Effect of Uterine Massage and Active Management during the Third Stage of Labor on Reduction of Postpartum Hemorrhage among High Risk Women.

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Abstract:

Background: *Postpartum hemorrhage (PPH) is the common form of obstetric hemorrhage. It remains one of the leading causes for maternal mortality in national and international areas. The active management must be implemented during the third and early in the fourth stage of labor to decrease the risk for developing PPH.* ***The aim of the study***: *was to evaluate the effect of uterine massage and active management during the third stage of labor on reduction of PPH among high risk women.* ***Subjects & Method: Research design:*** *A Quasi-experimental research design was adopted.* ***Setting:*** *The study was conducted at the delivery, postpartum department and outpatient clinic in Fayoum public hospital, Egypt.* ***Subjects :*** *A purposive sample of 180 women.* ***Tools for data collection:*** *Four tools were used: 1)Women structured interviewing questionnaire, 2) Postpartum assessment questionnaire, 3) Risk factors assessment questionnaire, and 4) Visual estimation of blood loss observation tool.* ***Results:*** *The reported risk factors for PPH included previous history of PPH (58.2%), abnormal uterine involution (29.1%), polyhdrmonis (25.5%), hypertension (25.5%), and multiple gestations (10.9%). There was a statistically significant difference between the study and control group as regards to the vital signs, the amount of blood loss, uterine contractions and involution, and bowel elimination during the posttest. The majority of the intervention group had a normal uterine involution and 47.8% of them discharged at the same day.* ***Conclusion:*** *The women who received the uterine massage and active management were less likely to develop PPH.* ***Recommendations***: *Early detection of high risk mothers for PPH and appropriate nursing care should be implemented. Moreover, implementation of active management during third stage of labor and uterine massage should be offered and recommended in all hospitals to prevent the risk of PPH.*

Key words: *uterine massage, active management, high risk women, Postpartum hemorrhage (PPH).*

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I.   Introduction

Maternal health is one of the major health concerns affecting the pregnancy outcomes worldwide (1). Pregnancy and childbirth have a huge impact on the health of women and their families. Pregnancy-related health outcomes are influenced by a woman's health. The CDC's Division of Reproductive Health supports the programs to improve women health before, during, and after pregnancy and reduce the higher rates of poor outcomes (2).

PPH is the major cause of maternal morbidity and mortality worldwide with the highest incidence in developing countries (3,4). According to WHO (5), obstetric hemorrhage causes 127,000 deaths worldwide and is the leading cause of maternal mortality. Globally, obstetric hemorrhage remains the most significant cause of maternal mortality. It is estimated that, PPH is the most common cause of maternal deaths across the world, responsible for more than 25% of deaths annually and is a significant cause of several maternal morbidities (6).Worldwide, maternal death results from a wide range of direct and indirect causes. The primary causes of maternal morbidity and mortality are hemorrhage, hypertension, infections, and complications from abortion, hypertensive disorders, obstructed labor, and ectopic pregnancy causes mostly due to an interaction between pre-existing medical conditions and pregnancy. The majority of these deaths occurs within few hours of delivery and in most cases is due to PPH (5, 7, 8). It accounts for the majority of the 14 million cases that occur each year.

Primary PPH occurs when a woman loses more than 500 mL of blood in a normal delivery and more than 1000 mL of blood in a cesarean delivery within 24 hours (9) while, the secondary PPH occurs between 24 hours and 6 weeks following the birth (10). A systematic review reported that, the highest rates of PPH in Africa (27.5%), and the lowest in Oceania (7.2%), with an overall rate globally of 10.8%. The rate in both Europe and North America was around 13%. The rate is higher for multiple pregnancies (32.4% compared with 10.6% for singletons), and for first-time mothers (12.9% compared with 10.0% for women in subsequent pregnancies) (11). A secondary PPH occurs in 2 % of postpartum women. The occurrence of secondary PPH is associated with a high maternal morbidity with approximately 85% requiring hospital admission. Approximately 15% of these women will require a blood transfusion and there is a 1% incidence of hysterectomy (10). There are a several causes for occurrence of PPH, and they cause bleeding in different ways (9).

The researchers stated that, the main signs and symptoms of PPH is the heavy vaginal bleeding (Bleeding of more than 500 mL in a normal vaginal delivery and more than 1000 mL in a cesarean birth qualifies for a PPH) tense and rigid uterus (12,13), an increased heart rate, feeling faint upon standing, and an increased breath rate (14). As more blood is lost the women may feel cold, their blood pressure drop, and they may become restless or unconscious (14). The condition can occur up to six weeks following delivery (15).This may also indicate internal bleeding and possible external bleeding (9).

The largest barriers to treating postpartum hemorrhage are symptom recognition, accurate assessment, and timely diagnosis (16,17). Blood loss during childbirth has been and continues to be a significant issue. Because hemorrhage is a significant cause of maternal mortality, methods to accurately measure blood loss and PPH are needed. Visual estimation is still commonly used in daily obstetric practice. Its continued use is likely related to ease of use. At a minimum, replacing specific amounts of blood loss with categories may be more useful as normal blood loss (< 500 mL), more than normal (500–1000 mL), and excessive (> 1000 mL) would be one way to categorize blood loss for use in the clinical setting (17). There is evidence that, obstetric nurses able to estimate blood loss during birth as accurate within 5 mL of a laboratory determination; however, the higher the blood loss, the greater the imprecision of the estimate by under- or overestimating the loss (18).

 PPH can be associated with uterine atony, retained placenta, or lacerations. Uterine atony usually is responsible for the majority (75 %) of PPH (19) while several important risk factors have been identified as; a history of PPH or advanced maternal age, fibroids, hypertensive disorders, obesity, chorioamnionitis, placenta previa, prolonged labor, and macrosomia. Several cases of PPH occur in the absence of recognized risk factors, and the pathophysiology that underlies this obstetric complication remains largely unknown (20, 21, 9). Also, Main et al., (22) stated that, the risk factors for PPH include; the inappropriate management of the third stage of labor, prolonged labor, pre-eclampsia, PPH in previous delivery, multiple gestations, multi parity, pregnancy induced hypertension, abruptio placenta, instrumental delivery, caesarean section, and absence of prenatal care(20). Identification of the risk factors is an important part of the nurse role and can help to prevent PPH. Prevention of PPH should begin in the antenatal period by assessing women's risk factors at every antenatal visit and then, in partnership with the women, planning care that identifies the most appropriate lead health care professional (23). Midwives are central to the effective prevention, recognition, and treatment of PPH. They need to be aware of the risk factors for this condition and take appropriate action when they are identified (24).

Management of PPH should be started during the third stage of labor. It is multifaceted and can involve health care team within the hospital (obstetricians, nurses, anesthesiologists, blood bank personnel, laboratory medicine, surgical subspecialists and interventional radiology). These teams are often required to work together under the conditions of great stress and time pressures. After the removal of the placenta, bleeding may be due to uterine atony. The first maneuver to reduce bleeding is uterine massage, an empty bladder and administration of drugs such as Oxytocin. The approach to treat PPH depends on the cause and whether hemorrhage occurs after vaginal birth or cesarean delivery (25, 26).

A systematic search was conducted by Haimee and his colleagues (27) to identify and analyze nursing practices related to the prevention and control of postpartum hemorrhage. They summarized that, implementation of the active handling of the third stage of the delivery; use of misoprostol; blood loss estimate; nursing training on the handling of postpartum hemorrhage, and use of technology to record data were most effective to reduce PPH(28). Similarly, the active management of the third stage of labor (AMTSL) involves intervention to promote the expulsion of the placenta and the uterine contraction with the intervention or reducing blood loss. It included the use of uterotonic, controlled cord traction and uterine massage, taking into consideration the clinical evidence (29). Other interventions related to prevention of PPH include breastfeeding and early cord clamping time (30). It was beneficial when compared with expectant management, based on the reduction rate of the PPH (28). In a quasi-experimental study (31) AMTSL was associated with more than thirty percent reduction in PPH incidence, reducing the time of the third stage, reducing the additional use of oxytocin (40%) and reducing the need for bimanual compression (40%). Another study (32) reported that, only one third of the nurses indicated the knowledge of uterine massage as a component of active management protocol.

Nurses can play a vital role in prevention and management of PPH. They need to intervene early or during the course of a hemorrhage to help the patient regain her strength and vitality. The data that the nurse would give would be essential in the care of the patient with hemorrhage. The nurse should assess the amount of bleeding, maternal vital signs to establish baseline data, assess for signs of shock and assess the condition of the uterus. Midwife nurses must assess for the risk factors of PPH at the time of delivery and at least once per shift in the postpartum period. They should modify the plan of care based on risk category considered to prevent PPH (33). Added to that, they should save all perineal pads used during bleeding and determine the amount of blood loss. Place the woman in a side lying position to make sure that no blood is pooling underneath her. Assess lochia frequently to determine if the amount discharged is still within the normal limits (9). So, obstetric nurses and community health nurses have an important role in prevention, early detection, and management of PPH. This can be done through accurate assessment, observations, providing nursing interventions and nursing instructions to the mother during the natal and postnatal period to reduce PPH and prevent any complications.

Significance of the study

Maternal mortality ratio was estimated as 216 globally. Every day in 2015, about 830 women died due to complications of pregnancy and child birth (8). Obstetric hemorrhage is the most common serious complication of childbirth and is the most of major source of maternal morbidity and mortality in both developed and underdeveloped countries (2, 28). Egypt has a relatively high maternal mortality ratio of 84 maternal deaths per 100,000 live births (5). But it was reduced to 33 per 100,000 live births (8), about 20% of these maternal deaths due to PPH. In 2013, (Egypt) was allocated of 0.7% of its total budget to treat PPH (34).

The practice of active management of the third stage of labor is an important nursing care for mother and newborn. Nurses can't ignore the importance of the estimation of blood loss after birth in diagnosing, controlling and managing PPH. Currently, very little is known about the actual practices and the vital role of obstetric and community health nurses to prevent development of PPH (35, 36). Also, Eshra and her colleagues (37) stated that, uterine massage during and after placental delivery are effective in reducing blood loss. So, there is a great need for practicing active management and uterine massage to prevent PPH. Therefore, the current study planned to evaluate the effect of uterine massage and active management during the third stage of labor on the reduction of PPH among women at the risk for developing PPH.

Aim of the study:

The aim of the current study was to evaluate the effect of uterine massage and active management during the third stage of labor on reduction of PPH among high risk women.

Research hypothesis:

To achieve the aim of this study, the following research hypotheses were formulated:

1) - The women who will apply the uterine massage and active management during third stage of labor will be less likely to develop primary PPH.
2) - The women who will apply the uterine massage and active management during third stage of labor will have better maternal outcomes during the postpartum period.

Operational definitions:

Uterine massage: In the current study refers to placing a hand on the woman's lower abdomen and stimulating the uterus by repetitive massaging or squeezing movements.

Active management of labor: In the current study refers to administer of a prophylactic uterotonic drug just before, with, or immediately after, the birth of the baby; Early cord clamping and cutting (i.e. prior to, alongside, or immediately after administration of an oxytocic, which is before cord pulsation ceases); and Controlled cord traction to deliver the placenta.

Postpartum hemorrhage: In the current study refers to blood loss exceeding 500 mL following vaginal birth as measured by estimation of blood loss is performed using visual estimation.

II. Subjects and Method

Study setting:

The study was conducted at delivery, postpartum department and outpatient clinic in Fayoum Public Hospital, Egypt. This is affiliated to the Ministry of Health.

Research design:

A Quasi-experimental (nonequivalent control group after only) research design was adopted in this research. One of the groups is the experimental group who will be administered the new treatment, while the other group is the control group who will have the standard treatment. If the two groups can be shown to be relatively equivalent the results of this design are very similar to a true experiment, and the comparison between the groups on the posttest should reflect the effect of the treatment (39).

Study subjects:

A purposive sample of 180 women who are at risk for the occurrence of hemorrhage were recruited in this study according to the following **Inclusion criteria:** women at risk for hemorrhage during pregnancy as; (over distention of the uterus, multiple gestations, polyhydrominas, and large baby) as well as, during labor as; prolonged labor, fundal pressure, and induction of labor), delivered vaginal delivery with or without episiotomy.

The sample consisted of two groups. Group A, (the control group) consisted of 90 women who received the routine hospital care. Group B, (the intervention group) consisted of 90 women who received the uterine massage plus active management during the third stage of labor**.**

The sample size: The sample size was calculated according to the following equation: $n = t^2 \times p (1-p)/m2$
Where
n = required sample size
t = confidence level at 95% (standard value of 1.96)
p = estimated prevalence of high risk women (0.06)
m = margin of error at 5% (standard value of 0.05)
Data was first collected from the control group through a period of three months, followed by three months of data collection for the intervention group. Sequential enrollment was conducted in order to avoid sample contamination.

Tools for data collection:
Tool (1): Women structured interviewing questionnaire: This tool was developed and used by the researchers after extensive literature review and it included two parts:
A. The first part contained questions related to 1) socio-demographic characteristics as; age, educational level, and occupation.
B. **The second part** contained questions related to 2) medical history; and 3) past and present obstetric history.

Tool (II): Postpartum assessment questionnaire: This tool was developed and used by the researchers after extensive literature review and it included two parts:
A. the first part consisted of ten questions related to assessment during the third stage of labor as; maternal pulse, blood pressure, duration of placental delivery, duration of the third stage, perineum intact, mode of present delivery, uterine tone, presence of tear or laceration, presence of placental products, and need to augment during labor.
B. The second part included ten questions related to assessment during the fourth stage of labor as; maternal pulse, blood pressure, uterine tone, lochia characteristics, bowel elimination, urinary function, and baby weight at delivery. Furthermore, it was included questions about maternal outcomes such as vital signs, amount of blood loss, uterine tone, involution of the uterus, voiding, empty of the bladder, and length of hospital stay.

Tool (III): Risk factors assessment questionnaire according to Shields et al., (40)**:** it was included different questions about the risk factors of PPH such as ante partum hemorrhage, poly-hydromnise, multiple gestations, gestational hypertension, coagulation disorders, previous PPH, placental causes, and perineum tear. It was related to the patient's potential risk for obstetric hemorrhage. According to Shields et al., (40) patients were then categorized as low, medium, or high risk. Low risk mothers have included singleton pregnancy, unscarred uterus, no history of PPH, ≤ 4 previous vaginal deliveries, and no history of bleeding disorder. The Medium risk mothers have included the mothers with a history of PPH, previous cesarean delivery or uterine surgery, ≥ 5 previous vaginal deliveries, multiple gestations, large uterine fibroid tumors, chorioamnionitis, and magnesium sulfate use. The High risk mothers were mothers with placenta previa, hematocrit level <30%, bleeding on admission, platelets <100,000/mL, bleeding on admission plus symptoms (heart rate, >110 beats/min, blood pressure, <85/45 mm Hg, shortness of breath, confusion, or agitation), and known coagulation defect.

Tool (IV): Visual estimation of blood loss observation tool: it was developed by **Schorn, (17)**. It was used to assess the amount of blood loss by visual estimation of soaked pads. If the pad soaked about 25 ml it will be mild, about 50 ml it will be moderate, and if the pad soaked 100 ml it will be severe blood loss. The researcher

observes if happened soaked 4 pads by half an hour and vital signs are not stable (bradycardia) it estimates the occurrence of PPH.

Content validity and reliability:

The validity of the tools was ascertained by a group of subject area experts in the field of obstetrics and community health nursing who reviewed the tools for content and internal validity. Moreover, they were asked to judge on the items for completeness and clarity. Suggestions were incorporated into the tools. Test – retest reliability measure for 10 women was applied by the researchers for testing the internal consistency of the tool. It was done through the administration of the same tools to the same participants under similar conditions on two or more occasions. Scores from repeated testing were compared to test reliability.

Pilot study:

Before performing the main study, a pilot study was carried out on a sample of 20 women were included from the postnatal ward. The aim was to test clarity of the instructions, the format of the questionnaire, comprehension of the items, and to estimate the exact time required for filling in the questionnaire sheet. The participants involved in the pilot study were excluded from the main study sample.

Study maneuver:

A written permission from the institutional authority of maternity hospital was obtained before conducting the study. After that, acceptance of the women who were participated in the study was done. Recruitment and follow-up of participants were carried out from July to December, 2016. The researchers attended the postpartum department three days per week starting at 9.00 a.m. to 2.00 p.m. Before conducting the study, permission was obtained from the head of the obstetric department in the previously mentioned setting followed by obtaining written acceptance from the women who agreed to participate in the study.

This study was conducted in three phases; interviewing and assessment phase, implementation phase, and evaluation phase.

Interviewing and assessment phase

Pregnant women who met the inclusion criteria were interviewed in the antenatal clinic before admission to delivery. After explaining the purpose of the study, socio-demographic and obstetrical data were collected utilizing a designed structured interviewing questionnaire. *Assessment*: Baseline assessment was done of pregnant women who met the inclusion criteria included different questions about the risk factors for PPH such as maternal age more than 30 years old, ante partum hemorrhage, poly-hydromnise, multiple gestations, gestational hypertension, coagulation disorders, previous PPH, placental causes, and perineum tear. Assessment consumed about 20-30 minutes for each woman; the women were asked in Arabic language and documented data were collected utilizing risk factors assessment questionnaire.

Implementation phase

The selected women were assigned into two groups equally (90 for each). The first group comprised of 90 women who were the control group and the second group comprised of 90 women who were intervention group based on the sample equation.

Regarding the control group , it is comprised of 90 women who were administered the routine hospital care during the third stage as hospital policy in term of giving oxytocin and early cord clamp.

Regarding the intervention group: this group comprised of 90 women who were implemented with uterine massage and active management during the third stage of labor. It is a multi-disciplinary approach between doctors and obstetric nurses. Active management of labor involve giving a prophylactic uterotonic, early cord clamping and controlled cord traction to deliver the placenta plus apply uterine massage after delivery of the placenta till early fourth stage of labor.

Evaluation phase: the researchers met the postnatal mothers (study & control group) in the outpatient clinic, as policy hospital after one week to assess the progress and recording the results in the follow up sheet.

Administrative and ethical consideration:

An official permission was granted from the director of the previously mentioned hospital. The researchers introduced themselves to the women who met the inclusion criteria and informed them about the purpose of this research to obtain their acceptance to participate in the study. The researchers assured that, the research posed no risk or hazards on them. All women were informed that, participations in the research is

voluntary and any one can withdraw from this research at any time without giving any reason. A written consent of the participant was taken before starting the study. Anonymity and confidentiality were assured.

Statistical analysis:

Data collected were analyzed by computer using the statistical package for social sciences (SPSS) software version 20. Mean and standard deviation, and percentages were used for data summarization. The t-test and Chi square test were used for testing significant differences and relations between variables. Pearson's correlation test was used for testing linear relationship between numeric variables. Significant difference was considered if $p \leq 0.05$.

III. Results

The study sample included 180 adult women who are at risk for the occurrence of hemorrhage. They were conducted at delivery, postpartum department and the outpatient clinic. **Table (1)** demonstrates that, the mean age of the women in the study was 26.9 ± 4.6 years old. Approximately half (50%) of the study group had at least university level of education, while, the remaining subjects (8.9 & 11.1%) were cannot read or write in the study and control group respectively. More than half (54.4 & 53.3%) of the sample were housewife's in the study and control group respectively while the remaining subjects are working during pregnancy. About three-quarters of the study group (74.5%) as compared to 56.7% in the control group had no medical history during pregnancy. About twenty-five percent as compared to nearly twenty (18.9%) in the study and control group respectively had no family history. While more than one-third (38.9%) in the study group as compared to 32.2% in the control group suffered from family history of diabetes.

Table (2) reveals that, more than half (52.2% & 55.6%) of the sample were multigravida in the study and control group respectively. Besides, it was observed that, there was a statistically significant difference between the study and control group (p<0.005) regarding some risk factors for developing PPH as polyhdromnise and macrocosmic baby.

Figure (1) summarizes that, 23.3% of the studied sample had a low risk for PPH and 28.9% of them had a medium risk. Furthermore, 47.8% of the participants had a high risk for PPH. As regards to figure (2), it shows that, there was different risk factors that might affect blood loss (500 ml and more) as; polyhdrmonis (25.5%), multiple gestation (10.9%), abnormal uterine involution (29.1%), previous history of PPH (58.2%), and hypertension (25.5%).

Table (3) illustrates that, women who received the interventions had statistical significance differences regarding their vital signs and amount of blood loss after one hour, two hours, and after one week from delivery.

Table (4) shows that, the highest percentage (75.6%) of the study group had contracted uterus after delivery as compared to 51.1% in the control group with statistically significant differences between the groups. Similarly, based on the statistical analysis of maternal outcomes after implementation of the interventions, there was a significant difference in both groups regarding normal involution of the uterus after deliver and normal voiding (figure 2).

Figure (3) clarifies the data regarding maternal outcomes for the intervention group. It demonstrates that, 85.6% of the intervention group develops a normal uterine involution and 75.6% of them had a contracted uterus after delivery. In addition, about half of them (47.8%) discharged at the same day.

IV. Discussion

PPH is one of the leading causes of maternal morbidity and mortality. The majority of these deaths occur within hours of delivery due to complications during the third stage of labor (41).The aim of the current study was to evaluate the effect of uterine massage and active management during the third stage of labor on reduction of PPH among high risk women. Therefore, the findings of the current research supported the first hypothesis that, the women who will receive the uterine massage and active management during third stage of labor will be less likely to develop primary PPH. Similarly, support the second hypothesis that the women who will receive the uterine massage and active management during third stage of labor will have better maternal outcomes during the postpartum period.

The discussion of this current study included two folds: (1) description of the study sample, risk factors for PPH; and (2) research hypothesis.

(1) Description of the study sample:
Regarding to the socio-demographic characteristics; the study findings presented that, the mean age of the intervention group was 26.4±3.8 years old and 27.4±5.3 years old for the control group. This finding was related to that described by Eshra et al., (37) who reported that, the age of patients in their study was 25.58 ± 4.99 years old and the majority of cases were housewives. This finding is concurrent with Stanton et al., (42). In contradictory Ibrahim and his colleagues, (43) in their study about the assessment of routine management of the third stage of labor for normal delivery in women's health center and El-Eman hospital for obstetrics and gynecology showed that, the mean maternal age was 28.0±6.2 years in group (A) and 28.2±5.9 years among group (B) with no significant difference in both groups. These differences may be due to cultural differences as most of the participants were from different socioeconomic status.

Concerning the risk factors for developing PPH, according to Abdul-Kadir and his colleagues (26), the causes of PPH included the uterine atony, placental problems including retained placenta and abnormal placental implantation, genital tract trauma, and systemic medical disorders including inherited and acquired coagulation defects. Uterine atony is the major cause of PPH accounting up to eighty percent of the cases of PPH. Our current results revealed that, there were different variables as; parity, ant-partum hemorrhage, multiple gestation, placental cause, gestational hypertension, and previous second and third stage complications during labor were consistent independent risk factors in both groups. The other risk factors based on the specified selection strategies were poly-hydrmnos and macrocosmic baby. These consequences agreed with Wetta and his college (44), who showed the multiple gestation, prior hemorrhage and prolonged labor, has also been cited as risk factors for PPH. This deduction may be attributed to that mothers with old age tend to have weak muscles tone compared to mothers with young age who have strong muscles tone and contracted uterus.

As demonstrated by Roberts et al., (45) who stated that, the predisposing risk factors for developing PPH was the antepartum hemorrhage during the birth admission, a hypertensive disorder, diabetes, cardiac disease and renal disease and/or sepsis. These results are in congruence with Malabarey et al., (46) who specified that, the following factors were significantly associated with PPH: increased birth weight, female gender (P=0.006), duration of membrane rupture (P=0.002), duration of second stage, chorioamnionitis, and use of prostaglandins. The research hypotheses of the current study were as follows: ***First research hypothesis:*** the women who will receive the uterine massage and active management during third stage of labor will be less likely to develop primary PPH.

Any bleeding that results in signs and symptoms of hemodynamic instability, or bleeding that could result in hemodynamic instability if untreated, is considered PPH. Blood loss of greater than 1000 ml with vaginal delivery or a decrease in postpartum hematocrit level greater than 10% of the prenatal value also can be considered PPH (47). In the current study, the intervention group who received the uterine massage and active management during third stage of labor is associated with decrease blood loss and stable vital signs with statistical significant differences between groups. Added to that, the results of this study are consistent with the study performed by Shields et al., (48) who assessed the effectiveness of instituting a comprehensive protocol for the treatment of maternal hemorrhage. They observed that, the group who received comprehensive protocol for the treatment of maternal hemorrhage experienced less overall blood loss with statistical significant differences. In the same line, Kacmar and his colleagues, (49) mentioned that, after using PPH protocols in United States women had experienced less developed PPH. This may be related to the severity of PPH will be influenced by the rate and the total volume of blood loss and also the response to it (26).This shows that mother who received the instructions developed uterine contracted that decreases the amount of blood loss at the postpartum period.

Second hypothesis, that the women who will receive the uterine massage and active management during third stage of labor will have better maternal outcomes during the postpartum period:

The findings of the current study revealed that, the period of recovery and discharge seem to play a very crucial role in clarification of maternal conditions. About more than two-thirds of the study group who has associated with a well uterine contraction immediately after delivery with complete placental delivery. Additionally, nearly half of the study group discharged at the same day of the delivery. This may be related to following the nursing guidelines and applying of the interventions which help to develop better maternal outcomes. This comes in accordance with Sheldon et al., (21) who reported that, the use of essential maternal interventions, including uterotonics for the management of PPH, was high in the participating facilities. This highlights the need for high quality of care to improve the maternal outcomes.

Numerous studies have suggested that, many deaths associated with PPH could be prevented with prompt recognition and more timely and adequate treatment (50,51). Morbidity from PPH can be severe including organ failure, shock, edema, compartment syndrome, transfusion complications, thrombosis, acute respiratory distress syndrome, sepsis, anemia, intensive care, and prolonged hospitalization (52,53). Many life

threatening postpartum complications occurs during the fourth stage of labor which can be prevented by careful observation by the nurses (3,54). Moreover, the complications of PPH occur most of the time when an unskilled attendant conducts a delivery while having little or no knowledge of active management of the third stage of labor (55). Main and his coleagues, (22) indicated that obstetric hemorrhage is the most common complication of childbirth and is the most preventable cause of maternal mortality. The present study findings showed that, the group who received the uterine massage and active management during third stage of labor associated with better maternal outcomes compared to control group. It demonstrates that, eighty five percent of the intervention group develops a normal uterine involution and three quarters of them had a contracted uterus after delivery. In addition, about half of them discharged at the same day. This may be related to nursing care consists of early recognition, routine observation of all postpartum women for blood loss, fundal tone, BP and pulse. This is important during the first four hours post birth. This result with the same line with Berg et al., (56); Clark et al., (57) and Crozier & Wallace, (58) who specified that, a percentage of PPH related deaths may be preventable through improvements in care. It is likely that improvements in care would decrease hemorrhage-related morbidities such as anemia, exposure to blood products, and myocardial ischemia as well as decrease postpartum intensive care unit admission (49,58). In total, they reported that early diagnosis and treatment are crucial to reduce PPH related morbidity and mortality (50). So, the obstetric and community nurses can play an important role in early detection, management, and reduction of the risk for PPH.

V. Conclusion

Based on the results of the current study it can be concluded that: The women who received the uterine massage and active management during third stage of labor were less likely to develop PPH and had better maternal outcomes during the postpartum period. So, implementing of the uterine massage plus active management for women at risk for PPH and ensuring appropriate follow-up counseling is the key to improve the maternal outcomes, reducing postpartum blood loss, and decrease the duration of hospital stay.

VI. Recommendations

On the basis of the most important findings of the study, the following recommendations are suggested:

- Early detection of high risk mothers for PPH during the antenatal period and immediately after admission. So, appropriate management plans can be implemented to reduce PPH.
- The active management of third stage of labor is an intervention that obstetric nurses should be empowered to implement in order to reduce PPH.
- Immediate uterine massage after placental delivery is recommended to decrease blood loss after delivery and prevent PPH.
- Implementation of routine observations for all postpartum women for blood loss, uterine massage, assessment of vital signs and follow the mothers through home visits are vital care to prevent the late complications.

Table (1) Socio-demographic and health related data for the studied sample (n=180)

| Socio-demographic and health related data	Control (N=90) N (%)	study(N=90) N (%)	Total N=180
Age(In years): ᵃ=mean ± SD	27.4±5.3ᵃ	26.4±3.8ᵃ	26.9± 4.6
Education			
• Illiterate	10(11.1)	8(8.9)	18(10.0)
• Read& Write	28(31.1)	18(20.0)	46(25.6)
• Primary	6(6.7)	18(20.0)	24(13.3)
• Intermediate	8(8.9)	1(1.1)	9(5.0)
• High	38(42.2)	45(50.0)	83(46.1)
Occupation			
• Not work	48(53.3)	49(54.4)	97(53.9)
• Work	42(46.7)	41(45.6)	83(46.1)
Medical history			
• No Disease	51(56.7)	67(74.5)	118(65.6)
• Hypertension	19(21.1)	10(11.1)	29(16.1)
• Blood coagulation disorder	4(4.4)	4(4.4)	8(4.4)
• Cardiac disorder	7(7.8)	6(6.7)	13(7.2)
• Anemia	8(8.9)	3(3.3)	11(6.1)
• Other	1(1.1)	0(0)	1(0.6)
Family history			
• No	17(18.9)	22(24.4)	39(21.7)
• Hypertension	31(34.4)	19(21.1)	50(27.8)
• Diabetes	29(32.2)	35(38.9)	64(35.5)
• Blood coagulant disorder	7(7.8)	7(7.8)	14(7.8)
• Other	6(6.7)	7(7.8)	13(7.2)

ᵃ= mean ± SD

Table (2) Comparison between the control and studied groups according to the risk factors for developing PPH (n=180)
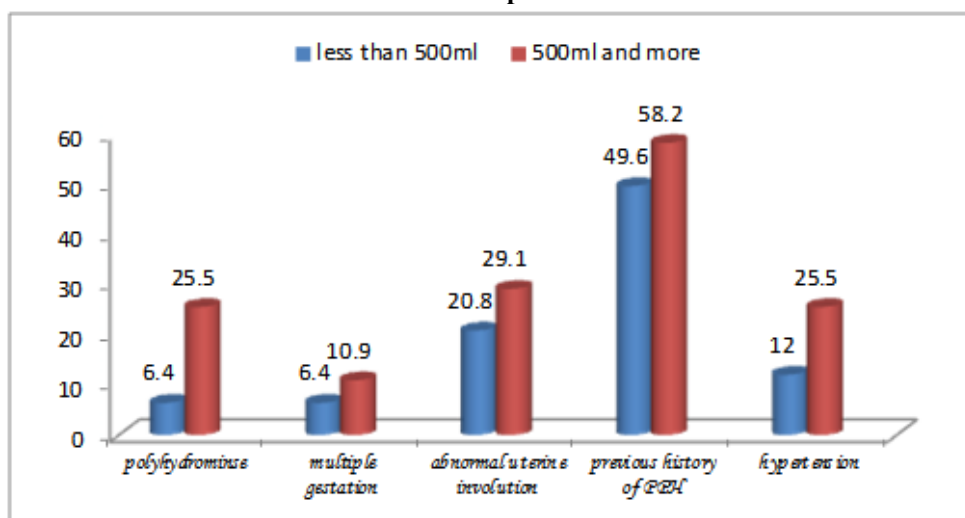
Risk factors for PPH	Control (N=90) N (%)	Study (N=90) N (%)	P-value
Parity • Primipara • Multigravida	40(44.4) 50(55.6)	43(47.8) 47(52.2)	P >0.05
Maternal age more than 30 years old	19(21.1)	18(20.0)	P >0.05
Ante partum hemorrhage	26(28.9)	27(30.0)	P >0.05
Poly-hydromnise	14(15.6)	8(8.9)	P < 0.05*
Multiple gestation	6(6.7)	8(8.9)	P >0.05
Macrosomia	4(4.4)	9(10.0)	P < 0.05*
Incomplete placental delivery	28(31.1)	19(21.1)	P >0.05
Perineum tear	24(26.7)	21(23.3)	P >0.05
Gestational Hypertension	21(23.3)	17(18.9)	P >0.05
Coagulation disorders	3(3.3)	3(3.3)	P >0.05
Last delivery from less than one year	27(30)	36(40)	P >0.05
Previous PPH	46(51.1)	48(53.3)	P >0.05
Previous 2nd stage of labor complications	27(30.0)	35(38.9)	P >0.05
Previous 3rd stage of labor complications	21(23.3)	16(17.8)	P >0.05
Mode of the present deliveries: • Normal vaginal delivery • Normal vaginal delivery with episiotomy	39(43.3) 51(56.7)	36(40.0) 54(60.0)	P >0.05
Duration of the third stage of labor (minute)	18.8 ± 3.5	18.7 ± 3.2	P >0.05

*=significant

Figure (1). Percentage distribution for the degree of risk for PPH among the studied sample (n=180).
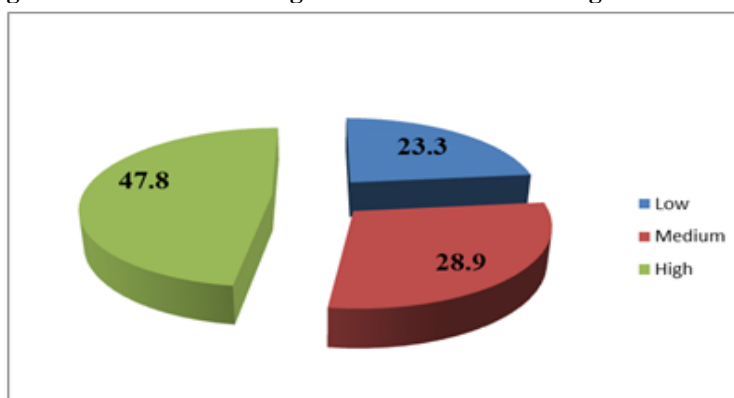
Figure (2). Percent distribution for the factors affecting the amount of blood loss among the studied sample

Table (3). Data regarding the indicators for PPH after implementation of the interventions for studied sample (n=180)

| Indicators of PPH	Control (N=90) N (%)	study(N=90) N (%)	P- value
One hour after delivery:			
Vital signs:			
Pulse	72.5±12.3	73.2±12.1	P <0.001*
Respiration	16±3.1	15.1±1.9	P <0.001*
B.p Systole	107±11.9	117±11.9	P >0.05
B.p diastole	70±6.99	72±8.9	P <0.05*
Amount of blood loss:			
• <500ml	49(54.5)	76(84.5)	
• 500-700ml	34(37.8)	13(14.4)	P <0.001*
• 700-1000ml	3(3.3)	1(1.1)	
• >1000ml	4(4.4)	0(0.0)	
Two hours after delivery:			
Vital signs:			
Pulse	70.1±13.6	73.3±12.5	P <0.05*
Respiration	16.5±3.2	14.7±2.1	P <0.05*
B.p Systole	104.9±11.9	105.6±11.6	P <0.001*
B.p diastole	75.1±7.6	75.5±9.0	P >0.05
Amount of blood loss:			
• <500ml	35(38.8)	74(82.2)	
• 500-700ml	24(26.7)	15(16.7)	P <0.001*
• 700-1000ml	24(26.7)	1(1.1)	
• >1000ml	7(7.8)	0(0.0)	
One week after delivery:			
Vital signs:			
Pulse	72.8±12.1	69.6±10.75	P >0.05
Respiration	15.8±2.39	15.8±2.19	P >0.05
B.p Systole	100±9.7	100.4±8.6	P >0.05
B.p diastole	75.4±9.1	75.3±9.0	P >0.05
Amount of blood loss:			
• <500ml	54(60.0)	76(84.5)	
• 500-700ml	24(26.7)	13(14.4)	P <0.001*
• 700-1000ml	5(5.5)	1(1.1)	
• >1000ml	7(7.8)	0(0.0)	

*=significant

Table (4). Distribution of maternal outcomes after implementation of the interventions for the sample (n=180)

Maternal outcomes	Control (N=90) N (%)	Study (N=90) N (%)	P-value
The uterus contract immediately after delivery	46(51.1)	68(75.6)	P <0.001*
Normal involution of the uterus after one week	61(67.8)	77(85.6)	P < 0.05*
Normal Voiding	55(61.1)	41(45.6)	P < 0.05*
Length of hospital stay:			
• Discharge at the same day	39(43.3)	43(47.8)	P >0.05
• 1-2	37(41.1)	35(38.9)	
• ≥ 3	14(15.6)	12(13.3)	

*=significant

Figure (3). Data regarding maternal outcomes for the intervention group
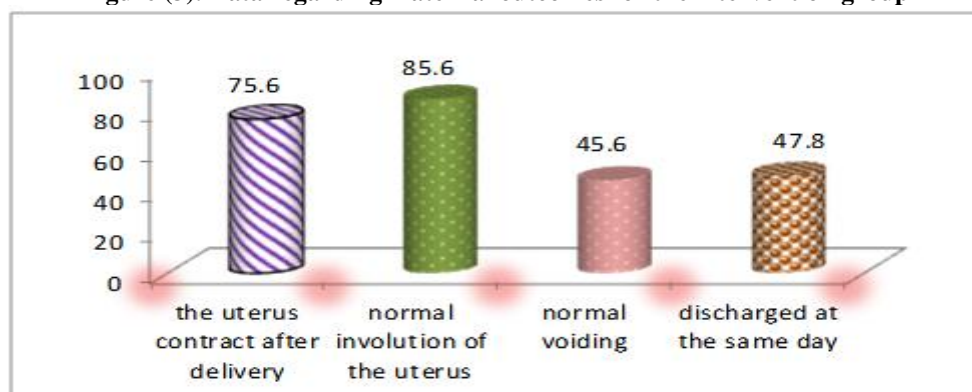
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