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## **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**

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**Abstract**--Postpartum intrauterine contraception (PPIUC) should be made more widely available because it can decrease unplanned pregnancies and short inter-pregnancy intervals. The aim was to evaluate the 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. Subjects and method: Design: To accomplish the goal of this study, a quasi-experimental research design was used. Setting: the study was carried out antenatal clinic at Beni-Suef University Hospital. Subjects: A purposive sample of 100 pregnant women was included in this study. Tools for data collection: A structured interview questionnaire which consisted of three parts; part (I) pregnant women's personal data; part (II) pregnant women's current obstetric history, part (III) pregnant women's knowledge regarding immediate versus late insertion of the intrauterine contraceptive device (pre/post). Results: The study's findings showed that pregnant women's knowledge regarding early vs late placement of an intrauterine contraceptive device after cesarean section showed highly significant improvements post-instructional guidelines ( $P < 0.001$ ). Conclusion: The results of the current study

showed that the application of instructional guidelines improved pregnant women's knowledge of early vs late placement of an intrauterine contraceptive device during cesarean section. Recommendations: The study recommended that instead of waiting until after the puerperium to put an IUD, cesarean patients should do it immediately and the instructional guidelines regarding its effects should be taught to the pregnant women to improve their knowledge and help them select the better methods.

**Keywords**--Cesarean Section, Instructional guidelines, Immediate Insertion, Late Insertion, Pregnant women's knowledge, Puerperium.

## **Introduction**

A common birth control method, intrauterine devices (IUDs) have a cumulative pregnancy rate of less than 1% within the first year of implantation and are inexpensive, long-lasting, and reversible. Furthermore, both breastfeeding and non-breastfeeding women are free to utilize them (Okusanya et al., 2014). Postpartum intrauterine contraception (PPIUC) should be made more widely available because it can decrease unplanned pregnancies and short inter-pregnancy intervals. The most used method of birth control worldwide is the intrauterine device (IUD), which is reversible and effective. The postpartum period is one of the crucial times when a woman requires specific services for optimal health because complications are common during this time and women are more susceptible to unwanted pregnancies (American College of Obstetricians and Gynecologists, 2016).

In the past, postpartum birth control was delayed until six weeks following delivery. Women have been told to refrain from sexual activity during these six weeks. However, some women engage in sexual activity during this time, particularly those who give birth via cesarean section as opposed to vaginal delivery. As a result, there is a high probability of an unexpected immediate postpartum pregnancy if a contraceptive technique is started after a six-week delay (Rodriguez et al., 2018). Moreover, non-breastfeeding women's early ovulation during the fourth week following delivery must be taken into account as this raises the risk of unintended very early postpartum pregnancy (Khajehei et al., 2019).

Placement of an intrauterine device (IUD) post-placental known as IUD placement within 10 minutes of placenta delivery, is an attractive strategy for increasing the availability of postpartum IUDs since it does not need a separate postpartum visit (Cameron et al., 2017). The immediate post-insertion of intrauterine devices (IUDs) following cesarean birth is safe and accepted, and it might help to overcome a significant obstacle to long-term effective contraception (Heller et al., 2017). During cesarean delivery (CD), both immediate insertion of an intrauterine contraceptive device (IUCD) and tubal ligation may be done, however, IUCDs offer some potential benefits (Faculty of Sexual & Reproductive Healthcare, 2017).

Copper T-380A IUDs may be successfully inserted intraoperatively by incision at the moment of cesarean delivery. Although full expulsions are less likely to be misclassified, partial expulsion may or may not involve malposition IUDs with uncertain clinical relevance (American College of Obstetricians and Gynecologists, 2016). If IUDs are administered to women soon after giving birth, especially if they don't have insurance, they may be cost-effective (Rodriguez et al., 2018).

Immediate intra-cesarean IUD insertion after placental delivery provides a changeable and efficient long-term contraceptive that does not interfere with lactation (Reproductive Health and Research, 2015). It may also eliminate the pain associated with normal insertion, and lochia will hide any insertion of blood. The lady is known to be not pregnant, thus contraception will be a key priority for her (Faculty of Sexual & Reproductive Healthcare, 2017) The goal of this research was to evaluate and compare the expulsion rate, discomfort, and quantity of hemorrhage after IUD (pregnant T Cu 380A) insertion at the cesarean section vs. after puerperium, to suggest or not recommend IUD insertion at the cesarean section instead of after puerperium (American College of Obstetricians and Gynecologists, 2016).

Less pain and a higher desire for contraception are benefits of immediate post-placental IUD insertion during this time (Bayoumi et al., 2020). In several trials, the safety, efficacy, and expulsion rates of the immediately following placental IUD have been examined. In general, less than 14% of IUDs implanted immediately after the placenta during cesarean birth are expelled (Levi et al., 2015).

### **Significance of the study**

All of the most recent postpartum intrauterine contraceptive (PPIUC) insertion recommendations from the World Health Organization 6–8 are in favor of this practice. This can be done up to 48 hours after vaginal birth and within the first 10 minutes (post-placental insertion) of placental delivery. 9

The viability of immediate postpartum IUD insertion is backed by its widespread use in various nations, including Egypt, China, and Mexico. This method has many benefits, including comfort, assurance that the woman is not pregnant, and enhanced incentives. To find spontaneous IUD expulsion, early follow-up is crucial.

### **Aim of the study**

The study aimed to evaluate the 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 through:

- Assessing pregnant women's knowledge regarding intrauterine contraceptive device insertion.
- Design instructional guidelines regarding intrauterine contraceptive device insertion based on the real requirements of the study sample.
- Evaluate the effect of instructional guidelines regarding intrauterine contraceptive device insertion on knowledge among pregnant women.

## Research Hypotheses

Pregnant women's knowledge regarding intrauterine contraceptive device insertion is expected to improve post-instructional guidelines implementation

## Subject and Methods

### Research design

To accomplish the goal of this study, a quasi-experimental research method was used, which identified a pre-group that is as similar to the post-group as possible which indicated variation in the outcomes between the before and after groups.

### Setting

The study was carried out at the antenatal clinic at Beni-Suef University Hospital

### Subjects

100 pregnant woman who had chosen to have a cesarean section and wanted to use a copper IUD for postpartum contraception was included in this study as a purposive sample. Inclusion Criteria: Pregnant women between the ages of 18 and 40 who are planning an elective cesarean delivery at a gestational age of 37 to 40 weeks and are looking for contraception after birth.

### Tool of data collection

**Tool: A structured interview questionnaire:** After evaluating the associated literature, which was divided into three parts (Thapa et al., 2018; Cooper et al., 2018; Blumenthal et al., 2018), the researchers created this tool;

**Part (1):** Pregnant women's personal data; to evaluate the pregnant women's personal information, which included their age, education, occupation, phone number, and place of residence.

**Part (II):** Pregnant women's current obstetric history, to assess the current obstetric history of the pregnant women; which included gestational age, antenatal care follow-up, and current pregnancy complications.

**Part (III): Pregnant women's knowledge,** to assess women's knowledge related to Comparing early versus late (pre/post) placement of an intrauterine contraceptive device during cesarean section. 15 questions made up the test (ended questions) regarding the followings items: Details of insertion procedures (timing of IUD Insertion, location, analgesia), Factors that affected postpartum IUDs insertion, Differences in the failure rate or frequency of unplanned pregnancy between immediate IUD placement during cesarean birth versus interval IUD insertion, barriers for IUD insertion, consequences assessed during the follow-up, and complications (infection, uterine perforation), device expulsion and removal, and their source of knowledge.

### **Scoring system for pregnant women knowledge**

The total score for the knowledge of pregnant women was 30. One mark was given for each incompletely accurate response, zero for incorrect or unidentified responses, and two for each completely correct response. For each knowledge area, the item scores were totaled up, the A mean knowledge score was produced by dividing the total responses by the number of items. The results were then transformed into a percentage score in the last stage when a pregnant woman has a knowledge score of at least 60%, it was seen to have a satisfactory level of knowledge; when it was lower than 60%, it was deemed to have an unsatisfactory level of knowledge.

### **Validity of the tools**

In addition to reviewing the tools' content validity, five experts—two professors in the field of obstetric nursing, two professors in the field of obstetrics and gynecology medicine, and one professor in the field of community health nursing—also examined the tools' clarity, comprehensiveness, appropriateness, and relevance. In accordance with the panel's recommendations, adjustments were made to ensure that the sentences were clear and the substance was appropriate.

### **Reliability of the tools**

Cronbach's alpha coefficients were used to calculate the tools' internal consistency. Tools for the study showed that they were reliable, with a Cronbach's alpha of 0.87.

### **Data collection procedure**

#### **Field of work**

Two days a week, from 9 a.m. to 1 p.m., the researchers collected data from the pregnant women who attended the previously chosen settings (Sunday and Monday). Data were gathered over 6 months, starting in September 2019 and ending in February 2020. Each interview's questions took about 40 to 45 minutes to complete. The three phases of the current study were preparatory, implementation, and evaluation.

#### **A-Preparatory phase**

In waiting rooms in previously chosen sites, the researchers met pregnant women one-on-one and introduced themselves before explaining the purpose of the study.

#### **Administrative and ethical considerations**

After explaining the study's goal to the relevant authorities, permission was granted for its conduct. The purpose and advantages of the trial were conveyed to expectant mothers by the researchers. To secure their compliance, pregnant

women were asked for their verbal agreement. Pregnant women were advised that participation in the study was voluntary and that they had the moral right to accept or reject it. More emphasis was placed on the confidentiality of their answers and their right to leave the research at any moment without providing a reason.

### **A pilot study**

To ensure that the measures were precise and appropriate and that the survey would take an acceptable amount of time to complete, the pilot study was carried out on 10% (10 pregnant women) of the overall sample. Women who were pregnant at the time of the pilot study's participation were excluded from the research study.

### **Implementation phase**

The study's pregnant women received the data collection tools twice: once as a pre-test to gauge their level of understanding before receiving instruction, and once after. (2) A post-test to evaluate pregnant women's understanding following the application of instructions recommended practices. After analyzing the pertinent literature based on the evaluation of the real needs of the studied pregnant women, the streamlined booklet was utilized as supporting material and delivered to pregnant women in the Arabic language to cover all topics relating to the understanding of cardiac surgery. Lectures, discussions, images, and posters were just a few of the various educational techniques used.

The instructional instructions for early versus late implantation of an intrauterine contraceptive device during cesarean section were created and implemented by the researchers. It was put into practice via lectures, posters, instructional movies, play scenarios, and role-plays. The researchers provided the expectant mothers with an instructional pamphlet that was written in plain Arabic and illustrated with photos. The subject material was divided into 4 sessions, each lasting around 25 to 30 minutes. The theoretical and practical portions took a combined two hours. Each session began with a review of the previous session's input, and the first session began with an introduction to the instructional criteria for the topic research. The instructional guidelines included knowledge regarding immediate insertion of an intrauterine contraceptive device during cesarean section versus late insertion after the puerperium asfollow:

- timing of IUD Insertion
- location
- Analgesia
- Factors that affected postpartum IUDs insertion
- difference between immediate IUD insertion following cesarean delivery
- Interval IUD installation about failure rate or occurrence of unplanned pregnancy
- barriers for insertions
- consequences assessed during the follow-up
- complications (infection, uterine perforation), device expulsion, and removal

### **Evaluation phase**

Each pregnant woman was re-interviewed immediately after to assess her level of knowledge. Using the same method, the m was again evaluated.

### **Statistical Analysis**

The data were acquired, processed, and statistically assessed using SPSS 22.0 for Windows (SPSS Inc., Chicago, IL, USA). The data's normal distribution was checked using the Shapiro Walk test. To represent qualitative data, frequency distributions, and relative percentages were used. As can be seen, the Fisher exact and Chi-square tests were used to calculate the variation between qualitative data. Quantitative information was shown as mean and SD (standard deviation) for parametric data and as median and range for non-parametric data. The Independent T-test and the Mann-Whitney test were used to calculate the variance between quantitative variables in two groups for parametric and non-parametric measurements, respectively. P value was set to <0.05 for statistically significant findings and <0.001 for extremely significant findings.

### **Results**

Table 1 shows that the age range for 61% of the pregnant participants was between 18 and 25. They were 42% literate, with a mean age of  $28.67 \pm 5.44$ . they were 80% unemployed, and 65% of them were from rural areas.

Table 2 shows that the majority (77%) of the pregnant women were receiving routine antenatal care, and 15% of them had gestational diabetes. The average gestational age of the pregnant women was  $36.2 \pm 1.3$  weeks.

Figure (1): Illustrates that all of the studied pregnant women (100%) didn't attend previous training programs regarding immediate compared to late insertion of an intrauterine contraceptive device.

Table (3): Demonstrates There was an improvement after the instructional guidelines were put into place, and there was a highly statistically significant difference between pregnant women's knowledge of early versus late insertion of an intrauterine contraceptive device before and after the instructional guidelines implementation ( $P < 0.001$ ).

Figure (2): Found that (94%) of pregnant women's knowledge of early vs late insertion of an intrauterine contraceptive device in the application of the pre-instructional guidelines was unsatisfactory, and just (5%) had satisfactory knowledge levels. Yet, after the instructional guidelines were put into place, (95%) of the pregnant women had satisfactory knowledge levels.

Table (4) portrays the relationship between personal data and the knowledge of the studied pregnant women. It also demonstrates a correlation between knowledge, age, place of residence, level of education, and occupation with a p-value of <0.05.

Table (1): Frequency and percentage distribution of studied pregnant women according to their personal data (n=100)

Personal data	No. (100)	%
Age/years:		
• 18<25	61	61.0
• 25<30	18	18.0
• 30<35	12	12.0
• 35≥ 40	9	9.0
Mean age		
28.67±5.44		
Educational level:		
• Read and write	42	42.0
• Basic education	20	20.0
• Secondary education	31	31.0
• University education	7	7.0
Occupation		
• Working	20	20.0
• Not-working	80	80.0
Residence:		
• Urban	35	35.0
• Rural	65	65.0

Table (2): Pregnant women distribution based on their current obstetrical history (n=100)

Item	No. (100)	%
Gestational week	36.2±1.3	
• Mean ±Stander deviation		
Antenatal care follow up		
• Regular	77	77.0
• Irregular	23	23.0
Current pregnancy complications		
• None	61	61.0
• Preeclampsia	4	4.0
• Gestational diabetes	15	15.0
• Genital infection	5	5.0
• Anemia	15	15.0



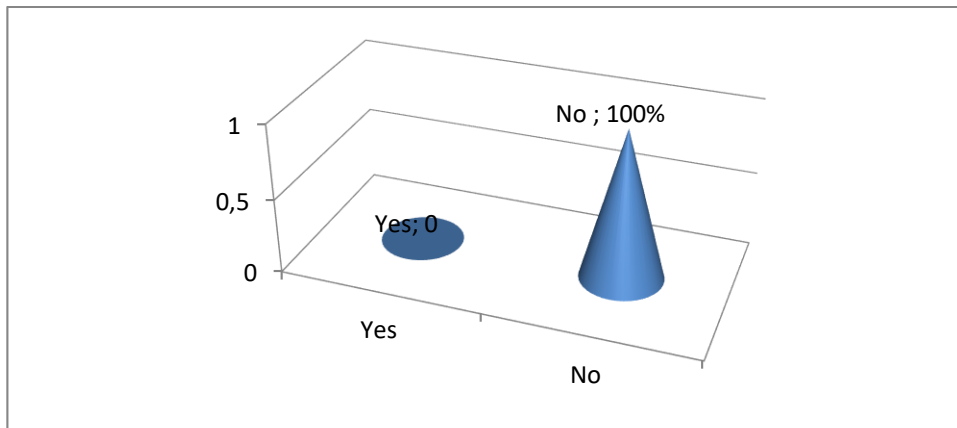


Figure (1): Percentage distribution of the studied pregnant women regarding previous attendance training program regarding immediate compared to late insertion of an intrauterine contraceptive device

Table (3): Distribution of the study's pregnant participants' knowledge of early versus late implantation of an intrauterine contraceptive device before and after the application of instructional guidelines

Pregnant women 's knowledge	No =(100)		X <sup>2</sup>	P-value
	Pre (%)	Post (%)		
Timing of IUD Insertion, location, analgesia	22%	90%	78.72	<0.001*
Factors that affected postpartum IUDs insertion	17%	93%	67.22	<0.001*
Barriers to IUD insertion	14%	87%	89.45	<0.001*
Consequences assessed during the follow-up	9%	85%	69.56	<0.001*
Complications	18%	89%	132.23	<0.001*
Device expulsion and removal	19%	80%	120.44	<0.001*
Differences in the failure rate or frequency of unplanned pregnancy between immediate IUD placement during cesarean birth versus interval IUD insertion	5%	79%	112.33	<0.001*

\*: significant ( $p \leq 0.05$ )

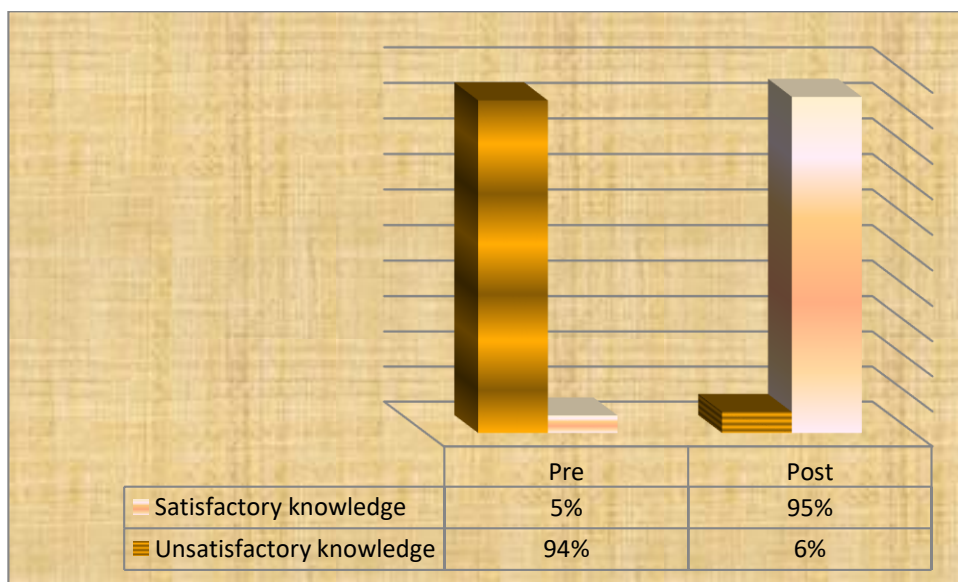


Figure (2): The study's pregnant subjects' total knowledge score level regarding immediate compared to late insertion of an intrauterine contraceptive device pre and post-instructional guidelines implementation (n=100)

Table (4): Association between the knowledge, personal data, and current history pre and post-instructional guidelines implementation (N=100)

Items	Pregnant women's knowledge						Chi-square	
	Pre		Chi-square		Post		Chi-square	
	Satisfactory (6%)	Unsatisfactory (94%)	$\chi^2$	p-value	Satisfactory (95%)	Unsatisfactory (5%)	$\chi^2$	p-value
	N (%)	N (%)			N (%)	N (%)		
Age/ years • 18<30 • 30≥ 40	5(83.0) 1 (17.0)	70(74.0) 24(26.0)	3.4	0.057*	60(63.0) 35(37.0)	4(80.0) 1(20.0)	6.13	0.024*
Residence Urban Rural	2(33.0) 4(66.0)	34(36.0) 60(64.0)	5.6	0.033*	40(42.0) 55(58.0)	2(40.0) 3(60.0)	4.8	0.045*
Educational level Read and write Basic education Secondary education University education	3(50.0) 3(50.0) 0(0.0) 0(0.0)	10(10.5) 10(10.5) 54(57.0) 20(22.0)	17.9	0.001**	30(31.0) 32(33.0) 20(22.0) 13(14.0)	2(40.0) 1(20.0) 1(20.0) 1(20.0)	18.5	0.001**
Occupation Housewife Working	4(66.0) 2(33.0)	60(63.0) 34(37.0)	23.8	0.001**	55(58.0) 40(42.0)	4(80.0) 1(20.0)	56.4	0.001**

(\*) Statistical significant difference

(\*\*) Highly statistical significant difference

## Discussion

Almost all women have been thought to be suitable candidates for the copper IUD as a means of contraception. Concerning effectiveness, safety, convenience, and problems, this study compared inserting a copper IUD immediately following placental ejection during LSCS to inserting an interval IUD.

The finding of the present study indicated that more than three-fifths of the pregnant women who took part were between the ages of 18 and 25. In a different investigation, conducted by Singal et al. (2014), 300 primiparous women underwent postpartum intra-cesarean insertion of Copper T 380A to assess the clinical outcome (safety, efficacy, expulsion, and continuation rates) of post-placental Copper T 380A insertion in primiparous women undergoing cesarean section. The study's women subjects were  $23.12 \pm 2.42$  years old on average.

The finding of the present study indicated that the majority of the pregnant women were from rural areas. From the researchers' point of view, it reflected the cause of the knowledge deficit due to insufficient resources to receive enough information regarding the topic

The results of this study reveal all of the studied pregnant women didn't attend previous training program regarding immediate compared to late insertion of an intrauterine contraceptive device. . From the researchers' point of view, this result reflects the need of the studied women to attend this training program to improve their knowledge.

The results of this study reveal that There was an improvement after the instructional guidelines were put into place, and there was a highly statistically significant difference between pregnant women's knowledge of early versus late insertion of an intrauterine contraceptive device before and after = instructional guidelines implementation. From the researchers' point of view, this result reflects the positive impact of instructional guideline implementations, which meet women's needs and provide them with sufficient knowledge to maintain their health. This improvement is the emphasis that most patients have the desire to learn more knowledge about their conditions and show the effect of the guidelines.

This result matched with Çelen et al., (2011), using a post-placental IUD has several advantages. It provides quick contraception without obstructing nursing and could lessen insertion pain. Only when these women addressed medical professionals during delivery could they learn more about birth control options. The combination of family planning programs with maternity and birthing services was therefore advised. In doing so, it would be easier to persuade women who wouldn't otherwise look for contraceptives to use them (Mohamed et al., 2013). As opposed to delayed postpartum insertion and immediate postpartum IUD insertion is safe (World Health Organization, 2015).

These results were supported by Levi et al., (2012), who carried out cohort research to learn about IUD expulsion rates, and they discovered that women consented to the upcoming post-placental IUD insertion at the time of cesarean delivery because they thought it was secure and satisfactory.

These results are in the same line with Celen et al. (2011) looked into the efficiency and safety of putting a TCu 380A IUD right after the placenta was removed during cesarean delivery. The 12-month cumulative rates of unplanned pregnancies, IUD ejection, and complications from an IUD due to illness were the main outcome markers. They discovered that placing an IUD during a cesarean section immediately following placental ejection provides adequate pregnancy protection without raising the risk of infection (Bayoumi et al., 2020).

This translational study teaches us several valuable lessons. Women must be thoroughly told about risks (including expulsion), during the prenatal stage, and physicians must keep track of results to calculate risks accurately. Despite a crucial counseling point, the majority of the women in our study elected to re-insert IUC after expulsion, indicating a continuous acceptance and motivation for the procedure. Yet, it is accepted that women in our context receive IUC insertion at no cost to them. The initial expenditures of PPIUC and potential re-insertion may restrict use and acceptability in situations where contraception is not offered without charge (Bayoumi et al., 2020).

The pregnancies in those who did not go and the tiny percentage of women who did not recognize that their device had discharged and may have been at risk of pregnancy help to emphasize the significance of a follow-up appointment. In response to the high expulsion risk, we have updated our service to include tailored feedback for employees, recurrent training, and a long time of supervision. A specific postpartum IUC inserter that more closely matches the widely used non-postpartum IUC inserters have been created. Healthcare experts preferred the specialized postpartum inserter over forceps for ease of insertion in a recent randomized controlled experiment by Blumenthal et al., (2018). A device like this could be able to get around some of the difficulties associated with training and insertion and potentially even reduce expulsions. It may be the most significant result in terms of public health is the high continuation rate after PPIUC. These results were supported by the aim and hypotheses of the present study.

post-placental IUD insertion utilization was 88.3% three months following PPIUC, which is remarkable considering that only 50% of women are anticipated to present for interval insertion. (Heller et al., 2016), argues that PPIUC fills a crucial gap in service. Twelve months following PPIUC, nearly four out of five women were still utilizing the procedure, maintaining this high continuation rate. PPIUC is a practical strategy to lessen unwanted and closely spaced pregnancies if ejection can be easily diagnosed and early re-insertion facilitated if desired. The high cost-effectiveness of PPIUC has been documented in a US study, despite the absence of recent health economics data from the UK., even when expulsion rates are higher than what is more commonly reported in the literature (Blumenthal et

al., 2018). Consequently, the advantages of PPIUC are expected to endure, especially in environments with low interval IUC insertion attendance rates.

## **Conclusion**

Based on the results and hypotheses of the present study, the study findings concluded that the results support the research hypothesis in the implementation of the instructional guidelines implementation had a positive effect on improving pregnant women's knowledge regarding immediate insertion of an intrauterine contraceptive device during cesarean section versus late insertion after the puerperium.

## **Recommendations**

Based on the current study results, the following recommendations are proposed:

- The study recommended that instructional guidelines regarding immediate insertion of an intrauterine contraceptive device during cesarean section versus late insertion after the puerperium and its effects should be taught to pregnant women to improve their knowledge and help them select better methods.
- counseling during the antenatal period should be provided to pregnant women regarding immediate early versus late placement of an intrauterine contraceptive device compared to following a cesarean section
- Teaching pregnant women about various IUD insertion techniques using illustrated pamphlets and booklets for each of them.
- To generalize the findings, the current study must be replicated using a broader sample of expectant mothers in various situations.

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