INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

COMPARISON OF COMPLICATIONS OF POST PLACENTAL INSERTION OF INTRAUTERINE DEVICE IN VAGINAL DELIVERY VERSUS CESAREAN SECTION

Original Research

Iqra Hafeez, Sana Sattar, Komal Mannan, Faisal Sattar, Aniza Maham, Iqra Sadaf
[1]Senior Registrar, Consultant Gynaecologist
[2]Consultant Gynaecologist, Lady Willingdon Hospital Lahore.
[3]Consultant Gynaecologist, Lahore General Hospital
[4]Medical Officer, Surgery Department, Government Kot Khawaja Saeed Teaching Hospital Lahore
[5]Post Graduate Paediatric Medicine, Children Hospital Lahore.
[6]Senior Registrar
Corresponding Author: Iqra Hafeez, Senior Registrar, Consultant Gynaecologist, animtaawan11@gmail.com

Conflict of Interest: None
Grant Support & Financial Support: None

ABSTRACT

Background: The immediate postpartum intrauterine contraceptive device (PPIUCD) offers an effective, reversible contraception method during the delivery process. Recognized for its strategic role in family planning, PPIUCD facilitates timely contraceptive intervention in both vaginal and cesarean deliveries.

Objective: This study aims to evaluate the differences in complication rates associated with PPIUCD following vaginal versus cesarean deliveries at Lady Willingdon Hospital, Lahore.

Methods: This prospective cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Unit 1 of Lady Willingdon Hospital, Lahore. Participants were categorized into two groups: Group A for those undergoing vaginal delivery and Group B for cesarean section. PPIUCD insertion was performed immediately post-delivery, with follow-up evaluations at 6 weeks and 6 months postpartum to assess for complications such as lower abdominal pain, irregular vaginal bleeding, vaginal discharge, missed threads, and device expulsion.

Results: At the 6-week follow-up, no complications were reported in either group. By 6 months, there were no significant differences between the groups in terms of lower abdominal pain (Group-A: 0% vs. Group-B: 6%, p-value=0.079), irregular vaginal bleeding (Group-A: 2% vs. Group-B:6%), and spontaneous expulsion (Group-A: 6% vs. Group-B:0%). Vaginal discharge was reported by 20% of Group-A and 10% of Group-B (p-value=0.161). Missed threads were noted in 6% of Group-A and none in Group-B (p-value=0.079).

Conclusion: The study indicates no significant difference in the complication rates of PPIUCD between vaginal and cesarean deliveries in the short term. Long-term follow-up showed slightly higher but non-significant rates of vaginal discharge, missed threads, and spontaneous expulsion in the vaginal delivery group compared to the cesarean section group.

Keywords: Cesarean section; Complications; Family planning; Intrauterine devices, postcoital; Postpartum period; Vaginal delivery; Women's health.

INTRODUCTION

The intrauterine contraceptive device (IUCD) stands as the most prevalent method of contraception worldwide, revered for its reversibility and efficacy. Commonly adopted in developing countries, the IUCD addresses the substantial unmet need for family planning, particularly in the postpartum period. It is during these initial years following delivery that women are physically less prepared for another pregnancy, with studies indicating that conceiving within two years can lead to complications such as abortion, postpartum hemorrhage, premature labor, and even maternal mortality. Thus, the insertion of an IUCD immediately after childbirth emerges as a crucial intervention, offering effective contraception when the return of ovulation remains unpredictable(1, 2). The appeal of post-placental IUCD insertion lies not only in its timing—within minutes of childbirth—but also in its minimal expulsion rates when executed by skilled personnel. This method proves particularly advantageous in settings like Pakistan, where many women may not encounter healthcare services again until their next pregnancy. The moment of delivery, therefore, presents a unique opportunity to initiate contraception, which is essential for the well-being of both the individual and the community(3, 4).

Recent systematic reviews have suggested that IUCD insertions during cesarean sections exhibit lower expulsion rates compared to those performed post-vaginally. This has sparked a debate on the optimal timing and method for IUCD placement, underlining the importance of tailored healthcare interventions that accommodate diverse patient needs and local healthcare conditions(5, 6). Moreover, the implementation of immediate postpartum intrauterine contraception is critical in mitigating the gaps in family planning services, particularly in under-resourced settings. It not only ensures immediate contraceptive protection but also leverages the post-delivery period when women are still under medical supervision, thereby enhancing the uptake of contraceptive methods. This practice aligns with global health strategies aimed at reducing maternal and infant mortality by encouraging spacing between pregnancies(7, 8).

In the context of this study, the objective is to assess and compare the complications associated with the postpartum insertion of IUCDs following vaginal deliveries and cesarean sections. This investigation will provide valuable insights into the safety and efficacy of this practice, potentially guiding future policies to optimize postpartum contraceptive care. Such data are essential for informing healthcare providers and policymakers in designing interventions that enhance the reproductive health of women and support sustainable population growth strategies(9, 10).

METHODS

The methodology for this prospective cross-sectional study was meticulously structured to evaluate the complications associated with post-placental intrauterine contraceptive device (IUCD) insertion following either vaginal delivery or cesarean section. Conducted over a period of nine months at the Department of Obstetrics and Gynecology in Lady Willingdon Hospital, Lahore, the study harnessed a non-probability, convenient sampling technique to gather data from a targeted sample of 100 patients. These participants, split evenly into two groups, were selected based on specific inclusion and exclusion criteria aimed at optimizing the relevance and reliability of the findings(11, 12). Inclusion criteria encompassed women aged between 18 and 40 who were 28 to 40 weeks pregnant, attending the antenatal clinic or labor room and who consented to post-placental CuT insertion. Women with a history of cesarean section were also included, provided they opted into the study. Conversely, exclusion criteria ruled out participants with ruptured membranes for over 18 hours, hemoglobin levels below 8g/dl, postpartum hemorrhage, coagulation disorders, a fever exceeding 38°C, or those unwilling to participate(13, 14).

Following ethical approval, eligible patients were admitted and grouped according to their mode of delivery: Group A for vaginal delivery and Group B for cesarean section. After informed consent was obtained, the IUCD insertion process was conducted with rigorous adherence to aseptic techniques. For vaginal deliveries, this involved using Sim's speculum to access and cleanse the cervix, followed by careful insertion of the IUCD into the lower uterine segment with the aid of ring forceps. The procedure for cesarean sections entailed manually placing the IUCD at the fundus during surgery, ensuring the strings were directed toward but not into the cervical canal to mitigate risks of infection(15, 16). Participants were discharged with instructions to return for follow-up visits at six weeks and six months, or sooner if symptoms such as unusual vaginal discharge, expulsion suspicions, or lower abdominal pain occurred. During follow-ups, a detailed history was recorded, focusing on menstrual regularity and any symptomatic changes. The presence and position of the IUCD were verified through per speculum examination, and if necessary, ultrasonography was utilized to locate an untraceable IUCD(17, 18).

Data collected throughout the study was analyzed using SPSS-26. Quantitative variables like age and parity were expressed as means and standard deviations, while qualitative variables, including the type of delivery, were presented in frequencies and percentages. The statistical significance between the vaginal and cesarean groups was determined using the chi-square test, with a p-value of 0.05 or less considered significant. This rigorous methodological approach ensured that the study was conducted with high scientific standards, aimed at yielding reliable data to inform better clinical practices regarding postpartum contraceptive methods(19).

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

RESULTS

In the conducted study, the mean age of participants in the vaginal delivery group was 28.02 years with a standard deviation of 4.62, while the cesarean section group had a mean age of 27.04 years with a standard deviation of 5.20. The parity status across the two groups varied, with a balanced distribution of participants ranging from primiparous to those having more than five pregnancies. During the six-week follow-up, none of the participants in either group reported lower abdominal pain. This lack of reported pain persisted across both groups at this early stage. Similarly, no cases of irregular vaginal bleeding or vaginal discharge were reported by any participants at six weeks.

However, the results at the six-month follow-up painted a slightly different picture. A small percentage of participants in the cesarean section group reported lower abdominal pain, but this did not reach statistical significance (p-value=0.079), suggesting that the incidence of pain was not substantially different between the groups. Similarly, while some participants reported irregular vaginal bleeding—2% in the vaginal delivery group and 6% in the cesarean section group—this difference was also not statistically significant (p-value=0.307). Regarding vaginal discharge, the incidence was higher in the vaginal delivery group, with 20% reporting this issue compared to 10% in the cesarean section group, yet this difference was not statistically significant (p-value=0.161). Furthermore, missed threads of the IUCD at six months were reported by 6% of participants in the vaginal delivery group, with no reports from the cesarean section group. This finding paralleled the reports of spontaneous expulsion, which occurred in 6% of the vaginal delivery group while no expulsions were reported in the cesarean section group. Despite these occurrences, the differences were not statistically significant (p-value=0.079).

These findings suggest that while some complications were reported, particularly at the six-month follow-up, the differences between the vaginal delivery and cesarean section groups were minimal and generally not statistically significant, indicating a relative similarity in the post-procedural outcome between the two delivery methods. This lack of significant differences underscores the potential viability of post-placental IUCD insertion as a contraceptive option following either method of delivery, although continuous monitoring and follow-up are recommended to manage and mitigate any long-term complications.

Figure-1: Histogram for Age of Patients

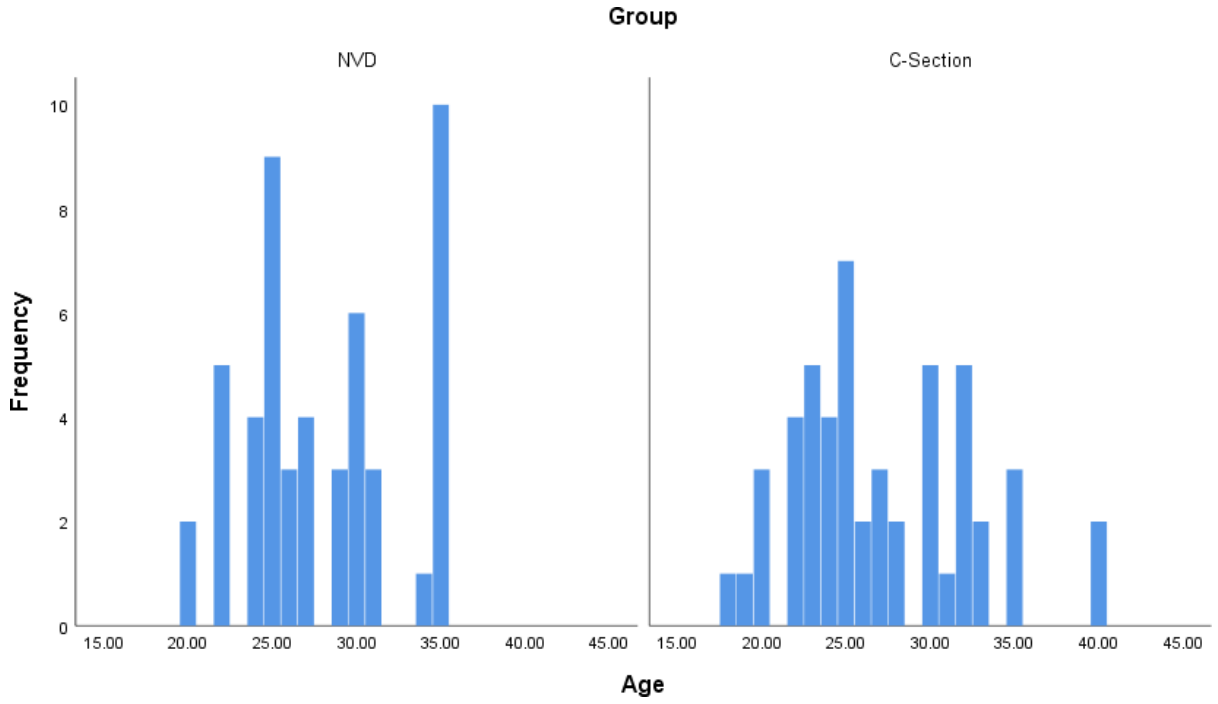


Table: Age of Patients in Treatment Groups

	Group-A (NVD)	Group-B (C-Section)
n	50	50
Mean	28.02	27.04
SD	4.62	5.20

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

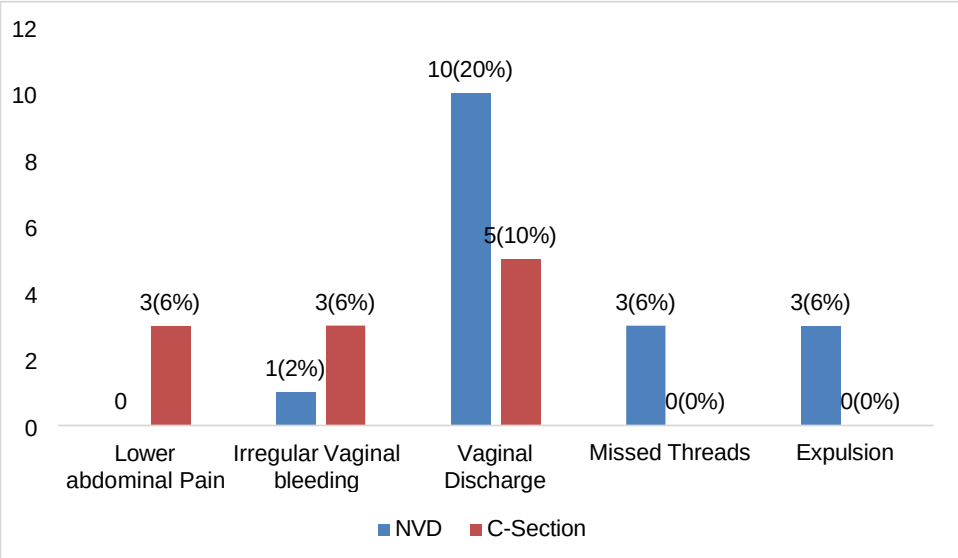
Minimum	20	18
Maximum	35	40

Table: Comparison of Gravida Status and Post-Treatment Outcomes Between Groups

Condition		Group-A (NVD)	Group-B (C-Section)	Total	p-value
Gravida	2	11 (22%)	12 (24%)	23	-
	3	5 (10%)	19 (38%)	24	
	4	15 (30%)	8 (16%)	23	
	5	12 (24%)	6 (12%)	18	
	>5	7 (14%)	5 (10%)	12	
Lower Abdominal Pain at 6 weeks	Yes	0 (0%)	0 (0%)	0	-
	No	50 (100%)	50 (100%)	100	
Lower Abdominal Pain at 6 months	Yes	0 (0%)	3 (6%)	3	0.079
	No	50 (100%)	47 (94%)	97	
Irregular Vaginal Bleeding at 6 weeks	Yes	0 (0%)	0 (0%)	0	0.307
	No	50 (100%)	50 (100%)	100	
Irregular Vaginal Bleeding at 6 months	Yes	1 (2%)	3 (6%)	4	-
	No	49 (98%)	47 (94%)	96	
Vaginal Discharge at 6 weeks	Yes	0 (0%)	0 (0%)	0	0.161
	No	50 (100%)	50 (100%)	100	
Vaginal Discharge at 6 months	Yes	10 (20%)	5 (10%)	20	-
	No	40 (80%)	45 (90%)	80	
Missed Threads at 6 weeks	Yes	0 (0%)	0 (0%)	0	0.079
	No	50 (100%)	50 (100%)	100	
Missed Threads at 6 months	Yes	3 (6%)	0 (0%)	3	-
	No	47 (94%)	50 (100%)	97	
Spontaneous Expulsion at 6 weeks	Yes	0 (0%)	0 (0%)	0	0.079
	No	50 (100%)	50 (100%)	100	
Spontaneous Expulsion at 6 months	Yes	3 (6%)	0 (0%)	3	-
	No	47 (94%)	50 (100%)	97	

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Figure-I: Complications at 6th Month in Study Groups



DISCUSSION

The promotion of long-acting reversible contraceptive methods, particularly post-placental intrauterine contraceptive devices (PPIUCD), is intensifying globally, especially in developing countries. These devices are valued for their convenience and effectiveness during the postpartum period when most women resume sexual activity. Our study focused on comparing the incidence of complications associated with PPIUCD following vaginal and cesarean deliveries(20). Consistently, our findings at six weeks postpartum showed no complications in either group, spanning from lower abdominal pain to expulsion. However, the six-month data revealed no significant difference in complications, suggesting a comparable safety profile for PPIUCD insertion regardless of the delivery method. This aligns with other studies indicating varying outcomes based on insertion techniques, timing, and the type of device used, underscoring the influence of clinical practice on PPIUCD success rates(21).

While the insertion during cesarean sections might suggest a lower complication rate due to controlled surgical environments, other studies have noted mixed outcomes. For instance, the perceived reduction in expulsion rates with cesarean insertions might reflect more on the insertion technique and immediate postoperative care than on the delivery method itself. Similarly, the higher reports of vaginal discharge and missing threads in certain studies highlight the subjective nature of postoperative symptoms and the potential influence of patient perception, especially following surgical procedures(22). Our study incorporated a robust methodological framework, yet it was not without limitations. The sample size, though adequate to detect differences, might still be too small to generalize across diverse populations. Furthermore, the reliance on self-reported symptoms could introduce recall bias or underreporting, particularly for symptoms like irregular bleeding or discharge, which are often influenced by personal and cultural perceptions(23).

The debate over the optimal timing and technique for PPIUCD insertion remains unresolved. However, our findings contribute to the growing body of evidence that supports the efficacy and safety of both vaginal and cesarean PPIUCD insertions. Future research should focus on longitudinal outcomes to better understand the long-term benefits and potential risks, enhancing patient counseling and clinical decision-making. Integrating PPIUCD services with maternal and child health programs could significantly improve contraceptive uptake, offering a practical solution for family planning in postpartum women(24). Both vaginal and cesarean routes for PPIUCD insertion are viable and effective. They offer a safe, convenient, and reversible contraceptive method that aligns with global health objectives to integrate effective family planning within postpartum care frameworks, ensuring women have access to reliable contraception before returning home(25).

CONCLUSION

The findings from this study indicate that the incidence of complications associated with post-placental intrauterine contraceptive device (PPIUCD) insertion is comparably low for both vaginal and cesarean deliveries in the immediate postpartum period. While there was a marginal increase in issues such as vaginal discharge, missed threads, and spontaneous expulsion observed during longer-term follow-up in vaginal deliveries, these differences were not statistically significant. This suggests that PPIUCD can be considered a safe and

effective contraceptive option for women regardless of the mode of delivery, supporting its integration into postpartum care practices to enhance family planning accessibility and effectiveness.

Author	Contribution
Iqra Hafeez	Conceptualization, Methodology, Formal Analysis, Writing - Original Draft, Validation, Supervision
Sana Sattar	Methodology, Investigation, Data Curation, Writing - Review & Editing
Komal Mannan	Investigation, Data Curation, Formal Analysis, Software
Faisal Sattar	Software, Validation, Writing - Original Draft
Aniza Maham	Formal Analysis, Writing - Review & Editing
Iqra Sadaf	Writing - Review & Editing, Assistance with Data Curation

REFERENCES

1. Tawfik WM, AMIN AE-S, Fayed MR, Abdelzaher YM. Post placental insertion of different types of intrauterine device during cesarean section versus delayed intrauterine device insertion in Sharkia Governorate. Benha Medical Journal. 2024;41(4):66-75.
2. Ali A, Ahmed A, Salam M, Ahmed MA, Bukhari N. Efficacy assessment of post partum intra uterine contraceptive devices following caesarean section and vaginal birth. The Professional Medical Journal. 2022;29(07):1023-7.
3. Sajid A, Khan SA, Sajid A, Sajid A. COMPARISON OF INTRAUTERINE CONTRACEPTIVE DEVICE INSERTION AFTER NORMAL VAGINAL DELIVERY VERSUS INTRA CESAREAN. Pakistan Postgraduate Medical Journal. 2024;35(02):55-9.
4. Alhaidari T, Majeed A, Al-Jassani S, Fawzi H, El Kak F. Safety profile of immediate post-partum intrauterine device insertion during caesarean delivery–a clinical trial with three years of follow up: Utility of Immediate Post Placental Insertion of Intrauterine Device During Cesarean Delivery. Al-Kindy College Medical Journal. 2022;18(1):44-8.
5. Elghasnawy F, Salama M, Abdelrahman R, Ramy A, Abdelnasser A, Elnajar A. Post-placental insertion of the intrauterine device after cesarean delivery versus delayed insertion: a randomized controlled trial. Pelviperineology. 2024;43(3):95-103.
6. Al-Mahmoudi AHA, Abdelmoaty MA, Mohamed MF. Intracesarean Postpartum Insertion of Intrauterine Contraceptive Device as an Alternative to Delayed Insertion: Safety and Complications. International Journal of Medical Arts. 2022;4(6):2448-55.
7. Sweeney HE, Bainvoll L, Mandelbaum RS, Sangara RN, Violette CJ, Klar M, et al. Uptake of postplacental intrauterine device placement at cesarean delivery. AJOG global reports. 2023;3(1):100157.
8. Abdel-Ghany A, Khalifa E, El-Din MZ, Ibrahim E, Abdallah A, Abdel-Aziz M, et al. Intrapartum versus postpartum insertion of intrauterine device in women delivering by cesarean section. BMC Pregnancy and Childbirth. 2022;22(1):365.
9. Seleem M, Sedik MM, Megahed AM, Nabil H. Conventional manual technique of post placental IUD insertion versus intra-cesarean post placental introducer withdrawal IUD insertion technique: a new standardized technique for IUD insertion during cesarean section: a randomized controlled trial. BMC Pregnancy and Childbirth. 2023;23(1):474.
10. Nnamani C, Onwusulu D, Okoye C. Clinical Outcomes of Trans-caesarean and Vaginal Post-placental CuT380A IUCD Insertions: A Comparative Study. International Journal of TROPICAL DISEASE & Health. 2021;42(6):46-57.
11. Koorapati S, Sandhya B, Kamma RC, Radhika P. A COMPARITIVE STUDY ON SAFETY AND EFFICACY AND COMPLICATIONS OF INTRA CAESAREAN INSERTION OF IUCD AND POST CESAREAN INSERTION OF IUCD. International Journal of Medicine and Public Health. 2023;13(4):136-40.
12. Marangoni Jr M, Laporte M, Surita F, Kraft MB, Bahamondes L, Juliato CR. One-year follow up on post-placental IUD insertion: A randomized clinical trial. Acta obstetricia et gynecologica Scandinavica. 2021;100(4):596-603.
13. Gebreel MM, Galal SK, Elnahas TM, Hamed HMMA. Comparative study between immediate versus post puerperium Intrauterine contraceptive device insertion during caesarean section. Al-Azhar International Medical Journal. 2023;4(8):14.
14. Soliman AS, Labib NAF, Shedid AAAH, Elmantwe AN. Comparison between Intrauterine Contraceptive Device Insertion during Cesarean Section and Postpartum Insertion. The Egyptian Journal of Hospital Medicine (April 2024).95:2266-9.
15. Dayer MZS, Abdelkader MA, El Din Helmy ME. Evaluation of Immediate Post-placental Insertion of the Copper Intrauterine Contraceptive Device during Caesarean Delivery. The Egyptian Journal of Hospital Medicine. 2023;91(1):4468-71.
16. Dawoud SESM, Abdelwahed AY, Mohamed NHA. Effect of instructional guidelines on pregnant women's knowledge

regarding immediate insertion of an intrauterine contraceptive device during cesarean section versus late insertion after the puerperium. International journal of health sciences.5(S1):636-49.
17. Bolling KR, Wahdan Y, Warnock N, Lott J, Schoendorf J, Pisa F, et al. Utilisation, effectiveness, and safety of immediate postpartum intrauterine device insertion: a systematic literature review. BMJ Sexual & Reproductive Health. 2023;49(2):e1-e.
18. Dabian B, Hofy S, Elshaaer H, Sheeba M, Elshemy S. New Method of IUD Insertion During Cesarean Section. The Egyptian Journal of Hospital Medicine (April 2024).95:2033-9.
19. Wojcik N, Watkins L, Nugent R. Patient acceptability, continuation and complication rates with immediate postpartum levonorgestrel intrauterine device insertion at caesarean section and vaginal birth. Australian and New Zealand Journal of Obstetrics and Gynaecology. 2022;62(5):773-8.
20. Safty A, Ismail A, Zakaria AMM, Saeed AM. Efficacy of Immediate Insertion of an Intrauterine Contraceptive Device during Cesarean Section in Comparison with Late Insertion after the Puerperium. Al-Azhar International Medical Journal. 2022;3(12):166-71.
21. Ramos-Rivera M, Averbach S, Selvaduray P, Gibson A, Ngo LL. Complications after interval postpartum intrauterine device insertion. American journal of obstetrics and gynecology. 2022;226(1):95. e1-. e8.
22. Herculano TB, Surita FG, Juliato CRT, Rehder PM. Comparison between two methods of the immediate post-placental insertion of copper intrauterine device in vaginal birth—a protocol for a randomized clinical trial. Trials. 2022;23(1):1053.
23. Gangwal H, Lamba I, Sharma A. To evaluate the efficacy and complications of post placental IUCD insertion in vaginal and post cesarean deliveries. International Journal of Science and Research Archive. 2022;5(2):163-70.
24. Bashir M, Ashraf S, Qureshi MK, Ali SS, Mahmud M, Yusuf L. Comparison of Complications of Postpartum Iucd (Ppiucd) Insertion with Interval Iucd Insertion. Pakistan Journal of Medical & Health Sciences. 2022;16(08):722-.
25. Ashraf A, Bari U, Khan S, Khan MM. Complications of Post-Partum Intrauterine Contraceptive Device Insertion. Pakistan Journal of Medical & Health Sciences. 2022;16(05):925-.

