#### Nurses' Knowledge and Practices Regarding Oxytocin Infusion Care for Women

#### during Labor

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#### Abstract

**Background:** Oxytocic are the drugs that give power to excite uterine muscles to contract. Between a large numbers of drugs belonging to oxytocic, oxytocin is the important one and is extensively used in clinical practice. **Aim of the study**: To assess nurses' knowledge and practice regarding oxytocin infusion care for women during labor. **Research design:** A descriptive study was conducted. **Setting:** The study was conducted in labor unit at obstetrics and gynecological department affiliated at Benha University hospital from the end of May to the end of November 2017. **Sample:** Convenient sample of a total nurses 50. **Tool:** Two tools were utilized to collect data; Tool (I): structure interviewing questionnaire divided in two parts including general characteristics of nurse and assessment knowledge sheet for assessing nurses' knowledge regarding oxytocin. Tool (II): an observational checklist to assess nurses' practices during oxytocin infusion. **Result:** Near half (44%) of the studied nurses had poor knowledge and two thirds (60%) of them had unsatisfactory practice regarding oxytocin infusion care. **Conclusion:** Half of studied nurses had poor knowledge and unsatisfactory practice and there was a positive correlation between total knowledge and practice score of studied nurses. **Recommendation:** Improve nurses' knowledge and practice regarding oxytocin and its safe administration.

Key words: oxytocin administration, knowledge, practices

## Introduction

Oxytocic are the drugs that have the power to stimulate uterine muscles contraction. Among a large drugs belonging to oxytocic, oxytocin is an important one and is extensively used in clinical practice (Shiny, **2017**). Oxytocin is a hormone synthesized by the hypothalamus, and then stored in the posterior lobe of the pituitary gland. Oxytocin is released in maternal circulation when breast stimulation and lower genital tract stimulation occurred and results in uterine contractions. Uterine sensitivity to oxytocin before 34gestational weeks is weak until full term and spontaneous labor is initiated it increases rapidly (Wing& Farinelli, 2012).

In spontaneous labor, the naturally oxytocin hormone helps stimulate uterine contractions, whereas a synthetic form of oxytocin is administered intravenously in order to artificially stimulate contractions. Pitocin, a synthetic form of oxytocin, is also used to augment labor that is not progressing quickly is often enough, and it injected intramuscularly following delivery during the third stage of labor to prevent post-partum hemorrhage (Lewis, 2012).

As oxytocin is a valuable, time-tested drug, one of the most commonly used medications during labor, and a high-alert medication, oxytocin bears a heightened risk of causing significant woman harm if used in error. Oxytocin has been associated with significant adverse effects to both the mother

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(arrhythmias, uterine hyperstimulation, postpartum hemorrhage) and the fetus (bradycardia, hypoxia, hyperbilirubinemia, retinal hemorrhage) so they require specific precautions to reduce the risk of error (**ISMP**, **2013**).

Nurses must be aware of the standards and guidelines of care that govern their actions during administer oxytocin. Nurses are primarily involved in the administration of medications across settings. Nurses especially the obstetric nurses, should check the dose, route and expiry date of the drug carefully because it will affect both the mother and fetus. Therefore, thorough understanding of the dose indications, contraindications, route of administration, and side effects of drugs will increase the odds of a positive outcome for both mother and fetus (**Drummond**, **2018**).

In addition to basic intra-partum care the nurse responsible for observing the maternal and fetal complications and takes corrective and safe actions if abnormalities are noted. The nurse own great responsibility once administering oxytocin. Nurses should maintain safeguard to each mother and the fetus once administering oxytocin and also recognize when begin, change or stop its infusion and once to notify the physician (**Pearson, 2011**).

# Significance of the problem

According to the institute for safe medication practices (ISMP) in 2007, Oxytocin was added to high-alert medication list. Those medications result in serious harm to patient if they are used error and sometimes fatal to patients so they require specific precautions to reduce the risk of error (ISMP, 2013& Kavitha et al. 2014). As oxytocin is serious drug that needs close monitoring to prevent complications every nurse must has a sound knowledge and practices about nursing care to woman who is receiving an oxytocin infusion, for giving perfect nursing care to prevent complications.

Therefore, there is an urgent need to assess nurses' knowledge and practices when deal with a serious medication as oxytocin. Moreover, there is no study done in this area in women's health and obstetrics nursing department at Benha faculty of nursing, thus the current study present data as baseline information about this problem between nurses in labor unit at Benha university hospital.

# Aim of the study

The study aims to assess nurses' knowledge and practices regarding oxytocin infusion care for women during labor. This aim achieved through:

 Assessing nurses' knowledge and practices regarding oxytocin administration and nursing considerations during oxytocin infusion.

# **Research Question:**

 To what extend nurses having knowledge & practices regarding oxytocin infusion care?

# Subject and method

# **Research design:**

Descriptive design was utilized in the study

# Setting:

The study was conducted in labor unit at obstetric and gynecological department affiliated at Benha University hospital.

#### Sample:

A convenient sample of a total nurse's in obstetrics and gynecology emergencies department at Benha university hospital were recruited for the study

**Sample size:** a total number (50) of nurses who worked at previous mentioned setting.

## Tools of data collection: -

Two tools were utilized to collect data of the current study.

## First tool :

A structure interviewing questionnaire: it included two parts:

Part 1: Concerned with general characteristics of nurses include: (age, educational level, years of experience, attendance of training program). Part 2: Assessment knowledge sheet for assessing nurses' knowledge regarding oxytocin as (definition of oxytocin, action. routs. indications, contraindications, complications, nurse's considerations regarding oxytocin administration).

## Scoring system:

The questions were scored as the following; score (2) was given for complete correct answer and (1) for in complete correct answer and (0) for don't know. The score of total knowledge was considers as more than 75% was good and from 60 % to 75% was average and less than 60% was poor.

#### Second tool

Observational checklist: adapted from **Krening et al., 2012;** *Sarathi & Semmalar,* **2015 ; Green, 2016** to assess nurses' practices during oxytocin infusion it include

three parts; pre-oxytocin checklist, during administration checklist and post administration checklist.

#### Scoring system:

The check list items were scored (1) for done each step completely while (0) for not done. The scores of total practices were considered as  $\geq 60\%$  was satisfactory and  $\geq 60\%$  was unsatisfactory.

## Approvals

A written official permission was obtained from the dean of faculty of Nursing/Benha University to the directors of Benha Hospital University.

## A Pilot study

The pilot study was done on 10 % of the sample size (5) nurses were recruited for the study sample to test clarity, applicability, understanding language and time needed for completing the tool. There was no modification in tool of data collection, Nurses are involved in the pilot were included in the study.

## Tools validity and reliability

Tool of data collection was tested for validity by panel of experts (three specialized in maternity health nursing) to measure the clarity of tools. Reliability done using Cronbach's Alpha, It was (0.789) for knowledge structured questionnaire sheet and (0.876) for nurses' practice.

#### **Ethical considerations**

All ethical aspects were assured, participants were given explanation about the purpose of the study, and they were also informed that they could withdraw from the study at any time before the completion of the study. Participants who agreed to complete in this study were asked to sign a consent form. Confidentiality of participants' information was assured and the data were accessed only by the investigators involved in the study.

## Statistical analysis:

After data collection each sheet was scored and data were organized and categorized. Result were presented in tables and analyzed by using the statistical package for social sciences (SPSS) program version (22). Numerical qualitative data were expressed as frequencies and percentages. As well mean, standard deviation (SD), Chi-square and probability of errors (P-value) test were used to examine the relation between qualitative variables.

## Results

**Table (1)** shows that more than half (56%) of studied nurses were in age group from 20-29 years old, with mean age of  $30.86\pm7.65$ . In addition more than half (54%) of them had nursing school diploma, and 38% of them had arrange of years of experience from 1-5 years, with mean 9.06±6.46. more over all of them hadn't attended training courses regarding oxytocin infusion.

**Table (2)** presents that more than two third (66%) of studied nurses don't know nursing intervention during uterine tachysystole after tachysystole has resolved, more over less than two third (62%) of them had incomplete correct knowledge about nursing intervention after administration of oxytocin, in addition more than half (54%) had complete and correct knowledge about nursing role during

uterine tachy-systole with non-reassurance fetal heart rate (FHR).

**Figure (1)** illustrates that near half of the nurses included in the study had poor knowledge regarding oxytocin drug.

**Table (3)** reveals that more than two third (76%) had unsatisfactory practices regarding pre oxytocin infusion check list. On the other hand half (52%) of them had satisfactory practices regarding preparation for of oxytocin infusion.

**Figure (2)** showed that more than half of studied nurses had unsatisfactory practice regarding oxytocin infusion care

**Table (4)** reveals that there was a highly statistical significant between studied nurses' educational qualification and their total knowledge score ( $P<0.001^{**}$ ). On the other hand there was no statistical significant between their total knowledge score and age and years of experience (P>0.05).

**Table (5)** shows that there was statistical significant relation between studied nurses' educational qualification and years of experience and their total practices score (P< $0.05^*$ ) On the other hand there wasn't statistical significant relation between studied nurses total practice score and their age (P>0.05).

**Table (6)** illustrates that there was a positive correlation between total knowledge and practices score of studied nurses. This mean that increase studied nurses' knowledge will improve their practice.

| personnel characteristics                                  | Frequency       | %     |  |
|--|-----------------|-------|--|
| Age in years   |                 |       |  |
| 20-29  | 28              | 56.0  |  |
| 30-39  | 8               | 16.0  |  |
| 40-49  | 14              | 28.0  |  |
| Mean ±SD   | 30.8600±7.65322 |       |  |
| Educational qualification                                  |                 |       |  |
| nursing school diploma                                     | 27              | 54.0  |  |
| technical institute of nursing                             | 18              | 36.0  |  |
| bachelor degree of nursing                                 | 5               | 10.0  |  |
| Years of experience  |                 |       |  |
| 1-5 years  | 19              | 38.0  |  |
| 6-10years  | 10              | 20.0  |  |
| 11-15years   | 13              | 26.0  |  |
| 16-20  | 8               | 16.0  |  |
| Mean ±SD   | 9.0600±6.46627  |       |  |
| Attendance of training courses regarding oxytocin infusion |                 |       |  |
| Yes  | 0               | 0.0   |  |
| No   | 50              | 100.0 |  |

Table (1): Distribution of studied nurses according to their personnel characteristics (n=50).

Table (2): Percentage distribution of the studied nurses' knowledge regarding nursing intervention for caring women under oxytocin infusion (n=50).

| Variable  | Don't know |      | Incomplete<br>correct |      | Complete<br>correct |      |
|---|------------|------|-----------------------|------|---------------------|------|
|   | No         | %    | No                    | %    | No                  | %    |
| Nursing interventions during uterine<br>tachysystole with Reassurance fetal heart rate<br>(FHR)     | 30         | 60.0 | 2                     | 4.0  | 18                  | 36.0 |
| Nursing interventions during uterine<br>tachysystole with non-reassurance fetal heart<br>rate (FHR) | 6          | 12.0 | 17                    | 34.0 | 27                  | 54.0 |
| Nursing interventions during uterine tachysystole After it has resolved                             | 33         | 66.0 | 1                     | 2.0  | 16                  | 32.0 |
| Nursing interventions pre-administration of oxytocin  | 9          | 18.0 | 19                    | 38.0 | 22                  | 44.0 |
| Nursing interventions during administration of oxytocin   | 9          | 18.0 | 24                    | 48.0 | 17                  | 34.0 |
| Nursing interventions after administration of oxytocin  | 10         | 20.0 | 31                    | 62.0 | 9                   | 18.0 |
| Nursing interventions for management of oxytocin complication                                       | 5          | 10.0 | 29                    | 58.0 | 16                  | 32.0 |

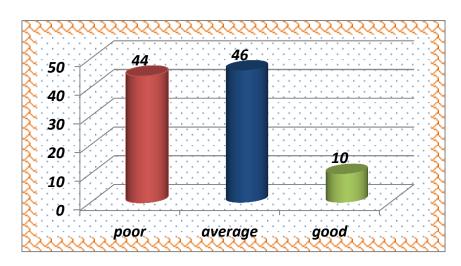
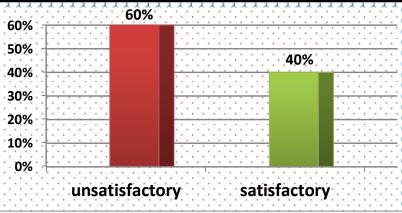
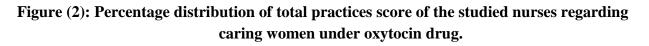


Figure (1): Percentage distribution of total knowledge score of the studied nurses regarding oxytocin drug.

| Table (3): Percentage distribution of the stud | lied nurses' total practices' scores regarding |
|--|--|
| technique of oxytocin infusion (n=50).         |  |

| Practices  | Unsatisfactory |      | Satisfactory |      |
|--|----------------|------|--------------|------|
|  | No             | %    | No           | %    |
| Nurses practices regarding pre oxytocin infusion check list      | 38             | 76.0 | 12           | 24.0 |
| Nurses' practices regarding preparation for of oxytocin infusion | 24             | 48.0 | 26           | 52.0 |
| Nurses practices regarding care during oxytocin infusion         | 29             | 58.0 | 21           | 42.0 |
| Nurses' practices regarding care after oxytocin infusion.        | 27             | 54.0 | 23           | 46.0 |
| Total practices  | 30             | 60.0 | 20           | 40.0 |







| personnel characteristics                          | Mean ±SD        | F test | p-value  |  |
|--|-----------------|--------|----------|--|
| Age in years                                       |                 |        |          |  |
| • 20-29  | 21.8214±5.85664 | 0.701  | >0.05    |  |
| • 30-39  | 22.6429±4.79755 | 0.701  |          |  |
| • 40-49  | 19.7500±5.67576 |        |          |  |
| Educational qualification                          |                 |        | <0.001** |  |
| <ul> <li>nursing school diploma</li> </ul>         | 18.8421±4.60993 | 12.64  |          |  |
| <ul> <li>technical institute of nursing</li> </ul> | 22.1923±4.80016 |        |          |  |
| <ul> <li>bachelor degree of nursing</li> </ul>     | 30.2000±1.78885 |        |          |  |
| Years of experience                                |                 |        |          |  |
| <ul> <li>1-5 years</li> </ul>                      | 21.9474±6.51045 | 1      | >0.05    |  |
| • 6-10years  | 22.5000±4.85913 | 0.155  |          |  |
| <ul> <li>11-15years</li> </ul>                     | 21.3077±5.76461 |        |          |  |
| • 16-20  | 20.8750±3.87068 |        |          |  |

 Table (4): Relation of the studied nurses total knowledge score and their personnel characteristics.

Table (5): Relation of the studied nurses' total practices score and their personnel characteristics.

| personnel characteristics                          | Mean ±SD        | F test | p-value |
|--|-----------------|--------|---------|
| Age in years                                       |                 | 0.317  | >0.05   |
| • 20-29  | 38.2857±3.26437 |        |         |
| <b>•</b> 30-39                                     | 38.5000±3.89773 |        |         |
| • 40-49  | 37.3750±1.99553 |        |         |
| Educational qualification                          |                 | 5.56   | < 0.05* |
| <ul> <li>nursing school diploma</li> </ul>         | 36.5000±3.34752 |        |         |
| <ul> <li>technical institute of nursing</li> </ul> | 37.4000±6.22896 |        |         |
| <ul> <li>bachelor degree of nursing</li> </ul>     | 39.4815±1.69548 |        |         |
| Years of experience                                |                 | 3.04   | < 0.05* |
| <ul> <li>1-5 years</li> </ul>                      | 37.2105±3.25882 |        |         |
| • 6-10years  | 37.8000±.42164  |        |         |
| <ul> <li>11-15years</li> </ul>                     | 40.3846±.86972  |        |         |
| • 16-20  | 37.5000±5.75698 |        |         |

## Table (6): Correlation between total knowledge and practices score of the studied nurses.

| Variable              | Total practice score |         |  |
|-----------------------|----------------------|---------|--|
|                       | r                    | P value |  |
| Total knowledge score | .120                 | < 0.05  |  |

#### Discussion

Oxytocin remains one of the most commonly medication used in obstetric practice and clearly has been associated with claims of medical negligence and injudicious use in cases of adverse outcomes. So the health care professionals should bear in mind the serious adverse reaction of oxytocin drugs if they are misused. Nurse at the bedside of laboring women must participate in oxytocin titration decisions based on their nursing assessments. Those decisions must be based on a sound knowledge of the pharmacologic properties of oxytocin, the physiology of uterine contractions, and the response of the woman and fetus to contractions Drummond S., 2018.

This study is a descriptive one which aimed to assess nurses' knowledge and practices regarding oxytocin infusion care for women during labor. A total number of 50 nurses at labor unit in obstetric and gynecological department. their sociodemographic characteristics revealed that more than half of studied nurses' age ranged between 20-29 years old with mean age of 30.86±7.65, this finding came in accordance with Esmaeil et al., 2013 who assessed Medication errors of nurses in the emergency department and revealed that, the half of studied nurses aged from 25 - 30 years old with Mean =  $27.7 \pm 3.4$ .

In addition the finding of the present study agree with **Muzeya et al., 2015**who assessed knowledge, attitudes and practices of nurse-midwives related to obstetric care in south Africa and found that more than half of studied nurses' age range from 21 - 30 years old. On the other hand the findings of the present study disagree with **Tenaw et al.**, **2017** who assess obstetric care providers' knowledge, practice and associated factors towards active management of third stage of labor, reported that the age of participants were from 22 to 45 years old.

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, quality patient care must continuously seek to expand the professional knowledge and practice Masters K., 2014. The finding of present study showed that all of them hadn't attended training courses regarding oxytocin infusion. This may be due to shortage of nurses' staff and working over load. These findings agree with Abd elhamied, 2016 who assess the nurse's practical skills regarding avoidance of post-partum hemorrhage reported that the majority of the nurses didn't attend any training course.

Additionally the finding of current study came in the same line with **Mohamed**, **2010** who assesses the nurse's skill regarding prevention of post-partum infection showed that the majority of studied nurses hadn't attended training work shop. On the other hand the results of present study disagree with **Faiza**, **2015** who assess knowledge and practice of nurse mid wives regarding management and prevention of postpartum hemorrhage reported that one third of studied nurses received training course.

Studied nurses' educational qualification in the present study showed that more than half of studied nurses had secondary nursing education this may be the cause of they have poor knowledge score. This results agree with **Muzeya, 2015** in the previous mentioned study revealed that two third of studied nurses had secondary nursing education. Also congruent with **Kavitha et al., 2014** who studied level of knowledge of staff nurses on emergency obstetric management, revealed that most of studied nurses were secondary nursing school graduates.

On the other hand the findings of the present study disagree with **Hsaio et al., 2010** who assessed nurses' knowledge of high-alert medications in Taiwan, revealed that most of studied nurses had Bachelor of Science degree. This may be due to the difference in number of studied sample as total number of studied sample (305) more than the number in the present study (50).

Total studied nurses' knowledge score about oxytocin infusion care for women during labor revealed that near half of the nurses included in the study had poor knowledge. This may be due to more than half of studied nurses had nursing school their curriculum diploma and doesn't sufficiently cover medication administration aspect. This result came in the same line with Dhanya, 2010 assessed the knowledge of staff nurses on oxytocin induction to mother during first stage of labor in Karnataka, revealed that majority of staff nurse had inadequate knowledge on the perfect administration of oxytocin.

Also the results of present study came in accordance with **Khalifa**, **2009** who studied effect of an intervention program on Nurses ' performance in relation to administration of oxytocin to parturient women in Shebin El Kom, revealed that more than two third of studied nurses had inadequate knowledge regarding administration of oxytocin. Additionally congruent with **Deepak et al.**, **2013** who studied knowledge, attitudes, and practices related to uterotonic drugs during childbirth in Karnataka, revealed that two third (58%) of studied nurses had lack of consistent and correct knowledge regarding oxytocin administration as an uterotonic drug.

Nurse' practice about oxytocin infusion in present study showed that more than half of studied nurses had unsatisfactory practice regarding oxytocin infusion care this may be due to the majority of studied nurses had working experience from 1 to 5 years only and this period not provide adequate chance for perfect practice another reason may be due to the policy of hospital not provide protocol for oxytocin administration.

The results of current study agree with Chowqui & Reddy., 2014 conducted a study to assess the knowledge and practice on induction with oxytocin in Guragon. Reported that more than two third (66.8%) of staff nurses had poor practice regarding induction with oxytocin. Additionally came in the same line with Hariati, 2013. that assesses the knowledge and practice of administering oxytocic during delivery, in Mangalore. The study results concluded that more than two third (66.2%) of the studied had poor practice regarding nurses administration of oxytocin during delivery.

The result of current study regarding the relation between studied nurses' total personnel knowledge score and their characteristics, revealed that there was a highly statistical significant between studied nurses' educational qualification and their total knowledge score. So the baccalaureate nurses group had got higher scores in total knowledge than diploma and technical nurses. On the other hand there was no statistical significant between their total knowledge score and age and years of experience. This result came in the same line with **Thamer & Abbas, 2014** in the previous mentioned study revealed that there was no statistical significant between total knowledge score and the age and years of experience.

Regarding relation between studied nurses' total practice score and their personnel characteristics the current study showed that there was statistical significant relation between studied nurses' total practice score and their educational qualification and years of experience so the baccalaureate nurses group had got higher scores in total practice than diploma and technical nurses and studied nurses had insufficient practice as result of the majority of them had 1-5 years of experience. The findings of current study disagree with Reda, 2014 in the previous mentioned study reported that there was no statistical correlation between studied nurses' total practice score and their educational qualification and years of experience.

Regarding correlation between total knowledge and practice score the finding for current study showed that there was a positive association between total knowledge and practice, this finding agree with **shiny**, **2017** who conducted a study to assess knowledge and practice on use of oxytocin among nurses. The result showed there was a positive correlation between knowledge and practice among the staff nurses. Also the result came in the same line with **Reda**, **2014** in the previous mentioned study reveals a strong relationship between total knowledge score and total practice. This indicates increase nurses' knowledge will improve their practice.

# Conclusion

On the light of the finding or current study, results answer the research question, it

can be concluded that near half of studied poor knowledge nurses had regarding oxytocin administration and unsatisfactory practice regarding oxytocin infusion care for women during labor. There was a highly statistical significant between studied nurses' educational qualification and their total knowledge score, as the baccalaureate nurses group had got higher scores in total knowledge than diploma and technical nurses. Also there was statistical significant relation studied nurses' educational between qualification and years of experience and their total practice score so the baccalaureate nurses group had got higher scores in total practice than diploma and technical nurses and studied nurses had insufficient practice as result of the majority of them had 1-5 years of experience. And also there was a positive correlation between total knowledge and practice score of studied nurses, this mean as increasing knowledge will improving the practice.

# Recommendations

Based on the findings of the present study, it seems that there is a great need for improving nurses' knowledge and practice regarding oxytocin administration through the following recommendations:

- Improve nurses' knowledge regarding oxytocin and its safe administration through nurse administrator should prepare teaching and learning materials based on need such as modules, protocols and booklets regarding medication administration.
- Encourage continuing education program for nurses regarding safe oxytocin administration to support nurses who are newly qualified or less experienced in oxytocin administration

• Develop standard protocol/policy or guidelines regarding oxytocin administration and nurses' role during administration.

• Improve nurses' practice through developing training program on oxytocin administration, how to care women under its infusion, monitoring FHR and maternal uterine contraction for maternity nurses to be proficient at maternal and fetal assessment.

• Further study should be conducted to study the same problem in deferent obstetric health agencies, using a large number of nurses.

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معرفة وممارسات الممرضات فيما يتعلق بالعناية خلال حقن الأوكسيتوسين للسيدات

## أثناء الولادة

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يعد الأوكسيتوسين من الأدوية التي تعطي القوة لإثارة عضلات الرحم للتقلص والذى يستخدم على نطاق واسع في الممارسة السريرية. وهدفت هذه الدراسة الى تقييم معرفة وممارسة الممرضات فيما يتعلق برعاية حقن الأوكسيتوسين للنساء أثناء المخاض. كما أجريت الدراسة على عينة متاحة من 50 ممرضة . بوحدة العمل في قسم التوليد وأمراض النساء التابعة لمستشفى جامعة بنها من نهاية مايو إلى نهاية نوفمبر وقد خلصت الدراسة الى ان ما يقرب من نصف الممرضات لديهن مستوى ضعيف من المعرفة والممارسة الغير مرضية كما ن هناك علاقة إيجابية بين المعرفة الكلية ودرجة الممارسة للممرضات. واوصت الدراسة بضرورة تحسين معرفة الممرضات وممارستهن فيما يتعلق بالأوكسيتوسين وإدارته بشكل آمن.

