

# Immediate Postpartum Long-Acting Reversible Contraceptive Utilization and Associated Factors among Women who Gave Birth at Adama Hospital Medical College, Adama, Ethiopia

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## Abstract

**Background:** Providing long-acting reversible contraceptive (LARC) methods in the immediate postpartum period is safe, effective, and efficient in reducing complications associated with short-inter-pregnancy intervals and unintended pregnancy. Addressing barriers to postpartum family planning utilization is vitally important to decrease high burden of un-mate need for family planning. The study aimed to determine the magnitude and factors associated with immediate postpartum LARC utilization among women who gave birth at Adama Hospital Medical College from January 1st to March 31st, 2024.

**Methods and Materials:** Institutional-based cross-sectional study was conducted on 421 women. A systematic random sampling technique was used to select the study participants. Data was collected through face-to-face interviews and medical record reviews. Descriptive statistics were calculated. Simple and multiple logistic regression analyses were performed to identify factors associated with immediate postpartum LARC utilization.

**Result:** The magnitude of immediate postpartum LARC utilization was 43.9%. Women who planned to extend the next pregnancy by 2 or more years were 2.5 times more likely to use the LARC method. Family planning counseling during ANC follow-up increases the odds of LARC utilization by 1.8-fold. The odds of immediate postpartum LARC utilization were increased by 1.8-fold when partner involved during counseling and double in a woman with a previous history of LARC use.

**Conclusion:** Immediate postpartum LARC utilization was high in the study area. Factors that favor utilization were; planning to delay the next pregnancy by 2 or more years, counseling during ANC, partner involvement during counseling, and history of using LARC.

**Keywords:** immediate postpartum LARC; postpartum family planning; prevalence of LARC

## Introduction

Postpartum family planning (PPFP) is the prevention of unintended and closely spaced pregnancies through the first 12 months following childbirth [1]. According to American College of Obstetricians and Gynecologists (ACOG), immediately postpartum LARC (long-acting reversible contraceptive) is defined as the placement of LARC method when the woman are in the health facility after delivery [2]. LARC method includes; intrauterine contraceptive device (IUCD) and contraceptive implants, which are safe and highly effective reversible forms of contraception [2, 3]. Since couples have multiple encounters with the health care system, providing contraception during the immediate postpartum period is cost-effective and efficient because it doesn't require significant increases in staff supervision or infrastructure [1].

The prevalence of postpartum LARC utilization varies in different parts of the world; in America (22.5%) [4], Tanzania (10.4%) [5], Kenya (38.3%) [6], and Addis Ababa, Ethiopia (34.3%) [7]. According to the EDHS 2019, the national prevalence of LARC utilization rate among married Ethiopian women was 11% [8]. Hospital based cross-sectional studies found that the prevalence of immediate postpartum LARC utilization was 44.6% in Kenya (9), 25.4% in Hawassa University Hospital (10), 44.3 % in Saint Paul's Hospital [11], and 53.2% in Jimma University [12]. The distribution of LARC methods Implanon is the commonly used one followed by jaddele and IUCD [10, 12].

Socio-demographic factors associated with postpartum LARC utilization includes; maternal age [12, 13], being urban residence [5, 14], maternal occupation as formal employment [5, 6], secondary or higher maternal education level [15, 16], educational-

level of partner as secondary and above [14, 17], and being married women [16, 18]. Reproductive characteristics of women associated with postpartum LARC utilization are; having four or more children [16], previous history of abortion [19], having postnatal care follow up [14, 17], spontaneous vaginal delivery [20], maternal satisfaction with intrapartum care [13], having three and four ANC follow up [19], counseling during ANC follow up [12, 19, 20], mothers who received partner approval [20], previous history of LARC use [12], and planning status of pregnancy [13].

According to data from 27 countries, 95% of women who are in the first 12 months postpartum want to avoid pregnancy in the next 24 months; but 70% of them are not using contraception [22]. Postpartum family planning significantly reduces maternal and fetal complications associated with short-inter pregnancy interval and unintended pregnancy which includes; increased risk of spontaneous abortion, stillbirth, postpartum bleeding, anemia, preterm birth, low birth weight, and small for gestational age [23, 24]. In general, family planning can avert more than 30% of maternal deaths and 10% of child mortality if couples space their pregnancies more than 2 years apart [23].

Studies found that contraceptive utilization in the immediate postpartum is associated with high patient satisfaction, increased contraceptive coverage, fewer unintended pregnancies, and cost savings for patients and healthcare systems [25]. In Ethiopia, the national coverage of LARC method is much lower than the global coverage. In a country like Ethiopia where maternal and neonatal mortality remains relatively high, increasing uptake of highly effective contraceptives like LARC methods is a key life-saving intervention for mothers and their children. Our study aimed to determine the magnitude and factors associated with immediate postpartum LARC utilization among women who gave birth at Adama Hospital Medical College. So this study generates local evidences to inform healthcare providers and policymakers to develop a strategy to increase the coverage of LARC methods using the immediate postpartum period as an entry point. The findings of this study would also serve as a reference for the scientific community, researchers, medical students, and the local community to understand the magnitude of immediate postpartum LARC utilization and associated factors. In addition, the

findings of this study would also serve as baseline information for further studies to be conducted.

## Methods and Materials

### Study Design, Period and Setting

The institutional-based cross-sectional study design was conducted at Adama hospital medical college (AHMC) from January 1<sup>st</sup> to March 31<sup>st</sup>, 2024. AHMC is found in Adama town; which is located 100 km Southeast of Addis Ababa. Currently, the hospital gives health care services to an estimated six million people coming from its catchment area. The department of Obstetrics and Gynecology provides several services including; labor and delivery, postnatal care, ANC, abortion, family planning, gynecologic surgery, and E.T.C. Average number of deliveries per month were estimated as 800.

### The study participants

All women who gave birth at AHMC who were in the immediate postpartum period during the study period were included in the study. Women who gave birth at another health facilities and referred to our hospital for other reasons; women with contraindications to implants such as current or previous history of breast cancer, severe liver disease, and women taking drugs for epilepsy (phenytoin, barbiturates) or Tuberculosis (Rifampicin); women with contraindication to IUCD such as mothers with puerperal sepsis, chorioamnionitis, prolonged ROM, and uterine mass; and women who can't give consent like critically ill mothers, women age < 18 years and those with mental illnesses were excluded from the study.

### Sample size determination and Sampling procedure

The required sample size was calculated using a single population proportion formula by considering the following statistical assumptions: 95% confidence interval, 5% margin of error, and taking 53.2% prevalence of immediate postpartum LARC utilization from the previous study [12]. Accordingly, the calculated sample size was 383 and by adding a 10% non-response rate, the total sample size was 421. Sample size was also calculated for the second objective using different factors associated with immediate postpartum LARC utilization and finally the largest sample size was used. A systematic random sampling technique was used to select the study participants. The sampling frame was developed using the delivery registration log book over 3 months (from

January 1<sup>st</sup> to March 31<sup>st</sup>, 2024). The total number of deliveries over 3 months was estimated as 2,400, which is divided by the sample size of 421 to determine the sampling interval which is  $K=6$ . For every 6 deliveries, one woman was selected. The first case was selected randomly by lottery method. If the selected woman doesn't fulfill the inclusion criteria, a woman who was registered next to the selected case was included in the study.

### Data collection tools and procedures

Data was collected by face-to-face interview and maternal medical record review using structured and pretested questionnaires. The questionnaires were developed after reviewing relevant literatures. The questionnaire was translated to the local language (Oromifa & Ahamaric language) and to check for consistency it was translated back to English. The questionnaire was pretested on 5 % of the sample size at Bishoftu hospital. Data was collected by 4 medical interns after half day training was given on the data collection tool and procedures. Data collection was begun by inviting the selected woman who fulfills the inclusion criteria and if she agreed, informed written consent was taken to precede the data collection processes. If the selected woman was not willing to participate in the study, a woman registered next to her would be invited. Supervision was carried out by the investigators throughout the data collection.

### Data Processing and Analysis

The collected data were checked for completeness, outliers, missed values, and inconsistencies before entering into software. Data were entered into Epi info version 7 and then exported to SPSS version 20 for analysis. Descriptive statistics like frequency, the measure of central tendency, and cross-tabulations were used to explore the characteristics of the study participants across their different socio-demographic and reproductive variables.

In order to identify factors associated with immediate postpartum LARC utilization, binary logistic regression analysis was performed; in this regard both simple and multiple logistic regression analysis were carried out. The statistical significance of independent variables in the final predictive model was declared at  $P$ -value  $<0.05$ . Finally, the magnitude of association between the independent variables and immediate postpartum LARC utilization were estimated using an odds ratio with 95% confidence. Goodness of fit of the model was assessed using Hosmer and Lemeshow test statistics before declaring the association between immediate postpartum LARC utilization and independent variables. Accordingly, the corresponding  $p$ -value for the Hosmer and Lemeshow tests' statistics indicated that the model was well fitted at  $P$ -value = 0.544. The final fitted model was also assessed for multicollinearity of the covariates using Variance Inflation Factor (VIF). Accordingly, the mean VIF value was found to be 1.29, and there was no VIF value above 5, indicating the absence of multi-collinearity among the covariates in the fitted regression model.

## Result

### Socio-demographic characteristics of the study participants

During the study period, 410 eligible women were directly included in the study and 11 women were excluded (5 women had a contraindication for LARC method and 6 women declined to give consent) (the response rate was 98.6%). Excluded cases were replaced by woman who was registered next to the selected cases. The mean ages of the women involved in the study were 26.65 years with a standard deviation (SD) of  $\pm 4.88$ . Majority (78.4%) of the women were urban residents (Table-1).

**Table 1:** Socio-demographic characteristics of women, who gave birth at Adama hospital medical college (AHMC) from January 1<sup>st</sup> to March 31<sup>st</sup>, 2024 (N=421)

Characteristics	Number	Percentage (%)
<b>Maternal Age in Years</b>		
15 - 19	27	6.7
20 - 24	106	25.2
25 - 29	178	42.3
30 - 34	74	17.6
$\geq 35$	36	8.6
<b>Place of Residence</b>		
Urban	330	78.4
Rural	91	21.6

<b>Maternal Education</b>		
No Education	50	11.9
Primary	148	35.2
Secondary	159	37.8
College or university	64	15.2
<b>Marital Status</b>		
In a marital relationship	405	96.2
Not in marital relationship	16	3.8
<b>Occupation</b>		
House wife	283	67.2
Merchant	46	10.9
Employed	65	15.4
Others	27	6.4
<b>Religion</b>		
Orthodox	205	48.7
Muslim	156	37.1
Protestant	57	13.5
Catholic	3	0.7
<b>Paternal Education</b>		
Can't read and write	34	8.1
Primary	131	31.1
Secondary	160	38.0
University or College	96	22.8
<b>Monthly Family Income</b>		
≤ 1,000	22	5.2
1,000-2,500	95	22.6
≥ 2,500	304	72.2

### Reproductive characteristics of the study participants

Majority of the study participants (78.4%) had a plan to delay their next pregnancy by at least 2 or more years. Three hundred sixty-eight women (87.4%) had information about long-acting reversible contraceptives and health care providers were the commonest source of information. Regarding counseling about family planning, 61% of the women were counseled about family planning during ANC

follow-up and 81% were counseled during the early stages of labor or immediate postpartum period. Partner involvement during family planning counseling was reported by 44.8 % of the clients. About 80.4 % of the women counseled during ANC follow-up were satisfied with the counseling. Only one-third (34.2%) of the study participants had previous experience of using LARC, and the commonest reason for the previous discontinuation was to get pregnancy (Table-2).

**Table-2:** Reproductive characteristics of women who gave birth at Adama hospital medical college (AHMC) from January 1<sup>st</sup> to March 31<sup>st</sup>, 2024 (N=421)

Characteristics	Number	Percentage (%)
<b>Parity</b>		
One	150	35.6
2 to 4	245	58.2
5 and above	26	6.2
<b>Number of living children</b>		
0	9	2.1
1-2	293	69.6
3-4	101	24.0
5 and above	18	4.3
<b>Mode of delivery of index pregnancy</b>		
SVD	200	47.5

Instrumental Delivery	9	2.1
C/S	212	50.4
<b>Outcome of current pregnancy</b>		
Alive	406	96.4
Dead or referred to NICU	15	3.6
<b>Desire for more children</b>		
Yes	353	83.8
No	68	16.2
<b>Plan to have children by next 2 years</b>		
Yes	91	21.6
No	330	78.4
<b>Information about LARC</b>		
Yes	368	87.4
No	53	12.6
<b>Source of information (368)</b>		
Health worker	278	75.5
Media	73	19.8
Other	17	4.6
<b>ANC follow up</b>		
Yes	410	97.4
No	11	2.6
<b>Place of ANC follow up (410)</b>		
Public health center	316	77.1
Public hospital	59	14.4
Private clinic or hospital	35	8.5
<b>Number of ANC follow up (410)</b>		
1-3	131	32.0
≥ 4	297	68.0
<b>Counseling about FP during ANC (410)</b>		
Yes	250	61.0
No	160	39.0
<b>Partner involved during counseling (250)</b>		
Yes	112	44.8
No	138	55.2
<b>Satisfaction with counseling (250)</b>		
Yes	201	80.4
No	49	19.6
<b>Previously used LARC</b>		
Yes	144	34.2
No	277	65.8
<b>Reason for discontinuation (144)</b>		
Side effect	38	26.4
To be pregnant	90	62.5
Other reason	16	11.1
<b>Counseling about FP during early labor or immediate postpartum period</b>		
Yes	341	81.0
No	80	19.0
<b>Currently used LARC</b>		
Yes	185	43.9
No	236	56.1
<b>Types of LARC (185)</b>		
Implanon next	153	82.7
Jadelle	24	13.0
IUCD	8	4.3

Reason for not using LARC (236)		
Preference of other methods	61	25.8
Use LARC other time	28	11.9
Concern of side effect	15	6.4
Communicate husband	34	14.4
To recover from delivery	34	14.4
Opposition from husband	5	2.1
Went to be pregnant recently	17	7.2
Not living with her husband	5	2.1
Religious prohibition	16	6.8
Other reason	21	8.9

### Magnitude of immediate postpartum LARC utilization

The magnitude of immediate postpartum LARC utilization was 43.9% (95% CI: 39.4 - 48.9%). Among the LARC methods, 82.7% of the women used implanon next, 13.0% of the women used jadelle, and the remaining 4.3% used an intrauterine contraceptive device (IUCD). The study also assessed the reason of not using LARC methods in the immediate postpartum period and found that; the preference of other methods (25.8%), need time to recover from delivery (14.4%), need to communicate with their husband (14.4%), and prefer to use LARC methods other time (11.9%) were the commonly reported reason by the participants (Table-2).

### Factors associated with Immediate Postpartum LARC Utilization

Simple logistic regression analysis found that; maternal age, paternal education, parity, number of living children, desire for more children, planning to delay the next pregnancy by 2 or more years, place of ANC follow-up, counseling about family planning during ANC follow-up, partner involvement during counseling, satisfaction with counseling, and history of using LARCs had crude association with immediate postpartum LARC utilization at P-value < 0.25. Those variables having a crude association were subjected to multiple logistic regression models to

estimate their adjusted effect on immediate postpartum LARC utilization, after controlling for all possible confounding variables. Accordingly, planning to delay the next pregnancy by 2 or more years, counseling about family planning during ANC follow-up, partner involvement during counseling, and history of using LARC methods were significantly associated with immediate postpartum LARC utilization at P-value <0.05 (Table-3).

The study found that; women who planned to delay the next pregnancy by 2 or more years were 2.5 times more likely to use LARC methods in the immediate postpartum period than mothers who planned the next pregnancy within the next 2 years (AOR=2.51, 95%CI: 1.30 - 4.85). Women who were counseled about family planning during ANC follow-up had 1.8 times more likely to use LARC methods during the immediate postpartum period compared to those mothers who are not counseled (AOR=1.82, 95% CI: 1.06 - 3.14). Partner involvement during the counseling sessions increased the odds of immediate postpartum LARC utilization by 1.8 fold compared to those women whose partner was not involved (AOR=1.84, 95% CI: 1.11 - 3.06). Mothers who previously used any of the LARC methods were nearly two times more likely to use LARC methods in the immediate postpartum period than mothers who never used it (AOR=1.99, 95% CI: 1.19 - 3.33) (Table-3).

**Table-3:** Factors associated with immediate postpartum long-acting reversible (LARC) utilization among women who gave birth at Adama Hospital Medical College from January 1<sup>st</sup> to March 31<sup>st</sup>, 2024 (N=421)

Characteristics	Use LARC, Number (%)		COR [95%CI]	AOR [95%CI]
	Yes	No		
<b>Plan to have pregnancy in the next 2 years</b>				
Yes	23(12.4)	68(28.8)	1.00 (Ref.)	1.00 (Ref.)
No	162(87.6)	168(71.2)	2.85[1.70, 4.79]*	2.51[1.30, 4.85]**
<b>FP counseling during ANC</b>				
Yes	128(71.1)	127(54.9)	2.00[1.32, 3.02]*	1.82[1.06, 3.14]**
No	52(28.9)	103(44.8)	1.00 (Ref.)	1.00 (Ref.)

Partner involved in the counseling				
Yes	74(60.2)	52(40.9)	2.08[1.35, 3.22]*	1.84[1.11, 3.06]**
No	49(39.8)	75(59.2)	1.00 (Ref.)	1.00 (Ref.)
Previous history of using LARC				
Yes	95(51.4)	59(25.0)	3.17[2.10, 4.78]*	1.99[1.19, 3.33]**
No	90(48.6)	177(75.0)	1.00 (Ref.)	1.00 (Ref.)

\*  $P < 0.25$ ; \*\*  $P < 0.05$

## Discussions and Conclusion

According to the findings of our study, the magnitude of LARC utilization during the immediate postpartum period was 43.9% (95% CI: 39.4 - 48.9%). The finding of our study is higher than the prevalence of postpartum LARC utilization in America (22.5%) [4], Tanzania (10.4%) [5], Kenya (38.3%) [6], and Addis Ababa, Ethiopia (34.3%) [7]. This variation could be explained by the difference in the study design and study population. It was also higher than the national LARC utilization rate among married women which was 11% according to EDHS 2019 [8]. This could be because of the fact that the national estimate was for all reproductive age groups, while our study was limited to specific groups of women in their immediate postpartum period that had repeated and prolonged contact with health care providers which increased the opportunity for LARC utilization rate. The finding of our study was in line with the hospital-based study done in Kenya (44.6%) [9] and Addis Ababa, Ethiopia (44.3%) [11]. In contrast, it was lower than the prevalence of immediate postpartum LARC utilization among mothers who gave birth at Jimma University Medical Center (53.2%)[12]. This difference can be explained by the variation in family planning counseling during the immediate postpartum period which was 100% in the jimma study and it was 81% in our study.

The odds of immediate postpartum LARC utilization among women who planned to extend the next pregnancy by 2 or more years were increased by 2.5-fold compared to their counterpart. Similar finding was reported by the study done at Jimma University [12] and North West Ethiopia [26]. Several studies found that most postpartum women want to avoid the next pregnancy by 24 months after delivery, so women who want to delay the next pregnancy by 2 or more years have an increased motivation to use LARC methods in the immediate postpartum period. Immediate postpartum period is a convenient time to increase the uptake of LARC methods, particularly for those women who wish to delay their next pregnancy by 2 or more years.

Antenatal care (ANC) follow-up provides an opportunity to counsel woman on the importance of family planning and the contraceptive options available to her, including those that can be provided immediately following delivery [2]. In this regard, 61% of the women involved in our study were counseled about family planning during ANC follow-up. Women who were counseled about family planning during ANC follow-up had 1.8 times more likely to use LARC methods during the immediate postpartum period, which is consistent with a study done in Rwanda [20], Northern Ethiopia [10] and Jimma University [12]. This association can be explained as counseling about family planning builds women's knowledge and attitude about contraceptive methods and helps women to clear misconceptions and myths associated with LARC methods, which in turn increases the uptake. Since pregnant women have multiple contacts with health care providers during ANC follow-up, it should be used as an opportunity to counsel all women about different options of family planning methods including LARCs.

The odds of immediate postpartum LARC utilization were increased by 1.8-fold when the partner was involved during the counseling session compared to those women whose partners were not involved during counseling. The finding of our study was in line with the study done in Uganda [27], Rwanda [20], and North West Ethiopia [26]. Including husbands during family planning counseling supports and strengthens women's decision to use family planning methods. In developing countries like Ethiopia where most of the women are economically dependent on their husband, involving the husband in the women's reproductive health care services including family planning utilization is essential. Partner involvement during family planning counseling should be encouraged in order to increase immediate postpartum LARC utilization.

Mothers who previously used any of the LARC methods were nearly two times more likely to use LARC method in the immediate postpartum period

than mothers who never used it. Similar findings were reported by studies done in Uganda [28], Kenya [9], and Ethiopia [12]. The positive association of prior use of LARC with the current use of the method could be explained by better understanding and experience with prior exposure that would facilitate the current utilization. In addition, those women with previous exposure had more likely to have knowledge and attitudes to disprove misconceptions and myths associated with LARC methods. A woman who was satisfied and had a good experience with prior LARC utilization would be taken as a good ambassador to increase LARC utilization rate in the community.

The study had some limitations of which being a cross-sectional study, so it doesn't establish the temporal sequence between the independent variable and LARC utilization. Since it was institutional based and focused on a specific group of women in the immediate postpartum period, the finding may not represent all reproductive age women. We recommend multicenter observational studies to identify barriers to immediate postpartum LARC utilizations.

The magnitude of immediate postpartum LARC utilization among women who gave birth at AHMC was 43.9%. The study found that; planning to delay the next pregnancy by 2 or more years, counseling about family planning during ANC follow, partner involvement during counseling, and history of using LARC were significantly associated with immediate postpartum LARC utilization. Integrating family planning counseling during ANC follow-up and involving the partner during counseling should be encouraged in order to increase LARC method coverage during the immediate postpartum period.

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