Effect of Instructional Guidelines regarding Uterotonic Drugs Administration on Nurses' Performance and Labor Outcome

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Abstract

Background: The nurse has a very important role before, during and after uterotonic drugs administration through assessment, observation, proper interventions and notification of any abnormalities to the physician to render the highest quality of obstetrical care. ***The aim of this study was to:*** Evaluate the effect of the instructional guidelines regarding uterotonic drugs administration on nurses' performance and labor outcome. ***Subjects and Methods*:** A quasi experimental research design was used**.** ***The study was conducted at three settings of labor units in Tanta city:*** Tanta University Hospital, El-Menshawy General Hospital and El-Mabara Hospital. ***The sample of this study*** *consisted of all available* nurses (40 nurses) as well as a purposive sample of 120 parturient women. ***Three tools were used for data collection; Tool I,*** Structured interview schedule**,** it included two parts. ***Part (1):*** Nurses socio-demographic characteristics. ***Part (2):*** Assessment of nurses′ knowledge regarding uterotonic drugs. ***Part (3):*** Socio-demographic characteristics of parturient women**.** ***Tool II:*** Observational checklist for nurses′ practice regarding uterotonic drugs administration. ***Tool III:*** Labor outcome assessment tool. ***Results*:** The implementation of the instructional guidelines resulted in a significant positive improvement of nurses' performance regarding uterotonic drugs administration compared to pre instructional guidelines implementation consequently the maternal, fetal and neonatal outcomes were positively improved. ***Conclusion*:** it can be concluded from this study that the research hypothesis has been achieved after implementation of the instructional guidelines regarding uterotonic drugs administration which resulted in a statistically significant positive improvement of maternity nurses' performance and labor outcome immediately and three months later compared to pre guidelines implementation. ***Recommendations****:* Planning in-service training programs for all nurses must be conducted in order to improve, update and refresh their knowledge and qualify their practices dependent on recent evidence based guidelines regarding uterotonic drugs administration.

Keywords: Instructional guidelines, Uterotonic drugs, Nurses′ performance, Labor outcome.

Introduction

Childbirth is the most pleasurable event for mother and at the same time, it is also considered a life-threatening event to her. It is a physiological process which may be defined as a coordinated effective sequence of involuntary uterine contractions that result in cervical effacement and dilatation as well as voluntary bearing down effort leading to expulsion of conception products including the fetus, membranes, umbilical cord, and placenta. Uterine stimulants (uterotonics or oxytocics) are medications that are given either to induce or augment the labor. (1-3)

Induction of labor (IOL) is defined as a process of artificial initiation of uterine contractions after the fetal viability and before spontaneous onset of labor, with the aim of achieving effective cervical effacement and dilatation which lead to vaginal delivery. Induction rates vary greatly between obstetric units depending on incidence of high risk pregnancies, local hospital protocols and the availability of resources. It has been estimated that more than 22% of all gravid women undergo IOL in the United States (US) and the overall rate of IOL has been increased and become doubled since 2006 to 2016 while in Egypt it is approximated that the use of uterotonic drugs during labor reached to 45 % of all births in 2015 which is utilized to induce or augment labor. (4-6)

Moreover, augmentation of labor refers to the stimulation of uterine contractions when spontaneous contractions have failed to produce progressive cervical dilatation needed for expulsion of the fetus. Uterine stimulants can be used to augment existing uterine contractions, to increase their frequency, duration and intensity by using uterotonic drugs such as oxytocin, prostaglandins, and misoprostol. Uterotonic drugs can be given intramuscularly (IM), intravenously (IV), and as a tablet, gel, and /or vaginal suppository. (7-9)

Uterotonics was designated as a high-alert medication in 2007 by the Institute for Safe Medical Practice (ISMP) which requires special considerations and precautions before, during and after their administration. Based on professional liability survey which done by American College of Obstetrics and Gynecologists (ACOG, 2011) found that about 21.9% of claims had involved neurologically impaired babies, and 14.7% had involved stillbirths or neonatal deaths among labors managed with oxytocin. Approximately one half of these claims had involved

allegations of oxytocin misuse. The ultimate goal of an active management of labor is to improve the quality of care for laboring women, prevent complications and thus in turn will decrease maternal morbidity and mortality. This could be achieved through promoting nurses' compliance with high alert medications such as uterotonics administration guidelines during labor.[10-12]

Compliance is a state of being in accordance with established guidelines, specifications, and legislation. Compliance with drug guidelines is considered as fundamental concept for accountability, autonomy, competence and delegation that are considered in determining scope of practice which also relates to the profession's role in medication management [13-15]. However, non-compliance with drug guidelines is a serious, widespread problem among nurses. Understanding and utilizing the scope of nursing and midwifery practice framework and its determinants in conjunction with professional guidance on medication management can facilitate the nurse's performance and response to medication errors as an individual and team member.[16-17] When medication errors result in patient harm, these adversely influence the patient, the health care providers, and also the health care setting. [18]

The ultimate goal of nurses' role is to reduce unsatisfactory effects of uterotonics by following guidelines of its use. These effects are the main source of serious maternal and fetal complications. Maternal complications such as; prolonged active phase, uterine hyper stimulation, uterine tachysystole, maternal intensive care unit admission, uterine rupture, cervical laceration as well as third and fourth degree perineal tear. In addition, the most frequent fetal complications such as; fetal heart rate abnormalities, fetal hypoxia, fetal distress, stillbirth, low Apgar score, neonatal morbidity (e.g. seizures, birth asphyxia, neonatal encephalopathy, infection) and neonatal intensive care admission.[19-22]

Significance of the study

The maternity nurse as a member of the health team could play a crucial role in promoting compliance with guidelines of uterotonic drugs before, during and after its administration. The maternity nurse has a vital role to assume responsibility for the management of obstetric and gynecological care essential for low risk women through assessment, observation, proper interventions and notification of any abnormalities to the physician to render the highest quality of obstetrical

care. Reducing nurses errors with uterotonics administration will save maternal and fetal life.[20-22] Unfortunately insufficient studies were conducted to evaluate the effect of instructional guidelines regarding uterotonic drugs administration on nurses performance and labor outcome.

The aim of this study was to:

Evaluate the effect of instructional guidelines regarding uterotonic drugs administration on nurses' performance and labor outcome

Research Hypothesis:

Nurses' performance as well as labor outcome are expected to be improved after implementation of the instructional guidelines regarding uterotonic drugs administration.

Subjects and Method

Subjects

Subjects and method of the current study were represented according to the following designs:

- Technical design.
- Administrative design.
- Operational design.
- Statistical design.

- **Technical Design.**

i. Research Design:

A quasi experimental research design was used to evaluate the effect of the instructional guidelines regarding uterotonic drugs administration on nurses' performance and labor outcome**.**

ii. Settings:

This study was conducted at labor units of obstetric department at three settings in Tanta city:

- Tanta University Hospital.
- El-Menshawy General Hospital Affiliated to the Ministry of Health and Population.
- El-Mabara Hospital Affiliated to the Health Insurance.

iii. Subjects:

The sample of this study consisted of:

1. All available nurses (40 nurses) who were working in the previously mentioned study settings and provided care to women before, during and after uterotonic drugs administration.
   - Nurses who are working at Tanta University Hospital (20 nurses).
   - Nurses who are working at El-Menshawy Hospital (10 nurses).
   - Nurses who are working at El-Mabara Hospital (10 nurses).
2. Purposive sample of 120 parturient women were selected from the

previously mentioned study settings with the following **inclusion criteria:**

- Age ranged from 20 -35years old.
- Free from any medical or obstetric diseases.
- Pregnant with singleton fetus, also with cephalic presentation
- Willing to participate in the study.

iv. Tools for data collection:

To achieve the aim of this study the following three tools were used by the researcher based on review of recent related literatures.

Tool I: A structured interview schedule:

A specially designed structured interview schedule was developed and used by the researcher based on the recent review of relevant literatures to collect the basic data about the study subjects. It included the following three parts;

Part (1): Nurses socio-demographic characteristics:

This part was used to collect data about nurses' general characteristics such as; age, marital status, level of education, occupation, years of experience in labor unit as well as previous training courses regarding care of women during uterotonic drugs administration.

Part (2): Assessment of nurses′ knowledge regarding uterotonic drugs: This tool was developed by the researcher after reviewing of recent related literature [15-16] to assess nurses′ knowledge regarding uterotonic drugs administration.

It entailed 32 questions regarding the following; general knowledge about uterotonics drugs, types, mode of action, storage temperature, routes for administration, indication, contraindications, regulation of the drip and side effects. In addition, precaution taken as well as nursing care before uterotonics administration, nursing intervention and observations recorded during the administration, frequency, duration and also intensity of uterine contraction to be achieved. Also, indication for stopping the infusion, signs of maternal and fetal distress, signs of uterine hyper stimulation, signs of uterine rupture, and also antidote for oxytocin as well as nursing measures after uterotonics administration.

The scoring system for nurses' knowledge was categorized as follows:

- Correct and complete answer was scored as (2).
- Correct and incomplete answer was scored as (1).

- Incorrect answer and didn't know was scored as (0).

The total score level of nurses' knowledge was calculated as follows (0-64):

- High level of knowledge 75-100%. (48-64)
- Moderate level of knowledge 60 - <75%. (38.4 - <48)
- Low level of knowledge <60%. (0-<38.4)

Part (3): A structured interview schedule for parturient women:

This tool was developed by the researcher after reviewing of recent related literature [17-18 and 27] and was used to collect basic data about parturient women:

(a): Socio-demographic characteristics of parturient women included data such as: age, marital status, education, occupation and also residence.

(b): Reproductive history of parturient women, this part was used to collect data about obstetric characteristics of parturient women such as: gravidity, parity, spacing period, number of abortion, mode and place of past deliveries as well as previous use of uterotonic drugs and previous maternal or fetal complications with uterotonics administration during previous labor and deliveries.

Tool II: Observational checklist for nurses′ practice regarding uterotonic drugs administration:

This tool was developed by the researcher after reviewing the recent related literature [17-19, 21]. It was used and comprised of 55 items to assess nurses′ practice during care of women who receive uterotonic drugs; it included the following parts:

Part (1): Pre-Preparation for uterotonic drugs administration

It comprised 4 items observed by the researcher to assess nurses' practice regarding uterotonic administration such as:

- Obtained obstetrician order before starting oxytocin induction.
- Ensured the following preliminary assessment to start oxytocin induction :-
  - Prenatal record on chart.
  - Indication for induction is documented.
  - Contraindications for induction are excluded.
- Assess women's pelvis to be clinically adequate.
- **Assess Bishop's score through vaginal examination as follows:-**

Inducibility features	Score 0	Score 1	Score 2	Score 3	Total
Cervical dilation	Os closed	1-2	3-4	5or more	0-3
Cervical effacement (or) Cervical canal length (cm)	0-30% <0.5	40-50% 0.5-1	60-70% 1<2	80% or more 2	0-3
Consistency of cervix	Firm	Medium Soft	Soft	-	0-2
Position of cervix	Posterior	Mid position	Anterior	-	0-2
Station of fetal head	-3	-2	-1,0	+1,+2	0-3

Minimum score required for uterotonic induction: 7 for primipara, 5 for multipara and the overall total score =0-13

Part (2): Administration of uterotonics

It involved 39 items observed by the researcher to assess nurses' practice regarding maternal and fetal condition before, during as well as after uterotonics administration:

a) Maternal and fetal assessment before uterotonics administration

Maternal assessment, it contained 14 items as follow;

- Review woman's sheet to ensure clarity of physician's order, also for correct date, time & dose of oxytocic.
- Compare name of oxytocic with woman's sheet to ensure correct name.
- Check woman's name by asking her name or checking wrist band.
- Obtain detailed history regarding previous abdominal or uterine surgery, history of hypovolemic state, cardiac disease or bronchial asthma.
- Obtain informed consent.
- Make sure that gestational age is 38 weeks or more.
- Check for contracted pelvis.
- Assess the status of cervix as documented.
- Check for malpresentation or assess the presentation as documented.
- Assess the vital parameters (blood pressure, pulse, respiration and temperature).
- Check for signs and symptoms of maternal distress.
- Place the hand on the fundus to monitor the uterine contractions to check the frequency of uterine contraction within 10 min and also the duration and intensity of uterine contractions.
- Calculate the dosage before administering oxytocin.
- Use ringer lactate solution for oxytocin infusion, solution with oxytocin is flagged with a label containing (date, time and dose) .

Fetal assessment, it consisted of 4 items as follow;

- Check the fetal gestational age, fetal weight in the last week, fetal heart rate as well as occurrence of tachycardia & bradycardia and signs and symptoms of fetal distress.

b) Maternal and fetal assessment during uterotonics administration.

Maternal assessment, it entailed 8 items as follow;

- Check duration, intensity and frequency of uterine contractions in 10 min also uterine relaxation in between uterine contractions.
- Increase the drip rate every ½ hour, double the drip rate to increase the dosage.
- Adjust the oxytocin infusion rate based on contraction, maintain the drip rate when contraction are 3 in 10mts for 45 seconds duration and also reduce the drip rate when contraction are >5 in 10mts .
- Check vital parameters (temperature, blood pressure, respiration and pulse) every 2 hours till membrane rupture .
- Assess for any sign of uterine rupture.
- Perform the per abdomen examination every ½ hour for descent of the fetal head .
- Monitor the progress status every ½ hour through vaginal examination .
- Make intake and output chart.

Fetal assessment, it covered 5 items as follow;

- Adjust oxytocin infusion based on fetal reaction.
- Observe & record fetal heart rate as follows;
  - On initiation of oxytocic infusion
  - 15 minutes after initiation of oxytocic infusion
  - Then every 30 minutes
  - On increasing or decreasing oxytocic infusion
- Check the number of acceleration and deceleration rate within 20min.
- Stop the oxytocin and give oxygen if the fetal heart rate <100beats/minute, or if the fetal heart rate >160beats/minute .
- Inform doctor in case of fetal heart rate abnormalities.

c) Maternal and neonatal assessment after uterotonics administration (after delivery)

Maternal assessment, it consisted of 5 items as follow;

- Monitor the uterine contractility every ½ hour after stopping the oxytocin.
- Check the amount of vaginal bleeding or lochia every ½ hour .
- Check the vital parameters temp, pulse, respiration and blood pressure .
- Monitor the urine output hourly .

– Check for edema all over the body .

Neonatal assessment after uterotonics administration, it comprised 3 items as follow;

– Assess for incidence of trauma, occurrence of seizures, birth asphyxia, neonatal encephalopathy and infection.

Part (3): Emergency measures during uterotonics administration

It entailed 4 items regarding actions should be taken if complications during uterotonics administration arise as follow;

– Discontinue the drug on conditions such as:-uterine hyper stimulation, maternal exhaustion, tachycardia or hypotension, non-reassuring fetal heart rate as well as meconium stained liquor .
– Turn the mother on left side .
– Administer oxygen at 2 to 3 lit/minute by facemask .
– Immediately inform the obstetrician about the maternal condition.

Part (4): Documentation

It included 8 items about documentation of the following data regarding oxytocic infusion on woman's sheet as follow:

- Dose of Oxytocic as well as amount & type of solution.
- Initial Oxytocics' rate, increasing or decreasing rate and discontinuation or restarting it.
- Fetal heart rate.
- Maternal vital signs.
- Vaginal examination findings.
- Intake and output.
- Progress of labor.
- Nursing intervention and signature.

Scoring system of nurses' practice was categorized as follows:

- Done correctly and completely was scored as (2).
- Done correctly but incompletely was scored as (1).
- Done incorrectly or not done was scored as (0).

The total score of nurses' practice was calculated and classified as follow:

The scores of nurses' practice were obtained for each nurse who ranged from (0-110) then summed up as well as, converted into a percent score. The total score of nurses' practice regarding uterotonics administration was classified as follow:

- **Satisfactory practice (≥ 75 %). (82.5-110)**

- Unsatisfactory practice (0 < 75%). (0-< 82.5)

Tool (III): Labor outcome assessment:

This tool was developed by the researcher, after reviewing of recent related literature [27-29] and was used to assess maternal and fetal/ neonatal outcome of parturient women before and after implementation of the instructional guidelines. Maternal and fetal/ neonatal outcome refers to the extent to which maternal and fetal/ neonatal well-being lies within normal or abnormal limits from onset of uterotonics administration, and then through labor and delivery of the baby. This tool included the following two parts as follow:

Part (1): Assessment of maternal outcome:

It was used to assess the effect of uterotonic drugs on maternal condition. Maternal outcome was measured on the basis of the following:

During labor

- Incidence of ineffective cervical dilatation / failed induction.
- Duration of second stage of labor.
- Incidence of uterine hyper stimulation/ hypertonic uterine contractions.
- Incidence of precipitous labor.
- Incidence of uterine rupture.
- Occurrence of intrapartum hemorrhage.

Immediately after delivery

- Type of delivery.
- Incidence of third or fourth degree perineal tear.
- Incidence of postpartum hemorrhage.
- Maternal intensive care unit admission.

Part (2): Fetal / neonatal outcome assessment:

It was used to assess the effect of uterotonic drugs on fetal/ neonatal condition. Fetal outcome was measured on the basis of the following:

During labor

- Occurrence of fetal heart rate abnormalities.
- Incidence of fetal hypoxia and fetal distress.
- Intrapartum fetal death (Stillbirth).

Immediately after delivery

- Apgar score at one and five minutes.
- Presence of meconium aspiration.
- Presence of respiratory distress.
- Neonatal intensive care admission.

Method

Administrative Design:

- An official permission and approval was obtained from the responsible

authorities before conducting this study through official letters from the Faculty of Nursing Tanta University, clarifying the purpose of the study directed to hospitals administrators of obstetric departments at the three settings (Tanta University Hospital, El-Menshawy and El-Mabara Hospitals) to obtain their approval and cooperation for carrying out the study.

- **The actual study (field work):** Data were collected from all available nurses (40 nurses) who are working in the previously mentioned study settings and providing care to women before, during and after uterotonics administration. In addition, purposive sample of 120 parturient women were selected from the previously mentioned study settings over a period of one year from the beginning of June 2020 to June 2021.
- Data collection was conducted at the morning, and afternoon shifts until the predetermined sample size were collected. All parturient women at time of data collection and had the inclusion criteria at each setting were included in the study.
- The data initially collected from the studied nurses for "assessment phase". Appropriate health instructional guidelines sessions were prepared, planned, and implemented by the researcher according to their needs.

Operational design:

The study was implemented and carried out according to the following steps:

A. Tools development:

Three tools were developed by the researcher after reviewing of the relevant and recent literatures and used for data collection including; **Tool I part (1)**: a structured interview schedule, **Tool I part (2):** Assessment of nurses′ knowledge regarding uterotonic drugs. **Tool I part (3):** A structured interview schedule for parturient women. **Tool II:** Assessment of nurses′ practice regarding uterotonic drugs administration by using observational checklist. **Tool III:** Labor outcome assessment tool. Tools were tested for content and construct validity by 5 experts in obstetric and gynecological nursing field and modifications were carried out. Tools reliability was tested used appropriate statistical test by calculating Cronbach's alpha from data collected in the pilot study. The alpha value was found to be 0.98 indicating high reliability of the study tool.

B. Ethical and legal considerations:

Nurses as well as parturient women's oral informed consent was obtained to participate in the study after explaining the purpose of

the study. The researcher ensured that the nature of the study didn't cause any harm and/or pain for the entire sample. Also, confidentiality and privacy were ascertained and put into consideration regarding the collected data and the women's rights to withdraw at any time if desired.

C. The Pilot Study:

After the development of the tools, the pilot study was carried out on 10% of the studied nurses and parturient women "4 nurses and 12 parturient women who administered uterotonic drugs" from the previously mentioned study settings to ascertain the clarity, feasibility and applicability of the developed tools. The pilot study was conducted before the actual data collection. Consequently the necessary modifications, and/or rephrasing, were done according to the results of this pilot study, then the tools made ready for use. Data obtained from the pilot study were included from the current study sample because there no major changes were done on the tools.

D. The instructional guidelines was implemented and conducted through 4 phases: assessment, planning, implementation, and evaluation.

Phase I: Assessment phase (Pre-test):

- This phase was done before **implementation of the instructional guidelines**. The researcher met the studied nurses at the morning and afternoon shifts in the previously mentioned study settings. Nurses were asked to participate in the study after explaining the aim of the study.
- **The studied nurses** were assessed using **Tool I part (1)** to collect their baseline data (socio-demographic characteristics) and **part (2)** was also used to assess their knowledge regarding uterotonic drugs.
- Nurses' knowledge regarding **uterotonics administration** was assessed individually from each nurse through a pre-test structured interview schedule which lasted 15-20 minutes in the presence of the researcher for necessary clarification.
- **Tool (II)** was used to assess nurses' practice regarding uterotonics administration before implementation of the instructional guidelines.
- Nurses' practice was assessed by the researcher individually for each nurse before, during as well as after uterotonics administration through an observational checklist.
- **The parturient women** were assessed for their general and obstetric characteristics (socio-demographic and

reproductive history) through a structured interview schedule that was distributed and conducted individually for each woman using **Tool I** part **(3)** as well as by using **Tool (III)** to assess the effect of uterotonic drugs on maternal and fetal outcome before implementation of the instructional guidelines.

Phase II: Planning phase

- Based on the data collected using an interview schedule to assess nurses' knowledge and practices (nurses' performance) regarding **uterotonics administration**" assessment phase". Appropriate instructional guidelines were prepared, planned, and implemented by the researcher for the studied nurses. The steps of planning for the instructional guidelines sessions included the following**:**

a-Setting the goals and objectives of the instructional guidelines:

- **The goal of the instructional guidelines was to:**

Enhance nurses' performance regarding uterotonics administration.

Improve labor outcome after uterotonic drugs administration.

- **Objectives of the instructional guidelines:** After implementation of the instructional guidelines the nurses will be able to:

- Identify types and mode of action of uterotonic drugs.

- Recognize routes of uterotonic drugs administration.

-Determine indications, contraindications and complications of uterotonic drugs administration.

- Recognize the maternal and fetal/ neonatal outcome after uterotonics administration.

- Demonstrate and re-demonstrate the nursing intervention before, during and after uterotonic administration.

b- The instructional guidelines included two main parts:

- **Theoretical part**: It was prepared based on the instructional guidelines objectives and assessment of nurses knowledge before conducting the educational session and was guided by relevant literature. The theoretical part included (types, mode of action, routes of administration, indications, contraindications, complications, signs to discontinue the drug and also antidote for uterotonic drugs).

- **Clinical part:** It was prepared based on the instructional guidelines objectives and assessment of nurses practice before conducting the educational session and was guided by relevant literature. The clinical part included (nursing care provided to parturient women before, during and after uterotonic drugs administration, assessment of Bishop Score, abdominal examination, vaginal examination as well as assessment of uterine contraction).

c- Prepare the content of the instructional guidelines:

- An educational booklet was developed by the researcher based on nurses′ knowledge and practice to increase their awareness regarding uterotonic drugs administration and nursing care measures needed before, during and after administration.

- Different methods of teaching were used to conduct the instructional guidelines such as; lecture, group discussion, posters, power point, demonstration and re-demonstration and video scenarios presentation.

- Content of the educational booklet was prepared by the researcher to be used as a guide for nurses self-learning.

Phase III: Implementation phase:- (Instructional guidelines sessions)

- The researcher explained the purposes of the instructional guidelines for the studied nurses, and obtained their consent to participate.
- The instructional guidelines included 3 sessions (one session for theoretical part and two sessions for clinical part); it was carried out in the previously mentioned settings. The total numbers of nurses were (40 nurses) divided into 8 groups. Each group included 5 nurses (four groups at Tanta University Hospital, two groups at El- Menshawy General Hospital and two groups at El-Mabara Hospital); the instructional guidelines were conducted over 3 days per week. The duration of each session ranged from 30 to 45 minutes including periods of discussion.
- The sessions were conducted at morning and afternoon shifts.
- The sessions were as follow:
  - **The first session:**

The aim of this session was to explain the goal and objective of the instructional

guidelines and also providing nurses with knowledge about different types of uterotonic drugs, mode of action, indications, contraindications, storage temperature, and routes of administration, available drugs units, regulation of the drip, side effects, precaution taken before drug administration and its effect on maternal and fetal condition.

- **The second session:**

The aim of this session was to explain the goal and objective of the instructional guidelines and providing nurses with practical skills about abdominal examination as well as assessment of uterine contractions.

- **The third session:**

The aim of this session was to explain the goal and objective of the instructional guidelines and providing nurses with practical skills about assessment of Bishop score, vaginal examination, assessment of maternal and fetal wellbeing before/ during and after uterotonic drugs administration including signs of uterine rupture, signs of fetal and maternal distress as well as emergency measures that should be taken during uterotonic drugs administration and also documentation of nursing intervention.

Phase IV: Evaluation phase (Post-test):

- Nurses' knowledge regarding uterotonic drugs administration was assessed individually from each nurse who fulfills it by herself in the attendance of the researcher immediately and three months after implementation of the instructional guidelines by using **Tool I part (2).**
- Assessment of nurses' practice regarding uterotonic drugs administration was done by using **Tool II (observation checklist).**
- Each nurse was observed three times individually while caring for parturient women to assess their practice when conducting nursing care before, during and after uterotonic drugs administration.
- Comparison was done in relation to nurses' knowledge and practice before, immediately and three months after implementation of the instructional guidelines.
- **The effect of the instructional guidelines regarding uterotonic drugs administration on labor outcome for**

mother and fetus/ neonate was assessed by using **tool (III)** before, immediately and three months after implementation of the instructional guidelines.

– **Statistical Design:**

The collected data were organized, tabulated and statistically analyzed using SPSS version 19 (Statistical Package for Social Studies) created by IBM, Illinois, Chicago, USA. For numerical values the range mean and standard deviations were calculated. The differences between two mean values were used using T test. For numerical data when the normal distribution was not guaranteed Mann-Whitney test was used to compare difference in mean values instead of T test. For categorical variable the number and percentage were calculated and differences between subcategories were tested by chi square test. When chi square wand not found appropriate, either Fisher exact test or Monte Carlo exact tests were used as appropriate. The correlation between two variables was calculated using Pearson's correlation coefficient. The level of significance was adopted at $p<0.05$.[22]

Results:

Table (1): Shows the distribution of nurses according to their socio-demographic characteristics. It is observed that nurses' age ranged from 28-57 years, with **Mean age ± SD** of 41.65±8.25. As regards their marital status, the majority (90.0%) of nurses were married, about two third (67.5%) of them had completed diplome of nursing; the vast majority (92.5%) of them were bed side nurse, while the minority (7.5%) of them were nursing supervisor. Moreover, the table also reveals that (62.5%) of nurses had 20 years of experience or more, the vast majority (85%) of nurses didn't take any previous training courses regarding uterotonic drugs administration and only (15%) of them who had previous training regarding uterotonic drugs administration. Finally, the table also reveals that the entire subjects (100%) reported that they did not have any teaching aids (booklet - poster - brochure) regarding uterotonic drugs administration in their department.

Figure (1): Displays the distribution of nurses according to their total score level of knowledge regarding uterotonic drugs administration pre, immediately and three months post guidelines implementation. It was observed that (12.5%) of nurses had high level of knowledge regarding uterotonic drugs administration pre guidelines implementation, which increased to (92.5%) immediately after guidelines

implementation, then the percentage decreased to (85%) three months post guidelines implementation with highly statistical significant difference (P<0.001**).

Figure (2): Displays the distribution of nurses according to their total score level of practice regarding uterotonic drugs administration pre, immediately and three months post guidelines implementation. The figure clarifies that (27.5%) of nurses had satisfactory practice regarding uterotonic drugs administration pre guidelines implementation, increased to (90%) immediately after guidelines implementation, while the percentage decreased to (85%) three months post guidelines implementation.

Table (2): presents the distribution of parturient women according to their socio-demographic characteristics pre, immediately and three months post guidelines implementation. It is observed that the parturient women age ranged from (21-32, 22-33, and 22-35 respectively) with Mean ± SD of (26.50±2.40, 27.50±1.32, and 28.40±1.81 respectively) pre, immediately and three months post guidelines implementation. The table also reveals that the majorities (90%, 100%, and 95% respectively) of the parturient women were married pre, immediately and three months post guidelines implementation. Concerning the occupation of parturient women, it is found that (72.5%, 67.5%, and 62.5% respectively) of them were housewives pre, immediately and three months post guidelines implementation. In relation to level of education, it is noticed that (50%, 42.5%, and 60% respectively) of parturient women had completed secondary education pre, immediately and three months post guidelines implementation. Regarding residence of parturient women, it is evident that (55%, 67.5%, and 57.5% respectively) of them were from rural residence pre, immediately and three months post guidelines implementation. The table also reveals that (75%, 85%, and 60%) of parturient women had enough income as well as (62.5, 67.5, and 65%) of them from nuclear type of family.

Table (3): Presents the distribution of the studied women according to maternal outcome assessment during uterotonic drugs administration pre, immediately and three months post guidelines implementation. In relation to ineffective cervical dilatation, it is observed that (37.5%, 7.5% and 2.5% respectively) of women had ineffective cervical dilatation or (failed induction) during labor also (30%, 100%, and 97.5% respectively) of them had normal duration of

second stage of labor pre, immediately and three months post guidelines implementation. The table also demonstrates that (20%, 0%, and 2.5% respectively) of women had uterine hyper-stimulation (hypertonic uterine contractions), it is also noticed that only (2.5%, 0%, and 0% respectively) of them had precipitous labor as well as uterine rupture pre, immediately and three months post guidelines implementation. It is also evident that only (5%, 0%, and 0% respectively) of women had intrapartum hemorrhage pre, immediately and three months post guidelines implementation. Also is observed that (62.5%, 92.5%, and 97.5% respectively) of parturient women delivered normal vaginal delivery as well as (17.5%, 5%, and 2.5% respectively) of them had experienced third or fourth degree perineal tear pre, immediately and three months post guidelines implementation. Finally, it is observed that only (5%, 0%, and 0% respectively) as well as (7.5%, 0% and 0% respectively) of women experienced postpartum hemorrhage and admitted to the maternal intensive care unit pre, immediately and three months post guidelines implementation.

Table (4): Reveals the distribution of the studied women according to fetal/ neonatal outcome assessment regarding uterotonic drugs administration pre, immediately and three months post guidelines implementation. In relation to occurrence of fetal heart rate abnormality, it is observed that only (12.5%, 0% and 5%) had fetal heart rate abnormality during labor pre, immediately and three months post guidelines implementation respectively. Also, it is found that (7.5%, 0% and 2.5%) experienced fetal hypoxia during labor pre, immediately and three months post guidelines implementation respectively. Concerning incidence of intrapartum fetal death, it is noticed that only (7.5%, 0% and 2.5% respectively) who had incidence of still birth pre, immediately and three months post guidelines implementation as well as only (12.5%, 0%, and 2.5% respectively) had abnormal Apgar score at one and five mints pre, immediately and three months post guidelines implementation. In relation to occurrence of meconium aspiration and incidence of respiratory distress, it is also evident that only (7.5%, 0%, and 2.5% respectively) who experienced meconium aspiration and respiratory distress pre, immediately and three months post guidelines implementation. As regard neonatal intensive care admission, it is also observed that only (12.5%, 0%, and 2.5%

respectively) of delivered newborn admitted to the neonatal intensive care unit pre, immediately and three months post guidelines implementation.

Table (5): Shows the correlation between nurses' socio- demographic characteristics and their total score level of knowledge and their total score level of practice pre, immediately and three months post guidelines implementation. A significant correlation was found between nurses' total score level of knowledge and between their age pre and three months post guidelines implementation where r=0.354 and P=0.022* and r=0.534 and P=<0.001**respectively. A significant correlation was also found between nurses' total score level of knowledge and between their years of experience immediately after guidelines implementation and three months post guidelines implementation where r=0.627 and P=<0.001**and r=0.362 and P==<0.001**respectively. Moreover, a significant correlation was noticed between nurses' total score level of practice and between their age pre guidelines implementation and three months post guidelines implementation where r=0.248 and P=0.039* and r=0.490 and P=<0.001** respectively. Finally, a significant correlation was also found between nurses'

total score level of practice and between their years of experience three months post guidelines implementation where r=0.755 and P=<0.001**.

Table (1): Distribution of nurses according to their socio-demographic characteristics (n=40).

Nurses' socio-demographic characteristics	N	%
Age (years)		
<40	15	37.5
40- <50	18	45.0
50 or more	7	17.5
Range	**28-57**	
Mean±SD	**41.65±8.25**	
Marital status		
Married	36	90.0
Widow	4	10.0
Level of education		
Diplome of nursing	27	67.5
Technical institute of nursing	10	25
Bachelor of nursing	3	7.5
Occupation		
Bedside nurse	37	92.5
Nurse supervisor	3	7.5
Years of experience		
5-<10	5	12.5
10- <20	10	25.0
20 or more	25	62.5
Previous training courses regarding uterotonic drugs administration		
Yes	6	15
No	34	85
Number of training courses (n=6)		
Only one training course	4	66.7
2-3 training courses	2	33.3
Time of the last training courses		
≥ 5 years	6	100
Agency provided previous training courses		
University	2	33.3
Ministry of Health and population	4	66.7
Nurses have teaching aids (booklet - poster - brochure) regarding uterotonic drugs administration		
No	40	100

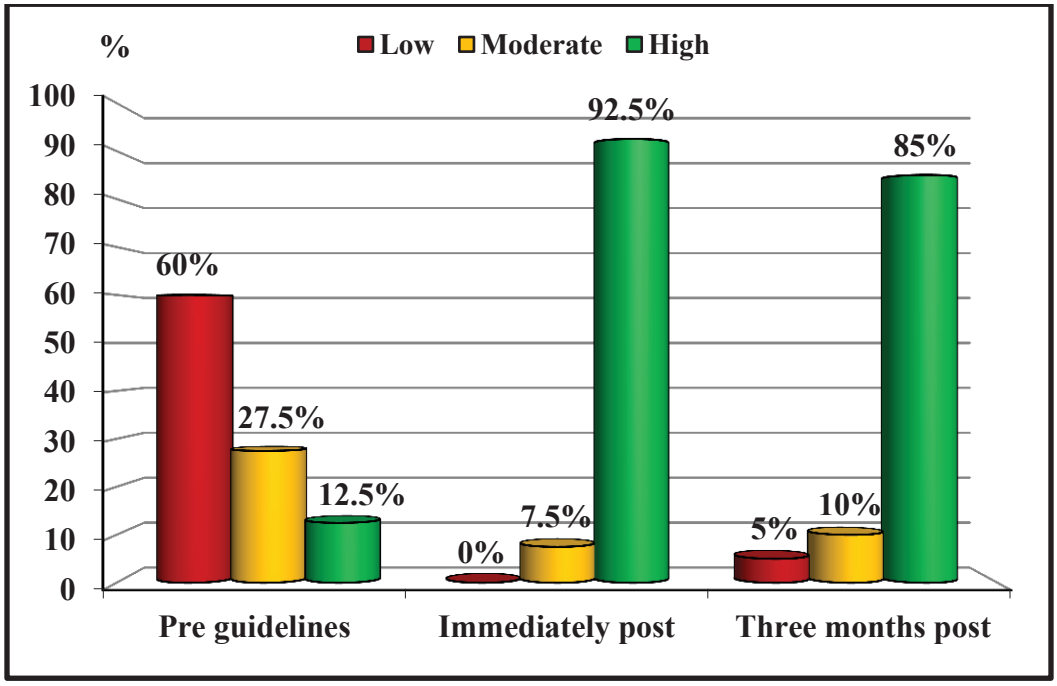
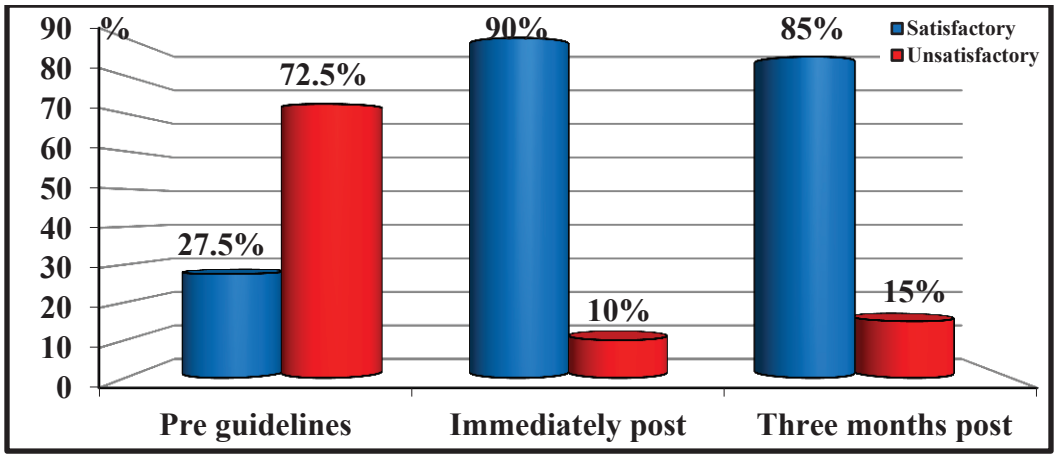


Fig (1): Distribution of nurses according to their total score level of knowledge regarding uterotonic drugs administration pre, immediately and three months post guidelines implementation. (n=40)

***Significant (P<0.05)**



***Significant (P<0.05)**

Fig (2): Distribution of nurses according to their total score level of practice regarding uterotonic drugs administration pre, immediately and three months post guidelines implementation. (n=40)

Table (2): Distribution of parturient women according to their socio-demographic characteristics pre, immediately and three months post guidelines implementation. (n=120)

Socio-demographic characteristics of parturient women	The studied women						Chi-square	
	Before guidelines implementation		Immediately post guidelines implementation		three months post guidelines implementation			
	N	%	N	%	N	%	$\chi 2$	P-Value
Age years:								
< 25	12	30	9	22.5	17	42.5	12.30	0.001*
25-29	15	37.5	16	40	11	27.5		
30-35	13	32.5	15	37.5	12	30		
Range	**21-32**		**22-33**		**22-35**			
Mean ± SD	**26.50±2.40**		**27.50±1.32**		**28.40±1.81**			
Marital status								
Married	36	90	40	100	38	95	70.731	<0.001**
Widow	2	5	0	0	1	2.5		
Divorced	2	5	0	0	1	2.5		
Occupation:								
House wife	29	72.5	27	67.5	25	62.5	0.374	0.829
Employee	11	27.5	13	32.5	15	37.5		
Level of education:								
Illiterate	1	2.5	0	0	0	0	6.947	0.326
Primary or preparatory	12	30	14	35	13	32.5		
Secondary	20	50	17	42.5	24	60		
University or postgraduate	7	17.5	9	22.5	3	7.5		
Residence:								
Rural	22	55	27	67.5	23	57.5	2.010	0.366
Urban	18	45	13	32.5	17	42.5		
Income/month:								
Not enough	10	25	6	15	16	40	4.013	0.236
Enough	30	75	34	85	24	60		
Family type:								
Nuclear family	25	62.5	27	67.5	26	65	11.100	0.004*
Extended family	15	37.5	13	32.5	14	35		

***Significant (P<0.05)**

Table (3): Distribution of parturient women according to maternal outcome assessment regarding uterotonic drugs administration pre, immediately and three months post guidelines implementation. (n=120).

(Maternal outcome assessment)	The studied women						Chi-square	
	Before guidelines		Immediately post-guidelines		three months post-guidelines			
	N	%	N	%	N	%	χ^2	P
During labor								
Ineffective cervical dilatation (failed induction).								
Yes	15	37.5	3	7.5	1	2.5	39.314	0.0001*
No	25	62.5	37	92.5	39	97.5		
Duration of second stage of labor								
Normal	12	30	40	100	39	97.5	81.783	0.0001*
Prolonged	28	70	0	0	1	2.5		
Incidence of uterine hyper stimulation (hypertonic uterine contraction)								
Yes	8	20	0	0	1	2.5	68.602	0.0001*
No	32	80	40	100	39	97.5		
Incidence of precipitous labor								
Yes	1	2.5	0	0	0	0	52.806	0.0001*
No	39	97.5	40	100	40	100		
Incidence of uterine rupture								
Yes	1	2.5	0	0	0	0	52.806	0.0001*
No	39	97.5	40	100	40	100		
Occurrence of intrapartum hemorrhage								
Yes	2	5	0	0	0	0	72.140	0.0001*
No	38	95	40	100	40	100		
Immediately after delivery								
Type of delivery.								
Normal vaginal delivery	25	62.5	37	92.5	39	97.5	74.538	0.0001*
Cesarean section	15	37.5	3	7.5	1	2.5		
Incidence of third or fourth degree perineal tear.								
Yes	7	17.5	2	5	1	2.5	55.925	0.0001*
No	33	82.5	38	95	39	97.5		
Post-partum hemorrhage.								
Yes	2	5	0	0	0	0	72.140	0.0001*
No	38	95	40	100	40	100		
Maternal intensive care unit admission.								
Yes	3	7.5	0	0	0	0	45.478	0.0001*
No	37	92.5	40	100	40	100		

***Significant (P<0.05)**

Table (4): Distribution of the studied women according to fetal/ neonatal outcome assessment regarding uterotonic drugs administration pre, immediately and three months post guidelines implementation. (n=120)

(Fetal/ neonatal outcome assessment)	The studied women						Chi-square	
	Before guidelines		Immediately post-guidelines		three months post-guidelines			
	N	%	N	%	N	%	χ^2	P
During labor								
Fetal heart rate abnormality.								
Yes	5	12.5	0	0	2	5	39.314	0.0001*
No	35	87.5	40	100	38	95		
Incidence of fetal hypoxia								
Yes	3	7.5	0	0	1	2.5	81.783	0.0001*
No	37	92.5	40	100	39	97.5		
Intrapartum fetal death (stillbirth)								
Yes	3	7.5	0	0	1	2.5	55.470	0.0001*
No	37	92.5	40	100	39	97.5		
Immediately after delivery								
Apgar score at one and five minutes								
Normal	35	87.5	40	100	39	97.5	73.723	0.0001*
Abnormal	5	12.5	0	0	1	2.5		
Meconium aspiration								
Yes	3	7.5	0	0	1	2.5	55.470	0.0001*
No	37	92.5	40	100	39	97.5		
Respiratory distress								
Yes	3	7.5	0	0	1	2.5	55.470	0.0001*
No	37	92.5	40	100	39	97.5		
Neonatal intensive care unit admission.								
Yes	5	12.5	0	0	1	2.5	73.723	0.0001*
No	35	87.5	40	100	39	7.5		

***Significant (P<0.05)**

Table (5): Correlation between nurses' socio- demographic characteristics and their total score level of knowledge and their total score level of practice pre, immediately and three months post guidelines implementation. (n=40)

Nurses' socio- demographic data		Total knowledge		Total practice	
		r	P-value	r	P-value
Age (years)	Pre	0.354	0.022*	0.248	0.039*
	Immediately	0.126	0.096	0.240	0.064
	Three months post	0.534	<0.001**	0.490	<0.001**
Years of Experience	Pre	0.152	0.125	0.047	0.723
	Immediately	0.627	<0.001**	0.158	0.432
	Three months post	0.362	<0.001**	0.755	<0.001**

***Significant (P<0.05)**

Discussion

Induction of labor is defined as the process of using drugs or other methods to artificially start labor by stimulation of uterine contractions to cause the delivery before spontaneous labor occurs [(13)]. Labor is typically induced using one or more of the following methods: cervical ripening agents, artificial rupture of membranes or uterine stimulation with oxytocic [(22-6)].

Oxytocin is a hormone that originates in the hypothalamus which is secreted by the posterior lobe of the pituitary gland. Synthetic oxytocic is the most commonly used drug for the induction of labor in viable pregnancies. It is given through the intravenous infusion route. It is used exclusively to stimulate the pregnant uterus to contract because it allows precise measurement of the amount of medication being administered, and rapid discontinuation of drug when side effect occurs [(26-9)].

Inappropriate use of oxytocin cause serious complication for parturient woman and her fetus. These complications include uterine hyper stimulation, uterine rupture, non-reassuring fetal heart rate, depressed newborns at birth, long term neurologic problems and/ or fetal death. It is important to consider that misuse of oxytocin is also

the most preventable cause of perinatal liability. (20-2)

The maternity nurse plays an important role during oxytocin titration decisions based on nursing assessment as well as a sound knowledge of the pharmacologic properties of oxytocin, the physiology of uterine contractions, response of the woman and fetus to contractions as well as the standards and practice guidelines of care that govern their actions during uterotonic induction or augmentation. Nurses must continually update their knowledge and understand the standards guiding their practice regarding uterotonic drug administration. Therefore, this study was conducted with the aim to evaluate the effect of the instructional guidelines regarding uterotonic drugs administration on nurses' performance and labor outcome (15-7).

Regarding the socio-demographic characteristics of the studied nurses women, the findings of the present study revealed that the studied nurses' age ranged from 28-57 years, the majority of them were married, about two third of them had completed diplome of nursing, slightly more than three fifths of them had 20 years of experience or more, the majority of them didn't take any previous training courses regarding uterotonic drugs administration and also about two thirds of them had only one training course regarding uterotonic drugs administration as well as the entire sample reported that they did not have any teaching aids (booklet - poster - brochure) regarding uterotonic drugs administration.

The findings of the present study is similar to **Shiny S.T (2017)(17)** study under the title "assessment of the knowledge and practice on use of oxytocin among nurses working in selected hospitals in Chennai" who reported" that the studied nurses age ranged from (28-50) as well as two third of them were bed side nurse and completed technical diplome of nursing. Again this finding is consistent with **Roma N et al., (2014)(3)** who investigated " nurses' compliance with oxytocic administration guidelines during labor". They found that the majority of the studied nurses did not attend any training courses regarding oxytocin administration and also the number of programs among those who attended them was 1-2. Again this is also matching with the study of **Thamer H (2014)(30)** about "assessment of nurses' knowledge regarding oxytocin administration during labor at maternity hospitals in Al-Kut City" who indicated that 62.9% of nurses had no training in the administration of oxytocin during labor and

52.9% of them had more than 5 years of experience.

On the other hand, this finding is contradictory to **Mohamed A et al., (2019)** [27] who studied the "effect of educational program on improving nursing knowledge and practice regarding administration of oxytocin during labor". They found that the studied nurses' age ranged from 18-38 years old with Mean age ± SD of 25.2±5.8. Moreover, the finding of the present study was dissimilar with **Gamal A et al., (2020)** [31] who investigated "assessment of nurses' compliance with oxytocin administration protocol during labor at Damietta city". They found that half of the studied nurses had two courses, and less than half had the last course from one year.

Concerning the total score level of nurses knowledge regarding uterotonic drugs administration, it was observed that the minority of the studied nurses had high level of knowledge regarding uterotonic drugs administration pre guidelines implementation, which increased to the majority of them had good level of knowledge immediately and three months after guidelines implementation with highly statistical significant difference. The findings of the present study is matching with **Mohamed A et al., (2019)**[27] who revealed that a significant increase of post-test knowledge score in all the items of knowledge during oxytocin induction. This finding was in accordance with **Zeinab R. A et al., (2017)**[32] who evaluated "the effect of an instructional package on nurses' performance regarding obstetrical emergencies during oxytocin administration". They reported that the minority of the studied nurses had good knowledge before implementation of the instructional package. While, most of them had good knowledge immediately after implementation of the instructional package that slightly decline at follow up phase of the instructional package implementation as (p=0.000).

From the researcher point of view, the congruity between the current study and the above mentioned studies attributed to the effect of the instructional guidelines in improving the knowledge of staff nurses and this will help them to improve the quality of care provided to woman during oxytocin induction. Therefore it is confirmed that the instructional guidelines regarding uterotonic drugs administration is an effective strategy

to improve the knowledge and practice level of the studied nurses.

Nursing is a profession that needs lifelong learning to keep up with struggling of dynamic healthcare setting which surround nursing practices in current century. Nurses need continuous education to provide safe level of practice and expand their level of competency as professionals. Therefore the nurses who strive for providing safe, high quality patient care must continuously seek to expand the professional knowledge and practice as justified by **Masters K., (2014)** [30].

Regarding the total score level of nurses practice during oxytocic administration, the majority of the studied nurses in the present study had unsatisfactory practice level pre guidelines implementation which significantly improved immediately and three months after guidelines implementation. This finding is in agreement with a study done by **Tenaw Z et al., (2017)** [33] about the "Role of doctors and midwives nurses in oxytocic administration in Istanbul". Their findings showed that 84.9% of midwives and 76% of doctors demonstrated poor compliance with oxytocic administration guidelines. They rationalized their results by the lack of oxytocic protocol. Again, **Sims M. E (2016)** [34] study about the "midwifery role in malpractice cases related to oxytocic application" who found that 39.6% of midwifery nurses had poor practice related to oxytocic application. Although the midwifery nurses spent more time with laboring women during induction or augmentation process, they are more blamed than other health service groups when mistakes occur during oxytocic administration. The similarity between the result of the present study and above mentioned study could be attributed to the absence of oxytocic protocol in labor unit as well as inadequate training of midwifes nurses on the proper administration of oxytocic drugs which reflect the importance of the instructional guidelines regarding uterotonic drugs administration on maternity nurses performance as well as labor outcome.

Referring to the maternal and fetal outcome assessment of parturient women after uterotonic drugs guidelines application, the findings of the current study yielded a significant improvement of maternal outcome in relation to; incidence of failed induction, duration of second stage of labor, incidence of uterine hyper

stimulation, 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 as well as maternal intensive care unit admission. Moreover, the findings of the current study illustrated a significant improvement of fetal outcome regarding fetal heart rate abnormalities, incidence of fetal hypoxia, intrapartum fetal death (stillbirth), Apgar score at one and five minutes, meconium aspiration, respiratory distress and also neonatal intensive care unit admission.

Therefore, the findings of the present study align with **Nour S et al., (2017)** [35] who investigated "outcomes of labor in women undergoing induction of labor and plan of nursing action". They reported that the majority of women had successful induction of labor, no incidence of uterine hyper-stimulation or uterine rupture as well as no need for maternal intensive care admission and also improvement in fetal condition such as normal Apgar score at one and five minutes and no need for neonatal intensive care admission. The findings were also compatible with **Lopezosa P et al., (2016)** [36] who studied "labor stimulation with oxytocin: effects on obstetrical and neonatal outcomes". They declared significant improvement on parturient women outcome in relation to; the rates of perineal lacerations, no need for advanced neonatal resuscitation, Apgar scores and meconium aspiration.

Moreover, the finding of the present study is relatively in accordance with **Mohamed A et al., (2019)** [27] who revealed a significant positive improvement of maternal and fetal outcome. Again the finding of the present study goes hand to hand with **Lonfeldt N et al., (2019)** [37] who conducted a descriptive study about assessing risk of neurodevelopmental disorders after birth with oxytocin. They revealed adverse maternal and fetal outcome and complication associated with injudicious use of oxytocin.

The results of the current study go in line with **Selin (2018)** [20] who performed a descriptive research to investigate the labor outcome and its relationship to oxytocin mismanagement. The findings indicated that 68.5% of bad fetal outcome and complication was associated with unfair use of oxytocin. Misuse of labor inducing drugs as oxytocin was recognized as contributing to maternal and neonatal mortality. The use

of labor inducing drug by inadequately qualified healthcare workers has serious implications for mothers and their children as reported by **Jackson (2019)** [18]. The similarity between the current study and the above mentioned studies could be attributed to the effect of the instructional guidelines regarding uterotonic drugs administration on nurses' performance and labor outcome.

Regarding the correlation between nurses socio-demographic characteristics and their total score level of knowledge and practices regarding uterotonic drugs administration, the findings of the current study had revealed a statistically significant positive correlation between levels of nurses' knowledge as well as the level of nurses' practice regarding oxytocic administration and their socio- demographic characteristics such as age, educational level as well as years of experience. The current finding is consistent with the results of **Anggraini D et al, (2018)** [38] study titled "analysis of training programs for nurses during oxytocin induction in south Kalimantan, Indonesia". They reported that there was a statistical significant correlation between the years of experience of the maternity nurse & their skill as well as their knowledge.

Moreover, this finding is supported by the results of **Sengab E. S et al., (2020)** [39] the study titled " nurses' knowledge and practices regarding oxytocin infusion care for women during labor ". They found that there was significant positive correlation between the maternity nurses knowledge, practices and their level of education. The current finding is also consistent with the results of **Housseine N et al., (2020)** [40] study about "intrapartum care review and guidelines", which found that there was significant positive correlation between nurses knowledge, practices and their socio-demographic characteristics.

Finally, the findings of this study revealed that the reason for poor level of knowledge as well as unsatisfactory practices during oxytocin induction pre guidelines implementation are the unavailability of the oxytocic guidelines at the studied health care settings, excessive work load, majority of the studied nurses are diplome also lack of training programs and in service education regarding uterotonic drugs administration.

Therefore, the written guidelines for uterotonics administration based on current standards of practice should be available. These guidelines should be accurately established at each health care setting for all

nursing staff. Oxytocic induction guidelines are useful to secure the maternal and fetal wellbeing, prevent maternal and fetal complications, and ensure save delivery as well as safe guard the maternity nurses. In addition, continues providing of training programs and in service education about oxytocic administration for the maternity nurses should be done periodically.

Conclusion and Recommendations

Conclusion

Based on the findings of the present study, it can be concluded that the research hypothesis has been achieved after implementation of the instructional guidelines regarding uterotonic drugs administration which resulted in a statistically significant positive improvement of maternity nurses' performance and labor outcome immediately and three months later compared to pre guidelines implementation

Recommendations

Based on the findings of the present study, the following recommendations are suggested:-

Planning in-service training programs for all nurses regarding uterotonic drugs administration must be conducted in order to improve, update and refresh their knowledge and qualify their practices dependent on recent evidence based guidelines during labor.

Written policies, protocol of care and guidelines should be developed for improving the quality of nursing care rendered to parturient women during uterotonic drugs administration.

Investigate barriers of nurses' non-compliance with uterotonic drugs administration guidelines.

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