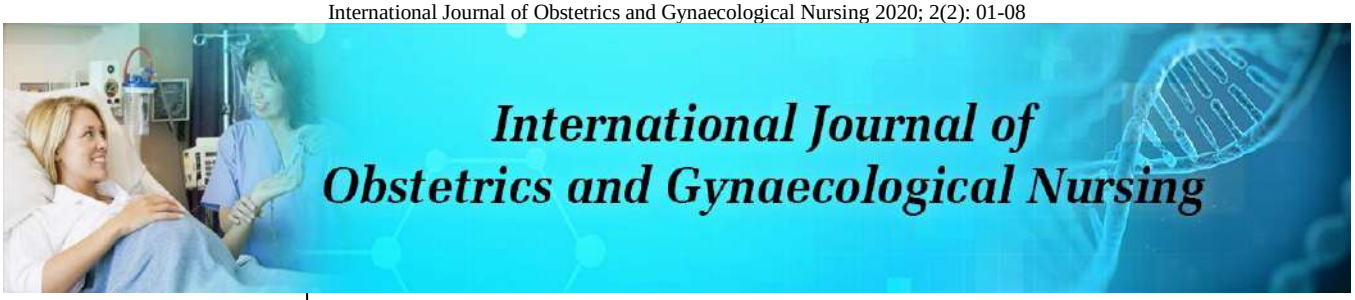

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Effect of teaching program for nurses on preventive and therapeutic measures of postpartum hemorrhage in woman's health hospital at Assiut University

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Abstract
Background: Postpartum hemorrhage is the major cause of maternal morbidity and mortality worldwide with the highest incidence in developing countries.
Aims of the Study: effect of teaching program for nurses on preventive and therapeutic measures of postpartum hemorrhage.
Setting: In woman's health university hospital at Assiut University.
Design: A quasi experimental (pre/post – education program) has been used in this study.
Sample: A convenient sample (100) from woman's health hospital,.
Tools: Self-administrative questionnaire has been used to collect data. (1) socio-demographic characteristics of nurses (2) assessment knowledge of nurses about preventive and therapeutic measures of PPH (pre education) (3) reassess knowledge of nurses about preventive and therapeutic measures of PPH (post educational program).
Results: The findings summarized that one-third of them have excellent knowledge and improved after education to majority of them about 93% have excellent knowledge and less half of them 48% have poor knowledge before education and it improved after educational program implemented to 4%.
Conclusion: Nurses had unsatisfactory knowledge regarding preventive and therapeutic measures of postpartum hemorrhage in the pre-test. The teaching program was successful increasing their knowledge.
Recommendations: This study recommended that make plans for nurses on teaching about management of postpartum hemorrhage on periodic manner for increasing its knowledge and practice.

Keywords: Postpartum Hemorrhage, Knowledge, Maternal Mortality & Morbidity

Introduction
Although maternal mortality rates have been declining at a steady rate in developed countries, postpartum bleeding remains one of the main causes of maternal mortality and morbidity in the United States. Statistics available on the public domain suggest that approximately 8% of maternal deaths in the United States are caused by PPH **(**Bingham, & Jones, 2012) [5]. The direct pregnancy related maternal death rate is approximately 7 to 10 women per 100,000 live births (Callaghan, Kuklina, & Berg, 2010) [6]. Globally, PPH affects approximately 5% of all deliveries and more than 50% of PPH related deaths are preventable (Leduc et al., 2009; WHO, 2012) [15, 22].
Postpartum hemorrhage is classified in to Primary postpartum hemorrhage or true postpartum hemorrhage bleeding that occurs after the expulsion of placenta and within 24 hours. Postpartum hemorrhage PHH can be minor (500-1000ml) or major (more than 1000ml). Major could be divided into moderate (1000-2000ml) or sever (more than 2000ml). Secondary postpartum hemorrhage PHH is defined as Abnormal or excessive bleeding from the birth canal between 24 hours up to six weeks postnatal. This also termed as late puerperal hemorrhage (Duha DC, 2011) [8].
postpartum hemorrhage (PPH) is also defined as primary or secondary: primary PPH occurs within 24 hours after delivery (also called early PPH) and secondary PPH occurs 24 hours to 12 weeks after delivery (also called late PPH) (Lockwood, et.al, 2011) [16].
The estimated rate is that the total number of maternal death worldwide due to postpartum hemorrhage is over 3 million and that sever blood loss, infection, hypertension, complication of pregnancy and unsafe abortion account for 75% of such deaths. Postpartum hemorrhage PHH is the main cause of maternal death in Africa (33.9 %) and Asia (30.8%) and second

cause in Latin America and in Carbbean (20<8%) globally 35% of maternal deaths are associated with PHH. (Who, 2015) [20]

The estimated mortality rate from bleeding in developed countries is below 13.4% However studies have shown the trend of increase incidence of postpartum hemorrhage as causes incidence of postpartum hemorrhage as cause of sever maternal morbidity (near miss) in developed countries such as Australia, Canada, United Kingdom and United State (Souza, 2016) [19].

In Egypt maternal mortality ratio (MMR) reached to 53 deaths per 100.000 live birth in 2003 but gradually decline to be 43.5 per 100.000 live birth in 2015 (Unicef, Who, the world bank and the united nations population division 2013).

According to Millennium Development Goals, 2015, Some Egyptian Governorates have high rates of MMR, that is 60-65 deaths Per 100000 live births in Assiut, Gharbia, Beni Sweif, Qena, and Sohag, whereas others have low rates of MMR 24-37 deaths per 100000 live births in the New Vally, Ismailia, Suez, and Port Said (Balchandani and Rai, 2017)

However 20% of postpartum hemorrhage occurs in woman with no risk factors, so health team must be prepared to manage these condition at every delivery, Different etiologies may have common risk factors, and this is especially true of uterine atony and trauma of the lower genital tract. PPH usually has a single cause, but more than one cause is also possible, most likely following a prolonged labor that ultimately ends in an operative vaginal birth (Sentilhes *et al.*, 2016) [18].

Follow-up of postpartum hemorrhage includes monitoring for ongoing blood loss and vital signs, assessing for signs of anemia (fatigue, shortness of breath, chest pain, or lactation problems), and debriefing with patients and staff. Many patients experience acute and posttraumatic stress disorders after a traumatic delivery. Individual, trauma-focused cognitive behavior therapy can be offered to reduce acute traumatic stress symptoms. (Evensen, 2014) [9].

The most effective strategy to prevent postpartum hemorrhage is active management of the third stage of labor (AMTSL). AMTSL also reduces the risk of a postpartum maternal hemoglobin level lower than 9 g per dL (90 g per L) and the need for manual removal of the placenta. (Begley, 2015) [3] Components of this practice include: (1) administering oxytocin (Pitocin) with or soon after the delivery of the anterior shoulder; (2) controlled cord traction (Brandt-Andrews maneuver) to deliver the placenta; and (3) uterine massage after delivery of the placenta. Placental delivery can be achieved using the Brandt-Andrews maneuver, in which firm traction on the umbilical cord is applied with one hand while the other applies suprapubic counterpressure 15 (Figure 1).

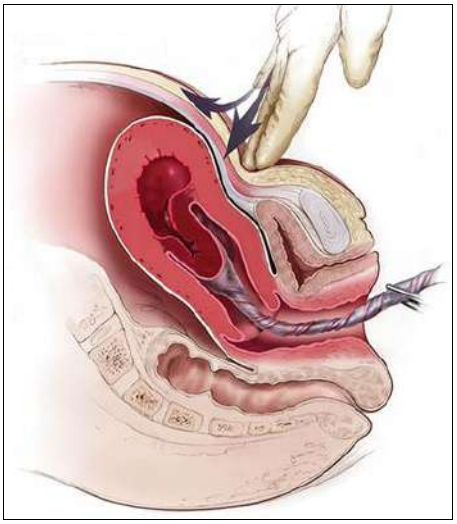

Fig 1: Brandt-Andrews maneuver for controlled cord traction. Firm traction is applied to the umbilical cord with one hand while the other hand applies suprapubic counterpressure. Reprinted with permission from Anderson JM, Etches D. Prevention and management of postpartum hemorrhage. Am Fam Physician. 2007; 75(6):880.

Subjects and Method

Research design

A quasi experimental (pre/post – educational program) design has been used in this study.

Setting

This study has been conducted at Women's Health Hospital which include Reception of women, Inpatient units and Monitoring and emergency department in hospital university.

Subjects

The subjects of this study includes 100 nurses who works at Reception of women (14 nurses), Inpatient units (27) and Monitoring and emergency (59) of Women's Health Hospital at Assiut University.

Sample

A convenience sample was used in this research.

Tools of data collection

The following tools were developed and used by the researchers for data collection.

Tools I: Self administrative Questionnaire

This self administered questionnaire was developed by the researchers after reviewing of literature. This tool was divided into three main parts.

Part (1): Nurse's Socio-demographic characteristics:

Such as age, education, years of experience,qualifications, working department and previous training.

Part (2): this part included correct or incorrect & multiple choice Questions to assess the nurses "Knowledge about postpartum hemorrhage". As (definition, types, high risk group, signs, and symptoms, nursing care (Before-During and after) of postpartum hemorrhage. (Before and after program)

Methods

This teaching program was conducted on 3 phases.
Phase I: (preparation phase):

Ethical consideration

- Written consent was taken from director of the place and oral consent was taken from all members of study participants. The purpose and nature of the study was explained for the directors and every interviewed member. Members have the right to participate or refuse participation in the study. The information that obtained is confidential and used only for the purpose of the study.
- The content validity was reviewed by expertise opinion in obstetric & Gynecological nursing field.
- Pilot study: A pilot study was carried out before starting data collection in 10 % from nurses (10 of them) included in main study to test clarity and applicability of included question and statement, content, feasibility and consistency of the tool to detect any ambiguity of this study tools. The pilot study has also served to estimate the time required to fill the form. It was included in the sample.

Phase II: (implementation phase)

- The process of data collection and implementation of teaching program consumed 3 months in period from October to December 2019.
- The researcher introduce herself to nurses and explained the purpose and importance of study. Hence, the approval for participation was secured from each nurse.
- Questionnaire was given to every nurse to fill in before educational program implementation (pre-test) to assess the theoretical knowledge needs and collected by the researcher. The time for completion of questioner sheet was ranged from 20-30 minutes.
- Based on this result of this questionnaire the investigator was determined the educational program content that was given to them.
- Theoretical content were given to nurses on the form session for 30 minutes according to their needs.
- The session time is spent in conference room in hospital departments that previously mentioned.
- The program was conducted over three sessions 2 times per week to cover all information related to postpartum hemorrhage. Session were arranged to take place while nurses working during morning shift would be available, in an attempt to maximize attendance.

Statistical analysis

Data entry and data analysis were done using SPSS version (23) "Statistical Package for social science". Data were presented as number, percentage, mean, standard deviations, Ch-Square test were used to compare qualitative variables. Independent samples T-test was used to compare quantitate variables between groups and ANOVA test was used for more than two groups. Paired samples T-test were done to compare quantitive data between pre test and post test, P-value is considered statistically significant when $P<0.05$

Scoring System

Using scoring system in the knowledge a correct response was score one grade and for uncorrected response.
-Poor <50 % -Good 50-70 % -Excellent >70 %

Results

Table 1: Distribution of studied nurses according to demographic and work data

Variable	No.	%
1- Age "years"		
• <30years	68	68.0
• 30-40years	29	29.0
• >40years	3	3.0
Qualification		
• Nursing's Institute or secondary school	85	85.0
• Bachelor of nursing	11	11.0
• Master in nursing	4	4.0
2- Department:		
• Reception of women	14	14.0
• Inpatient units	27	27.0
• Monitoring and emergency	59	59.0
3- Experience		
• <2years	15	15.0
• 2-5years	14	14.0
• 5-10years	20	20.0
• ≥10years	51	51.0
4- Previous Training:		
• Yes	89	89.0
• No	11	11.0
Total	100	100.0

Table 2: Distribution of studied nurses according to knowledge about PPH (ended questions) in pre and posttest:

Variable	Pre education		Post education		P-value
	No.	%	No.	%	
1- PPH main causes of death in mother					
• Correct answer	52	52.0	98	98.0	0.001**
• Incorrect answer	48	48.0	2	2.0	
2- PPH primary &secondary start after 48 hours post delivery					
• Correct answer	48	48.0	99	9.0	0.001**
• Incorrect answer	52	52.0	1	1.0	
3- Trauma: Injury to the birth canal					
• Correct answer	45	45.0	97	97.0	0.001**
• Incorrect answer	55	55.0	3	3.0	
4- Emptying the bladder at the third stage of birth helps to prevent the occurrence of PPH					

• Correct answer • Incorrect answer	38 62	38.0 62.0	96 4	96.0 4.0	0.001**
5- Misoprostol help to prevent PPH • Correct answer • Incorrect answer	49 51	49.0 51.0	99 1	99.0 1.0	0.001**
6- Fundus pressure to help in delivery • Correct answer • Incorrect answer	33 67	33.0 67.0	100 0	100.0 0.0	0.001**
7- shivering as a side effect of misoprostol • Correct answer • Incorrect answer	37 63	37.0 63.0	93 7	93.0 7.0	0.001**
8- Make massage after delivery of placenta prevent PPH • Correct answer • Incorrect answer	62 38	62.0 38.0	100 0	100.0 0.0	0.001**
9- Early breast feeding prevent PPH • Correct answer • Incorrect answer	54 46	54.0 46.0	98 2	98.0 2.0	0.001**
Total	100	100.0	100	100.0	

Mc Nemar test used for pair qualitative variables
(**) highly statistically significant p < 0.01

Table 3: Distribution of studied nurses according to knowledge about PPH (opened questions) in pre and posttest:

Variable	Pre education		Post education		P-value
	No.	%	No.	%	
1-Definition of PPH • Correct answer • Incorrect answer • Don't know	 22 25 53	 22.0 25.0 53.0	 87 10 3	 87.0 10.0 3.0	0.001**
2-Definition of WHO about PPH • Correct answer • Incorrect answer • Don't know	 19 36 45	 19.0 36.0 45.0	 85 8 7	 85.0 8.0 7.0	0.001**
3-Types of PPH • Correct answer • Incorrect answer • Don't know	 42 45 13	 42.0 45.0 13.0	 96 2 2	 96.0 2.0 2.0	0.001**
4-Causes of PPH • Correct answer • Incorrect answer • Don't know	 33 41 26	 33.0 41.0 26.0	 88 7 5	 88.0 7.0 5.0	0.001**
5- Signs& symptoms of PPH • Correct answer • Incorrect answer • Don't know	 48 35 17	 48.0 35.0 17.0	 93 4 3	 93.0 4.0 3.0	0.001**
6- Dose of Misoprostol • Correct answer • Incorrect answer • Don't know	 40 45 15	 40.0 45.0 15.0	 92 6 2	 92.0 6.0 2.0	0.001**
7-Route of Misoprostol • Correct answer • Incorrect answer • Don't know	 75 16 9	 75.0 16.0 9.0	 100 0 0	 100.0 0.0 0.0	0.006**
8-Prevention of PPH. • Correct answer • Incorrect answer • Don't know	 55 33 12	 55.0 33.0 12.0	 100 0 0	 100.0 0.0 0.0	0.001**
Total	100	100.0	100	100.0	

Mc Nemar test used for pair qualitative variables
(**) highly statistically significant p < 0.01

Table 4: Distribution of studied nurses according to total knowledge about PPH (ended and opened questions) in pre and posttest:

Total knowledge	Pre education		Post education		P-value
	No.	%	No.	%	
• Excellent “>70” • Good”50-70” • Poor “<50”	33 19 48	33.0 19.0 48.0	93 3 4	93.0 3.0 4.0	 0.001**
Total	100	100.0	100	100.0	

(**) highly statistically significant p < 0.01

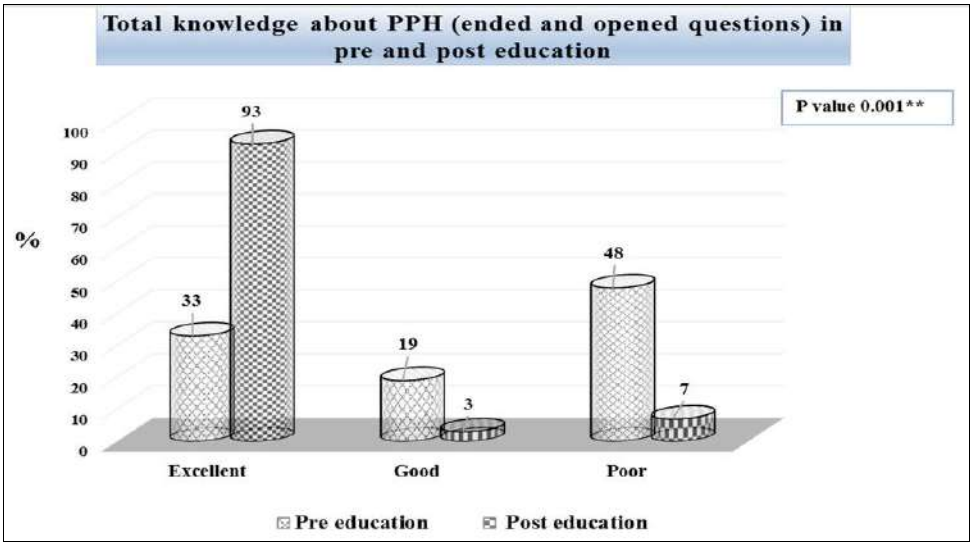

Fig 1: Total knowledge about PPH (ended and opened questions) in pre and posttest.

Table 5: Relation between total knowledge about PPH & nurses' qualification in pre and posttest

Item	Nurses' qualification						P-value
	Nursing's Institute or secondary school		Bachelor of nursing		Master in nursing		
	N	%	N	%	N	%	
Total knowledge in pretest							
• Excellent	26	30.6	7	63.6	2	50.0	0.051*
• Good	17	20.0	4	36.4	2	50.0	
• Poor	42	49.4	0	0.0	0	0.0	
Total	85	100.0	11	100.0	4	100.0	
Total knowledge in posttest							
• Excellent	78	91.8	11	100.0	4	100.0	0.001**
• Good	3	3.5	0	0.0	0	0.0	
• Poor	4	4.7	0	0.0	0	0.0	
Total	85	100.0	11	100.0	4	100.0	

(*) statistically significant p < 0.05
(**) highly statistically significant p < 0.01

Table 6: Relation between total knowledge about PPH years of experience in pre and posttest:

Item	Years of experience in obstetrics and gynecology								
	Less than 2 yrs		2-less than 5 yrs		5-10 years		More than 10 years		
	N	%	N	%	N	%	N	%	
Total knowledge in pretest									
• Excellent	4	26.7	5	35.7	9	45.0	15	29.4	
• Good	0	0.0	8	57.2	3	15.0	8	15.7	0.001**
• Poor	11	73.3	1	7.1	8	40.0	28	54.9	
Total	15	100.0	14	100.0	20	100.0	51	100.0	
Total knowledge in posttest									
• Excellent	15	100.0	14	100.0	18	90.0	46	90.2	
• Good	0	0.0	0	0.0	0	0.0	3	5.9	0.417
• Poor	0	0.0	0	0.0	2	10.0	2	3.9	
Total	15	100.0	14	100.0	20	100.0	51	100.0	

(**) highly statistically significant p < 0.01
Table (6) This table summarize that there significant difference between total knowledge about PPHand yrars of experiences according to excellent knowledge pre and post test (45%-90% respectively)

Table 7: Relation between total knowledge about PPH place of work in pre and posttest:

Item	Place of work						
	Reception of women		Inpatient units		Monitoring and emergency		
	N	%	N	%	N	%	
Total knowledge in pretest							
• Excellent	6	42.8	9	33.3	18	30.5	
• Good	4	28.6	3	11.1	12	20.3	0.466
• Poor	4	28.6	15	55.6	29	49.2	
Total	14	100.0	27	100.0	59	100.0	
Total knowledge in posttest							
• Excellent	12	85.7	27	100.0	54	51.6	0.039*

• Good	2	14.3	0	0.0	1	1.6	
• Poor	0	0.0	0	0.0	4	6.8	
Total	14	100.0	27	100.0	59	100.0	

(*) statistically significant $p < 0.05$
(**) highly statistically significant $p < 0.01$

Table (1)This table show that the demographic data of nurses involved in this study the most of them (68%) were age less than 20 years and less of one-third (29%) their age 30-40 years, according to qualification the majority of them (85%) have Nursing's Institute or secondary school, according to years of experience, more than half of them(51%) have experience for more than 10 years and majority of them (89%) have previous training.

Table (2) This table show that knowledge of nurses about PPH (ended questions) in pre and posttest: according to causes of PPH,more than half of them (51%) give correct answer, in pre education but in post education increase to (98%),according to Fundus pressure to help in delivery about (33%-100% Respectively) pre education and post education, so highly significant between them.

Table (3): this table show that knowledge of nurses about PPH (opened questions) in pre and posttest as definition of post-partum hemorrhage was (53%-3% respectively) answered don't know.

According to prevention of PPH (55%-100% respectively) answered correct answer, so there were significant Table (4): this table show distribution of nurses according to total knowledge about PPH in pre and posttest, as excellent knowledge (33%-93% Respectively) and who have poor knowledge were (48% - 45% respectively),so there highly statistically significant $p>0.001$ Table (5): This table show that relation between total knowledge about PPH &nurse's qualification in pre and posttest, (63.6% &50% respectively)who have Bachelor of nursing and master in nursing have excellent knowledge, according to post test, as to excellent knowledge was (91%-100% respectively) who have Bachelor of nursing and master in nursing, so there was significant differences between them.

Table (6): This table summarize that there significant difference between total knowledge about PPH and years of experiences according to excellent knowledge pre and posttest (45%-90% respectively).

Table (7): illustrates that There were significance differences between Level of knowledge and place of work, according to monitoring and emergency place the women have excellent knowledge in pre and post education (30.5% &51.6% respectively).

Discussion

Postpartum hemorrhage is one of the leading causes of maternal death worldwide; it occurs in about 10.5% of births and accounts for over 130 000 maternal deaths annually. Active management of the third stage of labor is highly effective at preventing postpartum hemorrhage among facility-based deliveries and Misoprostol is less effective for treatment of postpartum hemorrhage than oxytocin and has more side effects (Belladetal., 2012; Bulletin & WHO, 2009; Sheldonetal., 2012) [20].

The nurse plays an important role in monitoring the woman's status, assisting with measures to control bleeding, providing support to woman and woman's family, and education the woman about condition. Maintaining the woman's safety is paramount. The nurse be aware of the woman's history, labor progress, and risk factors for postpartum hemorrhage. Note the use of any analgesia or anesthesia during labor and delivery or the use of oxytocin for labor induction or augmentation. This information helps identify potential factors that would place the woman at risk for hemorrhage (Hatfield, 2014) [11].

In the United State (US) PPH has continued to be one of the most common causes of maternal death, with research supporting that more than half of those deaths could have been prevented (Berg, *et al.*, 2010) [4].

Therefore, this study was undertaken to provide nurses with the knowledge, and skills necessary for caring women who complain from postpartum hemorrhage.

The present study included more than half of nurses 68% there age less than 30 years and it was found that majority (85%) had Nursing's Institute or secondary school and minority of them (4%) had master education.

These results are similar to the study of (BB Mohamed Elfrok, 2015) [17] at Omdurman Maternity Hospital and Ribat University Hospital, and they were assessed for their knowledge towards postpartum hemorrhage in the aspect of management and prevention. Demographic characteristic of participants have shown that, the most common age group was forty seven to fifty five years followed by twenty to twenty eight years, and their education indicated that, they were mostly secondary school graduates or intermediate school graduates and Bachelor degree holders represented more than fifth of study group and Nurse midwives mostly had experience of twenty one years or more, followed by those who had one to ten years.

The present study illustrated that nurses have Nursing's Institute or secondary school about less than one –third (30.6%) pre education and increased to (91.8%) and have excellent knowledge and who had Bachelor of nursing degree 63.6% pre education increased to 100% post education have excellent knowledge about PPH. These agree with (Yakusheva *et al.*, 2014) [23] found that overall nurses had a significant impact on patient outcomes and had an even greater effect if the nurse held a baccalaureate degree and high expertise level. These positive impacts toward patient care were shown to shorten patient length of stays and lower costs.

Regarding the nurses knowledge about the definition of PPH before the training program, it was found that less than one-fifth of them (22%) know the correct answer. This lack of knowledge may be related to their level of education, while the correct answer increased to (87%)after training program this study agree with (A.N. Faiza, 2015) [10]. In which the participants showed poor knowledge towards the definition of postpartum hemorrhage (36.4%) before training program, but they had good about definition of postpartum hemorrhage to (84.5%).

In present study there were highly significance difference between nurses pre and post education who have coorect answer about definition of postpartum haemorrhage according WHO (19%-85% respectively). This agrees with (Kolade *et al.*, 2014) [13] who reported less than half of respondents indicated that, they have management protocol

on PPH this is in agreement with World Health Organization (WHO) guide line for management of PPH which recommend aloose-leaf insert of this are path ways that should be included for use as a wall chart. Every primary health care should have guideline protocol for managing PPH before referral. More than of respondent do not have management protocol for management of PPH at their clinic.

In this study, there were less than of one-half 45% have excellent knowledge about PPH pre educational program and their years of experience 5-10 years and increased to 90% after educational program. This agree with (Asuke *et al.,* 2016) [2] who reported only less than half of rural had good knowledge of referral; there as on may be due to years of working experience and continuous health education on the need for referral less than half of respondents aren't referral patient with PPH. There is an urgent need for training on referral system for combating PPH in primary health in resource limited settings.

In the present study there were significant differences found between level of total knowledge about PPH and nurses qualifications about fivty percent pre education have excellent knowledge and increased to 100 percent after educational program for nurses who have master degree in nursing and there were significant relation between level of knowledge about PPH and years of nurses experiences from 5-10 years of as (45%-90% respectively) pre and post education,so the level of knowledge increased with level of education and years of experience.(place of work) this agree with study assessment of nurses knowledge about preventive and therapeutic measures of post partum haemorrhage (abd-elghany k.l, *et al.,* 2019) [1] that found that nurses in woman,s hospital have higher level of knowledge about management of post partum hemorrhage than mabara hospital and also found that there is significant relationship between the level of knowledge and professional qualification as well as significant relationship between level of knowledge and years of working experience, Thus, as the professional qualification and years of working experience increases, the level of knowledge about PPH increases and vice versa.

Conclusion:

Based on the results of the present study, it can be concluded that level of nurses; s knowledge for caring of postpartum hemorrhage in pretest was poor. The educational program was successful in achieving its goal of increasing and improving their knowledge.

A statistical significant difference was found between the total knowledge score about PPH was excellent more than 70% pre and post educational program.

Based on the results of this research it is recommended that

1. Continuous evaluation and education for nurses is needed to determine and improve any defect related to knowledge.
2. In general more attention toward nursing educational curriculum and implement of an educational program for updating nursing staff knowledge regarding postpartum hemorrhage must be in mind/ curriculum and mass media should make public awareness regarding postpartum hemorrhage.
3. Encouraging nurses to attend continuous nursing education in the form of workshops, conferences, training programs and review update nursing care related to postpartum hemorrhage.
4. Guide posters or pictures about nursing diagnosis and intervention for postpartum hemorrhage management should be available at work departments.
5. Provision of adequate resources and facilities is crucial for improves the services for postpartum hemorrhage.

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