Effect of Pronurturance Plus on Labor Outcomes of Women at Risk to Postpartum Hemorrhage

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ABSTRACT

Background: Postpartum hemorrhage is still the leading cause of death of birthing mothers in the world today. Pronurturance plus evidence-based practice which includes early skin-to-skin contact and breastfeeding has a significant positive effect to improve the labor outcomes and decrease the occurrence of postpartum hemorrhage. **Aim**: was to study the effect of pronurturance plus on labor outcomes of women at risk to postpartum hemorrhage**. A Quasi-experimental research** study carried out at the Delivery Room and Postpartum Department in one of the Hospital that affiliated to the Ministry of Health, Fayoum, Egypt. **Sample:** A **purposive** sample of 90 laboring women at risk for postpartum hemorrhage was divided into the study and control groups (45 for each). The control group received routine hospital care and the study group received the pronurturance plus practice. Seven women were excluded from the study group due to that some babies failed to initiate breastfeeding after delivery and some mothers didn't complete the duration of skin to skin contact. Finally, the sample size reached 45 & 38 women in the control and study groups respectively. **Four tools** were used: 1) Laboring women's' demographic data assessment tool,2)Risk factors' to postpartum hemorrhage assessment tool 3) Labor outcomes assessment tool, and 4) Women's' satisfaction assessment tool. **The results***:* There were statistically significant differences between the study and the control groups with regard to the labor outcomes in third and fourth stage of labor. The study group exhibited less duration of 3rd stage of labor, efficient uterine contraction, less amount of blood loss, less occurrence of primary postpartum hemorrhage, and high satisfaction level regarding to the apply of pronurturance plus. **Conclusion:** The pronurturance plus practice had a positive effect in improving labor outcomes and reducing the occurrence of primary postpartum hemorrhage among women at risk to postpartum hemorrhage. **Recommendations**: The practice of pronurturance plus should be a part of routine 3rd and 4th stage care for all birthing women regardless of their level of risk.

Key words: Pronurturance practice, labor outcomes**,** postpartum hemorrhage (PPH)

Introduction

Reducing maternal and neonatal mortality have been global priorities for over two decades. 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 ***[Abrams and Rutherford, 2011].*** Postpartum hemorrhage (PPH) remains a significant contributor to maternal morbidity and mortality throughout the world. The World Health Organization defines primary postpartum hemorrhage as blood loss of 500

ml or more in the first 24 hours postpartum occurs in approximately 5% of postnatal mothers and late or secondary PPH occurs beyond 24 hours and extending up to 6 weeks following delivery. Annually, PPH is a major cause of more than 500,000 maternal deaths that occurs, responsible for approximately 25% of all maternal deaths globally [***WHO, 2015***]. According to the Ministry of Health and Population, accessed on 2015, the maternal mortality rate in Egypt was 33 per 100,000 live births, 19.7% of maternal deaths nationwide are due to PPH[***Egypt Ministry of Health and Population, 2015***]. Nearly 34% of maternal deaths in Africa, and more than 30% in Asia are due to PPH [***FIGO, 2012***].

Evidence-based interventions to reduce the incidence of PPH include the use of active management of third stage of labor (AMTSL) by a skilled provider. The AMTSL has been shown to decrease the incidence of PPH by up to 66%. So, there is another effective evidence- based practice risk reduction strategy for PPH called pronurturance plus. It is defined as a combination of early skin-to-skin contact (SSC) and breastfeeding within 30 minutes of birth which helps to optimize the release of endogenous oxytocin, which can help to improve the labor outcomes and reduce the occurrence of primary postpartum hemorrhage[***Srivastava, et, al ,2014***]. Once the baby is born, he/she is immediately placed skin-to-skin on the mother's bare chest/abdomen and the nurse covers both with a warm blanket. Holding, seeing, hearing, smelling and stroking a (wanted) naked, newborn skin-to-skin causes an oxytocin rush in the woman. Oxytocin continues to be released in large amounts during extended skin-to-skin contact when the newborn baby makes hand and leg movements, crawls to the mother's breast and sucks the nipple. When the newborn baby sucks on the nipple, further oxytocin is released so that the mother flooded with oxytocin in preparation for a loving relationship with the neonate as well as strengthening the uterine contractions that will help the placenta to separate and the uterus to contract down, which lead to the blood loss and the occurrence of postpartum hemorrhage decreased [***Abedi, et, al, 2013***].

The artificial oxytocin, which is given in the AMTSL, could be successfully substituted for endogenous oxytocin. However, peripheral injections of artificial oxytocin do not appear to cross the blood/brain barrier and therefore cannot have the same brain mediated effects as endogenous oxytocin. Also, when exogenous oxytocin is infused, it has a half-life of only 1–2 minutes, which means that a continuous infusion is required to maintain uterine contractions. In comparison, endogenous oxytocin is released in a pulsate manner, has a half-life of 20–30 minutes and rises to a crescendo in the 3rd and 4th stages of labor [***Uvnas, 2013***].

The key proposition from pronurturance evidence-based practice was that pronurturance promotes the woman's fascinated attention during the 3rd and 4th stages of labor and parasympathetic dominance, which optimizes her reproductive psychophysiology facilitating eutony (Maintenance of physiological uterine contractility which prevents excessive bleeding)and eulochia(The physiological amount of vaginal blood loss during the 3rd and 4th stages of labour that does not cause signs of anaemia or shock) and decreasing the anxiety levels . Pronurturance evidence based practice provides nurses with a model for clinical practice which may be used in any setting and for all women no matter what their level of risk for PPH [***Prata, et, al, 2013***].

A very crucial role for nurses aims to early detect the predisposing factors to take all precautions to prevent occurrence of PPH. There are multiple predisposing factors of PPH the nurse must be aware with them as; prolonged third stage of labor, whether due to uterine atony or other causes of retained placenta; some degrees of placenta accreta,

and mismanagement of third stage of labor by using expectant management [***Kramer,et al, 2013***]. Other factors which predispose the mother to PPH are ante-partum hemorrhage, multiple pregnancies, uterine over-distention such as polyhydramnios or macrosomia, also pre-eclampsia or pregnancy-induced hypertension, previous PPH, maternal obesity, existing uterine abnormalities and maternal age, 35 years or older [***Mehrabadi, et, al , 2013***].

In case of occurrence the PPH, the nurse must manage it by early reporting and taking action for accurate diagnosis followed by proper management according to the cause of hemorrhage. Nurse's care has a key role to play in optimizing the woman's reproductive psychophysiology because the nurse can positively influence the woman's external environment. By having a trusting relationship with the woman, the nurse can also be aware of and facilitate the woman's positive response to her labor and therefore, the emotions that she feels and ultimately whether the woman's parasympathetic system dominates or not [***Rouleau,et, al, 2013***].

Inaddition, the nurse must be knowledgeable with a different nursing strategy, which helps to reduce the occurrence of PPH and enhance the women to implement it, so the nurse should be the main member who supports all women and babies to have immediate and prolonged SSC and breastfeeding at birth. In this way, women's reproductive physiology is optimized so that, among other things, eutony and eulochia are achieved and the risk of postpartum hemorrhage is minimized [***Kennell and McGrath, 2013***].

Significance of the study

Significant complications can occur during the third and fourth stages of labor. The most common complication is PPH. While maternal mortality rates have declined dramatically in the developed world, PPH remains a leading cause of maternal mortality. According to the Ministry of Health and Population, accessed on 2015, the maternal mortality rate in Egypt was 33 per 100,000 live births and 55 per 100,000 in Fayoum[***Egypt Ministry of Health and Population, 2015***]. For 2013, the direct costs to the Egyptian health system were about L.E 20.5 million to treat the cases of PPH. The share of the Ministry of Health and Population budget dedicated to the treatment of PPH is roughly 0.7% of its total [***Vlassoff, et, al, 2016***]. Nurses have an important role to prevent PPH as they are a central to the effective prevention, recognition and treatment of PPH. In spite of the almost universal adoption of the active management of the 3rd stage of labor, PPH rates continue to rise. Therefore, the researchers try to study the effect of one of the evidence- based practice as a risk reduction strategy for PPH called pronurturance plus. The study is aiming to study the effect of pronurturance plus on labor outcomes of women at risk to postpartum hemorrhage**.**

Aim of the study

The aim of the current study was to study the effect of pronurturance plus on labor outcomes of women at risk to postpartum hemorrhage.

Research hypothesis

Women at risk to PPH who apply the pronurturance plus will have better labor outcomes than those who did not.

Operational definition:

Pronurturance plus at birth: Is a new evidence-based practice, it means, the combination of early skin-to-skin contact and breastfeeding within 30 minutes of birth [***Finigan and Long, 2012***].

Early breastfeeding: Any attempt by the baby to suckle the breast within 30 min after the birth. [***UNICEF and World Health Organization, 2013***].

Labor outcomes: In the current study the labor outcome includes; the duration of 3rd stage of labor, the tone of the uterus, use of additional doses of uterotonic drug, the amount of blood loss in 4th stage of labor, number of occurrence primary PPH, needed a blood transfusion and length of stay in hospital.

II Subjects and Method

Research Design:

A quasi-experimental design was adopted in carrying out the current study.

Setting:

The study was conducted at the Delivery Room and Postpartum Department in one of the Hospital that affiliated to the Ministry of Health, Fayoum, Egypt.

Sample: A purposive sample of 90 laboring women was selected based on the inclusion criteria and according to the following statistic formula n = Z21- α/2p (1-p)/d2. The sample was divided into two groups, namely, study group who apply the pronurturance plus and control group who receive routine hospital care according to their preference. Mothers in both groups had to fulfill the following criteria:

Inclusion criteria: Women having risk factors for postpartum hemorrhage as; previous history of PPH, factors leading to over distended uterus, multiparity, ante partum hemorrhage (APH), Maternal age more than 35years, women delivered vaginally without episiotomy, woman free from any medical disorder, who birthed a term baby (37 to 42 weeks of gestation) with an APGAR score of seven or more at fifth minutes of age, who prenatally expressed their desire to breastfeed their newborn baby and willing to join the study.

Exclusion criteria:

Stillbirths, babies who were admitted to the Neonatal Intensive Care Unit for any reason, women having general anesthesia, babies with major congenital malformations specially which affect the baby sucking as cleft lip and palate, women with perineal tear, uterine rupture, blood and coagulation disorder and emergency caesarean section.

Tools for data collection

Four tools were used to collect the data:

Tool I. laboring women demographic data assessment tool (Structured interviewing questionnaire**)**: Constructed by the researchers and used to assess women age, educational level and occupation.

Tool II: **Risk factors to postpartum hemorrhage assessment tool** [***Shields, et, al, 2011***]**,** this tool is used to identify the risk factors among the studied groups that might lead to primary postpartum hemorrhage. This tool categorized the risk factors for primary PPH into low, medium, or high risk. A simple scoring system was used to assess the risk status of the studied women to postpartum hemorrhage. The scoring system assigns different points to different maternal risk factor as: maternal age >35 years scores 5 points; placental previa scores 10 points; polyhydramnios scores 10 points; etc. Values of all the risk factors were summed up and a total score determined whether the woman was "Low risk" "Medium risk" or "High risk", accordingly and were categorized as: Low risk with the score of 0-3, Medium risk with the score of 4-9, High risk with the score of 10 or >10.

Tool III. Labor Outcome Assessment Tool. Constructed by the researchers after extensive literature review. It is used to

gather data related to labor outcomes in 3rd and 4th stage of labor as the following;

In the **3rd stage** of labor the researchers assess; (the duration of 3rd stage of labor, the tone of the uterus (Firm or boggy), used/not used of additional doses of uterotonic drug .

In **the 4th stage** of labor the researchers assess; The tone of the uterus and the amount of blood loss/ lochia in 1st & 2nd and 3rd hour after birth, occurrence of primary PPH and its severity [Mild PPH blood loss is 500ml to 700ml, moderate PPH blood loss is more than 700ml to 1000ml, and severe PPH blood loss is more than 1000 ml] [***Schorn, 2010***], needed a blood transfusion and the length of stay in hospital.

The blood loss in 4th stage of labor estimated by visual estimation of soaked bad. If bad soaked about 25 ml it will be mild, about 50 ml it will moderate, and if bad soaked 100 ml it will be sever blood loss. The researcher observes, if happened soaked 4 bad by half hours it estimate occurrence of PPH [*Schorn, et, al, 2010***].

Tool IV. Women satisfaction assessment tool (Six Simple Questions) [***Harvey, et, al, 2011***]: Translated into Arabic language by the researchers, it is a brief, easily administered questionnaire to assess the satisfaction with the procedure among the study group. Some modifications were done in statements of the questions to suit the Egyptian women and it consisted of six statements. Three responses were offered for each statement; (1) disagree, (2) neutral and (3) agree. **The scoring system** was as the following; the twelve scores represented "somewhat satisfied", while more than twelve scores were considered "satisfied" and less than twelve were considered not satisfied.

Reliability and validity of the tools

The tools were submitted to three academic nursing experts in the field of maternity and neonatal health nursing to test the content and shape validity. Modifications were carried out according to their judgments on the clarity and rephrasing of some of the sentences. Tool reliability was tested using an Alpha Cronbach test. The tool reliability for Tool IV; Women satisfaction assessment tool (Six Simple Questions) was 0.79.

Pilot Study: A pilot study was conducted on nine women (10 % of the total sample) in order to assess the feasibility of the study plan, accessibility of the sample and clarity of the tools, as well as to determine the time needed to answer the questions. Some modifications were done on the tools related to rephrasing and clarity of some sentences. All the mothers who participated in the pilot study were excluded from the research sample.

Ethical considerations:

Official permissions were granted by the Director of the previously mentioned Hospital and Head of Obstetric Department. Before the beginning of the study, an informed oral consent was taken from each woman who agreed to participate in the study, after explaining the aim of the study and its phases. The participants were assured about the confidentiality of their personal information and that they are allowed to withdraw from the study at any time without giving any reason.

Field work:

- The study started from, January 2016 to September 2016. The researchers visited data collection site for two days per week until the sample size was completed.

- Written permission from the institutional authority of the hospital and head of the obstetric department was obtained before conducting the study.

- The researchers started to collect the data related to the control group firstly, then the study group to avoid contamination of the results.

- The researchers obtained oral acceptance from the women who agreed to participate in the study after an explanation of the general purpose of the study.

- In the first stage of labor the women recruited for the study in the both groups, according to the inclusion criteria and determine the risk factors for PPH by using the risk factors' postpartum hemorrhage assessment tool (II).

- Then each woman was individually interviewed by the researchers to complete the demographic data which consumed about 10 minutes for each woman; the women were asked in Arabic language and her answers were documented in the tool utilized.

- **Concerning the control group (**received the routine hospital care during the third stage of labor according to hospital policy). The role of the researchers with this group during the third and fourth stages(1^{st} , 2^{nd} and 3^{rd} hour after delivery) of labor was observed the labor outcomes according to the tool (III);

- After delivery the baby taken into the heater, to get all his/her care.

- **Regarding the study group** (apply the pronurturance plus practice). During the latent phase of the first stage of labor, the researchers explain the benefits and the technique of the practice by using mobile video film and role played by the simulation model.

- Then, the researchers enter the delivery room with the woman. During the third stage of labor, once the cord clamping and cutting has taken place, the baby was placed undressed in a prone position against the mother's bare chest between the breasts (skin to skin) immediately after birth, and before placental delivery.

- The baby was suctioned with portable suction while on the mother's chest, well dried and covered with a pre-warmed blanket over both mother and baby. Baby's head was covered with a dry cap that was replaced when it became damp to prevent heat loss.

- Ideally, all other interventions are delayed. Also, the baby is encouraged to early breastfeeding.

- The researcher observed the labor outcome in the third stage of labor according to tool (III).

- Mother and baby will be left on skin to skin contact (SSC) for at least hour under the researchers support.

- After the women went to the postpartum ward, the researchers assess the labor outcomes related to the fourth stage of labor at (1^{st}, 2^{nd} and 3^{rd} hour after delivery) according to tool (III).

- In both groups the researchers ensure woman's bladder emptying before assessing uterine contraction.

- The researchers at the fourth stage of labor estimate the blood loss and assess the uterine contraction every 15 minutes for the first hour, then every 30 minutes for the second hour, as well as every one

hour after that [***King Edward Memorial Hospital, 2016***].

- Finally the women in the study group were asked to self-rate their level of satisfaction with the apply of the procedure in satisfaction assessment tool (Six Simple Questions).

Limitations of the study:

- The interruption of the health workers' team in the delivery room and postpartum unit usually decreases the attention of the mother during skin to skin contact with the baby.
- Studies related to the pronurturance practice as a reduction strategy to reduce PPH were not available in Egypt. So, the nursing local literature review was little.

Statistical Design:

Data entry and statistical analyses were done using statistical software package (SPSS) version 18.0. Results were presented as the frequencies, percentages, Chi square, t-tests analysis to test the statistical significance of some variables and to test the effectiveness of the practice. Statistical significance was considered at p-value <.05.

Results

Table (1) Demographic data for the control and study groups

Demographic data	Control Group (%)45n=	Study Group n=45(%)	P- value
Age(in years): Mean ± SD	33.2±4.1	32.8±3.2	t=0.74, p=0.46
Level of education			
• Read & write	15(33.3)	20(44.4)	
• Intermediate	10(22.2)	12(26.7)	χ^2=2.6
• University	20(44.4)	13(28.9)	p=0. 76
Occupation			
• Housewife	29(64.4)	24(53.3)	χ^2= 3.45
• Work	16(35.6)	21(46.7)	p= 0.06

*Significant p<0.5

Table (1) shows that the mean age in control and study group was 33.2±4.1 and 32.8±3.2 respectively. Regarding the education level, 44.4%, and 28.9% for the control and study groups respectively had a university degree. In addition, 64.4% and 53.3% for the control and study groups respectively were housewives. There were no significant differences between all the parameter of demographic characteristics among the control and study groups (P >0.05).

Table (2) Risk factors for developing primary PPH among the control and study groups.

Risk factors for PPH		Control Group (%)45n=	Study Group n=45(%)	χ^2	P-value
Current risk factor	Multipara • 1-2 • 3-4 • >4	 10(22.2) 31(68.9) 4(8.9)	 12(26.7) 28(62.2) 5(11.1)	4. 1	0. 08
	Maternal age >35years	17(37.8)	15(33.3)	3.45	0.10
	Factors related to ante partum hemorrhage				
	Placenta previa (parital & low lying)	12(26.7)	16(35.6)	3.45	0.06*
	Factors related to uterine over distension				
	Polyhydramnios	10(22.2)	2(4.4)	3.04	0.05*
	Multiple gestation	4(8.8)	3(6.6)	3. 9	0.14
	Macrosomia	11(24.4)	6(13.3)	3. 4	0. 04*
Previous risk factor	Ante-partum hemorrhage	10(22.2)	13(28.9)	3.15	0.08
	Uterine surgery	4(8.8)	2(4.4)	3. 1	0.09
	Previous PPH	23(51.1)	17(37.8)	2. 6	0. 76

*Significant p<0.5, "more than one factor was reported"

Table (2) reveals that, the multipara was the most risk factor for PPH (100%) among both groups, while the second risk factor was previous PPH (51.1% and 37.8 %) among the control and study group respectively. Also, there were no statistically significant differences regarding all the risk factors among the studied sample except in the following factors; placenta previa ,polyhydramnios, macrocosmic baby.

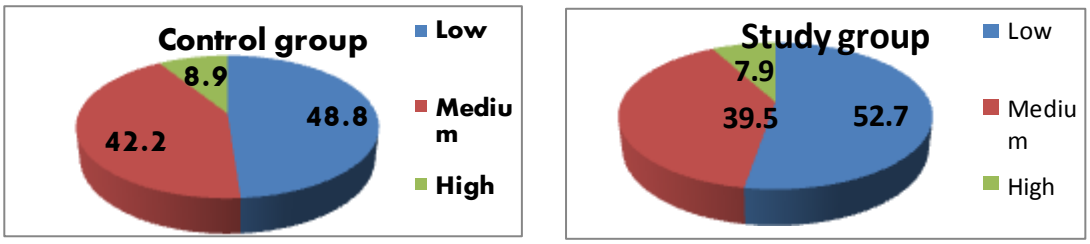

Figure (1): Risk factor levels for primary PPH among the study and control group.

Table (3): Labor outcomes among control and study group in 3rd and 4th stage of labor.

	Labor Outcomes	Control Group n=45(%)	Study Group n=38(%)	X2	P-value
Labor outcomes in the 3rd stage of labor	Duration of 3rd stage of labor (in minutes)	10.4±7.9	8.5±5.3 Mean ± SD	t= 3.8	0.04*
	Tone of the uterus				
	• Firm	33(73.3)	35(92.1)	2.3	0.001**
	• Boggy	12(26.7)	3(7.9)		
	Needed additional dose of Uterotonics	12(26.7)	6(15.7)	3.9	0.05*
Labor outcomes in the 4th stage of labor	Tone of the uterus(firm uterus)				
	• 1st hour after delivery	36(80)	35(92.1)		
	• 2nd hour after delivery	33(73.3)	36(94.7)	2.7	0. 02*
	• 3rd hour after delivery	31(68.9)	35(92.1)		
	Amount of blood loss(Lochia)				
	• 1st hour after delivery	290.1±62.3	223.6±44.2	2.06	0.001**
	• 2nd hour after delivery	258.3±41.3	201.8±7.1		
	• 3rd hour after delivery	219.2±39.3	158.9±52.1		
	Occurrence of primary PPH	13(28.9)	7(18.4)	2.36	0. 04*
	Severity of PPH	N=13	N=7		
	• Mild (500ml - < 700ml)	2(15.4)	4(57.1)	1.06	0. 02*
	• Moderate (700ml - 1000ml)	9(69.2)	3(42.9)		
	• Sever (>1000 ml)	2(15.4)	0		
	Needed blood transfusion	5(11)	3(7.9)	1.56	0. 04*
	Length of stay in the hospital				
	• Discharge at the same day	29(64.4)	31(81.6)	3.01	0.02
	• 1-2 days	10(22.2)	7(18.4)		
	• ≥ 3 days	3(6.6)	0		

*__Dropout__: there were seven women excluded from the study group due to that some babies failed to initiate breastfeeding after delivery and some mothers didn't complete the duration of skin to skin contact. Finally, the sample size reached 45 & 38 women in the control and study groups respectively.

Table (3) shows that, the mean duration of third stage of labor was less among the study group than the control group 8.5±5.3 and 10.4±7.9 minutes respectively. The results pointed to, the high percentages of firm uterus, and the less percentages of women who, needed to additional dose of uterotonics in the third stage of labor were among the study group. Regarding to the labor outcomes in 4th stage of labor were, the percentage of firm uterus and less amount of blood loss /lochia were more among the study group at 1st, 2nd and 3rd hour after delivery. While percentage of occur primary PPH and its severity, as well needed to blood transfusion and length of stay hospital were more among the control group. Totally, there were statistically significant differences between both groups regarding their labor outcomes in the third and fourth stages of labor

Table (4) Women satisfaction in study group regarding apply pronurturance plus at the 3rd stage of labor

Item	Study group n=38 (%)
Women satisfaction	
• Satisfied	34(89.5)
• Somewhat satisfied	4(10.5)
• Not satisfied	0

Table (4) revealed that the majority of women in study group exhibit more satisfaction regarding the care which received in the 3rd stage of labor.

Table (5) Logistic regression for both groups and primary PPH for low, medium and high risk women.

Variable	Low risk	Medium risk	High risk
	Odds ratio **(95%CI)**		
Study group (Pronurturance)	0.22* (0.17-0.30)	0.44* (0.34-0.58)	0.37* (0.24-0.57)
Control group (Routine hospital)	1.00	1.00	1.00

OR = 1.0; If there is no difference.
OR<1; If the risk in the intervention group is lower than the risk in the comparison group.
OR>1; If the risk in the intervention group is higher than in the comparison group.

Table (5) shows the results of logistic regression for the women at low, medium and high risk of PPH. For women in the lower risk group, having Pronurturance reduced their risk of PPH almost fivefold. Also, for medium risk women, having Pronurturance halved their risk of PPH. For women at higher risk of PPH, who had Pronurturance, their risk of PPH was reduced almost threefold. This apparent protective effect of skin contact and breastfeeding held true in sub-analyses for women at 'lower', medium and 'higher' risk.

Discussion

Primary postpartum hemorrhage (PPH) remains an important complication of childbirth and contributes significantly to maternal mortality. Nevertheless, PPH is the direct cause of maternal deaths and is a major contributing factor in a further 5 fatalities. The majority of these deaths occur within the first hours of delivery [***Belleza, 2016***]. The current study aimed to study the effect of pronurturance plus on labor outcomes of women at risk to postpartum hemorrhage. Therefore, the findings of the current study supported the research hypothesis that, women at risk to PPH, who received the pronurturance plus practice, will have better labor outcomes than those who didn't.

Regarding to the demographic characteristics; the present study findings showed that, the mean age of the study group was 32.8±3.2 years and 33.2±4.1 years for the control group. As well, the current research results revealed that, less than half and less than one third of the control and study groups respectively had university educational level. As well, almost two thirds and slightly more than half of the control and study groups were housewives. These findings were similar to those of a study [***Eshra, et, al ,2013***] carried out in Egypt, which reported that, the age of women ranged between15 to 48 years and that the majority of cases were housewives.

Considering to the risk factors for developing PPH, the current study results revealed that, the multipara was the major risk factor for PPH among both groups representing all the sample, followed by previous PPH represents about half of both groups as well, then maternal age >35 years. There were no statistically significant differences between the two groups regarding all risk factors among the studied sample except in placenta previa, polyhydramnios, and macrosomic baby. This may be due to differences in body mass index(BMI).

These results agreed with those of a similar study with [***Kramer, et, al, 2013***] who study the incidence, risk factors, and temporal trends in severe postpartum hemorrhage and showed that advanced maternal age and multiparous women were the most risk factors for PPH in their study sample. As well, the study is in agreement with [***Fullerton, et, al, 2013***] who stated that, the more risk factors for PPH include; past history of PPH, multiple pregnancy, multi-parity, advanced age. This similarity may be attributed to that mothers with advanced age and multiparous women tend to have weak muscle tone which puts them at risk for PPH compared to those with young age and primipara who have strong muscle tone and contracted uterus.

Immediately after a baby has been born, the mother meets her baby for the first time and, if uninterrupted, will experience a natural and instinctive behavioral pattern that supports the establishment of confident mothering, early breastfeeding, and a secure bond or attachment between herself and her baby. This natural process includes a surge in the mother's love hormone, oxytocin, which also causes her uterus to contract, and assists in the birthing of the placenta [***Dixon, et, al, 2013***]. The present study revealed that the labor outcomes for both groups in third stage of labor were as the following; the mean duration of the third stage of labor among the study group, who received the pronurturance plus at birth, was 8.5±5.3 minutes which is shorter than in the control group who received the routine hospital care that was 10.4±7.9 minutes. As well the majority of the women in study group their uterine tone was firm in third stage of labor compared with slightly less than three fourth of the women in the control group. Concerning the use of additional dose of uterotonic drug, the current finding represents that, less than quarter in the study group used it compared with more than quarter in the control group.

[***Matthiesen et, al, 2010***] had the similar finding with the previous study as they have elaborated a significant decrease in placental separation time among the study group after using pronurturance plus (early skin to skin and breastfeeding) rather than the control group. As well, the current study result was in the same line with [***Bramson, et, al, 2010***], Bramson et al., who reported that the women, who received pronurturance plus at birth their oxytocin level was higher than those who didn't which reflected on the duration of 3rd stage of labor and good uterine contraction efficiency and they didn't need additional dose of utrotonic drugs. This similarity might be due to the early maternal/newborn skin to skin contact and attempts to breast feeding that helped to release extra amount of the endogenous maternal oxytocin, which was more effective in strengthening the uterine contractions and helped with faster delivery of complete placenta.

On the other hand the present study revealed that, there was a statistically significant difference between both groups regarding the labor outcomes in fourth stage of labor. As well, the results indicated that, the majority of women in study group had firm uterus compared with the control group. As well the study group had less occurrences of the primary PPH than the control group (slightly more than one fifth) versus less than one third. Also the severity degree of primary PPH was more in control group than study

group (about less than one fifth compared to nothing respectively). In addition, the women in the study group required less blood transfusion comparing with the control group. Considering the amount of blood loss in the 1st, 2nd and 3rd hour postpartum, there was a statistically significant difference between both groups in the studied sample, as the mean amount of blood loss was lower in the study group at 1st, 2nd and 3rd hour postpartum than the control group.

The previous results were parallel with [***Khadivzadeh and Karimi,2012***], who stated that women who had neither skin to skin, nor breastfeeding were almost twice as likely to have a PPH compared to those who had both skin to skin contact and breastfeeding ($p < 0.001$). This apparent protective effect of skin contact and breastfeeding held true in sub-analyses for both women at 'lower ($p < 0.001$) and 'higher' risk ($p < 0.001$). This study suggests that skin to skin contact and breastfeeding immediately after birth may be effective in reducing PPH rates for women at any level of risk of PPH. As well, the previous results were in the same line with [***Philleps, 2013***], which recommended the importance of pronurturance plus for maternity care: Firstly, as a PPH risk reduction strategy; secondly, because of the known short and long-term health benefits of breastfeeding for both mother and baby; and thirdly, because of the way that bonding is facilitated by the emotions experienced when mothers and babies are skin to skin and breastfeeding at birth. The only exceptions to providing pronurturance should be where the woman gives informed refusal or where the baby or mother is so ill that they need intensive resuscitation and/or immediate transfer. This similarity may be due to, skin to skin and breastfeeding help that sensory stimuli, such as touch and warmth, is a powerful vagal stimulant for the mother, which releases maternal oxytocin, the "love" hormone, as doctors call it, into the blood. That will not only make women feel warm and loving, but it also will cause the uterus to contract which lead to decrease the amount of blood loss which reflects decrease in the occurrence of postpartum hemorrhage and this is physiologically based. Another reason for similarities in this study is that the inclusion criteria almost the same.

However the previous results contradicted with [***Radon and Divers, 2012***], who stated that no statistically significant difference was detected between the group who adopted the pronurturance plus and the group who adopted the routine hospital care regarding to the amount of blood loss and contraction of the uterine. This difference might be due to that the researchers didn't exclude the coagulation disorder factor and poor neonatal sucking from her study, which may have affected on the result and that was more common in the study group.

The findings of the current study revealed that, the periods of recovery and discharge seem to play a very crucial role in the clarification of maternal conditions. Moreover, the majority of the study group discharged on the same day of the delivery, while less than two thirds of the control group did it. This comes in accordance with [***Mahmoud et al, 2011***], who reported that the women in their study group whom adopted the early SSC and breast feeding discharged through 6 hours after delivery rather than women in the control group (routine care). This may be related to applying of the pronurturance plus which helped to develop better labor outcomes than others. However, the current study result contradicted with that of the ***American college of nurse –Midwives, 2013***, which revealed that there was no statistically significant difference between women who practiced SSC and women who practiced active management of third stage of labor regarding the lengthy stay in hospital. This difference may be due to that the researchers in this study had a high incidence of different grades of perineal tear, not equal in both groups, this factor may have affected the results of her study.

The present study showed that the majority of the women in the study group were satisfied with the early skin to skin and breastfeeding than women in control group regarding the care received at birth. These results are in line with the results of [***Buckley, 2013***] who mentioned that the majority of women reported satisfaction about their labor experience when they experienced SSC and breastfeeding during the third stage of labor. This finding may be due to that, when the nurse applies SSC and breast feeding; she used appropriate communication with the mothers which helped them to feel with peace and safety and deal as a human being.

Actually, the study also showed that the logistic regression for the women at low, medium and high risk of primary PPH reflected that, the women in the lower risk group, having Pronurturance reduced their risk of the primary PPH almost fivefold(OR 0.22, 95% CI 0.17-0.30, $p < 0.001$). Also, for medium risk women, having Pronurturance halved their risk of primary PPH(OR0.44, 95% CI 0.34-0.58). For women at higher risk of primary PPH, who had Pronurturance, their risk of PPH was reduced almost threefold (OR 0.37, 95% CI 0.24-0.57, $p < 0.001$). So that apparent the, skin contact and breastfeeding were considered as a protective effect. This study is incongruent with [***Saxton, 2015***] who studied the effect of pronurturance at birth and risk of postpartum hemorrhage: biology, theory and new evidence, revealed that the, women at 'lower' risk of PPH, who had both elements of Pronurturance, there was an approximate fourfold reduction in the risk of PPH. For women, categorized as 'higher' risk of PPH, and who had both elements of pronurturance, they were almost twofold reduction in the risk of PPH.

Conclusion

Based on the study findings, it's apparent that the women who were at risk to PPH, and received early pronurturance plus as evidence based practice during the third stage of labor have better labor outcomes in 3rd and 4th stage of labor than those who didn't.

Recommendations

Based on the study findings, the researchers recommend that:

- The practice of pronurturance plus should be a part of routine 3rd and 4th stage care for all birthing women regardless of their level of risk.
- All nurses in obstetrics and gynecology departments, especially those in labor and postnatal departments should be trained to perform pronurturance plus (early skin to skin and breast feeding), and be aware with its benefits.
- An awareness session in antenatal clinic for the women to disseminate the benefits of pronurturance practice for mother and baby, especially women who at risk for PPH.
- Further study is necessary to evaluate the effect of use SSC between mothers and babies on the uterine involution.

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