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Effect of Educational Guidelines on Maternity Nurses' Competencies Regarding Prevention and Controlling of Primary Postpartum Hemorrhage

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Abstract
Background: Postpartum bleeding is one of the most serious emergencies which nurses face. **Aim of the study:** To evaluate the effect of educational guidelines on maternity nurses' competencies regarding prevention and controlling of primary postpartum hemorrhage. **Design:** Quasi experimental research design. **Setting:** This study was carried out in Minia University for maternity and children hospital. **Sample:** Convenience sample consisted of 50 maternity nurses units who provide direct nursing care for women during labor and immediate post-partum period. **Tools:** four tools were used to fulfill this study (**tool I**: A structured self administered questionnaire, **Tool II:** Knowledge questionnaire, **Tool III:** Competency performance checklist (Observational Checklist), **Tool IV:** Maternity Nurses attitude scale regarding prevention of primary postpartum hemorrhage). **Results:** All knowledge, practices and attitude related items showed a statistical improvement (86%,83% and 88% respectively) after the intervention (P=0.001*). A positive correlation was found between maternity nurses' knowledge and their practices with a high statistical significant differences (P. value < 0.00). Additionally, there was a positive relation between studied nurses' practices and their attitude with a high statistical significant differences where p_ value was 0.01. **Conclusion:** Competency nursing intervention were effective in improving knowledge, attitude, and performance level of maternity nurses regarding the prevention and controlling of primary PPH. **Recommendations:** Provide competence-based standards and guidance for maternity nurses' knowledge and practices.

Keywords: Educational Guidelines, Maternity Nurses 'Competencies &Primary Postpartum Hemorrhage.

Introduction
Postpartum hemorrhage (PPH) stills the most popular problem of the process of birth and may end with severe health problems and death among mothers if diagnosis and treatment are late. Near 5-10% of deliveries worldwide are impacted by PPH. It can be detected by too much blood loss which happens mostly post-delivery that can lead to volume reduction and disastrous consquences. **(Bihan et al, 2023; Krishnamoorthy et al., 2022).**

Postpartum hemorrhage can be categorized as primary or secondary. If bleeding starts prior to placental birth and up to 24 hours after childbirth it is called primary and called secondary if it happens more than 24 hours after delivery. A blood loss of more than 500 cc during a vaginal birth or more than 1000 cc during a caesarean delivery is commonly referred to as primary PPH, accompanied by hypovolemia signs or symptoms and a drop in haematocrit >10% following the delivery process. **(Hofer et al., 2023; Gupta et al., 2023).**

Primary postpartum hemorrhage (PPH) is a leading direct cause of maternal deaths in low-income countries, representing 27.1% of maternal mortality. Approximately 54–93% of maternal deaths related to obstetric hemorrhage can be prevented with the application of standardized and multidisciplinary programs **(Francisco Zea-Prado et al, 2021)**

The causes of PPH can be classified into four main categories; the most common cause of PPH is uterine atony which refers to inability of the uterus to contract effectively after childbirth responsible for at least 80% of cases. It can occur due to prolonged labor, multiple pregnancies, large baby size, placental abnormalities, bladder distention, or the use of certain medications during labor **(Zheng et al., 2023).**

Primary postpartum hemorrhage can lead to a number of complications, including maternal anemia, hypovolemic shock, disseminated intravascular coagulation (DIC), organ dysfunction such as the kidneys, liver, lungs, and heart, Sheehan syndrome, infection, difficult maternal care of the new-born, and even death **(Manganye, 2022)**.

Additionally, skilled nurses require knowledge and skills to manage a number of challenges; well-planned and structured guidelines could develop nurses critical thinking and clinical competence. **(Akselbo & Aune, 2023).**

Primary PPH prevention ought to begin during the 3rd stage of labor. A series of maneuvers establishes

active management in order to stop primary PPH. It involves administering prophylactic uterotonic drugs, controlled traction of the cord and massage the uterus after placental expulsion. **(Vermeulen & Van de Velde, 2022).**

Nurses are fundamental in preventing effectively, early recognizing and managing PPH. They should be oriented of the risk factors for this situation and take the proper action as soon as they are identified. Nurses have a vital part in monitoring the status of the woman, helping with actions to stop bleeding, teaching the mother about her condition and giving help to the mother and her family (**Eldien& Ahmed,. (2019).**

'Competency' is the capability of any given person or professional to execute a certain task or action while having the necessary training and education to do so. The American Association of Colleges of Nursing defines "competency-based education" as "a process whereby students are held accountable to the mastery of competencies deemed critical for an area of study." This is another crucial concept. **(Zumstein-Shaha, et al, 2023).**

Competency helps them perform their duties while integrating multiple elements, including knowledge, techniques, attitude and thinking ability. 'Competency' will result in positive outcomes for patients, nurses, their profession and organisations. (**Mrayyan, et al, 2023)**

Enhancing nurses' competencies in relation to emergency obstetric care becomes a need, especially PPH and hypertensive disorders of pregnancy, as well as nursing care plans for the woman experiencing PPH emphases on controlling the bleeding, restoring fluid balance, injury prevention and maintaining sufficient tissue perfusion. As with any postpartum issue, make sure the woman and her family receive emotional support, discussing all events and procedures to relieve fear and anxiety, maintain the family oriented of the condition, as well explaining laboratory tests, procedures and signs of progress **(Ali & Ghafel,2022)**.

It's important to commit to maternity competency standards to guarantee safe maternity care and improve treatment quality. The World Health Organization (WHO) most current statistics included in its annual report show that maternal mortality has decreased internationally by 56% since 2010. The information, skills, and decision necessary for ethical and safe nursing practices are referred to as competencies. Competencies are behavioral activities rather than tasks. If a nurse is proficient in all aspects that concern her, then she is said to be competent, according to a criterion that has been decided to be suitable for the purpose of evaluating the nursing level **(Jejaw & Melak, 2023).**

Significance of the study:

The most common cause of death in malpractices is the primary postpartum hemorrhage, indicating that further improvement of healthcare providers education and competencies is necessary to increase the quality of maternity care in Egypt. **(Ghaleb et al., 2021).**

Women experiencing PPH each year are about14 million, causing around 70,000 maternal deaths globally **(World Health Organization, 2022).** An estimated 140,000 women die each year in developing nations. or every 4 minutes one maternal death occurs due to PPH. **(Menezes et al, 2021).**

In Egypt, PPH remains one of the chief causes responsible for maternal morbidity and deaths. It's responsible for about 19.7% of maternal deaths **(Onambele et al., 2022).**

So as to control blood loss and lessen the danger of maternal complications or even death, a nurse's quick thinking and skillful action based on guidelines and competencies will be essential. Nurses are fundamental in preventing, controlling of PPH and enhance treatment quality. When blood loss occurs, they might be the first and the only qualified person on the area **(Koyuncu, et al., 2023).**

Optimum level of nursing competency is imperative for patient safety and quality of care (**Kalsoom et al, 2023)**. In other words, lack of competency among nurses may end with inappropriate patient care, low self-efficacy and threatened patients' safety. **(Gaalan et al, 2019).**

Aim of the study:

The present study aimed to evaluate the effect of educational guidelines on maternity nurses' competencies regarding prevention and controlling of primary postpartum hemorrhage

Research Hypothesis

H1. Maternity nurses will have satisfactory knowledge regarding prevention of PPPH post-educational intervention compared to pre-intervention.

H2. Maternity nurses will have competent practices regarding prevention of PPPH post-educational intervention compared to pre-intervention.

Subject and Methods:

Research Design: The current study utilized a quasi-experimental research design to achieve its goals, with one group undergoing pre- and post-tests.

Research Setting:

The study was conducted at Minia university Hospital for Maternity and Child in the labor and postpartum departments. This facility is recognized as an essential healthcare facility in Upper Egypt's northern

region. And it is staffed by physicians, highly skilled nurses, and technical nursing staff. Their primary goal is to deliver complimentary healthcare services to women throughout the stages of adolescence, reproductive age, and the menopausal and post-menopausal periods.

Sample: Convenient sampling was used in this study.

Sample size:

The sample consisted of 50 maternity nurses, 35 in the labor unit and 15 in the postpartum department, who offer direct nursing care to women during labor and the immediate postpartum period. The nurses' qualifications, ages, and levels of experience differed. They focused on managing and preventing primary postpartum hemorrhage in the aforementioned setting.

Tools for collecting data

In order to complete this study, data was collected using four tools, which included :

Tool I: A structured self-administered questionnaire that includes questions about the sociodemographic traits of nurses, including age, education, marital status, years of experience, jop position, and area of residence, as well as whether or not they have previously attended training sessions on the prevention of primary postpartum hemorrhage**.**

Tool II: A knowledge questionnaire created to assess nurses' comprehension of primary postpartum hemorrhage prevention and managment**.** A total of 25 items were included in the questionnaire, which was developed by the researchers following a review of relevant literature. The questions include: definition, risk factors, causes, signs and symptoms, diagnosis, management and prevention of PPH during ante and intra natal period.

Knowledge scoring system: Questions are scored as follows: A perfect answer receives a score of 1, whereas a wrong response receives a zero. Every aspect's overall score: ≥75% for satisfactory, <75% for unsatisfactory

Tool III: Observational guidelines checklist for Competency Performance: A competency performance checklist adapted from (Mostafa et al, 2024 and Shahin etal, 2021. in English format and the researcher modified it to assess nurses competency performance in prevention and controlling of PPPH and discussed the management of competency in nursing during labor and the primary postpartum period. It was carried out on two occasions, both before and after implementation the competent nursing intervention program by overt observations of nurses providing care for women from the beginning of labor. It included the following items (tasks and instructions for preparation as (checking that all needed equipment and instruments are ready, and in working order, Asks the woman to empty her bladder , Assess vital signs every 15 minutes, check level of consciousness every 15 minutes , check amount, color, odor of blood of vaginal bleeding every 50 minutes, wears protective clothing (gown, mask, gloves, follow medication rights as RT (patient , drug, time , dose , route) , uterotonic drug administration, birth care, uterine massage, placenta examination, genital tract examination, and immediate postpartum care.

Method of scoring the observational check-list:

Continued to give a score of one for steps done compeletely and a score of zero for incomplete steps. Higher scores signified more competent practices those score classified as: A score of 75% or higher signifies competent practices, whereas a score below 75% denotes incompetent practices.

Tool IV: Maternity Nurses Attitude Scale towards Prevention of Primary Postpartum Hemorrhage was created by **Sallam et al 2024,** and then modified by researchers to assess maternity nurses' views on preventing primary postpartum hemorrhage. This scale consists of 8 items and is divided into 3 rating levels: agree = 3, neutral = 2, and disagree = 1. A total attitude score of 8 or higher is regarded as indicative of a positive attitude, while a score below 8 is interpreted as a negative attitude**.**

Validity

To establish validity, the questionnaire was revised by a panel of five expert professors in obstetrics and gynecology who reviewed the instruments for clearance, relevance, completeness, understandability, applicability, and easiness of use.

Reliability:

Reliability was conducted on the study instrument by Cronbach's Alpha reliability analysis. The test indicated that the instrument's internal consistency was sufficient for measuring knowledge reliability was 0.917, attitude reliability was 0.869, and practices reliability was 0.774.

A pilot study

A pilot study was conducted on 10% (5) of maternity nurses at the previous mentioned setting to assess the current study tools for its clarity, validity and time required to be applied. According to the results of the pilot, all required and necessary modifications were be done and the maternity nurses who was tested in the pilot study was included in study sample

Field work:

An official permission was obtained from the research ethical committee of faculty of Nursing-Minia University as well as director of the hospital, participant nurses were recruited from Minia University Maternity and Children's Hospital.

The data collection phase is scheduled to last for six months, starting in the beginig of July 2023 and concluding at the end of December 2023 following

the acquisition of official approval, a pilot test of the study instruments was conducted and subsequently analyzed. The researcher initiated data collection, which was carried out twice a week during both morning and evening shifts.

The educational guidelines translated into Arabic booklet for maternity nurses competencies regarding prevention and controlling of primary post par tum hemorrhage were implemented through **four phases:**

Assessment phase:

After obtaining formal approvals for conducting the research, the researchers greeted, discussed the goal and methodology of the study, and encouraged participation from the maternity nurses. After receiving permission to take part. As a pretest, the researcher gave the maternity nurses four measurement instruments: the sociodemographic features of the study population, a knowledge questionnaire sheet, an Observational checklist for nursing practices to measure competencies and attitudes scale of maternity nurses. Additionally, the researchers observed each nurse individually.

The data collected during this phase served as a baseline for assessing the impact of the educational intervention. The average time required to complete the questionnaire was 20 to 30 minutes. Two to three nurses were assessed each week. The time required to complete the checklist varied depending on the length of the procedure and was completed by the researcher during the morning and afternoon shifts when nurses were on the ward.

Planning phase

The researchers developed instructional guidelines in the form of utilizing the relevant research and the needs identified during the maternity nurses' assessment phase. A self-learning booklet was developed by the researchers, whose contents were assessed before being sent to nurses. The purpose of the booklet was to help nurses enhance their knowledge, practices and attitude regarding primary postpartum hemorrhage prevention through self-learning.

The implementation Phase:

It involves the use of nursing competency intervention, which consists of four sessions:

- Three sessions focus on implementing skills to ensure nurses are proficient in labor and postpartum care to prevent primary postpartum hemorrhage.
- One session covers theory to enhance nurses' understanding of primary postpartum hemorrhage, including its definition, types, causes, risk factors, symptoms, diagnosis, complications, and nursing interventions.

The American Nurses Association's competency performance session, which includes of two phases and addresses the prevention of primary postpartum hemorrhage, was conducted.

phase1: Acquiring Skills Phase: In two separate sessions, the researchers conducted a demonstration of the primary procedures for preventing PPPH. These included the steps that must be followed when labor begins, including getting all the tools and equipment ready, asking the woman to urinate when the second stage begins, Administering the uterotonic once the cervix is fully dilated, wearing protective equipment (masks, gowns, gloves), and giving birth care services like encouraging the woman to wait to push until she feels ready, as well as assisting her into positions she chooses (squatting, semisitting), and allowing her to change positions.

Then, following delivery, the mother is made comfortable by the necessary procedures to prevent postpartum hemorrhage (PPPH), such as basic assessment and uterine message, placental and vaginal tract examination, vital sign measurement, management of episiotomy wounds, Assess and calculate the vaginal lochia, provide the woman with self-care advice, and give her encouragement. starting to breastfeed, creating an intake and output chart, and examining hypovolemic shock symptoms and indicators. These processes were all carried out via PowerPoint presentations, role plays, and the use of anatomic models.

Phase II: Competency Skills: This involved three individualized session lasting 45 to 60 minutes each, during which each nurse were given the opportunity to re-demonstrate the main PPPH prevention procedures in delivery rooms and post partum department until they were proficient in doing so. The researchers used a learning guide to observe and provide feedback during these sessions.

Phase III: (Evaluation phase):

The researchers administered the post-test (Tools II and IV) immediately after the competency intervention sessions .They also observed the nurses' actual skills (practices) during labor and the early postpartum period while performing two deliveries. The researchers filled out the questionnaires based on their observations, which took approximately thirty minutes for each overt observation (Tools III).

The evaluation phase lasted for eight weeks. To ensure the security and privacy of the information gathered, all observation checklists and questionnaires are locked and secured.

Ethical considerations

- Formal permission and consent were required from the dean of faculty of Nursing and the Director of the Minia University Maternity and Childhood Hospital before conducting the pilot study and main study
- The study protocol had been approved by the Ethics Committee of the faculty of Nursing.
- The maternity nurses who expressed interest in participating in the study provided consent after being informed about the study's nature and purpose.
- Participants retain the right to reject participation or withdraw from the study without providing a justification.
- There is no health hazard.
- All participant data was kept confidential.
- Anonymity is guaranteed by assigning numbers instead of names to nurses.

Results:

Table (1): Distribution of Socio-Demographic Data Concerning Maternity Nurses under Study (n=50)

Sociodemographic characteristics	No.	%
Age		
20-<30	10	20.0
30-<40	20	40.0
40-<50	15	30.0
50+	5	10.0
Mean ±SD 33.9 ±1.1		
Level of Education		
Diploma from nursing school	33	66.0
Technical institute	15	30.0
Bachelor of nursing and post graduate	2	4.0
Marital status		
Married	43	86.0
Single	5	10.0
Widow	1	2.0
Divorced	1	2.0
Residence		
Urban	35	70.0
Rural	15	30.0
Job position		
Head nurse	10	20.0
Staff nurse	40	80.0
Years of experience		
< 5	5	10.0
5 -10	25	50.0
10-15	15	30.0
+15	5	10.0
Previous traning programs on preventing primary postpartum hemorrhage		
Yes	11	22.0
No	39	88.0

SD= Standard Deviation

Table (2): Comparison of Mean Knowledge Levels of the Nurses under Study both before and after a Teaching Intervention (n=50)

Domains	Pre-educational intervention Mean (SD)	Post-educational intervention Mean (SD)	t	P-value
General Knowledge about PPPH	11.34±1.25	18.31±1.14	5.314	0.001**
Management of PPPH	6.37±1.35	10.21±2.31	2.541	0.001**
Prevention of PPPH during antenatal period	3.12±0.25	7.41±1.24	1.124	0.001**
Prevention during intra-natal period	5.12±2.11	10.41±3.11	3.127	0.001**
revention during immediate post-natal period	8.34±1.25	13.11±1.12	4.214	0.001**
Total	**34.29±6.21**	**59.45±8.92**	**11.321**	**0.001****

** *Highly statistically significant difference at P ≤ .001, t = Paired (t) test, SD (Stander Deviation)*

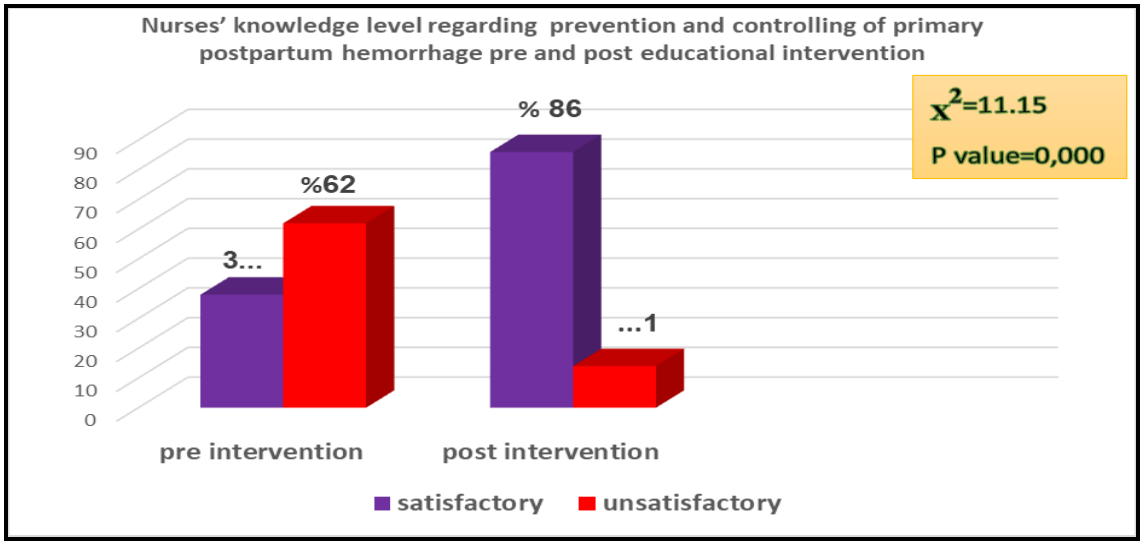

Figure (1): Nurses' knowledge level regarding prevention and controlling of primary postpartum hemorrhage pre and post educational intervention

Table (3): Comparison of Mean Practices Scores of the Studied Nurses before and after Educational Intervention (n=50)

Domains	Pre-educational intervention Mean (SD)	Post-educational intervention Mean (SD)	t	P-value
1. Preparation task and instruction (8 items)	4.14±2.11	8.31±1.14	12.64	0.001**
2. Follow medication rights (5 item)	1.31±1.12	5.21±2.31	12.17	0.001**
3. Administration uterotonic drug (21 item)	2.17±2.33	6.41±1.24	13.25	0.001**
4. Birth care (7 items)	5.12±3.41	9.41±3.11	14.34	0.001**
5. Examination of placental lobes for completeness (20 item)	4.54±1.25	8.11±1.12	16.31	0.001**
6. Examination of genital tract	3.46±1.34	8.61±1.27	12.72	0.001**
7. Fundal assessment and uterine massage after delivery (18 item)	5.34±2.31	9.37±2.17	11.47	0.001**
8. Immediately postpartum care (10 items)	3.49±1.67	6.19±1.61	10.37	0.001**
9. Episiotomy wound care drug (20 item)	2.38±2.31	5.14±2.37	12.18	0.001**
10. Assessing and caring the wound of cesarean section	4.31±1.67	9.31±1.47	11.21	0.001**
11. Check signs and symptoms of hypovolemic shock (8 items)	6.71±2.34	11.15±1.28	9.47	0.001**
Total	**42.97±21.82**	**87.71±19.09**	**22.35**	**0.001****

** *Highly statistically significant difference at P ≤ .001, t = Paired (t) test, SD (Stander Deviation)*

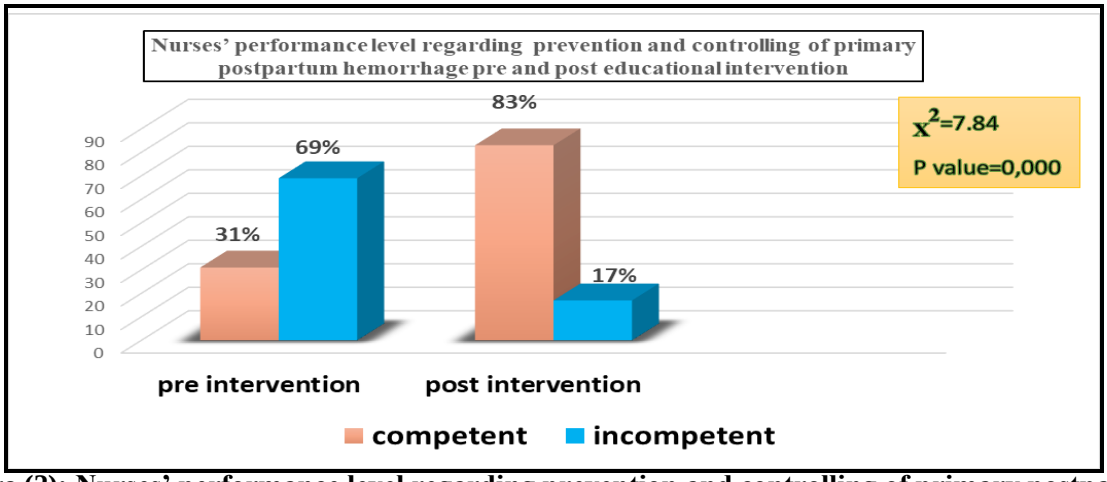

Figure (2): Nurses' performance level regarding prevention and controlling of primary postpartum hemorrhage pre and post educational intervention

Table (4): Comparison of Mean Attitude Scores of the Studied Nurses before and after Educational Intervention (n=50)

Domains	Pre-educational intervention Mean (SD)	Post-educational intervention Mean (SD)	t	P-value
1. Adherence to postpartum management guideline recommendations is important in saving women's lives	4.14±1.42	7.21±1.23	11.18	0.001**
2. Training on primary postpartum hemorrhage prevention and management (PPH) is essential	3.31±1.12	6.13±3.41	9.12	0.001**
3. A nurse should follow obstetric emergency protocols in applying clients' care	5.17±1.11	8.31±1.51	11.14	0.001**
4. One should use the knowledge gained in training programs on the PPH program while providing the care	3.12±2.18	7.72±2.11	8.34	0.001**
5. After attending the training, I can apply the new training guidelines in the working environment	3.54±1.46	7.34±1.35	11.21	0.001**
6. Managing PPH requires team work in the hospital	2.34±1.21	6.16±1.21	7.12	0.001**
7. Managing PPH requires effective communication in the hospital	3.71±2.17	6.24±1.37	10.22	0.001**
8. Most of reasons for maternal mortality are preventable when providing proper health care	4.16±1.34	7.47±2.14	9.17	0.001**
Total	**29.49±12.01**	**56.58±14.33**	22.35	0.001**

*** Highly statistically significant difference at P ≤ .001, t = Paired (t) test, SD (Stander Deviation)*

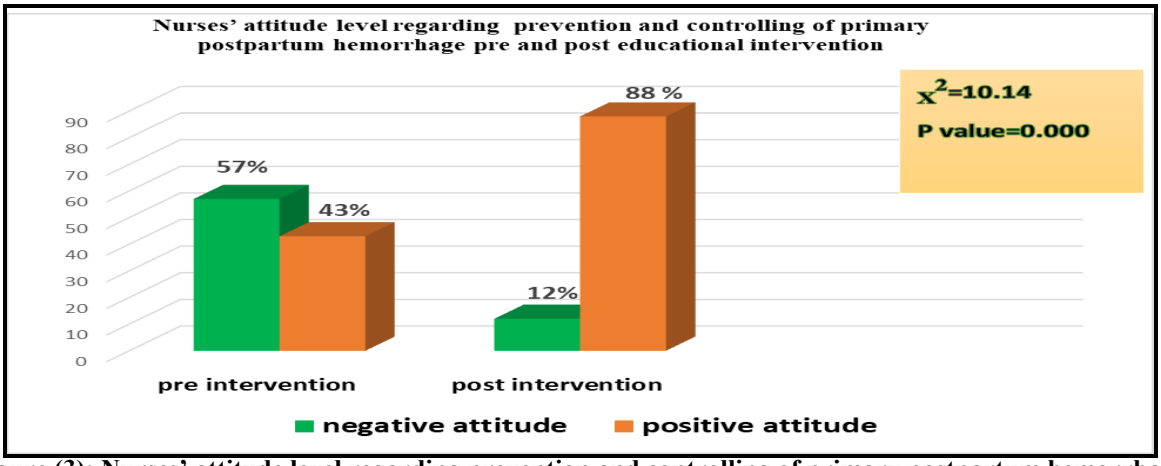

Figure (3): Nurses' attitude level regarding prevention and controlling of primary postpartum hemorrhage pre and post educational intervention

Table (5): Multiple linear Regression Analysis of Predictors Associated with Knowledge, Practices and Attitude about Preventing and Controlling of PPPH after Educational Intervention (n =50)

Variables	Knowledge	Practices	Attitude
Age (>30-40)			
OR	1.914	2.314	1.113
95% CI	0.213, 1.374	1.241, 1.612	1.417, 0.214
X^2 (P-value)	11.32(0.000**)	12.01(0.000**)	8.11(0.000**)
EducationaQualification (Bachelor degree and more)			
OR	2.471	2.781	2.159
95% CI	1.524, 7.521	0.914, 1.571	1.287, 1.917
X2 (P-value)	7.84(0.000**)	11.47(0.000**)	9.271(0.000**)
Years of experience (Between 10 and 15)			
OR	1.648	1.361	1.642
95% CI	2.416, 2.363	1.271, 1.276	2.318, 2.417
X2 (P-value)	11.91(0.000**)	9.31(0.000**)	8.562(0.000**)
Attendance of previous training courses (Yes)			
OR	1.367	2.164	2.317
95% CI	2.852, 1.143	2.024, 2.115	1.926,1.841
X2 (P-value)	12.74(0.000**)	9.24(0.000**)	9.151(0.000**)

*COR, crude odds ratio; CI, confidence interval, ** statistically significant at P – value ≤ .01.*

Table (6): Correlation between the Study Group's Total Knowledge, Practices, and Attitudes toward PPPH Prevention and Control Following an Educational Intervention (n =50)

Items	Knowledge	Practices	Attitude
Knowledge r. value (P. value)	1	0.452 (.00) **	0.212 (0.05) *
Practices r. value (P. value)	0.452 (.00) **	1	0.347 (0.01)*
Attitude r. value (P. value)	0.212 (.05) *	0.347 (0.01)*	1

*** Correlation is significant at the 0.01 level (2- tailed).* ** Correlation is significant at the 0.05 level (2- tailed).*

Table (1): Presents the sociodemographic characteristics of the maternity nurses incorporated into the research. It indicates that the average age of the nurses was 33.9 years with a standard deviation of 1.1. Additionally, 66% of the nurses held nursing school diplomas, 70% came from urban areas, and 86% were married. Furthermore, 80% of the nurses were staff nurses, while 50% had 5-10 years of experience. It was also revealed that 88% of the nurses had not attended past training programs on primary postpartum hemorrhage prevention and control.

Table (2): Clarifies that In comparison to the pre-educational intervention, Following the intervention, every knowledge-related item had a statistically significant improvement (P=0.001*). The mean and standard deviation of the overall knowledge score were unsatisfactory (34.29±6.21) prior to the educational intervention, but they significantly improved (59.45±8.92) following the training session.

Figure (1): Compares the nurses studied based on their knowledge toward preventing and controlling primary postpartum hemorrhage. Before the intervention, 62% of the nurses had unsatisfactory level of knowledge. While, after the intervention, 86% of them had satisfactory level. This improvement was highly statistically significant, with a p-value of 0.00.

Table (3): Illustrates that In comparison to the pre-intervention, all practices –related items showed a statistical improvement after the educational intervention (P=0.001*). Before the educational intervention, the Mean and SD of the total practices score were incompetent (42.97±21.82), but after the training program, they greatly improved (87.71±19.09).

Figure (2): Compares the nurses studied based on their practices toward preventing and controlling primary postpartum hemorrhage. Before the intervention, 69% of the nurses showed incompetence in their practices. While, after the intervention, 83%

showed competence. This improvement was highly statistical significant, with a p-value of 0.00.

Table (4): Indicates that In comparison to the pre-intervention, all attitude -related items showed a statistical improvement after educational intervention (P=0.001*). Before educational intervention, the Mean and SD of the total attitude score were negative (29.49±12.01), but after the training program, they greatly improved (56.58±14.33).s

Figure (3): Compares the nurses studied based on their attitude toward preventing and controlling primary postpartum hemorrhage. Before the intervention, 57% of the nurses had negative attitudes. However, after the intervention, 88% showed positive attitudes. This improvement was highly statistical significant, in which p-value 0.00.

In Table (5): It is show that there were statistical significant associations between the knowledge, attitude, and practices of the studied nurses and certain factors. These factors include the age group (>30-40), educational qualifications (Bachelor's degree and higher), years of experience (10-15 years), and attendance of previous training courses, with highly statistically significant differences, where P-values is 0.000.

Table (6): Demonstrate that the correlation was postive between studied nurses' knowledge and their practices where r_ value was 0.452 with a highly statistically significant differences (P. value < 0.00), also there was a weak positive correlation between studied nurses' knowledge and their attitude where r_ value was 0.212 with a statistically significant differences (P. value < 0.05). Additionally, there was a positive correlation between studied nurses' practices and their attitude where r_ value was 0.374 with a highly statistically significant differences where p_ value was 0.01.

Discussion:

According to the World Health Organization, postpartum hemorrhage (PPH) remains the primary reason of women's mortality in both developed and developing nations. If PPH is not detected promptly, it can be fatal within two hours, even for a healthy woman. (**Onambele et al., 2022 & Hossain et al., 2023).** According to **Mihretie et al. (2023)**, every birth attendant must have the necessary information, practice, attitude & critical thinking to effectively manage the third phase of childbirth and the initial postpartum period.

The current study' findings revealed that, the nurses in the study had a mean age of 33.9 ±1.1 decades , More than half of them held nursing school diplomas and came from urban. Over than three quarter of them were worked as nurses and were married. The half of them got 5-10 decades of work and the majority of the nurses in the hadn't received prior instructions on preventing PPH. **Mahmoud et al. (2024)** confirmed these results in their study the nurses had an average age of 31.2 ± 8.7 years, with over half of them being married and the majority working as staff nurses. Additionally, most of the nurses had not previously attended a workshop on postpartum hemorrhage prevention.

In addition, our finding agree with a study performed by **Mohamed et al (2024)**, It was found that most nurses held a nursing diploma, the majority worked as staff nurses, and most of the nurses in the study had not participated in PPH-related education courses. Also, **Abd-Elgany et al (2019) & Elbadrawy et al, (2022)** , agree with our findings. In contrast to the present results, **Dawood, et al, (2021)** stated that over half of the nurses had graduated from a technical institute of nursing, also, the present study finding come inconsistently with **Nishimwe et al., (2021) & Al-Rabeei et al, (2020).**

The current study concluded that before the program, nearly two third of the study's nurses had insuffient knowledge. While, after the program, the majority of them had satisfactory level of knowledge. This improvement was extremely significantly different relation, with a p-value of 0.00. This finding cleared that nurse's training and education contributes a significant enhancement of the knowledge regarding preventing and controlling primary postpartum hemorrhage. The high degree of compliance that the nurses exhibited to the nursing competency intervention sessions may also be taken into consideration when discussing the results of this study.

The findings of the present study confirmed by the study of **Metwally et al , (2021)** who stated that the majority of nurses having insufficient information about primary PPH prior to the intervention and had been a high positive relation in the nurses' knowledge on preventing primary PPH following implementing the competency nursing intervention. Additionally, this results agree with **Elbadrawy & colleagues (2022)** found that over half of their study' nurses having poor knowledge level about PPH and over than one third of the nurses in the study had an inaccurate and wrong response on how to prevent PPH. Moreover, the finding is supported by **Hashem, El-Kholy & Abo-Hatab, (2022)** who concluded that almost half of the nurses provided inadequate and incorrect answers about preventing postpartum hemorrhage during the antepartum period.

The result of the current study come inconsistently with **Alaswad & Acar Gül. (2024)** who discussed that over fifty percent off the nurses in the study have sufficient knowledge regarding PPH, also, the current study differ from **Musabwasoni et al., (2020)** who

demonstrated that the majority of analyzed nurses possess a moderate understanding of postpartum hemorrhage . Moreover, the result of our study came inconsistently with a study performed by **Mohammad (2020) & Wallen, (2019) & Scholar, (2021).**

Concerning the practices level of studied nurses regarding prevention and controlling of primary PPH prior and following educational intervention, the present study demonstrated that before the intervention, over two thirds of the the study' nurses showed incompetence in their practices. While, after the intervention, the majority of them showed greatly improvement incompetence. This improvement was high statistical association, with a p-value of 0.00. This might be because the training sessions on nursing competency guidelines were successful in improving nurses' ability to prevent and manage primary postpartum hemorrhage. The critical role of distributing Arabic booklets is key to gaining and maintaining knowledge that can improve performance.

The present study finding was agree with the finding of a research performed via **Metwally et al, (2021)** who stated that there was high significantly enhancement in the nurses' performance level about preventing the primary PPH following implementing of the competency nursing intervention. Also, the current study finding was confirmed by **Abdelgadir et al, (2020)** who reported that the majority of nurses had inadequate performance regarding management of PPH and their performance was improved in the after-test compared with before -test. Additionally, our study agree with **Farahat et al, (2023)** they stated that, the performance scores of the study nurses improved in the posttest after the competency training program, in comparison to the prior program, also, this finding come accordance with **Mohamed et al , (2024), Ali & Ghafel (2022), Elbadrawy et al., (2022), Shahin et al., (2021) &Elhabashy & Hafez (2019)**.

In contrast to the current results a study performed by **Alaswad & Acar Gül. (2024)** the study showed that over half of nurses possess accurate nursing skills related to postpartum hemorrhage. Also, our findings disagree with **Chabeli et al, (2024)** who found that nurses were skilled at estimating and documenting blood loss, evaluating the placenta, and monitoring patients' vital signs.

Regarding nurses' attitude toward preventing and controlling primary PPH, our study' findings found that prior to the intervention, over than half of the nurses in the study having unaffordable attitudes. However, after the intervention, the majority of them showed positive attitudes. This improvement was high statistical improvement, with a p-value of 0.00. This could be caused by the effectiveness of the competency program in enhancing the performance and competency levels of nurses. This result confirmed by a study performed by **Farahat et al, (2023)**, the study revealed that most nurses surveyed showed positive attitude levels following the training program, in contrast to nearly two thirds prior to the training intervention.

Also, our findings proved that there were high statistical significant associations among the knowledge, attitude, and performance of the nurses in the study and certain factors. These factors include the age group (>30-40), educational qualifications (Bachelor's degree and higher), years of experience (10-15 years), and attendance of previous training courses (P-values is 0.000). This outcome might be the result of the nurses' greater years of experience, attendance at earlier training sessions, advanced age, and extended exposure to PPH discussions at work, all of which could help them gain more knowledge and improve their performance. This result agree with **Elbadrawy et al., (2022)** who. Illustrated that, a positive statistical relationship was found between the study's nurses' educational level and their overall knowledge level regarding prevention of postpartum hemorrhage. Also, a statistical significantly relationship was discovered among the nurses' total degree of competence in preventing postpartum hemorrhages and the number of years they had experience as maternity nurses. Also, this result confirmed by a study performed via **Metwally et al, (2021)**, showed that, statistically significant correlations existed between nurses' knowledge level on preventing primary PPH, experience years, and previous training, following competency intervention. Additionally, a positive relationship was found between attitude scores of the nurses, practices score and age, and year of work. In the same line, our study agree with **Abd- Elgany et al., (2019)** who cleared that there was positive relationship between the knowledge level and years of work. Also, **Mahmoud et al, (2024),** discovered that there was a statistical significant association between practices of the nurses related to prevention of PPH & educational level. Additionally, **Mohamed et al, (2024)** showed that there was a significant relationship between the nurses' age, attendance of courses, and their total practices level.

The results of the current study also, demonstrated that there was a statistical relationship between knowledge level of the nurses in the study and their practices where r_ value was 0.452 with a high statistical significant differences (P. value < 0.00). This could be due to the more knowledge level of the nurses will enhance their performance , this result supported by a study performed by **Elbadrawy et al,**

(2022) who found that there was positive relation between the overall knowledge and skills of nurses in preventing postpartum hemorrhage. Additionally, this findings agree with a study done by **Ali et al, (2022)** the study illustrated that there was a significant relationship between overall 'knowledge of the nurses about management postpartum and their total performance. Also, **Metwally et al, (2021)** agree with the present study result.

The present study found that was a statistical positive relationship between the nurses' practices and their attitude where r_ value was 0.374 with a high statistical significant relation where p_ value was 0.01. This might be related to nurses' attitudes are mostly influenced by their practices and working with women with PPH more than knowledge. The finding of the present study was confirmed by **Farahat et al, (2023)** who identified a significant statistically relationship between a nurse's overall practices scores and their overall attitude scores .Also, our findings align with **Mohamed et al, (2024)** who found that there was a positive statistical relationship between level of nurses' practices and their attitude. Moreover, **Shahin et al. (2021)** clarified that there was a strong statistical relationship between the nurses' attitude scores and practices scores.

Conclusion

Based on the present study findings, the study concluded that:

The aforementioned results validated and supported the study hypothesis. They also demonstrated a highly significant improvement in the knowledge, attitude, and performance level of maternity nurses with regard to the prevention and control of primary PPH after competency nursing intervention as compared to preintervention.

Recommendations:

In light of the present study findings, the following recommendations are suggested:

- Provide Competency-based standards and guidelines for obstetric nurses in order to improving their the knowledge and practices.
- Conducted Well-planned ducation programs or workshops to enhance the knowledge and practices of competent nurses, which will reflect in improving the quality of health care.
- Encourage nurses to participate in regular training in the form of seminars, lectures and updated nursing assessments related to the prevention and control of PPPH.
- Provide maternity nurses with an instructional booklet on competent nursing practices in the prevention and control of PPPH to enhance their knowledge and practices.
- Revised and updated the basic nursing curriculum based on recent research on the management of PPPH.
- Replication of the research with a bigger group size to additional places.

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