

Effects of educational program on maternity nurses' knowledge and practices regarding oxytocin drug administration during labor

Walaa H. Ibrahim¹ & Mervat M. Hassan²

¹. Assistant Professor of Maternity & Newborn Health Nursing, Faculty of Nursing, Assiut University, Egypt.

². Lecturer of obstetric & gynecological Nursing, Faculty of Nursing, South Vally University, Egypt.

Abstract

Background: The maternity nurse's role is to promote and preserve the health of the mother and fetus during childbirth. Oxytocin is a dangerous drug that must be closely monitored to avoid negative effects on the mother and fetus and to assess labor progress. **Aim:** identify the effect of educational program on maternity nurses' knowledge and practices regarding oxytocin drug administration during labor. **Methods:** Quasi experimental research design was used in this study. It was conducted at Women Health Hospital, Assiut University in places that deal with oxytocin drugs. Sample included 144 maternity nurses. Two tools was used a structured interview questionnaire that involved two parts (personal data and knowledge assessment sheet) and observational checklist for practices sheet. An educational program was implemented to maternity nurses on oxytocin drugs. **Results:** there is highly statistical significance difference between pre & posttest regarding total knowledge and practices of studied maternity nurses regarding oxytocin drugs p-value 0.001 for both. **Conclusion:** The knowledge of maternity nurses about oxytocin drug improved between the pretest and posttest as evidenced by the pretest and posttest knowledge scores. **Recommendations:** provide a continuous education and training program to maternity nurses' on oxytocin drugs.

Keywords: Educational program, Maternity nurse, Knowledge, Practices, Oxytocin drug & Labor

Introduction:

Oxytocin, commonly known as "Love Hormone," is a hormone that helps people fall in love (Zafar & Shrivastava, 2019). Oxytocin is drugs that induce the contraction of the uterine muscles. Among the several oxytocic drugs, oxytocin is a significant one that is widely utilized in therapeutic practice. (Shiny & Sudha, 2017)

Synthetic oxytocin is a common medication used during and after childbirth. As a result, healthcare providers should be well-versed in the mechanism of action and negative effects (Alan et al., 2020).

The stimulation of uterine contractions during pregnancy before labor begins on its own in order to achieve a vaginal birth is known as induction of labor. It's usually done by giving the pregnant woman oxytocin or prostaglandins, or by manually rupturing the amniotic membranes. Labor induction and augmentation should only be carried out by highly qualified health workers in facilities with access to emergency obstetric care due to increased risks of complications accompanying these procedures (Fox et al., 2021).

Administration of oxytocin, especially at high levels, has the potential to harm both the mother and the fetus, causing uterine tachysystole and fetal heart rate abnormalities. This is because blood supply to the intervillous area is reduced or disrupted during contractions (Sukumaran & Yan, 2021).

Oxytocin is a critical drug that requires constant monitoring to avoid complications such as fetal respiratory crisis and uterine rupture. It also necessitates close monitoring to assess labor progress and detect early indicators of induction failure (Gad & El Monem, 2019).

Nurses play a critical role in adhering to medicine administration protocols for women during birth, particularly with high-alert medications like (Oxytocin), which requires nurses to be present before, during, and after oxytocin administration. Prior to oxytocin administration, the nurse's job includes evaluating the five rights of medicine, assessing maternal vital signs, uterine contractions, and fetal heart rate. While the nurse's duty during oxytocin administration is to monitor maternal, fetal, intake, and output charts, as well as handle any complications that may emerge, the nurse's role following oxytocin administration is to document and report (Esmail et al., 2020)

Significant of the study:

Oxytocin is the most extensively used induction agent in the world, with 50 % of all births using it to induce or augment labor. Oxytocin is a dangerous drug that must be closely monitored to avoid complications (Queensland Clinical Guidelines, 2020). Maternal and newborn mortality have been linked to oxytocin misuse. It is common for improperly trained healthcare staff to use labor-inducing drugs.

Uncontrolled use of such medications has serious effects for both mother and child (Caroline & Oats, 2019)

In order to develop and implement a successful nursing process, the midwife should have a complete understanding of the indications, action, and side effects of these medications, as well as the nursing considerations associated with each of them (Vaz et al., 2021).

Based on the finding of Mohamed et al 2020, which applied in Egypt to assess nurses' knowledge and practices regarding oxytocin drugs, it was reported that 44% of studied nurses had a poor knowledge and 60% had unsatisfactory practice. To save the lives of both the mother and the fetus, nurses must be knowledgeable and up to date in their knowledge, and they must be attentive to master all practical methods and guidelines connected to drugs administration. This study will help in minimizing complications that may arise from lack of knowledge about improper utilization of oxytocin drugs.

Aim of the study:

To identify the effect of educational program on maternity nurses' knowledge and practices regarding oxytocin drug administration during labor

Research hypothesis

Implementation of an educational program regarding oxytocin drug administration for maternity nurses will improve their knowledge and practice.

Subjects and Methods:

Subjects and methods of this study are displayed into four designs technical, operational, administrative, and statistical design.

Technical Design:

Which involved research design, setting, study sample, and tools of data collection.

Research Design:

A quasi-experimental (pre-posttest) design was used in this study. This study was used as it replicates findings before and after intervention.

Setting:

This study was conducted at Women Health Hospital, Assiut University in places that deal with oxytocin drugs to women in labor (admission ward, fetal medicine unit and emergency and inpatient ward). Women Health Hospital serves all areas of Upper Egypt. It is a building that has a six floor, five for governmental admission and the last one for private service.

Sample:

A total of 144 maternity nurses included in the study, who were close contact to use oxytocin drugs and involved (23 nurses from admission ward, 78 nurses from fetal monitoring and emergency ward, and 43 nurses from inpatient ward). The sample included all

maternity nurses on the head of the work in all previous places.

Tools of the study:

The data was collected using two tools

Tool (1): A structured interview questionnaire was developed by the researchers. It involved two parts.

Part one: included sociodemographic characteristics of maternity nurses as (age, qualification, place of work and years of experience).

Part two (Knowledge assessment sheet): included 7 questions (from them 4 had a multiple answer and ended into 22 item) to assess maternity nurse general knowledge about oxytocin drugs as definition, action, indication, contraindication route of administration and side effects. And 6 item to assess knowledge regarding oxytocin drugs administration during labor, 2 of them had more than one answer that ended into 14 items (Charles , 2018) & (Katie et al., 2017).

Knowledge scoring system:

Each question was scored as (1) for a correct answer and (0) for an incorrect answer. While the total knowledge score was calculated as the following: the total score was 36. Knowledge was considered inadequate if the percent score was <75% (27) and considered adequate if percent was 75% (27) and more.

Tool (2): observational checklist for practices sheet: involved 11 items before oxytocin administration, 9 during and 7 after administration. The total items was 27 item (World Health Organization, 2020).

Practices scoring system:

Each item was scored as (1) for a correct action and (0) for an incorrect action. While the total practices score was calculated as the following: the total score was 27. Practices were deemed unsatisfactory if the percent score was less than 75% (20), and satisfactory if the percent score was 75% (20) or higher.

Supportive materials:

It was designed by the researcher based on literature review. It prepared in the form of brochure with using a simple and clear Arabic language supported with photo to support some information to the nurses.

Tools Validity:

A panel of five specialists in the fields of maternity and newborn health nursing, as well as obstetrics and gynecological medicine, examined the tools for clarity and comprehensiveness

Tools Reliability:

Cronbach's Alpha was used to calculate the internal consistency of the tool scale for 68 elements, and the result was 0.815.

Operational design:

It was displayed in two phases; pilot study and field work.

Pilot study:

Pilot study was included 10% according to inclusion of the sample size (16 nurses) to evaluate the clarity and efficiency of the tool used in the study.

Field work:

Data collection of this study was taken nine months started from the beginning of October 2020, and completed by July 2021. Follow up ended in half of September 2021. This was achieved in three phases, pre intervention, intervention and post intervention:

Pre intervention phase:

Upon obtaining official permission to conduct the study. The researcher met each maternity nurse individually, explained the purpose of the study and method of implementation of educational program, and took their consent to participate in the study. After that personal data was obtained and asked to fill data regarding knowledge about oxytocin drugs as a form of pretest. Also observational check list was applied before educational program to assess nurses' practice regarding using oxytocin drugs during labor. The questionnaire took 30-35 minutes.

Intervention phase:

Carrying out of educational program which took about 37 weeks or nearly 9 months. The researcher visited the previously mentioned settings two days/week. Conducting two sessions a week to the maternity nurses, each session involved a small group with a number of 3-5 nurses. It was implemented in a form of lecture to each group. Session took a time of 40-60 minute to explain all information regarding oxytocin drugs general (definition, action, and route of administration, storage, indication, contraindication and side effects), and specific to oxytocin administration during labor as (definition of NVD, definition of first stage of labor, route of administration during labor, dose of oxytocin and adverse effect of oxytocin on mother and fetus).

Different teaching methods were used to reach to intended objective as lecture, group discussion, problem solving and critical thinking. Also a copy of brochure was given to each nurse as a supportive material. After receiving information, the researcher trained the nurses on ideal guidelines regarding oxytocin administration for induction of labor that take 50-70 minute.

Post intervention phase:

After 6 weeks of the educational program, the researcher interviewed nurses again involved in the session to take the post test that includes the same questions of the pretest questions to assess their knowledge. And observational check list was applied to assess nurses' practice regarding using oxytocin drugs during labor as a form of posttest. That took from 25-30 minute.

Administrative design:

This study was carried out with the approval of Assiut University's faculty of nursing's ethical committee, as well as official permission from the director of Woman Health Hospital. Each nurse participated in the study gave informed consent, and confidentiality was ensured. The nurse has the option to leave the study at any time.

Statistical design:

Statistical Package for Social Sciences (SPSS) V.25 was used to organize, categorize, code, tabulate, and analyze the acquired data. Numbers, percentages, averages, and standard deviation were used to portray data in tables and charts. The Pearson correlation between variables was employed, and the Mcnumer test was performed to determine statistical significance. A P-value of 0.05 was declared statistically significant.

Results:

Table (1): Distribution of studied maternity nurses according to socio demographic characteristics:

| Socio demographic characteristics | No. (n= 144) | % |
|--|----------------------------------|------|
| Age: (years) | | |
| Less than 25 year | 98 | 68.1 |
| 25- 35 year | 40 | 27.7 |
| More than 35 year | 6 | 4.2 |
| Age mean \pm SD | 26.25\pm2.81 | |
| Educational level: | | |
| Secondary nursing school | 81 | 56.3 |
| Technical institute of nursing | 33 | 22.8 |
| University | 25 | 17.4 |
| Master degree | 5 | 3.5 |
| Place of work: | | |
| Admission ward | 14 | 9.7 |
| Emergency and fetal monitoring | 86 | 59.7 |
| Internal department | 44 | 30.6 |
| Years of experience in obstetrics and gynecology ward: | | |
| Less than 5 years | 44 | 30.6 |
| 5-10 years | 69 | 47.9 |
| More than 10 years | 31 | 21.5 |
| Years of experience mean \pm SD | 6.83\pm3.21 | |
| Attending training courses regarding oxytocin administration: | | |
| Yes | 40 | 27.8 |
| No | 104 | 72.2 |

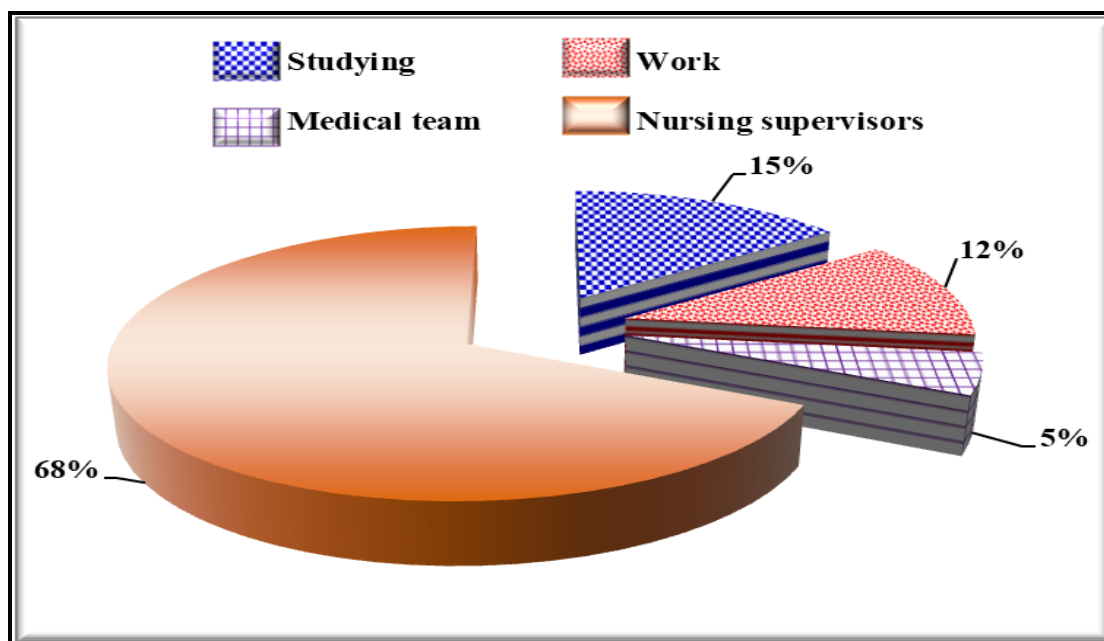


Figure (1): Source of nurses' knowledge before educational program

Table (2): Maternity nurses' general knowledge pertaining to oxytocin drugs in pre and posttest:

| Items | | Pre-test (n= 144) | | Post-test (n= 144) | | P-value |
|---|-----------|----------------------|------|-----------------------|------|----------------|
| | | No. | % | No. | % | |
| Definition of oxytocin | Correct | 39 | 27.1 | 140 | 97.2 | 0.001** |
| | Incorrect | 105 | 72.9 | 4 | 2.8 | |
| Action of oxytocin | Correct | 6 | 4.2 | 142 | 98.6 | 0.001** |
| | Incorrect | 138 | 95.8 | 2 | 1.4 | |
| Storage of oxytocin drugs | Correct | 94 | 65.3 | 142 | 98.6 | 0.001** |
| | Incorrect | 50 | 34.7 | 2 | 1.4 | |
| Route of administration | | | | | | |
| Directly in vein | Correct | 33 | 22.9 | 142 | 98.6 | 0.001** |
| | Incorrect | 111 | 77.1 | 2 | 1.4 | |
| By I.M | Correct | 127 | 88.2 | 143 | 99.3 | 0.001** |
| | Incorrect | 17 | 11.8 | 1 | 0.7 | |
| Diluted by intravenous fluid | Correct | 136 | 94.4 | 141 | 97.9 | 0.180 |
| | Incorrect | 8 | 5.6 | 3 | 2.1 | |
| Indication of oxytocin | | | | | | |
| Induction of labour | Correct | 88 | 61.1 | 143 | 99.3 | 0.001** |
| | Incorrect | 56 | 38.9 | 1 | 0.7 | |
| Augmintation of labour | Correct | 97 | 67.4 | 141 | 97.9 | 0.001** |
| | Incorrect | 47 | 32.6 | 3 | 2.1 | |
| In complete abortion | Correct | 92 | 63.9 | 141 | 97.9 | 0.001** |
| | Incorrect | 52 | 36.1 | 3 | 2.1 | |
| Prevention and treatment of postpartum uterine atony and hemorrhage | Correct | 64 | 44.4 | 142 | 98.6 | 0.001** |
| | Incorrect | 80 | 55.6 | 2 | 1.4 | |
| Contraindication: | | | | | | |
| Fetal distress | Correct | 98 | 68.1 | 143 | 99.3 | 0.001** |
| | Incorrect | 46 | 31.9 | 1 | 0.7 | |
| Contracted pelvis | Correct | 91 | 63.2 | 141 | 97.9 | 0.001** |
| | Incorrect | 53 | 36.8 | 3 | 2.1 | |
| Abnormal fetal presentation | Correct | 79 | 54.9 | 143 | 99.3 | 0.001** |
| | Incorrect | 65 | 45.1 | 1 | 0.7 | |
| Placenta previa | Correct | 52 | 36.1 | 143 | 99.3 | 0.625 |
| | Incorrect | 92 | 63.9 | 1 | 0.7 | |
| Umbilical cord prolapsed | Correct | 74 | 51.4 | 142 | 98.6 | 0.001** |
| | Incorrect | 70 | 48.6 | 2 | 1.4 | |
| Previous Cesarean section | Correct | 63 | 43.7 | 143 | 99.3 | 0.001** |
| | Incorrect | 81 | 56.3 | 1 | 0.7 | |
| Over distended uterus | Correct | 71 | 49.3 | 141 | 97.9 | 0.001** |
| | Incorrect | 73 | 50.7 | 3 | 2.1 | |
| Side effects | | | | | | |
| Hypertension or hypotension | Correct | 84 | 58.3 | 142 | 98.6 | 0.001** |
| | Incorrect | 60 | 41.7 | 2 | 1.4 | |
| Heart palpitations | Correct | 84 | 58.3 | 142 | 98.6 | 0.001** |
| | Incorrect | 60 | 41.7 | 2 | 1.4 | |
| Irregular heartbeat | Correct | 71 | 49.3 | 143 | 99.3 | 0.001** |
| | Incorrect | 73 | 50.7 | 1 | 0.7 | |
| Heart attack | Correct | 78 | 54.2 | 142 | 98.6 | 0.001** |
| | Incorrect | 66 | 45.8 | 2 | 1.4 | |
| Epilepsy | Correct | 86 | 59.7 | 142 | 98.6 | 0.001** |
| | Incorrect | 58 | 40.3 | 2 | 1.4 | |

Mc Nemar test used for pair qualitative variables

(**) highly statistically significant $p < 0.01$

Table (3): Maternity nurses’ knowledge pertaining to oxytocin administration during labor in pre and posttest:

| Items | | Pre-test (n= 144) | | Post-test (n= 144) | | P-value |
|---|-----------|----------------------|------|-----------------------|------|----------------|
| | | No. | % | No. | % | |
| Definition of NVD | Correct | 89 | 61.8 | 143 | 99.3 | 0.001** |
| | Incorrect | 55 | 38.2 | 1 | 0.7 | |
| Definition of first stage of labor | Correct | 50 | 34.7 | 143 | 99.3 | 0.001** |
| | Incorrect | 94 | 65.3 | 1 | 0.7 | |
| Route of administration during labor | Correct | 136 | 94.4 | 142 | 98.6 | 0.109 |
| | Incorrect | 8 | 5.6 | 2 | 1.4 | |
| Dose of oxytocin for induction of labor | Correct | 137 | 95.1 | 143 | 99.3 | 0.070 |
| | Incorrect | 7 | 4.9 | 1 | 0.7 | |
| Adverse effect of Oxytocin on mother | | | | | | |
| Nausea and vomiting | Correct | 46 | 31.9 | 143 | 99.3 | 0.001** |
| | Incorrect | 98 | 68.1 | 1 | 0.7 | |
| Postpartum hemorrhage | Correct | 32 | 22.2 | 143 | 99.3 | 0.001** |
| | Incorrect | 112 | 77.8 | 1 | 0.7 | |
| Tachycardia | Correct | 105 | 72.9 | 143 | 99.3 | 0.001** |
| | Incorrect | 39 | 27.1 | 1 | 0.7 | |
| Rupture of the uterus. | Correct | 73 | 50.7 | 143 | 99.3 | 0.001** |
| | Incorrect | 71 | 49.3 | 1 | 0.7 | |
| By I.M | Correct | 110 | 76.4 | 142 | 98.6 | 0.001** |
| | Incorrect | 34 | 23.6 | 2 | 1.4 | |
| Diluted by intravenous fluid | Correct | 68 | 47.2 | 143 | 99.3 | 0.001** |
| | Incorrect | 76 | 52.8 | 1 | 0.7 | |
| Adverse effect of Oxytocin on fetus | | | | | | |
| Brain damage | Correct | 65 | 45.1 | 143 | 99.3 | 0.001** |
| | Incorrect | 79 | 54.9 | 1 | 0.7 | |
| Bradycardia | Correct | 96 | 66.7 | 143 | 99.3 | 0.001** |
| | Incorrect | 48 | 33.3 | 1 | 0.7 | |
| Fetal death | Correct | 87 | 60.4 | 143 | 99.3 | 0.001** |
| | Incorrect | 57 | 39.6 | 1 | 0.7 | |
| Neonatal jaundice | Correct | 74 | 51.4 | 143 | 99.3 | 0.001** |
| | Incorrect | 70 | 48.6 | 1 | 0.7 | |

Mc Nemar test used for pair qualitative variables

(**) highly statistically significant $p < 0.01$

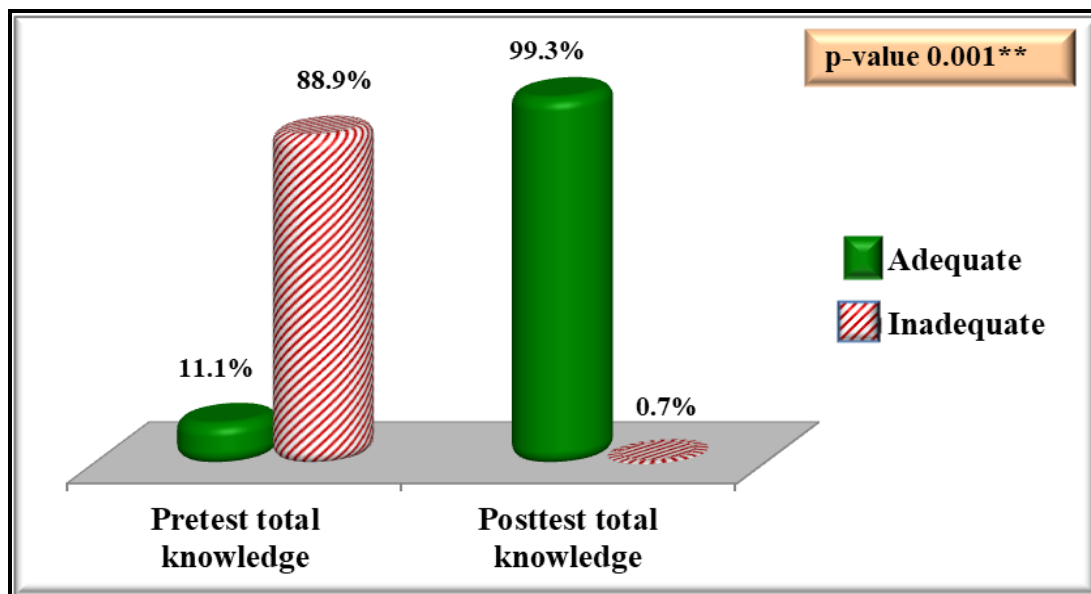


Figure (2): Maternity nurses’ total knowledge score regarding oxytocin in pre-test and posttest

Table (4): Maternity nurses' practices before oxytocin administration in pre and posttest

| Items | | Pre-test (n= 144) | | Post-test (n= 144) | | P-value |
|--|----------|----------------------|------|-----------------------|------|----------------|
| | | No. | % | No. | % | |
| Prepare equipment | Done | 107 | 74.3 | 142 | 98.6 | 0.001** |
| | Not done | 37 | 25.7 | 2 | 1.4 | |
| Checking woman's name by asking her name | Done | 89 | 61.8 | 140 | 97.2 | 0.001** |
| | Not done | 55 | 38.2 | 4 | 2.8 | |
| Explain procedure to the women and maintain privacy | Done | 27 | 18.7 | 138 | 95.8 | 0.001** |
| | Not done | 117 | 81.3 | 6 | 4.2 | |
| Ensure that the woman has no oxytocin contraindications. | Done | 83 | 57.6 | 141 | 97.9 | 0.001** |
| | Not done | 61 | 42.4 | 3 | 2.1 | |
| monitor woman's and fetal conditions | Done | 110 | 76.4 | 142 | 98.6 | 0.001** |
| | Not done | 34 | 23.6 | 2 | 1.4 | |
| Ask mother to empty her bladder | Done | 33 | 22.9 | 140 | 97.2 | 0.001** |
| | Not done | 111 | 77.1 | 4 | 2.8 | |
| Wash Hand & wear gloves | Done | 5 | 3.5 | 142 | 98.6 | 0.001** |
| | Not done | 139 | 96.5 | 2 | 1.4 | |
| Maintain woman's privacy | Done | 107 | 74.3 | 143 | 99.3 | 0.001** |
| | Not done | 37 | 25.7 | 1 | 0.7 | |
| Assist the woman to lie in suitable position | Done | 128 | 88.9 | 143 | 99.3 | 0.001** |
| | Not done | 16 | 11.1 | 1 | 0.7 | |
| Connect the woman with fetal monitor | Done | 141 | 97.9 | 143 | 99.3 | 0.625 |
| | Not done | 3 | 2.1 | 1 | 0.7 | |
| Insert the cannula in the right hands and fix it | Done | 112 | 77.8 | 143 | 99.3 | 0.001** |
| | Not done | 32 | 22.2 | 1 | 0.7 | |

Mc Nemar test used for pair qualitative variables

(**) highly statistically significant $p < 0.01$

Table (5): Maternity nurses' practices during oxytocin preparation and infusion in pre and posttest

| Items | | Pre-test (n= 144) | | Post-test (n= 144) | | P-value |
|--|----------|----------------------|------|-----------------------|------|----------------|
| | | No. | % | No. | % | |
| Prepare the intravenous fluids and dilute the oxytocin as directed by the doctor | Done | 142 | 98.6 | 143 | 99.3 | 0.999 |
| | Not done | 2 | 1.4 | 1 | 0.7 | |
| making sure the oxytocin solution is clearly labelled. | Done | 135 | 93.7 | 143 | 99.3 | 0.021* |
| | Not done | 9 | 6.3 | 1 | 0.7 | |
| Start oxytocin infusion as physician's written orders | Done | 141 | 97.9 | 143 | 99.3 | 0.625 |
| | Not done | 3 | 2.1 | 1 | 0.7 | |
| Assess and record the woman's blood pressure | Done | 5 | 3.5 | 139 | 96.5 | 0.001** |
| | Not done | 139 | 96.5 | 5 | 3.5 | |
| Assess and record the woman's uterine contractions | Done | 120 | 83.3 | 141 | 97.9 | 0.001** |
| | Not done | 24 | 16.7 | 3 | 2.1 | |
| Assess and record the woman's fetal heart rate | Done | 105 | 72.9 | 142 | 98.6 | 0.001** |
| | Not done | 39 | 27.1 | 2 | 1.4 | |
| Examine the woman for signs of oxytocin toxicity, such as nausea, vomiting, or headaches. ...etc | Done | 104 | 72.2 | 141 | 97.9 | 0.001** |
| | Not done | 40 | 27.8 | 3 | 2.1 | |
| Discontinue the oxytocin infusion and notify a physician if maternal or fetal complications occurred | Done | 141 | 97.9 | 143 | 99.3 | 0.625 |
| | Not done | 3 | 2.1 | 1 | 0.7 | |
| Record general observation , woman's reaction and complaint | Done | 113 | 78.5 | 141 | 97.9 | 0.001** |
| | Not done | 31 | 21.5 | 3 | 2.1 | |

Mc Nemar test used for pair qualitative variables

(*) statistically significant $p < 0.05$

(**) highly statistically significant $p < 0.01$

Table (6): Maternity nurses’ practices after oxytocin administration in pre and posttest

| Items | | Pre-test (n= 144) | | Post-test (n= 144) | | P-value |
|--|----------|-------------------|------|--------------------|------|----------------|
| | | No. | % | No. | % | |
| Discontinue the oxytocin infusion | Done | 139 | 96.5 | 143 | 99.3 | 0.219 |
| | Not done | 5 | 3.5 | 1 | 0.7 | |
| Remove the equipment | Done | 100 | 69.4 | 143 | 99.3 | 0.001** |
| | Not done | 44 | 30.6 | 1 | 0.7 | |
| Inform woman by findings and progress | Done | 44 | 30.6 | 141 | 97.9 | 0.001** |
| | Not done | 100 | 69.4 | 3 | 2.1 | |
| Complete oxytocin infusion after delivery and observe any signs of postpartum hemorrhage | Done | 96 | 66.7 | 142 | 98.6 | 0.001** |
| | Not done | 48 | 33.3 | 2 | 1.4 | |
| Record intake and output. | Done | 51 | 35.4 | 142 | 98.6 | 0.001** |
| | Not done | 93 | 64.6 | 2 | 1.4 | |
| Inform doctor by any abnormalities | Done | 141 | 97.9 | 143 | 99.3 | 0.625 |
| | Not done | 3 | 2.1 | 1 | 0.7 | |
| Wash hands | Done | 126 | 87.5 | 143 | 99.3 | 0.001** |
| | Not done | 18 | 12.5 | 1 | 0.7 | |

Mc Nemar test used for pair qualitative variables

(**) highly statistically significant $p < 0.01$

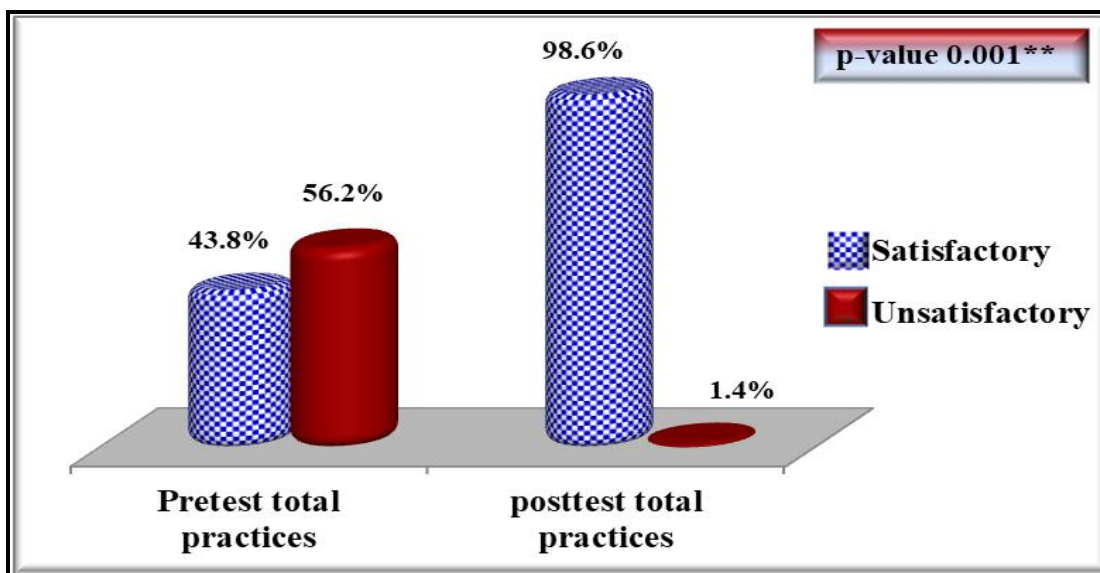


Figure (3): Maternity n nurses’ total practices score regarding oxytocin in pre-test and posttest

Table (7): Mean and SD of maternity nurses’ total knowledge and practice in pre and posttest:

| Items | Pre-test (n= 144) | | Post-test (n= 144) | | P-value |
|---|-------------------|-------|--------------------|--------|----------------|
| | Mean | ±SD | Mean | ±SD | |
| Total general knowledge score regarding oxytocin drugs | 11.22 | ±3.52 | 20.71 | ±1.83 | 0.001** |
| Total knowledge score regarding administration of oxytocin drugs during labor | 8.11 | ±3.61 | 13.88 | ±1.177 | 0.001** |
| Total practice score | 18.37 | ±4.42 | 26.59 | ±2.315 | 0.001** |

Paired sample test

(**) highly statistically significant $p < 0.01$

Table (8): Relation between maternity nurses' total knowledge in pretest and Socio demographic characteristics:

| Socio demographic characteristics | Total Knowledge | | | | P-value |
|--|------------------|-------|---------------------|-------|----------------|
| | Adequate (n= 16) | | Inadequate (n= 128) | | |
| | No. | % | No. | % | |
| Age: (years) | | | | | 0.171 |
| Less than 25 year | 11 | 11.2 | 87 | 88.8 | |
| 25- 35 year | 3 | 7.5 | 37 | 92.5 | |
| More than 35 year | 2 | 33.3 | 4 | 66.7 | |
| Educational qualification: | | | | | 0.001** |
| Secondary nursing school | 2 | 2.5 | 79 | 97.5 | |
| Technical institute of nursing | 2 | 6.1 | 31 | 93.9 | |
| University qualification | 7 | 28.0 | 18 | 72.0 | |
| Master degree | 5 | 100.0 | 0 | 0.0 | |
| Place of work: | | | | | 0.054* |
| Reception ward | 1 | 7.7 | 12 | 92.3 | |
| Emergency and fetal monitoring | 14 | 16.1 | 73 | 83.9 | |
| Internal department | 1 | 2.3 | 43 | 97.7 | |
| Years of experience in obstetrics and gynecology ward: | | | | | 0.015** |
| Less than 5 years | 0 | 0.0 | 44 | 100.0 | |
| 5-10 years | 4 | 12.9 | 27 | 87.1 | |
| More than 10 years | 12 | 17.4 | 57 | 82.6 | |
| Attending training courses regarding oxytocin administration: | | | | | 0.007** |
| Yes | 9 | 22.5 | 31 | 77.5 | |
| No | 7 | 6.7 | 97 | 93.3 | |

Chi-square test (*) statistically significant $p < 0.05$ (**) highly statistically significant $p < 0.01$

Table (9): Relation between maternity nurses' total practices in pretest and Socio demographic characteristics:

| Socio demographic characteristics | Total practices | | | | P-value |
|--|----------------------|-------|------------------------|------|----------------|
| | Satisfactory (n= 63) | | Unsatisfactory (n= 81) | | |
| | No. | % | No. | % | |
| Age: (years) | | | | | 0.769 |
| Less than 25 year | 42 | 42.9 | 56 | 57.1 | |
| 25- 35 year | 19 | 47.5 | 21 | 52.5 | |
| More than 35 year | 2 | 33.3 | 4 | 66.7 | |
| Educational qualification: | | | | | 0.001** |
| Secondary nursing school | 27 | 33.3 | 54 | 66.7 | |
| Technical institute of nursing | 14 | 42.4 | 19 | 57.6 | |
| University qualification | 17 | 68.0 | 8 | 32.0 | |
| Master degree | 5 | 100.0 | 0 | 0.0 | |
| Place of work: | | | | | 0.050* |
| Reception ward | 5 | 38.5 | 8 | 61.5 | |
| Emergency and fetal monitoring | 45 | 51.7 | 42 | 48.3 | |
| Internal department | 13 | 29.5 | 31 | 70.5 | |
| Years of experience in obstetrics and gynecology ward: | | | | | 0.001** |
| Less than 5 years | 9 | 20.5 | 35 | 79.5 | |
| 5-10 years | 15 | 48.4 | 16 | 51.6 | |
| More than 10 years | 39 | 56.5 | 30 | 43.5 | |
| Attending training courses regarding oxytocin administration: | | | | | 0.005** |
| Yes | 25 | 62.5 | 15 | 37.5 | |
| No | 38 | 36.5 | 66 | 63.5 | |

Chi-square test (*) Statistically significant $p < 0.05$ (**) highly statistically significant $p < 0.01$

Table (10): Relation between maternity nurses' total knowledge and practices in pretest and posttest

| Total practices | Total Knowledge | | | | | | | | p-value | |
|-----------------|------------------|------|---------------------|------|---------|-------------------|-------|-------------------|---------|---------|
| | pretest | | | | p-value | posttest | | | | |
| | Adequate (n= 16) | | Inadequate (n= 128) | | | Adequate (n= 143) | | Inadequate (n= 1) | | |
| | No. | % | No. | % | | No. | % | No. | | % |
| Satisfactory | 12 | 19.0 | 51 | 81.0 | 0.008** | 142 | 100.0 | 0 | 0.0 | 0.001** |
| Un satisfactory | 4 | 4.9 | 77 | 95.1 | | 1 | 50.0 | 1 | 50.0 | |

Chi-square test

(**) highly statistically significant $p < 0.01$

Table (1): Shows sociodemographic characteristics of studied maternity nurses, and reports that 68.1 of them have age group less than 25 years with a mean \pm SD of 26.25 ± 2.81 , about 56.3% have a certificate of secondary school of nursing, 59.7% work at emergency and fetal monitoring ward, about 47.9% have an experience in their work from 5-10 years, and about 27.8% attend training courses regarding oxytocin administration.

Figure (1): Demonstrates source of nurses' knowledge before educational program, and shows that 68% of studied nurses obtain their knowledge from nurses' supervisors.

Table (2): Reports maternity nurses' general knowledge pertaining to oxytocin drugs in pre and posttest, and finds that there is highly statistical significance difference between pre & posttest regarding definition, action, indication, contraindication p-value 0.001 for all previous items. Also there is highly statistical significance difference between pre & posttest in most items regarding route of administration and side effects p-value 0.001.

Table (3): Illustrates maternity nurses' knowledge pertaining to oxytocin administration during labor in pre and posttest, and clarifies that there is highly statistical significance difference between pre & posttest regarding definition of NVD, definition of first stage of labor, adverse effect of oxytocin on mother and on fetus p-value 0.001 for all previous items. It also indicated that there is no statistical significance difference between pre & posttest regarding route and dose of administration for induction of labor p-value 0.109 and 0.070 respectively.

Figure (1): Demonstrates that 11.1% of studied maternity nurses have adequate knowledge regarding oxytocin in pre-test that was improved to 99.8% in posttest. With a highly statistical significance difference between pre & posttest p-value 0.001.

Table (4): Clarifies maternity nurses' practices before oxytocin administration in pre and posttest, and shows that there is highly statistical significance difference between pre & posttest regarding prepares equipment, checking woman's name, explain

procedure to the women, ensure that the woman has no oxytocin contraindications, monitor woman's and fetal conditions, ask to empty bladder, wash Hand & wear gloves, maintain woman's privacy, assist the woman to lie in suitable position, insert cannula in the right hands and fix it p-value (0.001) for all . And there is no statistical significance difference between pre & posttest regarding connect the woman with fetal monitor p-value (0.625).

Table (5): Reveals maternity nurses' practices during oxytocin preparation and infusion in pre and posttest, and illustrates that there is highly statistical significance difference between pre & posttest regarding making sure oxytocin solution is clearly labeled, assess and record the woman's blood pressure, uterine contractions, fetal heart rate, examine for signs of oxytocin toxicity, and record general observation p-value 0.002 for first item and 0.001 for all other ones. And shows that there is no statistical significance difference between pre & posttest regarding prepare the intravenous fluids as directed by the doctor, Start oxytocin infusion as physician's orders and discontinue the oxytocin infusion if maternal or fetal complications occurred p-value 0.999, 0.625 and 0.625 respectively.

Table (6): Shows highly statistical significance difference between pre & posttest regarding remove the equipment, inform woman by findings and progress, complete oxytocin infusion after delivery, observe any signs of postpartum hemorrhage, record intake and output, and wash hands as maternity nurses' practices after oxytocin administration p-value 0.001 for all. And there is no statistical significance difference between pre & posttest regarding discontinue oxytocin infusion and inform doctor by any abnormalities p-value 0.219 and 0.625 respectively.

Figure (2): Demonstrates that 43.8% of studied maternity nurses have satisfactory practices regarding oxytocin administration in pre-test that was improved to 98.6% in posttest, with a highly statistical significance difference between pre & posttest p-value 0.001.

Table (7): Reports highly statistical significance difference between Mean and SD of maternity nurses' total knowledge and practice in pre and posttest p-value 0.001 for all.

Table (8): Show that there is relation between total knowledge in pretest and educational qualification, workplace, years of experience and attending training courses p-value 0.001, 0.054, 0.015 and 0.007 respectively. And there is no relation between total knowledge in pretest and age p-value 0.171.

Table (9): Demonstrates that there is relation between total practices in pretest and educational qualification, workplace, years of experience and attending training courses p-value 0.001, 0.050, 0.001 and 0.005 respectively. And there is no relation between total practice in pretest and age p-value 0.769.

Table (10): Show that there is relation between total knowledge and total practices in pretest and posttest p-value 0.008 and 0.001 respectively

Discussion:

This study was conducted to evaluate the effect of educational program on maternity nurses' knowledge and practices regarding oxytocin drug administration during labor

Concerning total knowledge score of maternity nurses about oxytocin drugs, the finding of present study denotes that less than one sixth of maternity nurses have adequate knowledge before intervention of educational program that improved to reach to the vast majority of studied nurses have adequate knowledge in posttest. This was matching with (**Vaz et al., 2021**), who applied their study in India to identify the effectiveness of planned teaching program on knowledge regarding oxytocin drug administration among midwives, and clarified that there was significant improvement in the score of total knowledge regarding oxytocin drug after implementation of teaching program.

Also (**Pandit et al., 2016**), who conducted a study in Maharashtra to examine the demographic features of nurses and to evaluate the influence of demonstration on knowledge and practices about chosen obstetric medications among nurses, found similar results to prior findings, as they reported that less than one tenth of studied nurses had adequate knowledge in pretest that improved to the great majority in posttest. All previous findings support the importance and vital effect to educational program as a remembering of maternity nurses by importance information needed in the work.

Also there were studies that shows the low level of maternity nurse knowledge as (**Mohammed et al., 2020**), who completed their research to evaluate nurses' knowledge and practice of oxytocin infusion

treatment for women in labor and (**Shiny & Sudha, 2017**), who performed their research to examine oxytocin knowledge and practice, as well as to associate oxytocin knowledge and practice. This support the importance of providing a continuous educational program to improve nurses' knowledge regarding a vital obstetric drug (oxytocin).

As regard general knowledge and knowledge regarding oxytocin administration during labor, actual study finds that there are statistical significant difference between pre and posttest regarding definition, action, route of administration, storage, indication, contraindication, definition of NVD, definition of first stage of labor, adverse effect on mother and fetus.

This was in accordance with (**Gad & El Monem, 2019**), who done their study to evaluate the effects of educational program on improving nursing knowledge and practice regarding administration of oxytocin during labor, and clarified that there was statistical significant between pre and posttest regarding action, definition of first stage of labor, route and dose of administration, indication and adverse effect on fetus. This also shows the change occurred after implementing educational program. And show the importance of educational program in improving nursing knowledge and practice regarding administration of oxytocin drugs during labor.

The present findings of current study reports a significant improvement in the nurses practices level regarding oxytocin administration after implementing a training program. This was in agreement with (**Pandit et al., 2016**) and (**Gad & El Monem, 2019**), who find a significant improvement in the nurses' practices regarding oxytocin administration after providing a training program on it. This reports the importance of continuous provision of nurses' practices to ensure that they apply the practices as it should be applied, and provide a guideline protocol to them.

Also there were studies that reported unsatisfactory level of nurses' practices for most of nurses that needed to be improved through training continuously as (**Mohammed et al., 2020**) and (**Shiny & Sudha, 2017**).

At terms of the practices of maternity nurses before, during, and after oxytocin administration, the current study shows that there is a statistically significant difference between pre and posttest in practically every phase. This was supported by (**Gad & El Monem, 2019**), who found a significant relation between before and after intervention of training on practices regarding oxytocin administration. This reports that some actions regarding oxytocin administration needed to be stressed to perform correctly to ensure safety to both mother and fetus.

Concerning mean and SD of total knowledge and total practices score in pre and posttest, actual study demonstrates that there is statistical significant difference between pre and posttest. This was on the same line with (Gad & El Monem, 2019), who illustrated a significant improvement in the total knowledge and practices mean an SD score between before and after implementing educational intervention.

Also (Vaz et al., 2021), found a significant relation between pre and posttest regarding total knowledge scores mean and SD of studied nurses. This explains changes occurred in the total knowledge and practices score after implementing educational program.

As regard relation between total knowledge in pretest and socio demographic characteristics, actual study reports that there are relation between total knowledge and educational level, workplace, years of experience and attending training courses and there is no relation between total knowledge in pretest and nurses' age. This clarify the role of educational level, workplace, years of experience and attending training courses in attaining knowledge among maternity nurses.

On the same line (Mohammed et al., 2020), showed a positive relation between total knowledge and educational qualification and no relation between total knowledge and nurses' age. Also (Esmail et al., 2020), who carried out their study to assess nurses' knowledge and practices toward compliance with oxytocin administration protocol during labor, and revealed that there was relation between total knowledge and educational qualification and years of experience.

As regard total practices and its relation to socio demographic characteristics, present study clarifies that there was relation between total practices in pretest and educational qualification, workplace years of experience and attending training courses and there is no relation between total practice in pretest and age. This was agreed with (Mohammed et al., 2020), who found a relation between total practice and educational level and years of experience and there is no relation between total practice and nurses' age. And (Shiny & Sudha, 2017), agreed also with previous findings, who showed a significant relation between total practices and educational status, place of work, and attending training courses and there is no relation between total practice and nurses' age.

From previous relations with total knowledge and total practices, it is explored that the knowledge and practices of maternity nurses are affected by level of qualification and experience in their work and no affected by their age.

Concerning relation between total knowledge and total practices, actual study clarifies a positive

relation between total knowledge and total practices. This was supported by (Mohammed et al., 2020) and (Gad & El Monem, 2019), who revealed a positive relation between total knowledge and total practice. This explains that the nurses' practices were affected by their knowledge about oxytocin administration.

Conclusion:

Nurses knowledge about oxytocin and practice was improved after implementing the educational and training program.

Recommendations:

- Provide a continuous education and training program to maternity nursing staff on oxytocin drugs.
- Study should be generalized to include maternity nurses in both governmental and health hospital.
- Encourage nurses to update their education in the form of attending workshops, conferences related to oxytocin drugs administration.
- Supported maternity nurses with an instructional booklet regarding oxytocin drugs and its care to improve their knowledge and practices.

Limitations of the study:

It was difficult to meet with nurses for educational program (as lecture and training), this back to their work, so the researcher was met with a small group to accomplish the study.

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References:

- Alan, S., Akça, E., Şenoğlu, A., Gozuyesil, E., & Surucu, S. (2020): The use of oxytocin by healthcare professionals during labor. *Yonago Acta Medica*, 63(3), 214–222. <https://doi.org/10.33160/yam.2020.08.012>
- Caroline Homer AO, & Oats, J. (2019): *Clinical Practice Guidelines: Pregnancy Care 2019 Edition*, p 95-98.
- Charles D. Ciccone. C.D. (Ed.), (2018): *Oxytocin's Drug Guide for Rehabilitation Professionals*. McGraw Hill. <https://fadavispt.mhmedical.com/content.aspx?bookid=1873§ionid=139021017>
- Esmail Shady, R., Ibrahim, S., Gamal, A., & Farahat, F. (2020): Assessment of Nurses' Compliance With Oxytocin Administration Protocol During Labor At Dammieta City. *Port Said Scientific Journal of Nursing*, 7(3), 42–65. <https://doi.org/10.21608/pssjn.2020.33674.1035>

- **Fox, K., Ramirez, M., & Ramin, S. (2021):** Induction and augmentation of labor. In *Management of Labor and Delivery: Second Edition* (pp. 62–85). <https://doi.org/10.1002/9781118327241.ch4>
- **Gad Mohamed, A., & el MonemDesoky, M. (2019):** Effect of Educational Program on Improving Nursing Knowledge and Practice Regarding Administration of Oxytocin during Labor. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 8(5), 44–53. <https://doi.org/10.9790/1959-0805104453>
- **Katie, P., McCool, W., & Guidera, M. (2017):** Examination of the Pharmacology of Oxytocin and Clinical Guidelines for Use in Labor. *Journal of Midwifery and Women's Health*, 62(4), 425–433. <https://doi.org/10.1111/jmwh.12610>
- **Mohammed E. Samy Sengab, Fahmy Mohammed, N., Mohammed3, A., & Abd-Elmoniem, S. (2020):** Nurses' Knowledge and Practices Regarding Oxytocin Infusion Care for Women. *Journal of Nursing Science -*, 4(Atcc 25923), 2020.
- **Pandit, S., Boricha, B., & Mhaske, A. (2016):** Effect of Demonstration on Knowledge & Practices Regarding Selected Obstetric Drugs among Nurses Working in Labour Room in Urban Area. *International Journal of Education and Research in Health Sciences*, 2(2).
- **Queensland Clinical Guidelines. (2020):** Maternity and Neonatal Clinical Induction of labour. In Queensland Government (pp. 1–30).
- **Shiny, S. ., & Sudha R.N. (2017):** Assessment of the Knowledge and Practice on Use of oxytocin among nurses working in selected hospitals in Chennai, p 13-19.
- **Sukumaran, Jia, S., & Yan-Ju Chandraharan, E. (2021):** Uterine Tachysystole, Hypertonus and Hyperstimulation: An Urgent Need to get the Definitions Right to Avoid Intrapartum Hypoxic-Ischemic Brain Injury. *Global Journal of Reproductive Medicine*, 8(2), 1–8. <https://doi.org/10.19080/gjorm.2021.08.555735>
- **Vaz, C., D'Almeida, V., Rajput, S., & Singh, M. A. (2021):** A Study to Assess the effectiveness of Planned Teaching Programme Regarding Oxytocin Drug Administration among Midwives in Selected Hospital of Kanpur. *International Journal of Nursing Education*, 5(1), 44. <https://doi.org/10.5958/j.0974-9357.5.1.011>
- **World Health Organization (2020):** WHO recommendation on Routes of oxytocin haemorrhage after prevention of postpartum administration for the vaginal birth, pages 5-19.