Immediate postpartum intrauterine contraceptive device utilization and influencing factors in Addis Ababa public hospitals: a cross-sectional study

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Abstract

Background: Postpartum intrauterine device (PPIUCD) utilization remains very low in Ethiopia beside high levels of unmet need for postpartum family planning even if nongovernmental organizations efforts to promote its use. This study investigates immediate PPIUCD utilization and influencing factors.

Methods: Institution based cross-sectional study was conducted on public hospitals of Addis Ababa city. All public hospitals which have PPIUCD service were included and systematic random sampling technique was used to select 286 participants. Data were entered using Epi Data and exported to SPSS for analysis. Bivariate and multivariate logistic regression analysis was used to determine the effect of independent variables on immediate PPIUCD utilization. Variables which have P-value < 0.2 on bivariate analysis were candidate for multivariate analysis. Variables which have P-value ≤ 0.05 on multivariate analysis was considered as statistically significant.

Results: Utilization of immediate PPIUCD among participants who gave birth in Addis Ababa public hospitals was 26.6% (95%CI: 21.3, 31.8). Eighty one percent respondents occupation was housewife were (AOR = 0.19, 95%CI: 0.06, 0.67) less likely to utilize PPIUCD compared to those who have personal job. In the other hand respondents who have discuss about PPFP with their partner were 1.21times (AOR = 1.21, 95%CI: 1.14, 25.67) more likely to utilize PPIUCD compared to those who never discuss. Contrarily 81% of respondents who need partner approval were (AOR = 0.19, 95%CI: 0.05, 0.79) less likely to utilize PPIUCD compared to those who doesn’t need approval. Respondents who have been counseled about PPIUCD were 1.13 times (AOR = 1.13, 95%CI: 1.10, 2.21) more likely to utilize PPIUCD compared to those who were not counseled. Similarly respondents who have good knowledge about PPIUCD were 7.50 times (AOR = 7.50, 95%CI: 4.06, 9.31) more likely to utilize PPIUCD compared to those who have poor knowledge.

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Conclusion: This study verifies that immediate PPIUCD utilization is high compared to other studies. Having a housewife occupation and necessity of partner approval to utilize PPIUCD have negative influences, whereas spousal discussion about PPIUCD, counseled during pregnancy and having good knowledge have positive influences on PPIUCD utilization. Therefore empowering women by the government and other organizations working on maternal health will advance immediate PPIUCD utilization.

Keywords: Immediate postpartum, Intrauterine contraceptive device, Contraception, Addis Ababa

Background
Postpartum family planning (PPFP) is defined as the use of family planning in the first 12 months following birth [1, 2]. Fertility after birth can return as soon as 45 days after giving birth for women who are not breastfeeding [3, 4] and it can also occur before menstruation is resumed on those who don’t feed breast exclusively [5].

World Health Organization (WHO) recommends spacing pregnancies by at least 24 months [6]. However, unmet need for family planning is high in the postpartum period, ranging from 32 to 62% in low and middle-income countries [3, 7, 8]. Because of unmet need, unintended pregnancy is common in the postpartum period [9, 10]. Beside this closely spaced pregnancies are expected to have adverse maternal, perinatal and infant outcomes [11, 12].

Postpartum intrauterine contraceptive device (PPIUCD) is one of the contraceptive methods which is safe and highly effective, reliable and long acting contraceptive [13, 14]. The effectiveness of intrauterine device (IUCD) as a contraceptive method is approximately 99.2 to 99.8% within the first year of use, which is better than other shorter-term reversible contraceptive methods [15, 16].

PPIUCD is an acceptable contraception with fewer complications [17, 18]. PPIUCD inserted just after 10 min of placental delivery is a safe, effective, and efficient method of meeting women’s need for long-acting but reversible method of contraception [19, 20]. It can be placed after abortion, vaginal delivery and during caesarian section [21].

In Ethiopia PPIUCD intervention on selected public health facility is started on 2014 even if it is not widely utilized [6]. Intrauterine device is the least utilized modern contraceptive method in Ethiopia [22]. Reasons for low utilization range from limited provision of IUCDs to a lack of staff trained in providing family planning counseling and services to pre-existing biases against IUCDs among both providers and the general public [19, 23–26].

Unmet need of family planning among married women in Ethiopia is 22% [22]. In addition to this 17% pregnancies were mistimed, and 8% of pregnancies were unwanted [27]. Increasing access to effective postpartum intrauterine contraceptive methods can reduce the risk of unintended pregnancy and short inter-birth intervals [28].

Postpartum unintended pregnancy is an important public health challenge in Ethiopia. Moreover, there are very few studies conducted on PPIUCD in low resource setting and it is an emerging service. Understanding the level of PPIUCD utilization will provide information that can be used by policy makers and other stakeholders to improve service delivery of PPIUCD. Therefor this study aimed to assess immediate PPIUCD utilization and influencing factors in Addis Ababa public hospitals.

Methods
Study setting and design
This study was conducted in public hospitals of Addis Ababa. Addis Ababa is the capital city of Ethiopia. The city has 10 sub-cities and located at the geographical center of the country. According to national census annual population growth rate of Addis Ababa was 2.1% between 1994 and 2007 and current total projected population size of 4,005,597, out of these female population accounted 52%. Women of reproductive age group among the total population are 947,855 [29].

Addis Ababa city has 13 public hospitals distributed throughout 10 sub cities. The public hospitals in the city are Black Lion Specialized Hospital (BLSH), St Paul Hospital Millennium Medical College (SPHMMC), Amanuel Hospital (AmH), Alert Hospital (AlH), St Peter Hospital (SPH), Police Hospital (PH), Armed Force Hospital (AFH), Zewditu Memorial Hospital (ZMH), Menilik II Memorial Hospital (MMH), Ras-Desta Memorial Hospital (RDMH), Yekatite-12 Hospital (YH), Tirunesh Beijing Hospital (TBH) and Gandhi Memorial Hospital (GMH). On the selected hospitals postnatal ward institution based crosssectional study was conducted from August 25–September 30, 2019.

Study subject
All postpartum women who gave birth in Addis Ababa public hospitals were the source population. Postpartum women who have had fulfilled WHO eligibility criteria for insertion of immediate postpartum IUCD were during the study period were included. Those who have high Fever during labor and delivery, having active
sexual transmitted diseases (STD) or other lower genital tract infection or high risk for STD, ruptured membrane for more than 24 h prior to delivery, known uterine abnormalities, unresolved post-partum hemorrhage or postpartum uterine atony requiring use of additional oxytocic drugs were excluded from the study in accordance with WHO exclusion criteria [30].

Sample size determination, sampling technique and procedures
The sample size was determined by using single population proportion formula. By considering 5% margin of error, 95% confidence interval (CI), 21.6% proportion of immediate PPIUCD practice from a study done in Sidama Zone, southern Ethiopia [31], and none response rate of 10% making final sample size of 286.

From the total public hospitals in Addis Ababa city all hospitals providing PPIUCD service were included in this study. Hospitals providing PPIUCD service are BLSH, SPHMMC, ZMH, MMH, and GMH. To select study participants, the total sample size was allocated proportionally to each included hospital based on the average number of monthly delivery service. Postpartum women’s in each included hospitals were selected using systematic random sampling technique. To select individual participant, order of delivery record book was used and interval of selection was calculated based estimated average monthly client flow to each hospital (Fig. 1).

Variables
Immediate Postpartum intrauterine contraceptive utilization was dependent variable of this study. Socio-demographic characteristic (age, marital status, occupation, educational status, religion); knowledge, attitude, obstetric characteristics (birth interval, decision to use family planning, number of birth and children, planned/unplanned Pregnancy); health service related (numbers of Antenatal care visits, Family Planning Counseling during Antenatal care and delivery setting, previous Family Planning experience, mode of delivery) were independent variables.

Operational definitions
Immediate PPIUCD
An IUCD that can be inserted post placental, intra cesarean and spontaneous vaginal delivery within 48 h of delivery.

Utilization of PPIUCD
Postpartum women who have used postpartum intrauterine contraceptive device.

Good knowledge
A score of greater than or equal to mean (correct answers for 5 or more out of 10) of knowledge assessment questions.

Poor knowledge
A score of less than mean of the knowledge assessment questions.

Favorable attitude
A score of greater than or equal to mean (correct answers for 2.5 or more out of 5) of attitude assessment questions.

Fig. 1 sampling procedures of study participants in Addis Ababa public hospitals, Addis Ababa, August 25 to September 30, 2019
Unfavorable attitude
A score of less than mean of the knowledge assessment questions.

Data collection tools and procedures
A pretested structured interviewer administered questionnaire consisting of items with pre-coded response categories was used. The questionnaire was adopted from EDHS 2016 [27] and reviewing literatures.

The tool has four sections: The first section consists of socio demographic characteristics, second section was about obstetrics related Practice, third section assesses knowledge, fourth section was about attitude and last section was about PPIUCD utilization and related characteristics of study participants. The questionnaire was designed in English and translated in to local Amharic language and then translated back to English by translators for consistency.

Data were collected by face to face interview. Five BSc midwives for data collection and one MSc midwife for supervision were recruited. One day data collection training was given to data collectors and supervisors on the objectives, benefits of the study, individual’s right, informed consent and techniques of the interview.

Before starting the actual data collection to assure the data quality, high emphasis was given to designing data collection instrument. First the questionnaire was pre-tested on 10% of sample size, 26 postpartum women in Teklehaymanot general hospital. After pre-test further adjustments on the tool was made to improve clarity, understandability, and simplicity of the messages.

All of the questionnaires were checked for completeness and accuracy before, during and after the period of data collection. Throughout the course of the data collection, interviewers were supervised. Regular meetings were held between the data collectors and the principal investigator to discuss on challenges and solutions of procedures. The collected data was again reviewed and checked for completeness before data entry. Data entry format template was prepared and programmed by principal investigator.

Data analysis
Data were entered using Epi Data version 4.2, and exported to statistical package of social sciences (SPSS) version 24.0 for analysis. Descriptive statistics were computed to describe study variables in relation to the population. Bivariate and multivariate logistic regression was used to determine the effect of independent variables on immediate PPIUCD utilization. Variables which have P-value $\leq 0.05$ on multivariate analysis was considered as statistically significant factors influencing immediate PPIUCD utilization. Finally, results were compiled and presented using texts and tables.

Results
A total of 286 included respondents were participated in this study, which makes response rate of 100%. About half of the respondents 141(49.3%) belongs to age category of 25–29 year with mean age of 28.0 and standard deviation of 4.69. Majority of the study participants 271(88.1%) were married (Table 1).

Obstetrics related practice of study participants
The mean age at first marriage was 20 year with standard deviation of 3.92. More than two third of

| Variable            | Frequency | Percent (%) |
|---------------------|-----------|-------------|
| Age (years)         |           |             |
| $\leq$ 19           | 4         | 1.4         |
| 20–24               | 58        | 20.3        |
| 25–29               | 141       | 49.3        |
| 30–34               | 47        | 16.4        |
| Above 35            | 36        | 12.6        |
| Marital Status      |           |             |
| Married             | 252       | 88.1        |
| Divorced            | 20        | 7.0         |
| Unmarried           | 6         | 2.1         |
| Widowed             | 8         | 2.8         |
| Level of education  |           |             |
| No formal education | 21        | 7.3         |
| Primary (1–8)       | 90        | 31.5        |
| Secondary (9–12)    | 104       | 36.4        |
| College and above   | 71        | 24.8        |
| Religion            |           |             |
| Orthodox            | 124       | 43.4        |
| Muslim              | 108       | 37.8        |
| Protestant          | 46        | 16.1        |
| Catholic            | 8         | 2.8         |
| Occupation          |           |             |
| Housewife           | 106       | 37.1        |
| Government employee | 28        | 9.8         |
| Private employee    | 51        | 17.8        |
| Daily laborer       | 20        | 7.0         |
| Self employed       | 56        | 19.6        |
| Merchant            | 25        | 8.7         |

Table 1 Socio-demographic characteristics of post-partum women in Addis Ababa public hospitals, Addis Ababa, August 25 to September 30, 2019-(N = 286)
study participants 210(73.4%) had at least one birth. About 81(37.2%) of the participants had a birth spacing of above 36 months (Table 2).

Knowledge of participants about postpartum intrauterine contraceptive device
This study showed that more than two third of the study participants 179(68.9%) of them responded that they have heard IUCD can be inserted immediately after delivery. From the study participants 92.3% of them answered PPIUD can be removed at any time you wish, followed by 75.5% who says PPIUCD is inserted free of charge in Ethiopia and 73.4% of them responded PPIUCD does not cause cancer (Table 3).

Participants attitude about postpartum intrauterine contraceptive device
The respondents were asked to reflect their opinion on a serious of questions concerning to attitude towards post-partum IUCD. The Likert scale with scores ranging from 1 = disagree to 3 = agree was used to measure their attitude (Table 4).

PPIUCD utilization and related characteristics of study participants
The study participants ever used family planning methods was 220(76.9%). Current use of PPIUCD among study participants were 76(26.6%). All of the study participants were attended ANC visits during current pregnancy and among the women 87(30.4%) had received family planning counseling (Table 5).

Influencing factors of PPIUCD utilization
On bivariate analysis age, level of education, occupation, time to have more children, discussion about family planning with partner, needs partner approval to use PPFP, counseled about PPIUCD and knowledge were candidates for multivariate analysis. From this variables Occupation, discuss about FP with partner, needs partner approval to use FP, counseled about PPIUCD and knowledge were remain statistically significant predictors to utilize PPIUCD (Table 6).

From the respondents 81% of those whose occupation is housewife were (AOR = 0.19, 95%CI: 0.06, 0.67) less likely to utilize PPIUCD compared to those who have personal job. In the other hand respondents who have discuss about PPFP with their partner were 1.21times (AOR = 1.21, 95%CI: 1.14, 25.67) more likely to utilize PPIUCD compared to those who never discuss. Contrarily 81% of respondents who need partner approval to use PPFP were (AOR = 0.19, 95%CI: 0.05, 0.79) less likely to utilize PPIUCD compared to those who doesn’t need approval. Respondents who have been counseled about PPIUCD were 1.13 times (AOR = 1.13, 95%CI: 1.10,

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**Table 2** Obstetric Characteristics of the participants who gave birth in Addis Ababa public hospitals, Addis Ababa, August 25 to September 30, 2019-(N = 286)

| Variable | Frequency | Percent (%) |
|----------|-----------|-------------|
| **Age at first marriage** | | |
| ≤ 18 | 76 | 26.6 |
| 19–20 | 86 | 30.1 |
| 21+ | 124 | 43.4 |
| **Number of Birth** | | |
| 1–2 | 210 | 73.4 |
| 3–4 children | 68 | 23.8 |
| 5 and above | 8 | 2.8 |
| **Age of last child (months)** (n = 218) | | |
| < 24 | 62 | 28.4 |
| 24–36 | 75 | 34.4 |
| > 36 | 81 | 37.2 |
| **Plan to have another child** | | |
| Yes | 173 | 60.5 |
| No | 72 | 25.2 |
| Undecided | 41 | 14.3 |
| **Time to have another child in the future (months)**(n = 173) | | |
| Less than 24 | 31 | 17.9 |
| 24–36 | 52 | 30.1 |
| Above 36 | 90 | 52.0 |
| **Number of alive children** | | |
| None | 4 | 1.4 |
| 1–4 | 210 | 73.4 |
| 5 and above | 72 | 25.2 |
| **Number of children want to have in your life** | | |
| ≤ 3 | 106 | 37.1 |
| ≥ 4 | 180 | 62.9 |
| **present birth planned** | | |
| Yes | 212 | 74.1 |
| No | 74 | 25.9 |
| **Decision on the use of modern FP** | | |
| Mainly respondents | 64 | 22.4 |
| Mainly Husband | 44 | 15.4 |
| Jointly decision | 178 | 62.2 |
| **Discussed on family planning methods with partner during pregnancy** | | |
| Yes | 133 | 46.5 |
| No | 153 | 53.5 |
| **Partner approves of family planning use** | | |
| Yes | 113 | 39.5 |
| No | 173 | 60.5 |
more likely to utilize PPIUCD compared to those who were not counseled. Similarly respondents who have good knowledge about PPIUCD were 7.50 times (AOR = 7.50, 95%CI: 4.06, 9.31) more likely to utilize PPIUCD compared to those who have poor knowledge (Table 6).

Table 3 knowledge of postpartum women about PPIUCD in Addis Ababa public hospitals, Addis Ababa, August 25 to September 30, 2019-(N = 286)

| Questions                                                                 | Responses | Correct responses | Percent correct |
|---------------------------------------------------------------------------|-----------|-----------------|-----------------|
|                                                                           | TRUE N   | FALSE N         |                 |
|                                                                           | %        | %               |                 |
| PPIUD can prevent pregnancies for more than 10 years.                     | 176       | 110             | TRUE 61.5       |
|                                                                           | 61.5     | 38.5            |                 |
| PPIUD is not appropriate for females at high risk of getting STIs.        | 147       | 139             | FALSE 48.6      |
|                                                                           | 51.4     | 48.6            |                 |
| PPIUD has no interference with sexual intercourse or desire.              | 148       | 138             | TRUE 51.7       |
|                                                                           | 51.7     | 48.3            |                 |
| PPIUD is immediately reversible (become pregnant quickly when removed).  | 182       | 104             | TRUE 63.6       |
|                                                                           | 63.6     | 36.4            |                 |
| PPIUD does not cause cancer.                                             | 210       | 76              | TRUE 73.4       |
|                                                                           | 73.4     | 26.6            |                 |
| PPIUD can be used by breast feeding mothers.                             | 202       | 84              | TRUE 70.6       |
|                                                                           | 70.6     | 29.4            |                 |
| PPIUD may cause changes in bleeding pattern.                             | 196       | 90              | TRUE 68.5       |
|                                                                           | 68.5     | 31.5            |                 |
| PPIUD can be used by HIV positive patients doing well on treatment.      | 117       | 169             | TRUE 40.9       |
|                                                                           | 40.9     | 59.1            |                 |
| PPIUD is inserted free of charge in Ethiopia.                            | 216       | 70              | TRUE 75.5       |
|                                                                           | 75.5     | 24.5            |                 |
| PPIUD can be removed at any time you wish.                               | 264       | 22              | TRUE 92.3       |
|                                                                           | 92.3     | 7.7             |                 |

Table 4 Attitude of postpartum women about PPIUCD utilization in Addis Ababa public hospitals, Addis Ababa, August 25 to September 30, 2019-(N = 286)

| Questions                                                                 | Frequency | Percent (%) |
|---------------------------------------------------------------------------|-----------|-------------|
| Insertion and removal of PPIUD is highly painful                          | 234       | 81.8        |
| Agree                                                                     | 81.8      |             |
| Not sure                                                                  | 38        | 13.3        |
| Disagree                                                                  | 14        | 4.9         |
| PPIUCD doesn’t move through the body after insertion                      | 202       | 70.6        |
| Agree                                                                     | 70.6      |             |
| Not sure                                                                  | 60        | 21.0        |
| Disagree                                                                  | 24        | 8.4         |
| PPIUCD does not interfere with sexual intercourse                         | 236       | 82.5        |
| Agree                                                                     | 82.5      |             |
| Not sure                                                                  | 34        | 11.9        |
| Disagree                                                                  | 16        | 5.6         |
| PPIUD is very effective at pregnancy prevention                           | 184       | 64.3        |
| Agree                                                                     | 64.3      |             |
| Not sure                                                                  | 84        | 29.4        |
| Disagree                                                                  | 18        | 6.3         |
| PPIUCD can harm a woman’s womb                                           | 184       | 64.4        |
| Agree                                                                     | 64.4      |             |
| Not sure                                                                  | 80        | 28.0        |
| Disagree                                                                  | 22        | 7.7         |

Discussion

In this study immediate PPIUCD utilization and influencing factors among participants who gave birth in Addis Ababa public hospitals was assessed. In accordance with immediate PPIUCD utilization knowledge and attitude of participants was studied as an independent predictors. In addition, effect of socio-demographic, obstetric and related factors over PPIUCD utilization was studied.

Immediate PPIUCD utilization among participants who gave birth in Addis Ababa public hospitals was 26.6% (95%CI: 21.3, 31.8). Similar figure of PPIUCD utilization was reported in Sidama region, Ethiopia [31] and another study in Rwanda [32]. This is higher than the national report of Ethiopian mini DHS 2019 which is 2% [22]. Similarly this result is higher than a study done in Sri Lanka 3.4% [11].

This difference might be due to proportion of women receiving postnatal care in Addis Ababa is higher which is 74% unlike other part of the country like 10% in Somali [22]. This might also be due to peoples living in Addis Ababa (capital city of the country) having better route of information. Additionally peoples living in Addis Ababa have different religions whereas Somali region is dominated by Muslim religion followers and the religion prohibits family planning utilization.

From the respondents 81% of those whose occupation is housewives were less likely to utilize PPIUCD compared to those who have personal job. Similarly a study conducted in Adaba town [33], Bahirdar town [34] and Janamora district [35] house wives were less likely to utilize long acting family planning compared to daily laborers.

This might be due to women’s working outside home may have economic difficulties to have additional family member. Additional reasons might be house builders...
Respondents who discuss about PPFP with their partner were more likely to utilize PPIUCD compared to those who never discuss. Consistently a study conducted in Bahirdar town explains that women’s who have spousal discussion were utilizing long acting family planning [34].

Respondents who need partner approval to use PPFP less likely to utilize PPIUCD compared to those who don’t need approval. Similarly a study conducted in Gamogofa zone public health facilities states that odds of mothers who have partner support for IUCD insertion were more likely to utilize PPIUCD than those do not have partner support [10].

This might be due to women’s usually depends on their husband’s decision in Ethiopia, even though government and different nongovernmental organizations were working on empowering women. In addition to this it might also be due to take care of their marriage and families from unresolvable quarrels and to prevent divorce. Another description might be decisions made jointly with agreement of both couples will have better outcome since issue of family planning is not only the concern of one partner.

In this study participants who have been counseled about PPIUCD were more likely to utilize PPIUCD compared to those who were not counseled. Similarly a study conducted in Sidama region [31] and Bahirdar town [36] shows counseled clients were dedicated to utilize PPIUCD.

Another clustered randomized data in Tanzania explains that giving women informational materials on PPIUCD and counseling after admission for delivery are likely to increase the proportion of women choosing PPIUCD [19]. In the same manner a study in India assures that counseling in the antenatal period was a key point in increasing acceptance of PPIUCD [37].

This might be because women who are received family planning counseling during ANC and PNC might be highly motivated to use PPIUCD. This might also be due to counseling can solve traditional attitudes and myths thinking that PPIUCD is bad. In the other hand counseling can make clients to improve their knowledge about the methods they are going to use. Result of this study verifies that clients who have good knowledge were utilizing PPIUCD.

 Respondents who have good knowledge about PPIUCD were more likely to utilize PPIUCD compared to those who have poor knowledge. In the same manner a study conducted in Janamora district [35] and Bahirdar town [34] women who had good knowledge were utilize PPIUCD compared to those who had poor knowledge.

Consistently a study conducted in India states that clients who have good knowledge have better experience

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### Table 5: PPIUCD utilization and related characteristics of participants who gave birth in Addis Ababa public hospitals, Addis Ababa, August 25 to September 30, 2019 (N = 286)

| Variable                                      | Frequency | Percent (%) |
|-----------------------------------------------|-----------|-------------|
| Ever used family planning methods previously  |           |             |
| Yes                                           | 220       | 76.9        |
| No                                            | 66        | 23.1        |
| Family planning use before recent pregnancy (n = 220) |           |             |
| Yes                                           | 180       | 81.8        |
| No                                            | 40        | 18.2        |
| Method used (n = 220)                         |           |             |
| Natural Family Planning                       | 7         | 3.2         |
| IUCD                                          | 42        | 19.1        |
| Implanon                                      | 62        | 28.2        |
| Injectable                                    | 76        | 34.5        |
| Pills                                         | 33        | 15.0        |
| Currently using PPIUCD                        |           |             |
| Yes                                           | 76        | 26.6        |
| No                                            | 210       | 73.4        |
| Reason not to use PPIUCD (n = 210)            |           |             |
| wanted to have another child                   | 31        | 14.8        |
| Not think I could be pregnant                  | 30        | 14.3        |
| Religion Prohibition                           | 14        | 6.7         |
| Husband disapproves                            | 13        | 6.2         |
| Afraid of side effects                         | 78        | 37.1        |
| Afraid of becoming infertile                   | 24        | 11.4        |
| Use later when menstruation begins             | 20        | 9.5         |
| Mode of delivery                               |           |             |
| SVD                                           | 197       | 68.9        |
| Vacuum/ Forceps delivery                       | 33        | 11.5        |
| C/S                                           | 56        | 19.6        |
| Have antenatal care follow up                  |           |             |
| Yes                                           | 286       | 100         |
| Number of antenatal care visits                |           |             |
| 1 visit                                       | 2         | 0.7         |
| 2–3 visits                                    | 42        | 14.7        |
| 4 visits and above                            | 242       | 84.6        |
| PPIUCD counseling in the health facilities     |           |             |
| Yes                                           | 87        | 30.4        |
| No                                            | 199       | 69.6        |
| Time of PPIUCD counseling (n = 87)             |           |             |
| During ANC follow up                           | 69        | 79.3        |
| During labor                                  | 4         | 4.6         |
| After delivery                                | 14        | 16.1        |
of PPIUCD [38]. In the other hand this study describes that 63.6% of participants scored mean and above the mean of attitude assessment questions, and considered as having a favorable attitude towards PPIUCD; attitude was not statistically a significant factor to utilize PPIUCD.

### Strength and limitation of the study
This study well presents residence of Addis Ababa city, their stance of utilizing immediate PPIUCD and identify the bottle neck factors for the service. Contrary to this it was conducted in Addis Ababa city (capital city of the country) public hospitals; hence the findings might not be adequately reflected the entire population and other cities of Ethiopia.

### Conclusion
This study concludes that PPIUCD utilization among Addis Ababa city public hospital was high compared to other studies. Participants whose occupation was housewife and who needs partner approval to utilize PPIUCD were less likely to utilize PPIUCD compared to their counter parts. Whereas participants who have discussed about PPIUCD with their spouse, have counseled about PPIUCD during their pregnancy and participants who have good knowledge were more likely to utilize

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**Table 6** PPIUCD utilization predictors among participants who gave birth in Addis Ababa public hospitals, Addis Ababa, August 25 to September 30, 2019-(N = 286)

| Variables/Category | PPIUCD | COR(95% CI) | AOR(95% CI) |
|--------------------|--------|-------------|-------------|
|                    | Utilized N (%) | Not utilized N (%) |         |         |
| Age                |        |             |             |         |         |
| 15–24              | 8 (10.5) | 54 (25.7) 0.37 (0.16, 0.82) | 0.29 (0.08, 1.14) |
| 25–34              | 54 (71.1) | 134 (63.8) | 0.23 (0.08, 0.63) | 0.51 (0.09, 2.76) |
| > 35               | 14 (18.4) | 22 (10.5)  |             |         |         |
| Level of education |        |             |             |         |         |
| No formal education| 2 (2.6) | 19 (9.0) 5.49 (1.18, 25.47) | 1.87 (0.02, 34.92) |
| Primary (1–8)      | 7 (9.2) | 83 (39.5) 6.85 (2.76, 17.02) | 1.61 (0.09, 4.15) |
| Secondary (9–12)   | 41 (53.9) | 63 (30.0) 0.89 (0.48, 1.66) | 0.62 (0.57, 4.62) |
| College and above  | 26 (34.2) | 45 (21.4) 1  |             |         |         |
| Occupation         |        |             |             |         |         |
| Housewife          | 22 (28.9) | 84 (40.0) 0.76 (0.69, 2.53) | 0.19 (0.06, 0.67)* |
| Employeda          | 28 (36.8) | 51 (24.3) 0.63 (0.33, 1.19) | 0.52 (0.15, 1.82) |
| Personal jobb      | 26 (34.2) | 75 (35.7) 1 |             |         |         |
| Time to have more child | |            |             |         |         |
| < 24 months       | 13 (29.5) | 18 (14) 0.39 (0.17, 0.94) | 3.56 (0.94, 13.81) |
| 24–36 months      | 11 (25) | 41 (31.8) 1.06 (0.46, 2.44) | 0.98 (0.33, 2.96) |
| > 36 months       | 20 (45.5) | 70 (54.3) 1 |             |         |         |
| Discuss about PPFP with partner | |            |             |         |         |
| Yes               | 37 (48.7) | 116 (55.2) 1.30 (0.76, 2.20) | 1.21 (1.14, 25.67)* |
| No                | 39 (51.3) | 94 (44.8) 1 |             |         |         |
| Needs partner approval to use PPFP | |            |             |         |         |
| Yes               | 51 (67.1) | 122 (58.1) 0.68 (0.39, 1.18) | 0.19 (0.05, 0.79)* |
| No                | 25 (32.9) | 88 (41.9) 1 |             |         |         |
| Counseled about PPIUCD during pregnancy | |            |             |         |         |
| Yes               | 25 (48.7) | 88 (23.8) 1.16 (1.12, 2.01) | 1.13 (1.10, 2.21)** |
| No                | 39 (51.3) | 160 (76.2) 1 |             |         |         |
| Knowledge about PPIUCD | |            |             |         |         |
| Poor              | 66 (86.8) | 72 (34.3) 1 |             |         |         |
| Good              | 10 (13.2) | 138 (65.7) 12.65 (6.14, 26.08) | 7.50 (4.06, 9.31)*** |

*a = P < 0.05, ** = P < 0.01, *** = P < 0.001, a = gov’t & private employee, b = merchant, self-employee and daily laborer
PPIUCD compared to their counter parts. Based on this result the following recommendations were given.

- Housewife’s need to be supported by Addis Ababa health office and health extension workers to work on PPIUCD utilization by delivering appropriate information.
- Discussion about family planning in the community at large in Ethiopia is not common. There for discussion with partner about family planning need to be a culture and should be encouraged by health professionals working on maternal health services.
- Good counseling can address client myths and misconceptions about the PPIUCD there for health professionals delivering this service should give emphasis for it. Each facilities working on this service should integrating postnatal care with postpartum family planning counseling.

Abbreviations
AFH: Armed Force Hospital; ALH: Alert Hospital; AmH: Amanuel Hospital; ANC: Antenatal Care; ADR: Adjusted Odds Ratio; BLSH: Black Lion Specialized Hospital; CI: Confidence Interval; FP: Family Planning; GHM: Gandhi Memorial Hospital; MVH: Menilik II Memorial Hospital; PH: Police Hospital; PNC: Postnatal Care; PPF: Post Partial Family Planning; PPF: Postpartum Family Planning; PPIUCD: Post Partial Intrauterine Contraceptive Device; RDMH: Ras-Desta Memorial Hospital; SPH: St Peter Hospital; SPHMMC: St Paul Hospital Millennium Medical College; SPSS: Statistical Package of Social Sciences; STD: Sexual Transmitted Diseases; THB: Tirunesh Beijing Hospital; WHO: World Health Organization; YH: Yekatit-12 Hospital; ZMH: Zewditu Memorial Hospital

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Authors’ contributions
All authors equally participated in this study in all sessions. The author(s) read and approved the final manuscript.

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Availability of data and materials
The datasets supporting result of this study is available from the corresponding author on reasonable request, but it is not available in public favor of participant’s confidentiality.

Ethics approval and consent to participate
Ethical clearance was obtained from institutional review board of Addis Ababa University, college of health sciences, School of Nursing and Midwifery research committee. Support letter from School of Nursing and Midwifery were written to all selected hospitals and Addis Ababa city administration Health Bureau.

After information was provided about purpose of the study, non-invasiveness of the data collection procedure, confidentiality of the information and all the participants were reassured. Then, after obtaining informed consent from every participant, the data collectors were continued with giving due respect to the norms, values, beliefs, culture, and ensured confidentiality of clients information.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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