Correlates of Post-Partum Intra-Uterine Copper-T Devices (PPIUCD) Acceptability and Retention: An Observational Study from North India.

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Research

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Abstract

Background: Immediate postpartum period is the most appropriate time for introducing contraception as women are more pliable and highly motivated to adopt family planning methods. We assessed the safety and efficacy of post placental IUCD insertion (Cu- T 380A) immediately after delivery of placenta in women undergoing expected vaginal delivery or caesarean section and its compliance.

Material and method: This prospective observational study was conducted for a period of (exact period of study) at a tertiary care institute in North India. Patients delivering at our hospital were recruited in the study as per inclusion and exclusion criteria after taking informed consent.

Results: A total of 300 women were counselled over one year. Of these, 60% of women accepted PPIUCD. The majority of the PPIUCD acceptors were primigravida (61.7%), educated (86.1%), belonging to urban areas (61.7%), between 25 to 30 years (40.6%). The Follow-up rate was 93%, 90% and 81% at six weeks, three months, and six months, while the continuation rate at six months was 80%. The most common complication during follow-up were abnormal uterine bleeding, infection and missing threads. There was no case of perforation or failure of PPIUCD. The expulsion rate was 5%, and 14% of women had removal of PPIUCD.

Conclusion: PPIUCD is a safe, highly effective, low cost, long-acting and feasible method of contraception. Skill enhancement of healthcare personnel for insertion techniques, adequate antenatal counselling, and advocacy of PPIUCD can help increase the acceptability of PPIUCD.

Introduction

India is experiencing exponential growth in population in recent decades, mainly driven by the progress in the socioeconomic and medical fields. This burgeoning population exerts colossal pressure on the already constrained resources, which have proved limited over time. As per the fourth round of the National Family Health Survey- an Indian counterpart for the Demographic Health Survey- Intra-uterine devices have a meagre contribution of just 1.5% amongst all the methods of contraception practised for family planning. However, IUCD services are offered free of cost at all government facilities.[1] This is mainly attributed to the low level of knowledge, myths and misconceptions, particularly for copper T, which has resulted in its low utilization and discontinuation.[2]

Consecutive pregnancies occurring within 24 months of a previous birth have a higher risk of adverse outcomes.[3, 4] This calls for reliable and effective long-term contraception in the postpartum period. IUCD is a highly recommended method of contraception due to its safety, efficacy, coitus independence, rapidly reversible and long-acting nature with relatively few side effects.[5] Also, women are highly motivated in the postpartum period and minimal need for additional hospital visits.[6] Insertion of IUCD in the immediate postpartum period (PPIUCD) is a technique of insertion of IUCD within 48 hours of vaginal delivery or caesarean section after removal of placenta. The copper ions released from the IUCD offers long-term contraception by interfering with the ability of sperm to survive and to ascend the fallopian

tube where fertilization occurs. It also stimulates a sterile foreign body reaction in the endometrium potentiated by copper.[7]

In India, PPIUCD is still emerging as a new contraceptive choice where delivery may be the only time a healthy woman comes in contact with health care personnel. It has been observed that the expulsion rate of PPIUCD varies according to the clinician's skill. In addition, follow up care of the PPIUCD is very important to ensure client satisfaction and continuation of the accepted method.[8] Limited studies have been conducted so far in India about the safety, efficacy, follow up data on complications, decision making, their perception and satisfaction among the women who accepted PPIUCDs.[9–12] In this context, we did the present study to assess the safety and efficacy of PPIUCD (CuT-380A) insertion immediately after delivery of placenta in women undergoing delivery and its compliance on follow-up till six months.

Methods

Study area and period

The study was conducted between 2018-20 in a tertiary care teaching health facility in the Malwa region of Punjab, India's northern state. It is a private facility where family planning, ANC and delivery services are provided at a nominal charge. It serves as a referral centre for complicated ante-natal cases by offering state of the art blood banks, operation theatre, and intensive care for the mother and child. Modern contraceptive methods (injectable, pills, implants, male condoms) are also offered to the clients in need after proper counselling.

Study design

A facility-based prospective observational study design was employed.

Study participants

Pregnant women between 28- 42 weeks of gestation willing to use IUCD for postpartum contraception within 48 hours of delivery were included in the study after explaining the purpose of the research and taking informed written consent. Pregnant women who did not fulfil World Health Organization medical eligibility criteria for IUCD insertion like those with HIV, antepartum haemorrhage, fever during labour and delivery, delivering at less than 28 weeks and with PROM more than 18 hours, who had a previous history of genital tuberculosis, known allergy to copper, history of uterine abnormalities and not willing to participate were excluded from the study.

Sample size and sampling procedures

A sample size of 289 was calculated using the single population proportion formula after considering the overall acceptability of PPIUCD to be around 25%[13], with a 95% confidence interval and a margin of error to be 5%. We included a total of 300 participants in the study. Study participants were selected by

systematic random sampling. The sampling interval was determined by dividing the average number of yearly deliveries by its sample size. The first woman was selected by lottery method from their order of discharge registration. Then we included every fourth woman at the exit of the health facility in the study. If the fourth patient was ineligible or unwilling to participate, the following patient was considered. We repeated the entire process till we achieved the requisite sample size.

Data collection

The structured and pre-tested questionnaire was prepared first in English from peer-reviewed articles and then translated into Hindi and Punjabi (local languages), using the standard WHO methodology for questionnaire translation. The tool consisted of three sections: Part A included questions to collect information regarding the socio-demographic factors (age, education, occupation, socioeconomic status, religion, residence) and obstetric history (parity, timing of PPIUCD insertion, client perception of pain during and after PPIUCD insertion and duration of last childbirth); while part B had questions about the acceptability of PPIUCD, decision making about PPIUCD (Period of counselling, decision making in PPIUCD as family planning method, reasons for acceptance and declining of PPIUCD, Time of the decision taken to choose PPIUCD as family planning method), and Part C collected data from the follow-up visits (acceptance of PPIUCD, side-effects, reason for removal and satisfaction). The study tool was pilot tested in 30 pregnant women and incorporated necessary changes in the final version. The authors collected data after ensuring the study subjects' confidentiality and privacy, maintaining a non-judgemental attitude to minimize bias.

After taking consent and adopting Universal Precautions, IUCD was inserted immediately after delivery of the placenta following a vaginal delivery or caesarean section. Women who accepted PPIUCD insertion were advised to follow up routinely after six weeks, three months, and six months on an outpatient basis. On follow up visits, the position of IUCD was verified by per speculum and vaginal examination. If the participant did not feel the threads, pelvic ultrasound or radiography of the pelvis was done. The findings on their follow up visit like expulsion, reasons for removal, continuation rate, loss to follow up and any complications like menstrual problems, infection/discharge per-vaginum, pyrexia, abdominal pain or backache, loss or missing thread, perforation and pregnancy were noted.

Data analysis

Data was entered in the Microsoft Excel sheet and checked for completeness and inconsistencies by the principal investigator. It was analyzed using SPSS version 21 (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp). We conducted a bivariate analysis to assess any association between independent variables (the socio-demographic characteristics, counselling process) and the dependent variable (PPIUCD acceptability). Further, we did a multivariable logistic regression analysis to identify the relationship between independent and dependent variables. Independent variables with a significant association ($p < 0.2$) in the bivariable analysis were entered into the multivariable analysis. In the final model, a significant association was declared at a $p < 0.05$. The results were presented in tables with adjusted odds ratio (AOR) and the corresponding 95% confidence interval.

Ethical considerations

Ethical approval was obtained from the research review committee of Adesh Institute of Medical Sciences and Research, Bathinda, Punjab (AU/EC/FM/133/ 2018). We obtained written informed consent from each study participant. We also ensured confidentiality of the information to all participants throughout the study process, and the data was made anonymous for analysis. Withdrawal from the study at any point was assured to all the participants.

Results

Of the 300 women who were counselled for PPIUCD, 60% of women accepted to use it as a contraceptive method in their postpartum period. **(Table 1)** Acceptability of PPIUCD was significantly higher (p -value <0.05) in educated women, homemakers, higher socioeconomic status, following Sikhism and Hinduism, rural area of residence, positive history of family planning usage in the past, and even the types of methods used in the past. However, the participant's age, gravidity and duration of last childbirth did not affect the chances of accepting PPIUCD. Further, we assessed the effect of counselling on the prospects of acceptability **(Table 2)**. It was seen that the acceptability was significantly higher when counselling was provided in the ante-natal period when the respondent was the sole decision-maker and those who ended up having a caesarean section. All of the respondents who were counselled ($n=180$) and finally accepted PPIUCD reported satisfaction from the counselling services. The most common reason for PPIUCD acceptance in the present study was its long lifetime period (42.2%), non-hormonal action (16.1%), non-interference with breastfeeding (15.6%) as seen with hormonal pills, the safety of usage (10.6%), need for fewer follow-ups (8.3%) and reversibility of fertility after removal (7.2%). However, women who declined ($n=120$) PPIUCD cited reasons of either refusal by their husbands (23.33%), concern about the partial/incomplete knowledge (18.3%), preference to other methods (17.5%), non-willingness for adopting any contraception immediately (15.8%), religious beliefs (15%) and due to fear of pain and heavy bleeding after insertion (10%). Nevertheless, in our study, 67.2% of participants who got PPIUCD perceived no pain on insertion, while only 8.3% admitted it to be very painful (data not tabulated).

By the end of 3 months, the proportion of respondents who retained their PPIUCD was 65% and remained the same even at six months. Among those non-compliant, 6.7% and 3.3% of respondents got their PPIUCD removed by the end of six weeks and six months, respectively. Whereas in 3.3% and 5.6% cases, IUCD got expelled spontaneously, while 6.7% and 15% couldn't be contacted and were lost to follow up **(Table 3; Figure 1)**. We also explored the reasons for removing PPIUCD from 12 and 13 women who got Cu T removed at six weeks and three months. At six weeks, the main reasons included AUB (66.67%) and infection (16.67%), while at three months, the reasons included AUB (53.84%), family pressure (23.1%). We also recorded the complications following PPIUCD insertion at the three follow up visits. At six weeks, 62 women reported complications which mainly included AUB (10.7%), missing threads (9.5%), infection/per-vaginal discharge (8.3%). At the end of 3 months, the most common complication was AUB (10.2%), while infection and per-vaginal discharge (3.8%) were most commonly reported at six months.

Further, unadjusted binary logistic regression depicted that most common factors for acceptability of PPIUCD included age between 26-35 years, education, employed or housewife, from the lower middle or richest SES, Hindu and Muslim religion, urban residence, primigravida, and counselling in the immediate postpartum period (**Table 4**). However, adjusted logistic regression depicted education, housewife, lower-middle and richest SES, Hinduism, and counselling in the antenatal and immediate postpartum period as final predictors of acceptability of PPIUCD during counselling sessions. Then, bivariate analysis of the participants who received a PPIUCD and different socio-demographic variables depicted that type of occupation, religion, duration of last childbirth and mode of delivery significantly affected retention. Unadjusted odds ratio showed that the chances of removal/expulsion of PPIUCD at six months were higher for Sikh women, age of youngest child <2 years, and last delivery to be instrumental or normal vaginal delivery. Age of client, education status, period of counselling for PPIUCD, SES, place of residence, h/o usage of FP methods in past depicted no significant effect on long-term retention of PPIUCD (**Table 5**).

Discussion

We highlight the effect of adequate counselling services on the long-term retention of PPIUCD and thus harness their actual potential as a practical family planning method. The revival of PPIUCD by the Ministry of Health and Family Welfare, Government of India, with technical assistance from Jhpiego in 2010, led to conscious efforts to provide the benefits of this long term reversible postpartum contraception.[14] In our study, 60% accepted PPIUCD as a method of contraception in their postpartum period. This is higher than acceptance observed by Agarwal N et al (41.1%) and Gautam R et al (21.8%).[12, 15] The origin of these studies was from the low performing states of India in terms of Family planning. To add, in our institute, Cu T 380A is available free of cost with support from the Government of India. Therefore, numerous advantages supplemented by no-cost contraceptive makes the pregnant women more receptive for PPIUCD. Many socio-demographic factors are responsible for higher acceptance and discussed in the subsequent parts of the manuscript.

We observed that the acceptability of PPIUCD as a long-term family planning method is significantly affected by education, SES, religion, and appropriate counselling, especially in the antenatal period. Similar results were seen in a study done by Rajni Gautam et al., Kanhere AV et al. and Pandher et al. [15–17]. Nearly 77% of our acceptors were educated women, similar to other studies [12, 17], and most of them belonged to urban areas, which was in concurrence with the study conducted by Patel J et al (93.14%) and Mule VD et al. (62.5%)[18, 19]. This reveals that women's education status and urban residence have a marked influence on the acceptance of PPIUCD. This also highlights the need for targeted interventions for better acceptance among less-educated women and those in rural areas where the healthcare services are relatively deficient and inaccessible. We observed that acceptability for PPIUCD was highest in the richest economic group. However, Agarwal N et al. noted higher acceptance in the lower socioeconomic status[12]. The difference needs to be further evaluated to account for any undue disparities based on SES. We also observed that the acceptance was not affected by the parity of

women. However, primiparous women were more inclined towards the spacing method and while multipara women were interested in the permanent form of contraception. Similar results were seen in the study by Garuda L et al (67.3%) and Mishra et al. (20.7%)[8, 20].

Acceptability also increased when the respondent was the sole decision-maker or counselled during a caesarean section. Anecdotally, it is seen that it is easy to guide and convince about the benefits of PPIUCD usage to the educated women who have a say in the decision-making process. However, the decision making among uneducated women is primarily influenced by their family members and guided by societal norms. The majority of the PPIUCD acceptors who were counselled decided after discussing it with their husbands, respectively. The involvement of husbands during the counselling session increases the chances of acceptance of PPIUCD as contraception[20–22]. However, men need to be engaged in counselling through tailor-made approaches[23]. We also counselled the women adequately about the benefits of PPIUCD during their intrapartum period, which essentially convinced them to choose PPIUCD as a family planning method, similar to observations made in previous studies.[24, 25] Women undergoing caesarean section showed a higher acceptance rate of PPIUCD, similar to other studies from India and abroad[11, 15, 26, 27]. This can be attributed to fear of post-caesarean conception over the scarred uterus. Previous systematic reviews have reported that post-placental placements during caesarean delivery are associated with lower expulsion rates than post placental vaginal insertions, without increasing rates of postoperative complications.[28, 29]

Satisfaction from the counselling services is also a significant determinant of acceptability and long term retention. As per WHO, the role of counselling cannot be ignored as it supports a woman and her partner in choosing the method of family planning that best suits them. It also involves them in making an informed decision and addresses any concerns that arise with the selected contraceptive method. Thus, if a woman can make an informed choice about any contraceptive method, it increases her acceptance, satisfaction, and usage.[30]

The most common reasons for **PPIUCD acceptance** that emerged in our study align with the existing literature.[16, 24, 31–33] Immediate postpartum period is the appropriate time to begin contraception as women are highly motivated and not known to be pregnant at this time. There is no need for additional hospital visits for insertion, which also has the advantage of being convenient for both women and health care providers. We observed that the most common reason cited for **declining** PPIUCD was resistance from the family members, notably the husband, **insufficient knowledge about PPIUCD**, preference for other less invasive methods of contraception, and fear of side effects similar to other studies.[16, 24, 31–33] Nigam A et al. have also pinpointed ineffective counselling as a crucial factor for refusal.[34] In our hospital, women were not accompanied by their partners during the antenatal visits, which deprives male spouses to understand the PPIUCD benefits. Thus, partner refusal was the most common reason for the denial of PPIUCD. This again highlights the importance of partner involvement during counselling and decision making, as stressed upon by previous studies.[21–23]

Most common **complications following PPIUCD** insertion included AUB, missing thread, and infections, and they were also the most common reason for removal. Most of the missing thread complications were seen within six weeks in the women who had intra-caesarean insertion of PPIUCD because, at the time of insertion, there is the practice of leaving the entire length of IUCD string in the uterine cavity and not passing it through the cervical-os which leads to curling up of thread that is not visible at external-os. This may cause apprehension as the missing thread is related to expulsion, malposition and perforation. However, there was no reported case of uterine perforation. None of the studies retrieved during the literature review has reported uterine perforation after PPIUCD insertion, except one case report[35].

In the present study, we observed a continuation rate of about 80.6% and a removal rate of 13.9% at six months postpartum. This is similar to the results from previous studies done by Ranjana et al. and Sunita Singhal et al. [36, 37]. PPIUCD retention was observed to be affected by the type of occupation, religion, duration of the last childbirth and mode of delivery. About one-third of our respondents either got their PPIUCD, or it was expelled at the end of 6 months. We explored the **reasons for the removal** of PPIUCD. The main reasons for removal included pain, AUB and infection, and family pressure. These factors are in coherence with the existing literature.[25, 34, 37–41]. The pain was seen as a pertinent factor responsible for removal. However, two-thirds of our participants perceived no pain during and after PPIUCD insertion, comparable with the study conducted by Kumar S et al.[25] This can be attributed to the use of the proper technique of insertion by skilled health care workers. Family pressure has been a critical determinant of retention of PPIUCD and a bottleneck for the effective implementation of women's reproductive rights. [8, 39, 40]. We observed a **cumulative expulsion** rate of 5.56% at the end of six months. In previous studies from India, the expulsion rate has been seen between 5-10 %[8, 12, 25, 42, 43]. Expulsion rate can be minimized if PPIUCD is inserted by a trained health care provider and proper fundal placement by placental forceps. When the IUCD is inserted immediately after the third stage of labour, expulsion rates at six months range between 31-41% per a WHO multi-centric trial and from 12 to 22% in a Family Health International multicentre trial [4]. Insertion 1–7 days after delivery results in even higher expulsion rates and may vary between 5-10%.[37, 41, 44] Findings in the present study that expulsion is more common in post-placental insertion than intra-caesarean insertion is supported by many studies worldwide.[8]

There are certain limitations in the present study that should be acknowledged. Being a time-bound study, we could not do a long term follow up of the participants, and assess the actual impact of PPIUCD. We could not rate the quality of PPIUCD counselling services and hence compare it with existing literature regarding the acceptability rates of PPIUCD. **Loss to follow** up was high in our study (15%), similar to observations made by previous researchers[45]. Loss of patients to follow-up is a significant problem with low and middle-income countries like India. Patients with poor education, low socioeconomic status and poor access to health care facilities tend not to give adequate importance to health-related issues. Lastly, this study was conducted in a health facility; hence the findings might not adequately reflect the entire population. There is a pertinent policy implication of this study. Our study highlights the need to focus on the continuation rates rather than just the initial acceptability rate of PPIUCD. In the long run, the number of women years counted free of unwanted pregnancy has long term effects on decreased Total fertility rates and population stabilization. Even if the lower proportion of women accept PPIUCD as

a contraceptive method of choice but continue to use it for a longer time, it can trade off the need for a larger number of women initially accepting PPIUCD.

Conclusion

The post placental IUCD is safe, highly effective, low cost, long-acting and feasible method of contraception, provided it is offered as an informed choice, followed up for the complications, and supported through adequate counselling. There are crucial factors responsible for accepting and removing PPIUCD before the desired time that should be stressed upon while counselling a potential client. Enhancing the skill of health care personnel through repeated training, promoting antenatal counselling and institutional deliveries, and widely disseminated public awareness campaigns can increase the acceptability of PPIUCD.

Abbreviations

IUCD: Intra-Uterine Contraceptive Device; PPIUCD: Post-Partum Intrauterine Contraceptive Device; ANC: antenatal care; PROM: Premature Rupture of Membranes; HIV: Human Immunodeficiency Virus; WHO: World Health Organization; SES: Socio-Economic Status

Declarations

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Nil

Availability of data and materials The datasets for the current study are available from the corresponding author on reasonable request.

Authors' contributions

SG, RB, PG conducted all the data analyses and drafted the manuscript. HKS, PS guided the literature review, helped draft the manuscript. SG conducted data management. PG suggested the literature review, analysis and drafting of the manuscript. All authors read and approved the manuscript.

Ethics approval and consent to participate

Ethical approval was obtained from the research review committee of Adesh Institute of Medical Sciences and Research, Bathinda, Punjab, India (AU/EC/FM/133/ 2018). Written informed consent was obtained from each study participant. Confidentiality of the information was ensured to all participants throughout the study process, and the data was made anonymous for analysis. Withdrawal from the study at any point was assured to all the participants.

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Tables

Table 1: Association between Socio-demographic variables and PPIUCD acceptability among the study participants.

	PPIUCD acceptability			p-value
	No	Yes	Total	
Total	120(40)	180(60)	300(100)	
Age in years				0.592
<26 years	17(39.5)	26(60.5)	43(100)	
26-35 years	95(41.1)	136(58.9)	231(100)	
>35 years	8(30.8)	18(69.2)	26(100)	
Education				<0.001
Literate	46(22.9)	155(77.1)	201(100)	
Illiterate	74(74.7)	25(25.3)	99(100)	
Occupation				<0.001
Employed	15(34.9)	28(65.1)	43(100)	
Housewife	90(39.8)	136(60.2)	226(100)	
Labourers	0	16(100)	16(100)	
Others	15(100)	0	15(100)	
Socio-economic status				0.001
Poorest	32(58.2)	23(41.8)	55(100)	
Lower middle	34(36.6)	59(63.4)	93(100)	
Upper middle	37(46.3)	43(53.8)	80(100)	
Richest	17(23.6)	55(76.4)	72(100)	
Religion				<0.001
Hindu	73(39)	114(61)	187(100)	
Muslim	27(67.5)	13(32.5)	40(100)	
Christian	15(41.7)	21(58.3)	36(100)	
Sikhs	5(13.5)	32(86.5)	37(100)	
Area of residence				0.002
Rural	26(27.4)	69(72.6)	95(100)	
Urban	94(45.9)	111(54.1)	205(100)	
Family Planning usage in past				0.003

No	42(77.8)	12(22.2)	54(100)	
Yes	108(43.9)	138(56.1)	246(100)	
Type of Family planning used in the past				0.006
Condom	35(42.2)	48(57.8)	83(100)	
Pills	31(50)	31(50)	62(100)	
Injectable	18(43.9)	23(56.1)	41(100)	
Others	24(46.2)	28(53.8)	52(100)	
IUCD	0	8(100)	8(100)	
No method	42(77.8)	12(22.2)	54(100)	
Gravid				0.661
Multigravida	43(38.4)	69(61.6)	112(100)	
Primigravida	77(41)	111(59)	188(100)	
Duration of last childbirth				0.086
< 2 years	17(30.4)	39(69.6)	56(100)	
2-3 years	23(52.3)	21(47.7)	44(100)	
>3 years	3(23.1)	10(76.9)	13(100)	
Not applicable	77(41.2)	110(58.8)	187(100)	

Table 2: Association between the process of counselling and the acceptability of PPIUCD

	PPIUCD acceptability			p-value
	No	Yes	Total	
Total	120(40)	180(60)	300(100)	
Period of counselling				<0.001
Antenatal	39(26.9)	106(73.1)	145(100)	
Immediate postpartum	38(42.7)	51(57.3)	89(100)	
Intrapartum	43(65.2)	23(34.8)	66(100)	
Satisfied with counselling				<0.001
No	75(100)	0	75(100)	
Yes	45 (20)	180(80)	225(100)	
Decision Taken by				<0.001
Self	40(30.1)	63(69.9)	59(100)	
Husband	60(48.8)	63(51.2)	63(100)	
mother	5(35.7)	9(64.3)	43(100)	
Mother-in-law	15(50.0)	15(50.0)	15(100)	
Mode of the delivery				<0.001
Caesarean section	70 (40.7)	102(59.3)	172(100)	
Normal vaginal	42 (48.8)	44(51.2)	86(100)	
Instrumental	8 (19.1)	34(80.9)	42(100)	

Table 3: Status of PPIUCD at long-term follow-up visits.

	Six week	Three months	Six months
Status of PPIUCD			
Retained	150(83.3)	118(65.6)	118(65.6)
Removal	12(6.7)	25(13.9)	25(13.9)
Expulsion	6(3.3)	10(5.6)	10(5.6)
Loss to follow up	12(6.7)	27(15)	27(15)
Reasons of removal			
Abnormal Uterine Bleeding	8(66.7)	7(53.84)	0
Missing thread	1(8.3)	1(7.7)	0
Family pressure	1(8.3)	3(23.1)	0
Infection	2(16.7)	2(15.4)	0
Complications			
Infection/Discharge P/v	14(8.33)	8(5.44)	4(3.39)
Backache/Abdominal pain	10(5.95)	7(4.8)	2(1.7)
AUB	18(10.71)	15(10.20)	3(2.54)
Missing threads	16(9.523)	1(0.7)	0
Perforation	0	0	0
Pyrexia	4(2.4)	0	0

Table 4: Logistic regression analysis to describe the correlates of acceptability of PPIUCD during the counselling session.

Variable	Unadjusted odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value
Age in years				
<26 years	Ref		Ref	
26-35 years	1.4 (1.1-1.8)	0.007	1.3 (0.5-3.2)	0.533
>35 years	2.2 (1.0-5.2)	0.056	3.2 (0.8-12.9)	0.101
Education				
No	Ref		Ref	
educated	3.4 (2.4-4.7)	0.000	14.8 (6.9-31.6)	0.000
Occupation				
Employed	1.9 (0.9-3.5)	0.05	0.7 (0.3-1.8)	0.494
Housewife	1.5 (1.1-1.9)	0.002	2.1 (1.7-3.2)	0.040
Labourers	1.6(0.0-1.0)	0.998	1.9 (1.2-2.5)	0.041
Others	Ref		Ref	
Socio-economic status				
Poorest	Ref		Ref	
Lower middle	1.7 (1.1-2.6)	0.100	7.3 (2.7-19.7)	0.000
Upper middle	1.2 (0.7-1.8)	0.503	2.4(0.9-6.2)	0.066
Richest	3.2 (1.9-5.6)	0.000	5.5 (1.9-15.3)	0.001
Religion				
Sikhs	Ref		Ref	
Muslim	1.5 (1.2-2.1)	0.003	1.3(0.5-3.8)	0.525
Christian	0.5 (0.2-0.9)	0.030	0.3 (0.9-1.2)	0.091
Hindu	6.4 (2.5-16.4)	0.000	4.2 (1.2-18.4)	0.049
Area of residence				
Rural	Ref		Ref	
Urban	2.6 (1.7-4.2)	0.000	1.6 (0.7-3.6)	0.204
Family Planning usage in past				

no	Ref		Ref	
yes	3.5 (1.8-6.6)	0.000	2.9 (1.2-7.3)	0.019
Gravid				
Multigravida	Ref		Ref	
Primigravida	1.6 (1.1-2.3)	0.015	1.3 (0.6-2.6)	0.461
Period of counselling				
Antenatal	1.3 (0.8-2.0)	0.170	5.1 (2.1-12.6)	0.000
Immediate postpartum	0.5 (0.3-0.9)	0.015	3.7 (1.4-9.4)	0.006
Intrapartum	Ref		Ref	

Table 5: Logistic regression analysis to describe the correlates of retention of PPIUCD at six months.

	Retention at six months				Unadjusted odds ratio	
	Yes	No	total	P-value	OR(95% CI)	p-value
Total	118(77.1)	35(22.9)	153(100)			
Age in years				0.901		
<26 years	15(75)	5(25)	20(100)		1	
26-35 years	90(76.9)	27(23.1)	117(100)		0.9 (0.3-2.7)	0.851
>35 years	13(81.3)	3(18.8)	16(100)		0.7 (0.1-3.5)	0.655
Education				0.586		
No	104(76.5)	32(23.5)	136(100)		1	
educated	14(82.4)	3(17.6)	17(100)		0.7 (0.2-2.6)	0.588
Occupation				0.047		
Employed	19(86.4)	3(13.6)	22(100)		1	
Housewife	86(72.9)	32(27.1)	118(100)		2.4 (0.6-8.5)	0.191
Labourers	13(100)	0	13(100)		0	0.998
Socio-economic status						
Poorest	13(76.5)	4(23.5)	17(100)	0.873	1	
Lower middle	40(76.9)	12(23.1)	52(100)		0.9 (0.3-3.5)	0.975
Upper middle	31(81.6)	7(18.4)	38(100)		0.7 (0.2-2.9)	0.662
Richest	34(73.9)	12(26.1)	46(100)		1.1 (0.3-4.2)	0.836
Religion				0.000		
Sikhs	9(36)	16(64)	25(100)		1	
Christian	19(100)	0	19(100)		0	0.998
Hindu	78(80.4)	19(19.6)	97(100)		0.1 (0.1-0.4)	0.000
Muslim	12(100)	0	12(100)		0	0.999

Residence				0.914	
Rural	46(76.7)	14(23.3)	60(100)	1	
Urban	72(77.4)	21(22.6)	93(100)	1.0 (0.5-2.2)	0.914
Family Planning usage in past				0.358	
no	29(82.9)	6(17.1)	35(100)	1	
yes	89(75.4)	29(24.6)	118(100)	0.6 (0.2-1.7)	0.361
Period of counselling				0.167	
Antenatal	73(76)	23(24)	96(100)	1	
Immediate postpartum	35(85.4)	6(14.6)	41(100)	0.5 (0.2-1.6)	0.258
Intrapartum	10(62.5)	6(37.5)	16(100)	0.2 (0.1-1.0)	0.065
Duration of last childbirth				0.000	
NA	80(80)	20(20)	100(100)	1	
< 2 years	9(37.5)	15(62.5)	24(100)	6.7 (2.5-17.4)	0.000
>3 years	10(100)	0	10(100)	0	0.999
2-3 years	19(100)	0	19(100)	0	0.998
Mode of delivery				0.018	
C section	78(84.8)	14(15.2)	92(100)	1	
Instrumental	16(61.5)	10(38.5)	26(100)	3.5 (1.3-9.2)	0.012
Normal vaginal	24(68.6)	11(31.4)	35(100)	2.5 (1.0-6.4)	0.044

Figures

Figure 1

Status of PPIUCD by the end of 6 months among the participants visiting a tertiary care hospital in the Malwa region of Punjab.