mothers participated in this study which gave a 98.9% response rate. The mean age of the respondents was 26.9 years ($\pm$ 5.4 SD). More than two-fifths of the study participants (213) had secondary education and about half (246) were housewives (Table 1).

| Table 1. Socioeconomic and demographic characteristics of mothers who gave birth in public health facilities of Adama town, Ethiopia, 2021 ($n=488$). |
| Characteristics | Category | Frequency | Percent |
|-----------------|----------|-----------|---------|
| Residence       | Urban    | 403       | 82.6    |
|                 | Rural    | 85        | 17.4    |
| Age (years)     | 18–22    | 116       | 23.8    |
|                 | 23–27    | 179       | 36.7    |
|                 | 28–32    | 95        | 19.5    |
|                 | 33–37    | 69        | 14.1    |
|                 | 38–42    | 29        | 5.9     |
| Marital status  | Married  | 471       | 96.5    |
|                 | Unmarried| 17        | 3.5     |
| Religion        | Orthodox | 239       | 49.0    |
|                 | Muslim   | 165       | 33.8    |
|                 | Protestant| 79        | 16.2    |
| Educational level | No formal | 52        | 10.7    |
| status          | education|           |         |
|                 | Primary  | 89        | 18.2    |
|                 | Secondary| 213       | 43.6    |
|                 | Higher and above | 134 | 27.5 |
| Occupational status | Student | 29 | 5.9 |
| Partner’s education | No formal | 65 | 13.3 |
| status          | education|           |         |
|                 | Primary  | 85        | 17.4    |
|                 | Secondary| 196       | 40.2    |
|                 | Higher and above | 142 | 29.1 |
| Partner’s occupation | Daily laborer | 51 | 10.5 |
| Monthly income  | <5000    | 363       | 74.4    |
|                 | ≥5000    | 125       | 25.6    |

*Others: Catholic, Pagans, business owners, daily laborers.

**Reproductive characteristics of participants**

This study found that 216 (44.3%) of the participants had a history of 2–3 pregnancies. The majority, 363 (74.4%), of the participants had 1–2 alive children. Among the participants, 116 (23.8%) mothers had unplanned last pregnancies. The most commonly cited reason for unplanned pregnancy was the non-use of contraceptive method (76.2%) (Table 2).
Health service utilization of the participants

Most of the study participants, 471 (96.5%), had ANC follow-up for their current pregnancy and 124 (26.3%) mothers had counseling on postpartum FP during their visit. Four hundred (82.0%) of the participants ever used contraceptives. While 194 (48.5%) of the participants used injectable FP, only 14 (3.5%) used IUCD (Table 3).

Immediate postpartum IUCD utilization among the participants

Of the total participants, 108 (22.1%) had utilized PPIUD immediately (within 48h of giving birth). The reported reasons for not using immediate PPIUD were as follows: wanting to use it another time 197(51.9%), preference for another method 117(30.8%), fear of side effects 18(4.7%), and partner disapproval 15(4.0%) (Figure 1).

Knowledge and attitude of participants toward PPIUCD

Out of 488 study participants, 466 (95.5%) have heard about PPIUCD and 307 (62.9%) were aware that PPIUCD can be inserted immediately after delivery. More than half (53.7%) of the participants had a good knowledge about PPIUCD and knew that pregnancy can happen after removal of IUCD. Furthermore, 292 (59.8%) of the participants knew the side effect of IUCD and more than half, 274 (56.1%) of them had a positive attitude toward PPIUCD use.
Factors associated with immediate postpartum IUCD utilization

Women who had three or more children were four times more likely to use IPPIUCD than those who had only 1–2 children (AOR = 4.18, 95% CI: 1.785–9.790). Women with no desire to have another child were almost four times more likely to use IPPIUCD than those who have a desire to have another child (AOR = 3.9, 95% CI: 1.863–8.173). Mothers who had counseling after delivery were three times more likely to use PPIUCD than women who had not (AOR = 3.1, 95% CI: 1.522–6.346). Women with good knowledge of PPIUCD were 3.8 times more likely to use IPPIUCD than women with poor knowledge (AOR = 3.815, 95% CI: 1.942–7.494) (Table 4).

Discussion

For mothers who rarely visit health institutions, IUCD insertion during the immediate postpartum increases the opportunities for reaching couples with FP options. This study assessed the prevalence of IPPIUD utilization and associated factors among postpartum women visiting public health facilities in Adama town, Ethiopia.

The prevalence of IPPIUCD utilization in this study was 22.1% (95% CI: 17.3–25.2), which was consistent with studies done in North Shoa (21.3%), Sidama (21.9%), and pooled prevalence in Ethiopia (21.6%). However, it was higher than the studies conducted in Uganda (16.3%), Bale zone (12.4%), Bahir Dar (13.3%), and Debre Tabor (3.3%), Ethiopia. These variations might be due to differences in sociocultural and demographic characteristics, and the number of facilities involved in the study. Moreover, studies conducted in Bahir Dar, Debre Tabor, and Uganda were conducted with small sample size and on a single facility which may result in decreased number of IPPIUCD users.

Yet, the finding of this study was lower than the one reported in the studies conducted in Addis Ababa (26.6%), and other African countries such as Nigeria (41%). This difference might be the result of variation in the quality of healthcare provision, where tertiary-level healthcare services were given and most of the participants had higher educational status with better access to information about IPPIUCD compared to our study.

According to this study, mothers who did not have the desire to have other children were 3.9 times more likely to use IUCD than women who had the desire. This finding is similar to the study done in Sidama, Ethiopia. This may be due to mothers who had more children might use PPIUCD to prevent unplanned pregnancy and to space birth.

In this study, women who got counselling after delivery were three times more likely to use postpartum IUCD than their counterparts (AOR = 3.1 95% CI: 1.522–6.346). This finding is similar to studies done in Sidama, Bahir Dar, Addis Ababa, Ethiopia, and Rwanda. This might be because women who received FP counseling could be highly motivated and encouraged to use PPIUCD. This might also be due to counseling can solve traditional attitudes and myths thinking that PPIUCD is bad. On the other hand, counseling can have made clients to improve their knowledge about the methods they are going to use.

This study shows that women who had good knowledge about PPIUCD were 3.8 times more likely to use IPPIUCD than those who had poor knowledge (AOR = 3.815, 95% CI: 1.942–7.494). This is comparable with the study done in Addis Ababa, and meta-analysis finding in Ethiopia. This could be because mothers who had good knowledge about PPIUCD may have better practice and they are more likely to use the method consistently and effectively than their counterparts.

This study also revealed that the number of alive children was significantly associated with IPPIUCD utilization.
Mothers who had three or more alive children were four times more likely to use IPPIUCD than those mothers who had 1–2 children. This is in line with the study done in Nigeria, Jimma, Ethiopia. This similarity may be due to mothers who had three or more children wanting to limit the number of children; hence, they are more likely to use the method consistently and effectively than their counterparts. Furthermore, having more children may decrease the women’s desire for another pregnancy and they might need enough time to recover from their exhaustion.

As a limitation, this study was conducted among mothers who were in their immediate postpartum period (48 h) only. In addition, it did not include private clinics which provide maternal healthcare services. So, the result of this study may not be generalized to all postpartum mothers and facilities providing maternal healthcare services. With this limitation, this study can be used in the local context to plan an implementation program and set strategies to improve PPIUCD utilization.

**Conclusion**

Immediate postpartum IUCD utilization in the study area was low. Having three or more children, desire to have another child, counseling after delivery, and having good knowledge about PPIUCD were significant factors for IPPIUCD utilization. The results imply the need for designing appropriate strategies to ensure effective utilization of IPPIUCD.

**Acknowledgements**

We acknowledge the study participants, data collectors, supervisors, Adama town health office, health facility administrators, and staff for their willingness to give their time and information for this study.

**Authors’ Contributions**

All authors conceived the study, involved in the study design, reviewed the articles for analysis, and drafted the manuscripts. All authors have read and approved the final manuscript.

**Consent for publication**

Not applicable

**Data Availability**

All related data are presented fully within the paper. Additional data are available from the corresponding author on reasonable request.
Declaration of conflicting interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

Ethical Consideration
Ethical clearance was obtained from Adama Hospital Medical College Ethical Review Board with the Ref. No. AHMC-IRB/09/2020 and a formal letter was obtained from Oromia regional health bureau and Adama town health office. A letter of cooperation was submitted for those selected health facilities. Informed written signed consent was obtained from study participants, and from legally authorized representatives for illiterate participants. To ensure confidentiality, the questionnaire was coded and the name of participants was not included. The women were counseled to return back to the facility if there were any complications related to PPIUCD insertion and a need for help arose.

Informed consent
Formal letters were written to all concerned authorities and permission was secured at all levels. After explaining the purpose and procedure of the study, informed written signed consent was obtained from study participants, and from legally authorized representatives for illiterate participants. All the basic principles of human research ethics (respect of persons, beneficence, voluntary participation, confidentiality, and justice) were respected.

Trial registration
Not applicable

ORCID iDs
Teshale Mulatu https://orcid.org/0000-0002-5134-6701
Alemayehu Molla https://orcid.org/0000-0001-6987-2497

Supplemental material
Supplemental material for this article is available online.

References
1. WHO. Programming strategies for postpartum family planning, https://www.who.int/reproductivehealth/publications/family_planning/ppfp_strategies/en (2020, accessed 8 August 2020).
2. World Health Organization. WHO recommendations on postnatal care of the mother and newborn. World Health Organization, 2014, https://apps.who.int/iris/bitstream/handle/10665/97603/?sequence=1
3. Shonkoff JP, Richter L, van der Gaag J, et al. An integrated scientific framework for child survival and early childhood development. Pediatrics 2012; 129(2); e460-e472.
4. Pörtner CC, Beegle K and Christiaensen L. Family planning and fertility: estimating program effects using cross-sectional data. World Bank Policy Research Working Paper no. 5812. 2011.
5. Singh S and Darroch JE. Adding it up: Costs and benefits of contraceptive services—Estimates for 2012, New York: Guttmacher Institute and United Nations Population Fund (UNFPA), 2012, http://www.guttmacher.org/pubs/AIU-2012-estimates.pdf
6. Gaffield ME, Egan S and Temmerman M. It’s about time: WHO and partners release programming strategies for postpartum family planning. Glob Health Sci Pract 2014; 2(1): 4–9.
7. Central Statistical Agency (CSA) [Ethiopia]. ICF. Ethiopia demographic and health survey 2016. Addis Ababa, Ethiopia and Rockville, MD, USA: CSA and ICF, 2016.
8. Gallagher MC, Morris CN, Fatima A, et al. Immediate postpartum long-acting reversible contraception: a comparison across six humanitarian country contexts. Front Glob Women’s Health 2021; 2: 613338.
9. Cleland J, Conde-Agudelo A, Peterson H, et al. Contraception and health. Lancet 2012; 380(9837): 149–156.
10. Winner B, Peipert JF, Zhao Q, et al. Effectiveness of long-acting reversible contraception. N Engl J Med 2012; 366(21): 1998–2007.
11. Averbach SH, Ermias Y, Jeng G, et al. Expulsion of intrauterine devices after postpartum placement by timing of placement, delivery type, and intrauterine device type: a systematic review and meta-analysis. Am J Obstet Gynecol 2020; 223(2): 177–188.
12. Wayessa MB, Abebe TW, Habtewold EM, et al. Focused family planning counseling increases immediate postpartum intrauterine contraceptive device uptake: a quasi-experimental study. Open Access J Contracept 2020; 11: 91–102.
13. Arero W, Tekola W and Jarso H. Prevalence, and pattern of Larc use in immediate postpartum period at Jimma University Medical Center, Ethiopia [18f]. Obstet and Gynecol 2018; 131: 68S.
14. FMOH. Health Sector Transformation Plan (HSTP. 2016–2020). Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia Ministry of Health, 2015.
15. Kesetebirhan A. National guideline for family planning services in Ethiopia. Addis Ababa, Ethiopia: Federal Democratic Republic of Ethiopia, Ministry of Health, 2011.
16. Central Statistical Agency . 2007 population and housing census of Ethiopia. Addis Ababa, Ethiopia: Central Statistical Agency, 2007.
17. Tefera L, Abera M, Fikru C, et al. Utilization of immediate post-partum intra-uterine contraceptive device and associated factors: a facility based cross sectional study among mothers delivered at public health facilities of Sidama Zone, South Ethiopia. J Preg Child Health 2017; 4: 326.
18. Kanakuze CA, Kaye DK, Musabirema P, et al. Factors associated with the uptake of immediate postpartum intrauterine contraceptive devices (PPIUCD) in Rwanda: a mixed methods study. BMC Pregnancy Childbirth 2020; 20(1): 650.
19. Geda YF, Nejaga SM, Belete MA, et al. Immediate postpartum intrauterine contraceptive device utilization and influencing factors in Addis Ababa public hospitals: a cross-sectional study. Contracept Reprod Med 2021; 6(1): 4.
20. Silesh M, Lemma T, Abdu S, et al. Utilisation of immediate postpartum family planning among postpartum women at public hospitals of North Shoa Zone, Ethiopia: a cross-sectional study. BMJ Open 2022; 12(2): e051152.
21. Kassa BG, Ayele AD, Belay HG, et al. Postpartum intrauterine contraceptive device use and its associated factors in Ethiopia: systematic review and meta-analysis. *Reprod Health* 2021; 18(1): 225.

22. Omona K and Namuli W. Factors influencing utilization of intra-uterine device among postpartum mothers at Gombe Hospital, Butambala district, Uganda. *Cogent Med* 2020; 7(1): 1846264.

23. Gonie A, Worku C, Assefa T, et al. Acceptability and factors associated with post-partum IUCD use among women who gave birth at bale zone health facilities, Southeast-Ethiopia. *Contracept Reprod Med* 2018; 3(1): 16.

24. Animen S, Lake S and Mekuriaw E. Utilization of intra uterine contraceptive device and associated factors among reproductive age group of family planning users in Han Health Center, Bahir Dar, North West Amhara, Ethiopia, 2018. *BMC Res Notes* 2018; 11(1): 922.

25. Hagos H, Tiruneh D, Necho W, et al. Postpartum intra-uterine contraceptive device utilization among mothers who delivered at debre tabor general hospital: cross sectional study design. *Int J Fam Commun Med* 2020; 4(5): 139–145.

26. Eluwa GI, Atamewalen R, Odogwu K, et al. Success providing postpartum intrauterine devices in private-sector health care facilities in Nigeria: factors associated with uptake. *Glob Health Sci Pract* 2016; 4(2): 276–283.