International Journal of Multiphysics
Volume 18, No. 3, 2024
ISSN: 1750-9548

# Effect of an Instructional Package on Nurses' Knowledge and Practice Regarding Uterotonic Drugs Administration and Labor Outcome

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**Abstract**

Promoting and maintaining the health of the mother and her fetus is a major duty of the maternity nurse in order to ensure a safe delivery.

**The aim of the study** was to assess the effect of an instructional package on nurses' knowledge and practice regarding uterotonic drugs administration and labor outcome.

**Research Design**: A Quasi-experimental design (pre-posttest) study design was utilized.

**Setting**: The study was carried out in the labor unit of the maternity hospital at Zagazig University Hospital, Sharqia Governorate, Egypt.

**Sample**: All available nurses (20 nurses) were included as well as a purposive sample of 100 parturient women. **Tools**: Tool I: A structured interview schedule which included two parts; Staff nurses' socio-demographic characteristics and assessment of nurses′ knowledge regarding uterotonic drugs. Tool II: Observational checklist for nurses′ practice regarding uterotonic drugs administration. Tool III: A structured interview schedule for parturient women. Tool IV: Labor outcome assessment tool.

**Results**: The results revealed a significantly positive improvement in nurses' knowledge and their practice consequently the maternal, fetal and also neonatal outcomes.

**Conclusion**: The implementation of the instructional package about uterotonic drugs administration can improve the maternity nurses' knowledge and practice and labor outcome.

**Recommendations**: Planning an in-service training program for all staff nurses to update, improve and refresh their knowledge and their practices depending on the recent evidence-based guidelines during labor.

**Keywords:** Instructional package, Uterotonic drugs, Nurses′ knowledge, practice, Labor outcome.

***Introduction***

For mothers, giving birth is both the most amazing and enjoyable experience of their lives and a potentially fatal one (Mohamed et al., 2019). Therefore, it is the duty of a maternity nurse to promote and maintain the health of the mother and fetus from conception until delivery in order to provide a safe delivery (Esmail et al., 2020).The naturally occurring oxytocin hormone, a peptide hormone secreted from the posterior lobe of the pituitary gland and released into the blood circulation in a pulsatile manner, causes a coordinated effective sequence of involuntary uterine contractions. This process is known as spontaneous physiological. It results in cervical effacement and dilatation, as well as voluntary bearing down effort that causes the expulsion of conception products, such as the fetus, membranes, umbilical cord, and placenta (Mohamed et al., 2022).

Most women and families around the world view labor as a life-altering experience. Additionally, labor carries a number of dangers, including the possibility of serious impairment or even death for both the mother and the child (World Health Organization, 2018).

Chemical substances known as "uterotonic drugs" improve the uterine smooth muscles' tone and contraction. During labor and the postpartum period, these substances make the contractions of the uterine muscles more intense. Medications known as uterine stimulants (oxytocics or uterotonics) are administered to either induce or enhance labor. In order to achieve effective cervical effacement and dilatation that result in vaginal birth, induction of labor (IOL) is the procedure of artificially starting uterine contractions after fetal viability but before spontaneous onset of labor (Macones, 2021). Depending on the prevalence of high-risk pregnancies, regional hospital policies, and the resources available, induction rates differ significantly amongst obstetric units (Kozhimannil et al., 2018).

Furthermore, when spontaneous contractions have not resulted in the increasing cervical dilation required for the fetus's evacuation, uterine contractions are stimulated, a process known as "augmentation of labor" (Heather et al., 2020). By employing uterotonic medications like oxytocin, misoprostol, methethergine, and other prostaglandins, uterine stimulants can be utilized to enhance preexisting uterine contractions, increasing their frequency, duration, and strength. According to WHO (2018), uterotonic medications can be administered intramuscularly (IM), intravenously (IV), or as a pill, gel, or vaginal suppository. Even though uterotonic medicines can save lives when used appropriately, using them without a thorough clinical understanding of their mechanisms of action can have major negative effects on both the mother and the fetus. Long-term active phase, uterine hyperstimulation, uterine tachysystole, admission to the intensive care unit, uterine rupture, cervical laceration, and third- or fourth-degree perineal tears are examples of maternal problems. Fetal heart rate anomalies, fetal hypoxia, fetal distress, stillbirth, poor Apgar score, newborn morbidity (e.g., seizures, birth asphyxia, neonatal encephalopathy, infection), and neonatal intensive care admission are among the most common fetal problems (Gill et al., 2022).

Being in conformity with established directives, rules, regulations, and laws is known as compliance. When determining the scope of practice, which also pertains to the profession's role in medication management, adherence to drug instructions is regarded as a fundamental concept for accountability, autonomy, competence, and delegation (The Provincial Council for Maternal and Child Health, 2019).

The nurse's performance and response to medication errors as an individual and team member can be facilitated by comprehending and applying the scope of nursing and midwifery practice framework and its determinants in conjunction with expert advice on medication management. The standards and rules of care and activities during induction/augmentation must be known by nurses at the bedside of laboring women who make decisions on the titration of uterotonic medicines (Lohani, 2020).

**Significance of the study**

50% of all births require uterotonic medicines, such as oxytocin, to induce or enhance labor, making it the most widely used induction agent worldwide. In order to prevent problems, these drugs need to be continuously managed (Queensland Clinical Guidelines, 2020). Misuse of uterotonic medicines has been

associated with maternal and neonatal death. Inadequately trained healthcare personnel frequently utilize medicines that cause labor. According to Caroline and Oats (2019), unchecked usage of these drugs might have detrimental impacts on both the mother and the kid. The midwife should be fully informed on the indications, action, and side effects of these medications, as well as the nursing considerations related to each one, in order to create and carry out an effective nursing process (Vaz et al., 2021). According to the results of Mohamed et al. 2020, who conducted an assessment in Egypt to evaluate nurses' knowledge and practices related oxytocin medicines, 44% of the nurses in the study had inadequate knowledge, and 60% had unacceptable practice. In order to save the mother's and the fetus's lives, nurses need to be informed, current, and careful to learn all the practical techniques and protocols related to drug delivery. The difficulties that could result from ignorance of inappropriate uterotonic medication use will be reduced thanks to this study.

**The aim of this study was to:** Assess the effect of an instructional package on nurses' knowledge and practice regarding uterotonic drugs administration on labor outcome.

**Research Hypothesis:**

Nurses' knowledge and practice as well as labor outcome will be expected to be improved after implementation of an instructional package regarding uterotonic drugs administration.

**Subjects and Method:**

**Research Design:**

A Quasi-experimental design (one group pre-posttest) was utilized in this study.

**ii.Settings:** The study was carried out at the labor unit of the maternity hospital at Zagazig University Hospital, Sharkia Governorate, Egypt.

**Sample size: -** There were two samples where determined:

**Group I:** The total parturient women (which were in normal labor) of this study were (100 women). The parturient women were chosen according to this next inclusion criteria:

1. Age ranged from 20 -35years old.
2. Primiparous and multiparous, with spontaneous labor.
3. Delivery at full term.
4. Free from any medical or obstetric diseases.
5. Pregnant with singleton fetus, also with cephalic presentation.
6. Willing to participate in the study.

The parturient women were chosen according to this next exclusion criteria:

1. Women with induced labor and those who were not in labor due to elective or emergency cesarean section.
2. Pregnant women with mal-presentation and mal-position.
3. Fetal with congenital malformation.
4. Multiple pregnancy.

**Group II:** Staff nurses: All staff nurses whom provided direct nursing care for women during labor in the above-mentioned setting were participated in this study were (20 staff nurses).

For participant staff nurses

**Inclusion criteria**

1. Staff nurses who are working in maternity ward.
2. Staff nurses who are willing to participate in the study.
3. Staff nurses who are available at the time of study.

**Exclusion criteria**

1. Staff nurse work in maternity ward who are not ready to consent in the study.
2. Staff nurses work in maternity ward that are not available during study period.
3. Staff nurses who had the qualification of ANM or multipurpose workers.

**iv. Tools for data collection:**

Based on a survey of recent related literature, the researcher employed the following three strategies to accomplish the study's goal.

**Tool I: A structured interview schedule:**

Based on a recent evaluation of pertinent literature, the researcher created and employed a specially designed structured interview schedule to gather basic information about the study participants. The following three sections were included in it:

**Part (1): Staff nurses' socio-demographic characteristics:** This section was used to gather information about the general characteristics of the staff nurses, including their age, marital status, occupation, education level, years of experience in the labor unit, and prior training on how to care for women when administering uterotonic medicines, among other things.

**Part (2): Assessment of staff nurses′ knowledge regarding uterotonic drugs:**

There were thirty-eight questions about general knowledge about the following topics: uterotonics drugs (types, mode of action, storage temperature, routes for administration, indication, contraindications, drip regulation, and side effects); labor definition, stages, and management; and labor induction and augmentation. Furthermore, nursing care and precautions taken prior to the administration of uterotonics, nursing interventions and observations made during administration, and the frequency, length, and strength of uterine contractions to be attained are all important considerations. Additionally, the antidote for various uterotonic drug kinds, indications for discontinuing the infusion, indicators of uterine rupture, signals of maternal and fetal distress, signs of uterine hyper-stimulation, and nursing measures following uterotonics administration.
The following categories were used to classify the staff nurses' knowledge score system and interpretation:

A thorough and accurate response received a score of (2).

An incomplete and correct response received a score of 1.

I didn't realize my incorrect response was worth zero points.
Instrument (II): Observational checklist for staff nurses' administration of uterotonic drugs:

After examining the most recent relevant literature, the researcher created this tool. It had 72 items designed to evaluate nurses' practices when caring for women on uterotonic medications. It contained the following components:
Section 1: Preparation for administering uterotonic drugs: It included eight elements for the researcher to observe in order to evaluate nurses' practices with regard to uterotonic administration, including: (Set up the required equipment, Inform the women about the process while protecting their privacy. Verify that the patient receiving oxytocin has no risk factors (contraindications). Before beginning the infusion, check the patient's vital signs, fetal

position, uterine contraction, cervical dilatation, and fetal heart sounds. Cleaning your hands and putting on gloves Help her drop and lie in the appropriate posture. Attach the fetal monitor to the woman and place the cannula in her right hand.
Part (2): Administration of uterotonic drugs: The researcher observed 53 items to evaluate nurses' practices about maternal and fetal conditions prior to, during, and following the administration of uterotonics.

Part (3): Emergency measures during the administration of uterotonic medications: This section had four things about what to do in the event that issues arose during the delivery of uterotonic drugs. These were as follows: Stop the medication, turn the mother to her left side, use a facemask to deliver oxygen at a rate of two to three liters per minute, and notify the obstetrician of the mother's condition right away.

Section (4): Records: There were eight items on the woman's sheet about documenting the following information about the infusion of uterotonic drugs: (Dose of uterotonic drugs as well as amount and type of solution, Fetal heart rate, Maternal vital signs, Vaginal examination findings, Intake and output, Progress of labor, Nursing intervention and signature…. etc.).

The following categories comprised the staff nursing practice grading system: Completed accurately and fully (always) received a score of (2).

Completed accurately but occasionally insufficiently received a grade of 1. Erroneously completed or never completed received a score of zero.
The following categories were created from the total score of nurses' practices: Each nurse's practice scores, which varied from 0 to 14, were collected and then totaled and converted to a percentage score.

Tool (III): A methodical interview schedule for women who are parturient:

Section (A): Parturient women's sociodemographic traits: Data like age, marital status, education, occupation, and place of living were included in this section.
Data on the obstetric features of parturient women, including gravidity, parity, spacing period, number of abortions, and mode and location of previous deliveries, were gathered in Section (B): Reproductive history of parturient women.
Tool (IV): Evaluation of labor outcomes:

Section 1: Evaluation of maternal outcome

It was employed to evaluate how uterotonic medications affected the health of the mother. Both during labor and immediately after delivery, maternal outcomes were assessed. During labor, the following factors were measured: the type of delivery, the incidence of third- or fourth-degree perineal tears, the incidence of postpartum hemorrhage, the duration of the second stage of labor, the incidence of ineffective cervical dilatation or failed induction, the incidence of precipitous labor, etc.

Section 2: Evaluation of fetal and neonatal outcomes:

It was employed to evaluate how uterotonic medications affected the health of the fetus and newborn. Apgar score at one and five minutes, the presence of meconium aspiration, the presence of respiratory distress, and neonatal intensive care admission were the measures used to assess fetal outcome twice: during labor (occurrence of fetal heart rate abnormalities, incidence of fetal hypoxia and fetal distress, and intrapartum fetal death (stillbirth)).

Tool (V): Program for intervention:

The four phases of the instructional package's implementation and operation were assessment, planning, execution, and evaluation.

**Pilot Study:**

Ten percent of the overall sample, consisting of both women and staff nurses, participated in a pilot study. The total sample size does not include those. It was done to test the study tools for clarity and feasibility, to gauge the amount of time needed to complete the study, to gauge the level of staff nurses' comprehension of the questionnaire and willingness to participate, to identify potential issues and roadblocks that could arise and impede data collection, and to estimate the amount of time needed for data collection. According to the findings of the pilot study, all necessary changes were made by adding or removing some questions and making some of the questions' typing clearer and easier, such as by rewriting some lines.

**Ethical considerations:**

After outlining the goal of the study, a formal letter from Zagazig University's Faculty of Nursing was sent to the appropriate authorities to request their approval to carry it out. The study was conducted with official approval from the director of Zagazig University Hospitals, the head of the nursing department responsible for women's health and midwifery, and the ethical committee of the nursing faculty. Every nurse and parturient woman was given an explanation of the study's purpose, nature, advantages, and disadvantages. Participation in the study was agreed upon orally. Participants were guaranteed privacy, anonymity, and the freedom to withdraw from the study at any time for any reason. anonymity was maintained during the whole investigation, and the findings were only used for publication and educational purposes.

***Field work:***

To fulfil the aim of the study, the instructional package was implemented and conducted through (4) phases: assessment, planning, implementation, and evaluation

**Statistical design**:

IBM Corp. was used to gather, tabulate, and statistically analyze all of the data. published in 2015. Version 23.0 of IBM SPSS Statistics for Windows. NY: IBM Corp., Armonk. Qualitative data were presented as and (percentage), whereas quantitative data were presented as mean ± SD and median (range). Pairs of normally distributed variables were compared using the paired t test. Ordinal variable pairs were compared using the marginal homogeneity test.

**Result:**

**Table (1): Frequency and percentage distribution of the Studied nurses according to personal parameters (n.=20):**

| Variables | | Number | Percent |
|---|---|---|---|
| **Age / years:** | **21-30** | 2 | 10 |
| | **31-40** | 2 | 10 |
| | **41-50** | 11 | 55.0 |
| | **≥50** | 5 | 25.0 |
| Mean ± Stand. = 42.8 ± 5.25 | | | |
| **Gender nurse:** | **Female** | 20 | 100.0 |
| **Marital status:** | **Unmarried** | 0 | 0 |

| | | | |
|---|---|---|---|
| | **Married** | 16 | 80.0 |
| | **Widowed** | 4 | 20.0 |
| | **divorced** | 0 | 0 |
| **Residence:** | **Rural** | 8 | 40.0 |
| | **Urban** | 12 | 60.0 |

Table 1 presents frequency and percentage distribution of the studied nurses according to personal parameters. It illustrates that about (55.0%) of of studied nurses were in age group 41-50 years with a mean of age 42.8 ± 5 years. Regarding studied nurses' residence, the same table indicates that more than half (60 %) of them lived in urban areas. Furthermore, the majority of them (80.0 %) were married.

**Table (2): Comparison of uterotonic drugs administration nurses′ knowledge level pre and post intervention program**:

| **Item** | **Study phase** | | | | **eta** | **t-test** | **p-value** |
|---|---|---|---|---|---|---|---|
| | pre intervention | | post intervention | | | | |
| | No. | % | No. | % | | | |
| **Nurses′ knowledge regarding uterotonic drugs** | | | | | | | |
| satisfactory | 1 | 5.0 | 18 | 93.0 | **0.74** | 7.281 | **0.0001*** |
| unsatisfactory | 19 | 95.0 | 2 | 7.0 | | | |
| Mean ±SD | 21.1±7.03 | | 36.5±7.1 | | | | |
| median (range) | 17.5(12-39) | | 39(18-43) | | | | |

t: paired t test, p<0.05 statistically significant.

Table 2 shows comparison of uterotonic drugs administration nurses′ knowledge level pre and post intervention program which illustrate that the program increased knowledge scores of nurses by 74%. These differences were highly statistically significant (P=0.000).

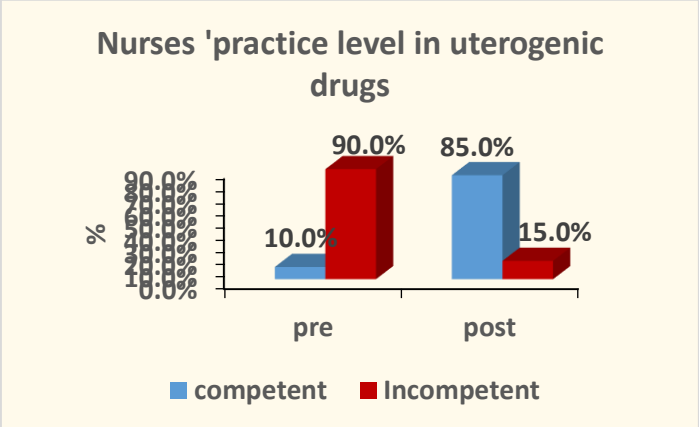


**Figure (2):** Nurses' practice level pre and post intervention program about Uterotonic Drugs Administration

Figure 2 reflects an improvement in nurses practice' level regarding Uterotonic Drugs Administration at post intervention (85%) were competent respectively compared to pre intervention (10%) were incompetent.

**Table (3): Correlation between nurses' knowledge score and their practice for uterotonic drugs administration**

| Variable | | knowledge score | | | |
|---|---|---|---|---|---|
| | | Pre | | post | |
| | | r | p | r | P |
| Practice score | pre | 0.012 | 0.96 | | |
| | post | | | 0.54 | 0.014* |

**correlation coefficient (r) p>0.05 no significant, *p<0.05 significant**

Table 3 reflects a positive correlation between nurses' knowledge score and their practice for uterotonic drugs administration. Moreover, there was significance ($p<0.05$) and direct relation between knowledge score and their practice for uterotonic drugs administration post intervention program.

**Table (4): Frequency and Percentage Distribution of the Studied women according to personal parameters (n.100):**

| Variables | | No. | Percent |
|---|---|---|---|
| **Age /years:** | **<25** | 33 | 33.0 |
| | **25-29** | 44 | 44.0 |
| | **30-35** | 17 | 17.0 |
| | **>35** | 6 | 6.0 |
| **Woman Education level:** | **Illiterate** | 18 | 18.0 |
| | **Preparatory education** | 33 | 33.0 |
| | **secondary education** | 42 | 42.0 |
| | **university education** | 7 | 7.0 |
| **Woman occupation:** | **house wives** | 87 | 87.0 |
| | **Employment** | 13 | 13.0 |
| **Residence:** | **urban** | 30 | 30.0 |
| | **Rural** | 70 | 70.0 |
| **Family income:** | **not enough** | 89 | 89.0 |
| | **enough** | 11 | 11.0 |
| **Family type:** | **nuclear family** | 23 | 23.0 |

| | | | |
|---|---|---|---|
| | **extended family** | 77 | 77.0 |
| **Body mass index (BMI):** | **normal weight** | 24 | 24.0 |
| | **over weight** | 44 | 44.0 |
| | **obese** | 32 | 32.0 |

Table 4 presents the frequency and percentage distribution of the studied women according to personal parameters. It illustrates that about (44.0%) of the Studied women were in age group **25-29** years. As regarding the educational level of studied women, the same table indicates that less than half (42 %) of them were secondary educational level. Furthermore, about two third of them (70.0 %) were from rural areas.

**Table (5): Incidence of maternal outcome:**

| **Variable** | | | **No.** | **Percent** |
|---|---|---|---|---|
| **During labor** | failed induction. | Yes | 16 | 16.0 |
| | | No | 84 | 84.0 |
| | Duration of second labor stage. | Normal | 93 | 93.0 |
| | | prolonged | 7 | 7.0 |
| | Hypertonic uterine contraction. | Yes | 1 | 1.0 |
| | | No | 99 | 99.0 |
| | precipitation labor. | Yes | 1 | 1.0 |
| | | No | 99 | 99.0 |
| | uterine rupture. | Yes | 1 | 1.0 |
| | | No | 99 | 99.0 |
| | Intrapartum hemorrhage (IPHg). | No | 100 | 100.0 |
| **Immediately after delivery** | type of current delivery. | vaginal delivery | 93 | 93.0 |
| | | CS | 7 | 7.0 |
| | perineal tear third or fourth degree. | No | 100 | 100.0 |
| | Post partum hemorrhage (PPHg). | No | 100 | 100.0 |
| | maternal intensive care admission. | No | 100 | 100.0 |

Table 5 shows the incidence of maternal outcome during labor and immediately after labor. It illustrates that induction was succeed in (84%) of the women. About 99% of the studied women had no complications during labor as (Hypertonic uterine contraction, precipitation labor, uterine rupture and Intrapartum hemorrhage). While which related to immediately during labor, about (93%) of them were vaginal deliveries and (100%) of them had no complications during labor.

**Table (6): Incidence fetal/neonatal outcome:**

| Variables | | | No. | Percent |
|---|---|---|---|---|
| During labor | Fetal heart abnormality. | Yes | 3 | 3.0 |
| | | No | 97 | 97.0 |
| | Fetal hypoxia. | No | 100 | 100.0 |
| | Stillbirth. | No | 100 | 100.0 |
| Immediately after delivery | Birth weight. | <3500 gm | 12 | 12.0 |
| | | ≥3500 gm | 88 | 88.0 |
| | Apgar score1 minute. | Normal | 96 | 96.0 |
| | | Abnormal | 4 | 4.0 |
| | Apgar score 5minute. | Normal | 98 | 98.0 |
| | | Abnormal | 2 | 2.0 |
| | Apgar score after 5minute. | Normal | 100 | 100.0 |
| | Meconium aspiration. | Yes | 2 | 2.0 |
| | Respiratory distress. | Yes | 2 | 2.0 |
| | Neonatal complication. | Yes | 2 | 2.0 |
| | Neonatal intensive care. | Yes | 2 | 2.0 |

Table 6 shows incidence fetal/neonatal outcome during labor and immediately after labor. It reveals that 97% of fetus had no fetal heart abnormalities while only 3% had. There were no other complications happened during labor. While APGAR score in 1 and5 min. was (96%and98%) respectively.

**Discussion**

The practice of employing medications or other techniques to stimulate uterine contractions in order to induce labor before spontaneous labor happens is known as induction of labor. One or more of the following techniques are commonly used to induce labor: oxytocic stimulation of the uterus, cervical ripening drugs, or artificial rupture of the membranes.

The posterior lobe of the pituitary gland secretes the hormone oxytocin, which has its origins in the brain. The most widely used medication to induce labor in healthy pregnancies is synthetic oxytocic. The intravenous infusion method is used to administer it. Because it enables accurate dosage monitoring and prompt drug withdrawal in the event of an adverse effect, it is only used to induce the uterus to contract during pregnancy.

When uterotonic medications are used inappropriately, parturient women and their fetuses suffer grave complications. Uterine hyperstimulation, uterine rupture, a fetal heart rate that is not comforting, depressed babies at delivery, long-term neurological issues, and/or fetal death are some of these difficulties. It is crucial to keep in mind that the most avoidable source of perinatal liability is oxytocin abuse.

When it comes to administering uterotonic drugs, nurses need to be up to date on the latest developments and comprehend the guidelines that govern their practice. Thus, the purpose of this study was to

assess how nurses' performance and labor outcomes were affected by the instructional instructions pertaining to the administration of uterotonic medicines.

Regarding the sociodemographic characteristics of the nurses under study, the results of this study showed that the nurses' ages ranged from 41 to 50 years, that most of them were married, that roughly two-thirds of them had earned a nursing diploma, that slightly more than three-fifths of them had 20 years or more of experience, that most of them had never taken any prior uterotonic drug administration training, and that roughly two-thirds of them had only taken one uterotonic drug administration training course.

The results of this study are comparable to those of a study named "assessment of the knowledge and practice on use of oxytocin among nurses working in selected hospitals in Chennai" by Shiny S.T. (2017), which found that the nurses in the study ranged in age from 40 to 50 and that two-thirds of them were bedside nurses with a technical diploma in nursing.

However, Mohamed A. et al.'s (2019) study on the "effect of educational program on improving nursing knowledge and practice regarding administration of oxytocin during labor" contradicts this finding. They discovered that the mean age ± SD of the nurses under study was 25.2±5.8, with ages ranging from 18 to 38.

Regarding the overall score level of nurses' knowledge about the administration of uterotonic drugs, it was found that a small percentage of the nurses in the study had a high level of knowledge prior to the implementation of the guidelines, and that this number rose to the majority of nurses having a good level of knowledge both immediately and three months later, with a highly statistically significant difference.

This result was consistent with the evaluation of "the effect of an instructional package on nurses' performance regarding obstetrical emergencies during oxytocin administration" conducted by Zeinab R. A. et al. (2017). They stated that prior to the training package's adoption, just a small percentage of the nurses under study have adequate expertise. Although the majority of them had high knowledge right after the instructional package was implemented, this knowledge marginally decreased over the follow-up phase (p=0.000).

In terms of the overall score level of nurses' practice during oxytocic administration, most of the nurses in this study had subpar practice levels before to the implementation of the guidelines, which sharply improved as soon as the guidelines were put into place. This result is consistent with a study on the "role of doctors and midwives nurses in oxytocic administration in Istanbul" conducted by Tenaw Z et al. (2017). According to their findings, 76% of physicians and 84.9% of midwives showed poor adherence to oxytocic administration guidelines. They explained their findings by pointing to the absence of an oxytocic procedure.

The results of this study showed a significant improvement in maternal outcomes with regard to the incidence of failed induction, duration of the second stage of labor, incidence of uterine hyperstimulation, incidence of precipitous labor, incidence of uterine rupture, occurrence of intrapartum hemorrhage, type of delivery, incidence of third- or fourth-degree perineal tear, post-partum hemorrhage, and maternal intensive care unit admission. These findings are related to the assessment of maternal and fetal outcomes of parturient women following the application of uterotonic drug guidelines.

Additionally, the results of this study showed a notable improvement in the fetal outcome in terms of meconium aspiration, respiratory distress, fetal heart rate abnormalities, the incidence of fetal hypoxia, intrapartum fetal death (stillbirth), the Apgar score at one and five minutes, and neonatal intensive care unit admission.

Nour S et al. (2017) examined "outcomes of labor in women undergoing induction of labor and plan of nursing action," and the results of this study are consistent with their findings. According to their findings, most women experienced a successful induction of labor, no cases of uterine hyperstimulation or rupture, no need for the mother to be admitted to intensive care, and an improvement in the fetal condition, including a normal Apgar score at one and five minutes and no need for the neonatal intensive care unit.

Lastly, the results of this study showed that the lack of oxytocin guidelines at the health care settings under study, an excessive workload, the fact that the majority of the nurses under study have diplomas, and a lack of training programs and in-service education regarding the administration of uterotonic drugs are the main causes of the low level of knowledge and unsatisfactory practices during oxytocin induction prior to guidelines implementation.

Consequently, written instructions for administering uterotonics that are based on current best practices must to be accessible. Every healthcare facility should appropriately create these standards for all of its nursing personnel. Guidelines for oxytocic induction are helpful in ensuring the safety of the maternity nurses, preventing difficulties for both the mother and the fetus, and ensuring a safe delivery. Additionally, it is important to periodically provide maternity nurses with ongoing training programs and in-service instruction regarding oxytocic administration.

## CONCLUSION

The results of the current study suggest that the nurses under study had inadequate knowledge and practice of administering uterotonic medicines prior to the implementation of the training package. Following the implementation of the instructional package regarding the administration of the uterotonic drugs, the research hypothesis was met when compared to pre-implementation results. This resulted in a statistically significant improvement in the nurses' performance, knowledge, and labor outcomes that were directly related to the health of both the mother and the fetus. Additionally, there was a favorable correlation between the nurses' practice ratings and overall knowledge. Based on the observations of researchers, the practice is improving and knowledge is growing. Furthermore, there was a favorable correlation between the nurses' practice ratings and total knowledge.

### Recommendation:

Based on the current study's findings, the following recommendations are suggested: -To update, enhance, and refresh their knowledge and practices based on the most recent evidence-based guidelines during labor, an in-service training program for the administration of uterotonic medicines must be planned for all staff nurses. -To improve the standard of nursing care provided to women when uterotonic medication is administered, written standard protocols, rules, and guidelines of care must be created. -An examination of the obstacles preventing nurses from adhering to the administration recommendations for uterotonic medicines. -Encouraging nurses to attend conferences and workshops on the administration of uterotonic medicines in order to upgrade their knowledge. -Taking precautions like following a checklist prior to beginning uterotonic medication delivery. -creating various, user-friendly teaching and learning resources according to needs, like uterotonic drug administration modules and pamphlets, to increase nurses' understanding of these medications and how to provide them safely. In order to assist nurses who are recently qualified or lack administration experience, it is recommended that nurses participate in ongoing education programs about safe uterotonic drug administration.

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