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Nurse-Led Intervention On Management of Postpartum Haemorrhage Among Midwives in Selected Secondary Health Facilities in Ondo State, Nigeria

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Abstract:

Postpartum Haemorrhage (PPH) causes a significant amount of morbidity and mortality among mothers giving birth in sub-Saharan Africa, Nigeria included. One root cause is the insufficient health worker skills to address postpartum haemorrhage. This study therefore was a nurse-led intervention on management of postpartum haemorrhage among midwives in selected secondary health facilities in Ondo State, Nigeria. A quasi-experimental research design pre-test and post-test two groups was used, and a sample size of 83 respondents were selected using simple random sampling technique. A self-designed questionnaire was used for data collection, which was pilot tested through test-re-test and yielded a reliability coefficient (index) of 0.723. Analysis of data was done using descriptive statistics and t-test statistical analysis at 0.05 level of significance. The findings of the study revealed that the skill level of midwives in control and experimental groups on the manual removal of placenta and use of NASG in the management of PPH was poor in the experimental and control groups. Going through the skill mean scores, there was a significant difference between post intervention mean score in the

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experimental group on manual removal of placenta (N = 66, Mean = 21.988, Std. dev. = 1.013) and the control group (N = 17, Mean = 9.621, Std. dev. = 6.429). The skill mean scores on use of NASG revealed a significant difference between post intervention mean score in the experimental group (N = 66, Mean = 16.921, Std. dev. = 2.523) and the control group (N = 17, Mean = 8.809, Std. dev. = 3.100). In conclusion the intervention study and the training programme had empowered the midwives to acquire more skills of the use of NASG and manual removal of placenta. Therefore, it is recommended that an annual education and training update manual removal of placenta as a measure of controlling postpartum haemorrhage including practical assessment and demonstrate competency.

Keywords: Nurse-led Intervention**,** Midwives, Postpartum Haemorrhage, Skills,

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Introduction

Pregnancy and delivery are supposed to be a safe process when it is well-managed, but a number of times it involves major health risks, even to women with no pre-existing health problem. Thousands of women die all over the world from issues directly associated with pregnancy, delivery and its complications (World Health Organization, 2018). Globally, Post Partum Hemorrhage (PPH) constitutes a public health problem which is the foremost cause of maternal mortality. Women with PPH in developing countries like ours often present in critical condition, when treatment might be insufficient to save lives. Even in situations where proper care and equipment are available, many women and their families experience delays in reaching or receiving services.

The maternal mortality rate in Africa is the highest in the world, and it is estimated at 500 deaths per 100, 000 live births (UNICEF, 2020). Two regions, sub-Saharan Africa and South Asia, account for 86 per cent of maternal deaths worldwide. Sub-Saharan Africans suffer from the highest maternal mortality ratio – 533 maternal deaths per 100,000 live births, or 200,000 maternal deaths a year. This is over two thirds (68 per cent) of all maternal deaths per year worldwide (WHO, 2019; UNICEF, 2020). PPH is a major cause of maternal morbidity and mortality worldwide with the highest incidence in developing countries (Aina, et al, 2020). This menace has been identified as the leading cause of maternal mortality globally and all women who carried pregnancy beyond 20 weeks gestational age are at risk for PPH and its sequelae (WHO, 2019). Postpartum hemorrhage is commonly defined as blood loss exceeding 500 milliliters (mL) following a vaginal birth and 1000 mL following a cesarean section. It is often classified as primary/immediate/early, occurring within 24 hours of birth, or secondary/delayed/late, occurring more than 24 hours post-birth to up to 6 weeks postpartum. PPH may also be described as third or fourth stage complication, depending on whether it occurs before or after delivery of the placenta, respectively (Aina, et al., 2020).

PPH is the excessive loss of blood per vagina after the delivery of the baby and up to forty-two days postpartum. It can either be primary or secondary (WHO, 2018). Primary postpartum haemorrhage is the loss of more than 500ml of blood within the first twenty-four hours of delivery or loss of any amount that is enough to cause hemodynamic instability in the mother or loss of more than 10% of the total blood volume. It is the most common form of post-partum haemorrhage (WHO, 2018). Conventionally, blood loss after delivery is visually estimated with wide variations in accuracy, the birth attendant grossly makes a quantitative estimate; however, the associated amount of loss is often far greater than appreciated by visual estimation alone (Duthie, et al., 2016).

Emerich, et al. (2016) noted that in developing countries like Nigeria, the provision of emergency obstetrical care is not guaranteed in some disadvantaged communities, where there is high rate of patients to midwife ratio, inadequate knowledge and skills in PPH prevention and management, inability of health workers to make timely and appropriate decisions, and delays in referral system and transportation. Also, Ogbeye, et al (2015) in their study found out that there is still an increase in maternal mortality rate in Nigeria because of factors such as delays in receiving prompt management, inadequate supply or lack of many of the new necessary equipment used in managing emergency cases in hospitals such as NASG.

Due to the unavailability of these equipment and other technological instruments in the hospitals, lack of technical know-how and/or underutiliazation of such equipment. This is buttressed by the findings of Aina, et al. (2020) in their study that the utilization of the garment (NASG) for the management of postpartum hemorrhage was very poor among the skilled health attendance probably due to suboptimal knowledge and non- availability of the garment.

It has been observed by the researcher during clinical experience that most patients with PPH are poorly managed because of non-application of NASG due to its non-availability, lack of skill in manually removing the placenta among midwives even though they are skilled attendants. Hence, the study seeks to assess the management of postpartum hemorrhage through the application of Anti-Shock Garment as well as utilization of manual removal of placenta as a measure of controlling postpartum haemorrhage among midwives in selected health facilities in Ondo State. The study specifically examined:

1. the pre intervention skills mean score of midwives in control and experimental groups on the use of NASG in the management of PPH;
2. the pre intervention skills mean score of midwives in control and experimental groups on the manual removal of placenta;
3. difference in the post intervention skills of midwives on the use of NASG in the management of PPH between control and experimental groups; and
4. difference in the post intervention skill mean score of midwives on the manual removal of placenta in the management of PPH between the experimental and control groups.

Research Questions

This study sought answers to the following questions:

1. What is the pre intervention skills mean score of midwives in control and experimental groups on the use of NASG in the management of PPH?
2. What is the pre intervention skills mean score of midwives in control and experimental groups on the manual removal of placenta?

Research Hypotheses

This study attempted to test the following hypotheses.

H_{o1}: There is no significant difference in the post intervention skills of midwives on the use of NASG in the management of PPH between control and experimental groups.

H_{o2}: There is no significant difference in the post intervention skill mean score of midwives on the manual removal of placenta in the management of PPH between the experimental and control groups.

Literature Review

According to World Health Organization (2017), postpartum haemorrhage is defined as a blood loss of 500ml or more within 24 hours after birth. Postpartum haemorrhage is one of the most dangerous situations a midwife can encounter and is very disturbing. The possibility of losing the woman to postpartum haemorrhage depends on the volume of blood

loss, amount of blood loss and also on her health status (Ajenifuja, et al, 2017). WHO (2014) has categorized the skills for preventing and managing of PPH into general and specific. The specific includes; identification of the risk factors to PPH, management of the third stage of labour, massaging the uterus and expelling clots after delivery of the placenta, suturing perineal tears and episiotomies, repair of cervical tears and manual removal of the placenta.

According to the WHO (2019), maternal death or mortality is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. Most of maternal deaths and complications are preventable, treatable, and develop during pregnancy. Other complications may exist before pregnancy but are worsened during pregnancy, especially if they go unnoticed during antenatal care (WHO, 2018). Maternal mortality can be conceptualized as a direct result of obstetrical complication leading to death, or indirectly from a previously existing disease for which pregnancy exacerbates the pathology or contributes to increased severity of illness. Direct causes account for the great majority of maternal deaths in the developing world (Ronsmans & Graham, 2016). About 99% of maternal deaths occur in developing countries, more than half of them in sub-Saharan Africa and one third in Asia. The annual number has decreased 43% from 532 000 to 303 000 between the years of 1990 and 2015 (WHO, 2018). The rates are decreasing, but in Sub-Saharan Africa the rate has not decreased as seen elsewhere (Buchmann, et al, 2016). Sub-Saharan Africa has a total of 201,000 maternal deaths in the year 2015. The difference in maternal mortality ratio (MMR) is more between developing and developed countries. The mortality ratio in 2015 was 239/100,000 in developing countries versus 12/100,000 in developed countries (Alkema, et al., 2016; Buchmann, et al, 2016; WHO, 2018).

The NASG is a first aid device used to stabilize women suffering from postpartum hemorrhage. It is reusable multiple times after sterilization in a diluted bleach solution. The NASG is made of neoprene, with six segments that wrap around a woman´s legs and lower abdomen, and using Velcro to hold it attached. The NASG squeezes blood from lower extremities and centralizes blood circulation to brains, lungs and heart, and can keep these vital organs functioning. It can be worn from 12 to 24 hours, during transport, while getting to other treatments like IV fluids, oxygen, vaginal surgery, and partly opened abdominal surgery. Any trained person has the possibility to put on the NASG, but removing the NASG requires trained medical staff. The NASG is removed once a woman is stabilized in terms of her pulse and blood pressure. Systolic blood pressure, pulse, and bleeding must be monitored during removal. The NASG must be removed one segment at a time and removal takes minimum 1 hour (Maternova, 2016).

The NASG is a lightweight, relatively inexpensive, washable neoprene suit composed of articulated horizontal segments with three segments on each leg, one segment over the pelvis and another, over the abdomen, which includes a foam compression ball, using the three-way elasticity of neoprene and the tight closure of the Velcro (Safe Motherhood, 2017). The garment applies 20–40 mm Hg circumferential counter-pressure to the lower body to reverse hypovolemic shock by shunting blood to the vital core organs. (Onasoga, et al, 2015).

The Non-pneumatic anti-shock garment is first-line intervention for the management and stabilization of PPH patients in hypovolemic shock; its principle or mechanism of action is based on the exertion of a circumferential counter-pressure (20 – 40mmHg) to the lower extremities, which consequently shunts blood flow to the essential organs such as the heart, lungs and brain hence, reversing hypovolemic shock and decrease blood loss (Onasoga, et al., 2015). By a direct compression to the descending aorta, the garment counteracts blood flow from the uterine arteries as well as the vasculature of the mesenteric bed hence; blood loss is reduced (Escobar, et al, 2017). The circumferential pressure (20 – 40mmHg) exerted by the garment at the lower extremities and pelvis, increases perfusion as well as cardiac output via a reduction in the total vascular volume thus, allowing for a systemic blood distribution (Stephen, et al, 2019).

The application of the NASG is capable of reversing the haemorrhagic shock and as well stabilize a patient during delays or transportation; prior to receiving definite care at referral facilities. A comparative study done in Egypt and Nigeria by Sullen Miller and her colleagues show that using the non-pneumatic anti-shock garment (NASG) reduced both blood loss and mortality in postpartum haemorrhage (PPH) patients by 50% (Miller, et al.,2016). The garment was reported to be worn for extensive periods of time (18 – 24 hours averagely) with no adverse effect recorded. Interestingly a woman in Nigeria was reported to have worn the garment for almost 60 hours with no adverse effects (Ojengbede, et al, 2012) however; it was reported that the positive outcome of the garment is not influenced by the duration of wearing the garment (Miller, et al., 2016).

This device/garment comprises of five articulated horizontal segments; three of which fastens firmly around each leg, one segment over the pelvis and another over the abdomen and is applied sequentially from the ankle upward as described by the World Health Organization (WHO, 2018) as follows:

1. Place the NASG under the patient;
2. Close segments one (1) tightly around the ankles;
3. Close segments two (2) tightly around each calf;
4. Close segments three (3) tightly around thigh, leaving the knees free;
5. Close segment four (4) around the pelvis;
6. Close segment five (5) with pressure ball over the umbilicus;

Segments 1, 2, and 3 can be applied by two persons simultaneously but, segments 4 and 5 should be applied by one person. For shorter women, fold segment 1 into segment 2 before starting.

While anyone can be trained to apply the NASG, the NASG should only be removed by a skilled health care provider. Likewise, the NASG should only be removed at the facility level, where the woman's blood pressure and pulse can be closely monitored. Removing the NASG before a woman is stable or removing it in the wrong order can be dangerous for the patient, as she may rapidly revert to profound shock. The NASG should only be removed with the woman's IV line still running, in case her condition deteriorates during removal. NASG removal should begin only when the woman's condition has been stable for two hours. A woman is considered stable if:

1. Bleeding has decreased to < 100 BPM)

2. Pulse is stable (your facility's protocols should specify if there is a specific threshold for pulse, for example pulse < 100 BPM)
3. 3. Systolic blood pressure is stable (your facility's protocols should specify if there is a specific threshold for systolic blood pressure, for example SBP > 100 mmHg or > 90 mmHg)
4. The woman is conscious and aware

The NASG is opened from segment pair 1 up the woman's body to segment 6, starting with the ankles and ending with the abdomen. The leg segments are comprised of segment pairs: segment pair 1 around the ankles, segment pair 2 around the calves and segment pair 3 around the thighs. Each pair must be opened, followed by fifteen minutes of waiting for blood redistribution, before moving upward to open the next segment pair. For example, segment pair 1 must be opened from both ankles, followed by fifteen minutes of waiting, then taking blood pressure and pulse, before moving on to open segment pair 2 from both calves.

STEP 1; Take the woman's pulse and blood pressure immediately before opening the first segment pair. You must do this even if you have been monitoring vital signs. Always wear gloves when removing the NASG, or handling a soiled NASG.

STEP 2; NASG removal always begins with the lowest segment (this is segment pair 1, unless segment pair 2 is placed on the ankles of a short woman).

STEP 3; Wait 15 minutes before opening the next segment pair so that blood can redistribute. When 15 minutes have passed, take the woman's pulse and blood pressure again to make sure that she is still stable. To check that her hemodynamic status has not become unstable we use the "Rule of 20", which means that her pulse has not increased by more than 20 beats per minute and her systolic blood pressure has not decreased by more than 20 mmHg. If pulse and blood pressure remain stable, open the next segment pair (2).

STEP 4; Wait another 15 minutes and recheck the pulse and blood pressure to be sure they have not changed by >20 beats per minute or >20 mmHg before opening the next segment pair (3).

STEP 5 ;Wait another 15 minutes and recheck the pulse and blood pressure to be sure they have not changed by >20 beats per minute of >20 mmHg before opening the next segment (4).

Methodology

A quantitative research, which is quasi-experimental two group (Experimental and Control) pretest and posttest design was used for this study. The target population were midwives working in the Antenatal clinic, Antenatal ward, labor and postnatal wards of the selected secondary health facilities in Ondo State. To obtain the sample size for the study Taro Yamane (1998) formula was applied.

$$n = \frac{N}{1 + N(R)2}$$

The values used are
N= Study population (126),
R= 0.05 (margin of error)
n= sample size?

The computation for this is expressed below.

$$n = \frac{N}{1 + N(R)2}$$

$$n = \frac{126}{1+126\ (0.05)^2}$$

$$n = \frac{126}{1+126(0.0025)}$$

$$n = \frac{126}{1+0.315}$$

$$n = \frac{126}{1.315}$$

n= 95.82

96+ 10% (due to inappropriate filling of questionnaires) =

Therefore, the sample size for this study is 106.

Multi stage sampling procedure was used to select study settings for the study. Ondo state consist of three senatorial districts these are central, southern and northern.

Stage One: Northern Senatorial District was conveniently selected out of the three senatorial districts because a similar study has been done in the southern area.

Stage Two: There are four (Ifon, Owo, Ikare, and Iwaro-Oka) Secondary Health Facilities in this Senatorial district, and all facilities were selected for this study

Stage Three: Midwives working at antenatal clinic, antenatal ward, labour ward, and postnatal wards of Ifon, Owo and Ikare facilities were selected as the experimental group, while Iwaro-Oka facility were selected as the control group to prevent contamination and bias because its farther away.

The rating scale and checklist were used as the measuring instrument. They are standardized and easy for data collection. They were designed bearing in mind the topic of research objectives and research questions, care was taken to ensure that it would provide the data needed in a table form and simple percentage. The rating scale has 9 items on application of NASG use by the midwives and 10 items on removal of NASG. The checklist consists of 26 items of WHO standard checklist for performing manual removal of placenta. The Pathfinder International Teaching package on the use of NASG in the management of postpartum haemorrhage was adapted for training of midwives in the study.

The instruments were given to the test and measurement expert and nurse educators to determine its face and content validity. The comments received were used to modify the final draft of the instruments before it was finally administered. Pre-test of the questionnaire was done with 10% of the respondents which was 20 in a facility that did not participate in the study and not nearer to the study sites. Questionnaires were given to the respondents. The data collected was used to determine the reliability of the instrument using Cronbach Alpha (R) in order to bring out internal consistency and construct validity of the instrument. The collected data were statistically analyzed using SPSS version 23 to get the Cronbach's alpha coefficient as explained below:

Table 1: Sectional Reliability report:

Variables	Coefficients
The use of NASG in the management of PPH	0.707
Checklist for performing manual removal of placenta	0.811
Total	**0.761**

The study was carried out in three phases namely pre-intervention phase, intervention phase and post-intervention phase. Data obtained from the study were analyzed using the statistical package for social sciences (SPSS), version 25. Descriptive statistics such as frequency counts, percentages and mean scores were used to provide answers for the research questions while inferential statistics of student t-test was used to provide answers to the two hypotheses at 0.05 level of significance.

Results

Research Question 1: What is the pre intervention skill level of midwives in control and experimental groups on the use of NASG in the management of PPH?

Table 1: Pre-intervention skill mean score of participants on the use of NASG in the management of PPH in the control and experimental group

The use of NASG in the management of PPH	Category of scores	Pre- intervention			
		Experimental		Control	
		Freq.	Percent (%)	Freq.	Percent (%)
Low	1-6	29	43.9	9	53.0
Average	7-12	27	40.9	5	29.4
High	13-19	10	15.2	3	17.6
Total		66	100.0	17	100.0
Mean		8.955		8.821	
Percentage (%)		47.1		46.4	
Standard dev.		2.633		3.095	
Mean diff.		0.134			
T-value (p)		1.021 (.093)			

Table 1 presents the pre intervention skill level of midwives in control and experimental groups on the use of NASG in the management of PPH. The pre-intervention mean scores of the midwives' skill level on the use of NASG in the management of PPH in the experimental group was 8.955 (47.1%) and 8.821 (46.4%) in the control group. It could be said that the skill level of midwives in control and experimental groups on the use of NASG in the management of PPH was not encouraging. The result further revealed that there is no difference between the pre intervention skill level of midwives in control and experimental groups on the use of NASG in the management of PPH (t-value = 1.021, p = 0.093).

Research Question 2: What is the pre intervention skill level of midwives in control and experimental groups on the manual removal of placenta in the management of PPH?

Table 2: Pre-intervention skill level mean score of participants on the manual removal of placenta in the management of PPH in the control and experimental group

The manual removal of placenta in the management of PPH	Category of scores	Pre- intervention			
		Experimental		Control	
		Freq.	Percent (%)	Freq.	Percent (%)
Low	1-9	42	63.6	13	76.4
Average	10-18	14	21.2	2	11.8
High	19-26	10	15.2	2	11.8
Total		66	100.0	17	100.0
Mean		9.789		9.007	
Percentage (%)		37.7		34.6	
Standard dev.		5.081		4.983	
Mean diff.		0.782			
T-value (p)		1.219 (.227)			

Table 2 presents the pre intervention skill level of midwives in control and experimental groups on the manual removal of placenta in the management of PPH. The pre-intervention mean scores skill level of the participants on the manual removal of placenta in the management of PPH in the experimental group was 9.789 (37.7%) and 9.007 (34.6%) in the control group. It could be said that the skill level of midwives in control and experimental groups on the manual removal of placenta in the management of PPH was poor. The result further revealed that no difference between the pre intervention skill level of midwives in control and experimental groups on the manual removal of placenta in the management of PPH (t-value = 1.219, p = 0.227).

Test of Hypotheses

H_o1: There is no significant difference in the post intervention skill mean score of midwives on the use of NASG in the management of PPH between the experimental and control groups.

Table 3: Independent t-test showing the post intervention skill mean score of midwives on the use of NASG in the management of PPH between the experimental and control groups

		N	Mean	Std. Deviation	Std. Error Mean	Df	T	Mean diff	Sig
Post-test	Exper.	66	16.921	2.523	.747	81	3.696	8.112	.000
	Control	17	8.809	3.100	.697				

Table 3 presents the result of hypothesis three postulated in this study. It is indicated that there is a difference in the post intervention skill mean score of midwives on the use of NASG in the management of PPH between the experimental and control groups (Mean diff. = 8.112, $t_{(81)}$ = 3.696, *p* = .000). Going through the skill mean scores, one can say that there is a

significant difference between post intervention mean score in the experimental group (N = 66, Mean = 16.921, Std. dev. = 2.523) and the control group (N = 17, Mean = 8.809, Std. dev. = 3.100). Based on this, the earlier set hypothesis is rejected. Therefore, the difference observed in the post intervention mean score on the use of NASG in the management of PPH between the experimental and control groups could not have happened by error or chance but due to the intervention the participants in experimental group were exposed to.

H_o2: There is no significant difference in the post intervention skill mean score of midwives on the manual removal of placenta in the management of PPH between the experimental and control groups.

Table 4: Independent t-test showing the difference in the participants' skill level of the manual removal of placenta in the management of PPH between experimental and control groups

		N	Mean	Std. Deviation	Std. Error Mean	Df	T	Mean diff	Sig
Post-test	**Exper.**	66	21.988	5.876	1.013	81	7.780	12.372	.000
	Control	17	9.621	6.429	0.998				

Table 4 presents the result of hypothesis four postulated in this study. It is indicated that there is a difference in the post intervention skill mean score of midwives on the manual removal of placenta in the management of PPH between the experimental and control groups (Mean diff. = 12.372, $t_{(81)}$ = 7.780, p = .000). Going through the skill mean scores, one can say that there is a significant difference between post intervention mean score in the experimental group (N = 66, Mean = 21.988, Std. dev. = 1.013) and the control group (N = 17, Mean = 9.621, Std. dev. = 6.429). Based on this, the earlier set hypothesis is rejected. Therefore, the difference observed in the post intervention mean score on the manual removal of placenta in the management of PPH between the experimental and control groups could not have happened by error or chance but due to the intervention the participants in experimental group were exposed to.

Discussion

The pre intervention skill level of midwives in control and experimental groups on the use of NASG in the management of PPH was not encouraging. The result further revealed no difference between the pre intervention skill level of midwives in control and experimental groups on the use of NASG in the management of PPH. In-service training has long been used to improve health workers' competences with varying degrees of success. More recent advances in educational research have led to the conceptualization of competency-based training supported by simulations to make learning more effective. One of such training is a 1-day competency-based Helping Mothers Survive Bleeding after Birth (HMS BAB) programme using a low-fidelity simulator the Mama Natalie (Al-beity, et al., 2019). Also, results obtained from Stephen, et al. (2019) were lower in a study conducted in Jos, North, Plateau State, Nigeria by Bulndi, et al., (2017), where 80% of registered nurses and registered midwives had high PPH management knowledge levels.

The pre intervention skill level of midwives in control and experimental groups on the manual removal of placenta in the management of PPH was poor. The result further revealed no difference between the pre intervention skill level of midwives in control and experimental groups on the manual removal of placenta in the management of PPH.

The study indicated a difference in the post intervention skill mean score of midwives on the use of NASG in the management of PPH between the experimental and control groups. Therefore, the difference observed in the post intervention mean score on the use of NASG in the management of PPH between the experimental and control groups could not have happened by error or chance but due to the intervention the participants in experimental group were exposed to. Training on practical skills, such as diagnosis and management of PPH and related processes have been found to improve mental preparedness and confidence in the ability of the student to implement the acquired clinical skills effectively (Kolade et al., 2014). In addition, the use of student-centered approaches that allow them to play an active role in their learning has been found to improve their level of knowledge, skills, and self-confidence.

The study also revealed that there is difference in the post intervention skill mean score of midwives on the manual removal of placenta in the management of PPH between the experimental and control groups. Therefore, the difference observed in the post intervention mean score on the manual removal of placenta in the management of PPH between the experimental and control groups could not have happened by error or chance but due to the intervention the participants in experimental group were exposed to. The findings of the quality improvement reinforce that an evidence-based educational module on PPH enhances the ability of midwives to recognize the deteriorating signs of PPH, perform assessments, and manage PPH in a timely manner to prevent/decrease complications. Bedside nurses play a vital role in the management and prevention of PPH. They are typically the first health care providers to arrive at the bedside of the patient in case of an emergency like PPH (Sharma, et al., 2016, Kerr, et al., 2016). Thus, equipping the nurses with knowledge and skills required to make suitable decisions in emergency situations is key to improved patient safety and outcomes.

Conclusion

The training has increased the skills of midwives on the use of NASG and manual removal of placenta was also enhanced. This study concluded that the training programme has empowered the midwives to acquire more skills of the use of NASG and manual removal of placenta.

Recommendations

Based on the findings of this study, the following recommendations are made:

For nurse educators, the continuing education unit of the hospitals should organize:

i. An annual education and training update manual removal of placenta as a measure of controlling postpartum haemorrhage including practical assessment and demonstrate competency.

ii. Greater accuracy in PPH management and other core skills and act as positive role models in the simulated environment.

For qualified nurses:

i. An annual education and training update in PPH management including assessment of the use and application of NASG, as well as the manual removal of placenta as a measure of controlling postpartum haemorrhage.

ii. Act as positive role models for PPH management and other core skills in clinical practice.

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