UPTAKE OF IMMEDIATE POSTPARTUM INTRAUTERINE DEVICE AND ASSOCIATED FACTORS AMONG MOTHERS WHO DELIVERED AT TWO PUBLIC HOSPITALS IN ADDIS ABABA, ETHIOPIA

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ABSTRACT

BACKGROUND: Most women do not desire pregnancy immediately after delivery and are highly motivated to accept family planning methods. The post-partum intrauterine device is one of the family planning methods that can address this need. However, intrauterine device use has been very low in low- and middle-income countries.

OBJECTIVE: To assess the utilization and factors associated with the uptake of postpartum intrauterine devices among mothers who delivered at two public hospitals in Addis Ababa, Ethiopia.

METHOD: This was a hospital-based cross-sectional study conducted using a standardized questionnaire. A simple random sampling method was used to select study participants, and 412 eligible participants were included. SPSS version 25 statistical software was used for data analysis. Descriptive statistics were used to present data, and regression analyses were employed to determine the strength of association between postpartum intrauterine device uptake and explanatory variables. A p-value of < 0.05 was used as a cutoff point for statistical significance.

RESULT: In this study, the uptake of postpartum intrauterine contraceptive devices was 11% (95% CI = 8.0, 14). The barriers to the non-uptake of postpartum intrauterine devices were fear and concern (61.6%), religious values regarding family planning (16.9%), husband and relative opinions (7%), cultural norms (5%), and health provider-related factors (5%). Increasing parity and assisted vaginal delivery were significantly associated with increased odds of postpartum intrauterine device uptake ($p < 0.05$). The odds of intrauterine device utilization for mothers with a previous number of deliveries of ≥3 were 35 times higher (AOR = 34.8, 95% CI = 7.33, 165.4) than those with no previous delivery. In addition, assisted vaginal delivery had 11 times increased odds of intrauterine device uptake compared to spontaneous vaginal delivery (AOR = 11.06, 95% CI = 3.26, 37.5).

CONCLUSION AND RECOMMENDATIONS: The uptake of postpartum intrauterine devices was low (11%). The main reasons for the low uptake were fear and concern due to myths and misconceptions, religious values regarding family planning, husband and relative opinions, cultural norms, and health provider-related factors. Identifying and addressing reasons for gaps in awareness and clearing public misconceptions and fears, as well as conducting further large-scale studies, are recommended.

KEYWORDS: PPIUD, Contraception, postpartum, barriers, Ethiopia.

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INTRODUCTION

Family planning is defined as a way to enable couples to anticipate and attain their desired number of children and the spacing and timing of their births through the use of contraceptive methods and the treatment of infertility.[1] Globally, in 2021, it was estimated that 164 million women of reproductive age, mostly in low-income countries, want to avoid pregnancy but are not using modern contraceptives.[2,3] Postpartum family planning (PPFP), the prevention of unintended pregnancy and closely spaced pregnancies during the first 12 months following childbirth, is recognized as one of the key life-saving interventions for mothers and their children.[4] Short birth intervals are associated with adverse pregnancy outcomes, such as induced abortions, miscarriages, preterm births, stillbirths, and neonatal and child mortalities.[5,6]

Research has demonstrated that long-acting methods, such as intrauterine devices (IUDs), are a cost-effective and sustainable way of reducing unmet need and unintended pregnancy in low-resource settings.[7] Most women do not desire a pregnancy immediately after delivery but are unclear about contraceptive usage in the postpartum period. This results in unplanned and undesired pregnancies, which in turn increases induced abortion rates and consequently maternal morbidity and mortality.[8]

The postpartum intrauterine device (PPIUD) is one of the PPFP methods that can address this gap and improve maternal and newborn health by preventing obstetric complications, such as maternal and newborn mortality and other health-related complications associated with closely spaced pregnancies.[9] The immediate postpartum period is an ideal time for PPIUD insertion, as women are highly motivated to accept family planning methods.[10,11] The immediate postpartum period presents a great opportunity for PPIUD service providers to introduce the method, especially in settings where women have difficulty meeting with healthcare providers due to geographical barriers.[12] Nowadays, more women are being encouraged to deliver in facilities, providing increased opportunities for the immediate postpartum insertion of an intrauterine device (IUD).

PPIUD use is particularly important in sub-Saharan African countries because there is a large unmet need for long-acting and permanent methods during the postpartum period. Moreover, in developing countries, women who go back home after delivery do not return for even a routine postpartum check-up, let alone for contraception. Thus, immediate postpartum contraceptive services need to be emphasized to ensure that women leave the hospital with effective contraception in place.[8.13]

Despite the benefits of PPIUDs, such as preventing unwanted pregnancies due to early resumption of sexual activities and unpredictable ovulation after delivery, their uptake is low in many settings. According to a study conducted by Pradhan et al., only 2% of contraceptive users opted for PPIUDs.[14] This is due to various barriers to its utilization. According to a study report from Rwanda, barriers to immediate PPIUD use include fear of side effects (10%), inadequate knowledge of the method (12%), and partner disapproval (10%) for the method.[15] According to the Ethiopia Demographic Health Survey 2019 report, IUD use has been minimal within the contraceptive method mix. It showed that, from 41% of modern family planning (FP) method choices, the use of IUDs contributed only 2%. The report also implied that there was almost no focus on immediate PPIUD use.[16] A study conducted in Addis Ababa revealed that a housewife occupation and the necessity of partner approval had negative influences, whereas spousal discussion about PPIUDs, counseling during pregnancy, and having good knowledge had positive influences on its utilization.[17]

The PPIUD uptake in Ethiopia is not well documented, and there is little information on the factors that hinder its uptake. Studies on the use of immediate PPIUDs are limited in Ethiopia and other African countries. The main objective of this study was to assess the utilization and factors associated with the uptake of immediate PPIUDs among mothers who delivered at the study hospitals.

Here's the edited text for the **METHODS** section, including the **Results** introduction, with attention to grammar, punctuation, spelling, and citation accuracy:

METHODS

Study Design: This is a cross-sectional descriptive study. It was conducted at Tikur Anbassa Specialized Hospital (TASH) and Gandhi Memorial Hospital (GMH) in Addis Ababa, Ethiopia, from December 2021 to March 2022. Women who delivered at the hospitals during the study period and were eligible for the PPIUD were included in the study. Those who refused to participate were excluded.

Sampling: A single population proportion formula was used to calculate the sample size. Considering the absence of previous data in Ethiopia, an assumption of 50% (p = 0.5 to achieve maximum variability) regarding barriers to the uptake of immediate PPIUD and the desired confidence level and precision of 95% and ±5%, respectively, were used to calculate the sample size. The calculated sample size, considering a 10% non-response rate, was 422.

Data Collection Tool and Procedure: The data collection tool was adapted from the literature and modified based on contextual situations. The tool was pre-tested on 5% of the sample size of a similar study population prior to data collection to ensure consistency and to modify it accordingly if necessary. The tool included socio-demographic data (age, marital status, religion, occupation, family income, and level of education), obstetric variables (parity, antenatal care (ANC) follow-up, gestational age of the pregnancy, and number of children), and awareness of family planning (FP)/PPIUD. It also contained questions on potential barriers to PPIUD uptake, such as fear and concern, husband and relative opinions, cultural norms, and health provider-related factors.

Data were collected by trained health providers and supervised by the principal investigator. Women who fulfilled the inclusion criteria were included in the study. Data were then collected by interviewing eligible participants and reviewing their medical records until the sample size was fulfilled. The collected data were reviewed and checked for completeness and consistency by the principal investigator.

Data Analysis: The collected data were coded, cleaned, and analyzed using SPSS version 25 statistical software. The proportion of barriers to the uptake of PPIUD was computed using descriptive statistics. A stepwise bivariate and multivariable logistic regression was then conducted to explore the presence and strength of associations between the independent variables and the uptake of PPIUD. Factors that had a significance level of ≤ 0.2 in the bivariate logistic regression analysis were considered in the multivariable logistic regression analysis. The presence and degree of association between the outcome and independent variables were assessed using odds ratios with 95% confidence intervals (CIs), and a p-value < 0.05 was set for significant statistical associations.

Operational Definitions:

- **PPIUD:** A long-acting reversible contraceptive method inserted immediately into the uterine cavity following the delivery of the placenta or up to 48 hours after giving birth.[18]
- **PPIUD Uptake:** The actual usage of an IUD during the first 48 hours after birth and before discharge to home following any mode of delivery.

Results

Socio-Demographic Characteristics:

In this study, 412 eligible participants were included. Forty-five percent (186/412) of the study participants were in the age group of 25-29 years, with a mean age of 26.9 (SD ±4.3). The majority of the participants were from Addis Ababa and were married, accounting for 88.1% (363/412) and 92.5% (381/412), respectively. Fifty-nine percent of the participants were Orthodox in religion, 43% (177/412) had a primary education level, and 46.8% (193/412) were housewives. (Table 1)

Table 1: Socio-demographic characteristics of study participants who delivered at two public hospitals, December 2021 to March 2022 (n = 412).

Variable	Frequency	Percent (%)
Age of the study participants		
≤24	122	29.6
25-29	186	45.1
30-34	80	19.4
≥35	24	5.8
Residence		
Addis Ababa	363	88.1
Outside of Addis Ababa	49	11.9
Marital status		
Single	8	1.9
Married	381	92.5
Divorced	18	4.4
Widowed	5	1.2
Religion status		
Protestant	40	9.7
Muslim	128	31.1
Orthodox	244	59.2
Education status		
Illiterate	28	6.8
Primary	177	43.0
Secondary	85	20.6
Collage/university	122	29.6
Occupation status		
Unemployed	44	10.7
Housewife	193	46.8
Self-employed	94	22.8
Government employee	53	12.9
Daily labor	28	6.8

Table 2. Reproductive characteristics and wishes of study participants who delivered at two public Hospitals, Dec. 2021 to March 2022. (=412)

Variable	Frequency	Percent (%)
ANC follow-up status		
Booked	401	97.3
Un-booked	11	2.7
Mode of delivery		
SVD	293	71.1
Assisted delivery	23	5.6
Cesarean section	96	23.3
Number of previous deliveries		
None	70	17
1-3	326	79.1
>3	16	3.9
Number of alive children		
None	147	35.7
1-3	251	60.9
>3	14	3.4
Wish to have more children		
Yes	341	82.8
No	71	17.2
If yes, when do you wish to have another pregnancy		
< 2 years	29	8.5
2-5years	228	66.9
> 5 years	71	20.8
Not decided	13	3.8
Outcome of last delivery		
Alive	400	97.1
Dead	12	2.9

Reproductive characteristics

ANC status was un-booked in 2.7% (11/412) of the study participants. Majority had spontaneous vaginal delivery (SVD), 1-3 deliveries and 1-3 children with proportions of 71.1% (293/412), 79.1% (326/412) and 60.9% (251/412) respectively. Eighty three percent of the participants wished to have more children. Majority of those who plan more delivery, 66.9% (228/341), wish to have their next pregnancy in 2-5 years time. Birth outcome of the last delivery was alive in 97.1%. (Table 2)

Study participants' awareness and utilization of modern family planning methods

Injectable and implant contraceptives were known by most of the study participants known by 76.7% (316/412) and 72.6% (299/412) participants, respectively. IUD was the fourth known method mentioned by 66% (272/412) of the participants. Majority, 82.3% (339/412), reported to have ever used modern contraceptive methods. Injectable and implants were the methods ever used reported by 43.5% (148/339) and 40.3% (137/339) of participants, respectively. IUDs were ever utilized before the last delivery by only 7.3% (30/339).

Table 3. Awareness and utilization of modern family planning methods by participants among mothers who delivered at two public Hospitals, Dec. 2021 to March 2022.

Variable	Frequency	Percent (%)
List of modern contraceptives known by participants		
Injectable	316	76.7
Implant	299	72.6
Pills	296	71.8
Intrauterine device	272	66.0
Condom	176	42.7
History of ever used any modern family planning method		
Yes	339	82.3
No	73	17.7
Types of family planning ever used before last delivery		
Injectable	148	43.5
Implant	137	40.3
Pills	71	17.2
IUD	30	7.3
Condom	11	3.2

Uptake and barriers of immediate PPIUD

Only 11% (45/412) of the participants had immediate PPIUD inserted. Various reasons were stated for not opting for PPIUD. Fear and concerns of myths and misconceptions were the commonest reason for not opting for PPIUD stated by 61.6% (226/367) of participants. Religion was the second commonest reason stated by 18% (62/367) participants. Health provider related factor was reported by 5% (17/367) of the participants. (Figure 1)

Factors associated with PPIUD use:

Age of participants, mode of deliveries, number of previous deliveries, participants wish to have more children, and awareness about IUD were variables associated with PPIUD use in the bivariate logistic regression with P-value of 0.2. Hence these variables were included in multivariate logistic regression model.

The most significant association was seen between parity and PPIUD uptake. As parity increased the prevalence of PPIUD utilization increased. The odds of PPIUD utilization for mothers with previous number of deliveries of ≥3 and 1-2 were 35 (AOR=34.8, 95% CI=7.33, 165.4) and 4 (AOR=4.2, 95%CI=1.47, 12.07) times higher than those with no previous delivery. In addition, assisted vaginal delivery had 11 (AOR=11.06, 95% CI=3.26, 37.5) times increased odds of PPIUD uptake than SVD. On the other hand, participants who wish to have pting for PPIUD uptake but the association was lost on multivariate analysis. (Table 4)

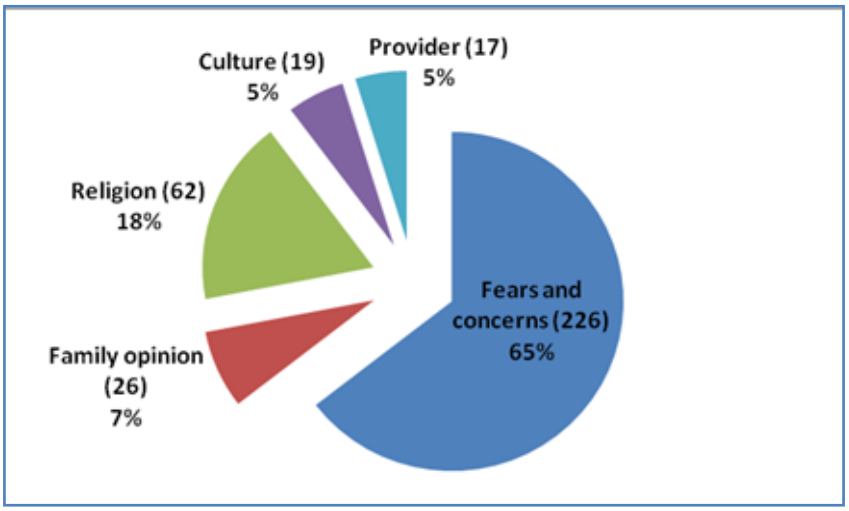

Figure 1.Reasonsfor not using post-partum intrauterine device among mothers who delivered at two public Hospitals, Dec. 2021 to March 2022.

Table 4. The logistic regression analysis of independent variable and PPIUD uptake among the study participants who delivered at two public Hospitals, Dec. 2021 to March 2022.

Variable	PPIUD uptake		p-value	COR (95%)	P-value	AOR (95%CI)
	Yes	No				
Age of the study participants						
≤24	8	114	1		1	
25-29	25	161	0.061	2.2(0.96, 5.08)	0.052	2.64 (0.99, 7.04)
30-34	11	69	0.093	2.3(0.87, 5.92)	0.347	1.7(0.56, 5.33)
≥35	1	23	0.659	0.62(0.07, 5.19)	0.617	0.56(0.06, 5.36)
Mode of delivery						
Spontaneous vaginal delivery	26	267	1		1	
Assisted delivery	7	16	0.003	4.5(1.69, 11.91)	0.000	11.06(3.26, 37.5)
Cesarean section	12	84	0.301	1.47(0.71, 3.03)	0.264	1.56(0.74, 3.42)
Number of previous deliveries						
None	6	141	1		1	
1-2	32	219	0.007	3.4(1.40, 8.42)	0.007	4.22(1.47, 12.07)
≥3	7	7	0.000	3.5(2.22, 8.72)	0.000	34.8(7.33, 165.4)
Participants wish to have more children						
Yes	33	313	1		1	
No	12	54	0.043	2.1(1.02, 4.33)	0.704	1.18 (0.50, 2.79)
Knows Intra Uterine Contraceptive Device						
Yes	38	234	1		1	
No	7	133	0.008	0.32(0.14, 0.75)	0.85	0.45 (0.19, 1.11)

DISCUSSION

In this study, the uptake of PPIUD was 11% (95% CI = 8.0, 14). This finding is within the range of prior reports, which ranged from 2% to 46%[14,19]. It is lower than a report from a systematic review and meta-analysis of twelve full-article studies conducted in Ethiopia, which revealed a pooled prevalence of PPIUD use of 21.63%[20]. Our finding was higher than only 3 out of the 12 reports included in the systematic review. It is also much lower than the study conducted at Muhima Rwanda Hospital (28%) and a recent study done in Addis Ababa (26.6%)[15, 17]. This difference may be due to the socio-demographic differences among the study participants, variations in health models, and family planning practices in the study areas.

However, this finding is higher than reports from Tigray (9.4%), Debretabor (3.3%), and Uganda (9.6%)[6, 21, 22]. It is also higher than the Ethiopia Mini Demographic and Health Survey (2019 EMDHS), which reported a national IUD utilization prevalence of 2%[16]. The difference with the EMDHS report is attributed to the fact that the EDHS included all forms of IUD use and not specifically just PPIUD, which have different denominators. This indicates that there is better PPIUD uptake during the immediate postpartum period compared to the interval period. The low uptake of PPIUD use calls for more action to increase this uptake by leveraging the opportunities that the immediate postpartum period provides to reach the levels achieved by others. This can be accomplished by identifying and tackling context-specific barriers.

The major reason for not utilizing PPIUD identified in the current study was fears and concerns about IUD use, as reported by 61.5% of the participants. This finding was supported by studies conducted in rural settings in Ghana and at Debre Tabor General Hospital[21, 23]. This may be due to the quality of counseling provided to the participants, which in turn may reflect providers' attitudes toward PPIUD

and the timing of counseling for PPIUD use. These have been long-standing obstacles to IUD uptake in general, necessitating further investigation to identify and address the exact sources of these fears and concerns.

The number of children has been identified as an important individual characteristic influencing women's reproductive health behaviors, including uptake of immediate postpartum family planning. Parity was associated with the uptake of PPIUD; women with higher parity were more likely to use PPIUD than those with lower parity. This simply reflects that women with high parity require long-term contraceptives for spacing. Additionally, multiparous women are more likely to repeatedly meet health service providers and obtain more information regarding family planning methods, which helps alleviate their concerns and misconceptions. These findings are consistent with reports from many prior studies that reported a higher acceptance rate for PPIUD among multiparous women[11, 15, 21, 24-27].

The mode of delivery also contributed to the uptake of immediate PPIUD insertion. In this study, women who underwent operative delivery were more likely to use PPIUD compared to those with spontaneous vaginal delivery (SVD). This could be related to the level of health care providers conducting operative deliveries. Operative deliveries in the study hospitals are performed by more experienced and senior clinicians, which may lead to better quality of counseling and increased confidence in inserting PPIUD.

Awareness about IUD was not associated with the uptake of immediate PPIUD in the present study. This may be due to inadequate knowledge that did not change attitudes enough to break down barriers such as fear, misconceptions, and cultural norms regarding PPIUD. This finding is contrary to study results from Gondar Hospital in Northwest Ethiopia24. A limitation of the present study is that it was an institutional-based study conducted in Addis Ababa; hence, the findings may not fully reflect the actual situation at the country level.

Conclusion

The findings indicate that the uptake of immediate PPIUD is significantly low (11%). The main barriers identified for the non-uptake of PPIUD were fears and concerns stemming from myths and misconceptions, religious values regarding family planning, opinions of husbands and relatives, cultural norms, and negative attitudes from staff. The determinant factors affecting the uptake of PPIUD were parity and mode of delivery. The low uptake of PPIUD calls for more action to leverage the opportunities presented by the immediate postpartum period. Identifying and addressing the reasons for gaps in knowledge regarding PPIUD, as well as clearing public misconceptions and fears, are recommended for further large-scale studies. Wider public education on PPIUD use could be one intervention to improve uptake.

List of abbreviations:

ANC: Antenatal care,
EDHS: Ethiopia Demographic and Health Survey,
FP: Family Planning,
GMH: Gandhi Memorial Hospital,
IUD: Intrauterine Device,
PPIUD: Post Partum Intrauterine Device,
PPFP: Postpartum family planning,
SVD: Spontaneous Vaginal Delivery,
TASH: Tikur Anbassa Specialized Hospital.

DECLARATIONS:

Ethics approval and consent to participate:

Ethical clearance was obtained from the Research and Publication Committee (RPC) of the Department of Gynecology and Obstetrics, College of Health Sciences, Addis Ababa University. Permission was also obtained from the study facilities to collect data. Participation in the study was completely voluntary and informed consent was acquired from every participant before participation. All the information obtained from the medical record was held with confidentiality and used only for the intended purpose.

Competing interests:

The authors declare that they have no competing interests.

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