The National Ribat University
College of Graduate Studies & Scientific Research
Faculty of Nursing Science

Assessment of Nurse Midwives’ Knowledge Regarding Nursing Care of Post-Partum Hemorrhage at Ribat University Hospital and Omdurman Maternity Hospital
June. 2015 – Nov. 2015

A dissertation submitted to The National Ribat University as partial fulfillment for the requirement of Master Degree in Nursing Science (Obstetric, Gynaecology and Midwifery

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َسُورَةَ مُرْيَمَةَ

صِدَاقُ اللَّهِ الْعَظِيمِ
Dedication

With love and respect, I dedicate this research
To lovely people in my life
To my parents,
daughters,
teachers
And colleagues
First I thank God for giving me strength to accomplish this study.

I wish to express my thanks, gratitude and deep appreciation for
my supervisor Dr. Tarig Hassan for his kind efforts, valuable
instructions and patience during supervision.

My gratitude and respect extend to Dr. Sahar whose knowledge
and valuable notes helped accomplishing this study

Also, provide my sincere gratitude and thanks to my colleagues
who kindly responded to participate in this study.

Thanks to everyone helped me during this study
# List of Contents

<table>
<thead>
<tr>
<th>Contents</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedication</td>
<td>I</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>II</td>
</tr>
<tr>
<td>List of contents</td>
<td>III</td>
</tr>
<tr>
<td>List of tables</td>
<td>IV</td>
</tr>
<tr>
<td>List of figures</td>
<td>V</td>
</tr>
<tr>
<td>Abstract English</td>
<td>VI</td>
</tr>
<tr>
<td>Abstract Arabic</td>
<td>VII</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>VIII</td>
</tr>
<tr>
<td><strong>Chapter one: Introduction</strong></td>
<td>1</td>
</tr>
<tr>
<td>1.1 Background</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Justification</td>
<td>3</td>
</tr>
<tr>
<td>1.3 Objectives</td>
<td>3</td>
</tr>
<tr>
<td><strong>Chapter two: Literature Review</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Chapter Three: Material and Methods</strong></td>
<td>28</td>
</tr>
<tr>
<td><strong>Chapter Four: Results and Discussion</strong></td>
<td>31</td>
</tr>
<tr>
<td>4.1 Results</td>
<td></td>
</tr>
<tr>
<td>4.2 Discussion</td>
<td>46</td>
</tr>
<tr>
<td><strong>Chapter Five: Conclusion and Recommendations</strong></td>
<td>52</td>
</tr>
<tr>
<td>5.1 Conclusion</td>
<td></td>
</tr>
<tr>
<td>5.2 Recommendations</td>
<td>53</td>
</tr>
<tr>
<td><strong>References</strong></td>
<td>54</td>
</tr>
<tr>
<td><strong>Appendices</strong></td>
<td>59</td>
</tr>
</tbody>
</table>
# List of Tables

<table>
<thead>
<tr>
<th>Tables</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table (1):</strong> Distribution of the sample size according to the demographic characteristics of midwives at OMH and Ribat TH</td>
<td>31</td>
</tr>
<tr>
<td>Table (2): Distribution of the sample size according to the more suitable definition of PPH, primary PPH and secondary</td>
<td>35</td>
</tr>
<tr>
<td>Table (3): Distribution of the sample size according to knowledge about assessing of blood loss</td>
<td>39</td>
</tr>
<tr>
<td>Table (4): Distribution of the sample size according to knowledge about Signs of PPH</td>
<td>40</td>
</tr>
<tr>
<td>Table (5): Distribution of the sample size according to knowledge about observation of mother with PPH</td>
<td>41</td>
</tr>
<tr>
<td>Table (6): Distribution of the sample size according to knowledge about causes and risk factors of PPH</td>
<td>42</td>
</tr>
<tr>
<td>Table (7): Distribution of the sample size according to knowledge about methods for preventing incidence of PPH</td>
<td>43</td>
</tr>
<tr>
<td>Table (8): Distribution of the sample size according to knowledge about uterotonic drugs</td>
<td>44</td>
</tr>
<tr>
<td>Table (9): Mean of Nurses midwives’ knowledge for the different PPH criteria</td>
<td>45</td>
</tr>
</tbody>
</table>
List of figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure (1): Courses and workshop in postpartum hemorrhage</td>
<td>33</td>
</tr>
<tr>
<td>Figure (2): Knowledge about classification of PPH</td>
<td>34</td>
</tr>
<tr>
<td>Figure (3): Necessity of inserting IV line for all ladies in labour</td>
<td>36</td>
</tr>
<tr>
<td>Figure (4): Who should attend laboring mothers</td>
<td>37</td>
</tr>
<tr>
<td>Figure (5): The need to do episiotomy</td>
<td>38</td>
</tr>
</tbody>
</table>
Abstract

Background: Postpartum hemorrhage is one of the most alarming and serious emergencies which nurse midwives face when hemorrhage occurs, her prompt and competent action will be crucial in controlling blood loss and reducing the risk of maternal morbidity or even death.

Aims: The study aimed at assessing knowledge of midwives toward postpartum hemorrhage in Ribat University Hospital and Omdurman Maternity Hospital, June. 2015 – Nov. 2015.

Methods: This descriptive hospital-based study conducted among 77 nurse midwives. The data was collected by using a questionnaire designed, then processed by using Statistical Package for Social Sciences and presented as tables and figures.

Results: Participants were mostly secondary school graduates (35.1%) or intermediate school graduates (28.6%). Most of them had experience of 21 years or more (57.2%). General evaluation of participants’ knowledge towards PPH was found high (84.7%). They showed the highest knowledge regarding definition of primary postpartum hemorrhage, necessity of inserting intravenous line (97.4% for each), while they showed poor knowledge towards definition of PPH (51.9%).

Conclusion: Nurse midwives in the current study showed good knowledge in general, but the study editing updating knowledge of midwives regarding management and prevention of postpartum hemorrhage, the study recommended for further planned studies in the aspect of knowledge regarding postpartum hemorrhage.
خلفية: يعتبر نزف ما بعد الولادة من الحالات الطارئة الأكثر خطورة والذي يواجه القابلة، مدى كفاءة القابلة يعتبر أمر حاسم في التحكم في النزف وتقليل معدل الإمارض وحتى الوفيات.


منهجية البحث: هذه دراسة وصفية سريرية تم إجراها وسط 77 قابلة. تم جمع البيانات باستخدام استبيان، ثم تحليلها باستخدام برنامج الحزمة الإحصائية للدراسات الاجتماعية.

النتائج: المؤهل الدراسي لدى معظم القابلات كان الثانوية العليا (35,1%) والمتوسط (28,6%). كما وجد أن معظم المشاركات لديهن خبرة 50 سنة أو أكثر (72,6%). أظهرت مجموعه الدراسة مستوى جيد من المعرفة عن نزف ما بعد الولادة (88,7%) حيث كانت أعلى معدلات المعرفة فيما يخص تعريف النزف الأولي، ضرورة تركيب القسطرة الوريدية لكل الأمهات في غرفة الولادة وأهمية حضور الطبيب والقابلة لكل عملية ولادة (97,4%) بينما كانت أظهرن معرفة ضعيفة فيما يخص تعريف نزف ما بعد الولادة (51,9%).

الخلاصة: خلصت الدراسة أن مستوى معرفة القابلات في الدراسة كان جيداً بصورة عامة كما خلصت إلى أن التعليم أثناء الخدمة يساعد على تجديد المعرفة تجاه نزف ما بعد الولادة. وقد أوصت الدراسة بمزيد من الدراسات في مجال معرفة القابلات تجاه نزف ما بعد الولادة.

مستخلص الدراسة
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP</td>
<td>Blood Pressure</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>D &amp; C</td>
<td>Dilatation and Curettage</td>
</tr>
<tr>
<td>hCG</td>
<td>Human Chorionic Gonadotropin</td>
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<tr>
<td>HELLP</td>
<td>Hemolysis Elevated Liver Enzymes Low Platelets</td>
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<tr>
<td>HIV/AIDS</td>
<td>Human Immuno Deficiency Virus/ Acquired Immunodeficiency Syndromes</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous</td>
</tr>
<tr>
<td>MNM</td>
<td>Maternal Near-Miss</td>
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<tr>
<td>OR</td>
<td>Odd Ratio</td>
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<tr>
<td>PE</td>
<td>Pre-Eclampsia</td>
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<tr>
<td>PPH</td>
<td>Postpartum Hemorrhage</td>
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<tr>
<td>RCOG</td>
<td>Royal College of Obstetricians and Gynaecologists</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Science</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

1.1 background:

Obstetric hemorrhage remains one of the major causes of maternal death in both developed and developing countries. In the 2012–2013 report of the Sudan Maternal Deaths Review, hemorrhage was the first direct cause of maternal death. Hemorrhage emerges as the major cause of severe maternal morbidity in almost all ‘near miss’ audits in both developed and developing countries[1].

Postpartum hemorrhage (PPH) is the most common form of major obstetric hemorrhage. The traditional definition of PPH is defined as excessive bleeding from the genital tract at any time following the baby’s birth up to six weeks after delivery. A quantitative definition is related to the amount of blood loss in excess of 500 ml following birth of the baby[1].

Postpartum hemorrhage is classified depending on time of occurrence as: primary postpartum hemorrhage or true postpartum hemorrhage bleeding that occurs subsequent to expulsion of placenta and within 24 hours. PPH can be minor (500–1000 ml) or major (more than 1000 ml), major could be divided to moderate (1000–2000 ml) or severe (more than 2000 ml). Secondary PPH is defined as abnormal or excessive bleeding from the birth canal between 24 hours up to sixth weeks postnatally. This is also termed as late puerperal hemorrhage[2].

Blood volume equals weight in kilograms divided by 12 expressed as litres. In estimating percentage of blood loss, consideration should be given to body
weight and the original hemoglobin, this is simple measure can be used to estimate blood loss as post partum hemorrhage or not amount of blood loss that affect patient’s vital signs[3].

All protocol of management of post partum hemorrhage there is involvement of senior midwife as the major player, she may be the first one who notice the bleeding and start ABC for management[2].

Sudan is wide country with limited resources, so the way to reduce maternal death through training of midwives rather than establishing maternal hospitals and post partum hemorrhage is the direct cause of death there is urgent call to put attention for knowledge and attitude of midwives regarding post partum hemorrhage.

The overall prevalence of PPH worldwide is estimated to be 6 to 11 percent, rates vary by data source and country as well as assessment method with a prevalence of 10.6 percent when measured by objective appraisal of blood loss and 7.2 percent when assessed with subjective techniques. A systematic review estimated prevalence of PPH with 500 mL of blood loss or more at 10.5 percent in Africa, 8.9 percent[4,5].

**Problem statement:**

Postpartum hemorrhage remains the leading cause of maternal mortality and severe morbidity in Africa and around the globe. Maternal death from obstetrical hemorrhage in Sudan contributed to 28% of the reported maternal
mortality cases in 2013. Uterine atony remains the leading cause of death (55%) in deceased women, followed by ruptured uterus (22.2%), retained placenta (16.7%) and birth canal injuries (5.6%)\cite{6,7}.

1.2 Justification

Postpartum hemorrhage is one of the most alarming and serious emergencies which nurse midwives may face first and may be only professional person present when hemorrhage occurs, her prompt and competent action will be crucial in controlling blood loss and reducing the risk of maternal morbidity or even death. Knowledgeable nurse midwife in Sudan can play important role in prevention and management and reduction of postpartum hemorrhage. Very little is known about the actual knowledge of nurse midwives regarding management, prevention and reduction of postpartum hemorrhage risk factors.

1.3 Objectives

1.3.1 General objective

-To study knowledge of midwives towards PPH in Ribat University Hospital and Omdurman Maternity Hospital during the period from June to Nov. 2015.

1.3.2 Specific objectives

- To assess knowledge of midwives regarding nursing management and prevention of PPH during the period from June to Nov. 2015.
- To identify the knowledge of midwives regarding definition, classification, causes and risk factors of PPH during the period from June to Nov. 2015.
2. LITERATURE REVIEW

Postpartum hemorrhage (PPH) is an obstetrical emergency that can follow vaginal or cesarean delivery. It is a major cause of maternal morbidity, and one of the top three causes of maternal mortality in both high and low per capita income countries, although the absolute risk of death is much lower in high income countries (1 in 100,000 versus 1 in 1000 births in low income countries)\(^8\). Furthermore, hemorrhage is the leading cause of admission to the intensive care unit and the most preventable cause of maternal mortality\(^9\).

INCIDENCE

The incidence of PPH varies widely, depending upon the criteria used to define the disorder. A reasonable estimate is 1 to 5 percent of deliveries\(^8,10\). An analysis of population-based data from the United States National Inpatient Sample for the years 1994-2006 found that the discharge diagnosis of PPH increased 26 percent over this period (from 2.3 to 2.6 percent). Uterine atony was the most common cause of PPH and accounted for most of the increase. The proportion of women diagnosed with uterine atony increased from 1.6 to 2.4 percent over the same interval\(^11\).

Published studies in Sudan have indicated that, postpartum hemorrhage represent one of the major three causes of maternal mortality as reported by the Sudanese-American-Association which reviewed that, maternal death from obstetrical hemorrhage in Sudan contributed to 28% of the reported maternal mortality cases in 2013. Uterine atony remains the leading cause of death.
(55%). 41% of women who died delivered at home and the remainder (59%) delivered in hospital; most of the women who died in hospital were admitted as an emergency from home and the majority died within the first 24 hours of hospital admission.

Recent reports published in 2014 by Umbelli T, et al reported that, hemorrhage was the most common cause of Maternal Near-Miss (MNM), followed by eclampsia, sepsis, hepatitis, cardiac disease and other indirect events: 48.5%, 28.8%, 15.7%, 3.1%, 2.7% and 1.2 % respectively\textsuperscript{[12]}.

DEFINITION AND DIAGNOSIS

PPH is best defined and diagnosed clinically as excessive bleeding that makes the patient symptomatic (eg, pallor, lightheadedness, weakness, palpitations, diaphoresis, restlessness, confusion, air hunger, syncope) and/or results in signs of hypovolemia (eg, hypotension, tachycardia, oliguria, low oxygen saturation [<95 percent]). Vaginal bleeding is usually noted, but may not be present in cases where hemorrhage is related to abdominal bleeding from a cesarean delivery or a broad ligament hematoma after a sulcus laceration. A timely, accurate diagnosis of PPH is important in order to initiate intervention (eg, drugs, surgery, referral) and improve outcome\textsuperscript{[13]}.

Other definitions that have been proposed have been problematic. The most common definition of PPH is estimated blood loss $\geq500$ mL after vaginal birth or $\geq1000$ mL after cesarean delivery. The inadequacy of this definition was illustrated in studies that assessed blood loss using various objective methods:
the mean blood loss reported after vaginal and cesarean deliveries was approximately 400 to 600 mL and 1000 mL, respectively, and clinicians were likely to underestimate the volume of blood lost.\textsuperscript{[14]}

Another classic definition of PPH is a 10 percent decline in postpartum hemoglobin concentration from antepartum levels. However, this is not a clinically useful definition for several reasons: rapid blood loss may trigger a medical emergency prior to observation of a fall in hemoglobin concentration; laboratory changes that are not correlated with events that endanger the patient should not be used to define a medical emergency; and antepartum hemoconcentration (eg, from preeclampsia or dehydration) may cause a large fall in serum hemoglobin concentration following delivery in the absence of excessive intrapartum blood loss.

PPH is also defined as primary or secondary: primary PPH occurs within 24 hours after delivery (also called early PPH) and secondary PPH occurs 24 hours to 12 weeks after delivery (also called late PPH).

**DIFFERENTIAL DIAGNOSIS**

The findings of lightheadedness/syncope, oliguria, tachycardia, and hypotension following delivery almost always indicate PPH. Although vasovagal reactions and vasodilatation due to drugs may also result in some of these symptoms, this is less common than PPH immediately postpartum, readily reversible, and generally not dangerous.

In particular, pressor drugs should not be administered to a heavily bleeding
patient under the mistaken belief that lightheadedness, tachycardia, or hypotension are due to an epidural block. An epidural block is unlikely to be the cause of these signs/symptoms if the woman was stable hemodynamically prior to delivery, the level of the block has not become significantly higher immediately following delivery, and her symptoms did not abruptly follow systemic administration of a drug known to cause hypotension.

ETIOLOGY AND RISK FACTORS

In late pregnancy, uterine artery blood flow is 500 to 700 mL/min and accounts for about 15 percent of cardiac output. Uterine bleeding after delivery is controlled by a combination of (1) contraction of the myometrium, which constricts the blood vessels supplying the placental bed, and (2) local decidual hemostatic factors, including tissue factor\textsuperscript{[9]}, type-1 plasminogen activator inhibitor\textsuperscript{[15,16]}, and systemic coagulation factors (eg, platelet and circulating clotting factors). Deficient contraction of the myometrium is manifested clinically as uterine atony. Defective decidual hemostasis is associated with inadequate decidualization (eg, placenta accreta) or bleeding diatheses (eg, factor deficiencies or thrombocytopenia). The major etiologies of and risk factors for PPH are described below:

Atony

The most common cause of PPH is uterine atony (ie, lack of effective contraction of the uterus after delivery), which complicates 1 in 20 births and is responsible for at least 80 percent of cases of PPH\textsuperscript{[17]}. Correlates of atonic uterus
include:

- Overdistension (multiple gestation, polyhydramnios, macrosomia)
- Uterine infection
- Drugs (uterine relaxants)
- "Uterine fatigue" after a prolonged or induced labor
- Uterine inversion
- Retained placenta or placental fragment (either a normally attached placenta or placenta accreta).

However, atony can occur in the absence of any of these risk factors.

If the uterus appears to be firmly contracted after delivery, then other etiologies of hemorrhage should be considered. However, one should keep in mind that a focal area of the uterus can be atonic, which is difficult to appreciate on physical examination, or the uterus may not be maximally contracted.

**Trauma**

Trauma-related bleeding can be due to lacerations (perineal, vaginal, cervical, uterine), incisions (hysterotomy, episiotomy), or uterine rupture. Lacerations are more common after instrumental delivery.

**Coagulation defects**

Acquired and congenital bleeding diatheses may be associated with thrombocytopenia and/or hemostatic defects. Acquired causes include disorders related to pregnancy (eg, severe preeclampsia, HELLP syndrome, abruptio placentae, fetal demise, amniotic fluid embolism, sepsis), as well as surgical site
bleeding. The mechanism is related to hemodilution, failure of liver synthetic function, or disseminated intravascular coagulation.

**RISK FACTORS**

A study including 154,311 deliveries compared 666 cases of PPH to controls without hemorrhage\(^{18}\). Factors significantly associated with hemorrhage, in decreasing order of frequency, were:

- Retained placenta (OR 3.5, 95% CI 2.1-5.8)
- Failure to progress during the second stage of labor (OR 3.4, 95% CI 2.4-4.7)
- Placenta accreta (OR 3.3, 95% CI 1.7-6.4)
- Lacerations (OR 2.4, 95% CI 2.0-2.8)
- Instrumental delivery (OR 2.3, 95% CI 1.6-3.4)
- Large for gestational age newborn (eg, >4000 g) (OR 1.9, 95% CI 1.6-2.4)
- Hypertensive disorders (OR 1.7, 95% CI 1.2-2.1)
- Induction of labor (OR 1.4, 95% CI 1.1-1.7)
- Augmentation of labor with oxytocin (OR 1.4, 95% CI 1.2-1.7)

In addition to the risk factors cited above, placenta previa, history of previous PPH, obesity, high parity, Asian or Hispanic race, precipitous labor, first stage of labor longer than 24 hours, uterine overdistention, uterine infection, and preeclampsia have been associated with PPH\(^{18,19-22}\). However, only a small proportion of women with any risk factors for PPH develop the disorder and
many women without risk factors experience hemorrhage after delivery; thus, knowledge of risk factors is not very useful clinically.

Women with von Willebrand disease are prone to postabortal bleeding, but are unlikely to experience PPH at term. On the other hand, women with factor XI deficiency or who are hemophilia carriers are at increased risk of both early and late PPH (16 to 22 percent for early and 11 to 24 percent for late). This is unlikely to be catastrophic\(^{[23,24]}\). PPH alone is not a strong indication for screening for these defects, given that bleeding disorders are rarely the cause of PPH. As an example, one study of 50 women with PPH who underwent postpartum screening identified a bleeding diathesis in only one woman\(^{[25]}\). However, unexplained PPH that does not respond to general measures should alert clinicians to the possibility of a bleeding disorder as a causative factor, especially in women with a history of menorrhagia, excessive bleeding after minor trauma, or a family history of a bleeding disorder.

**MANAGEMENT AND PREVENTION:**

General preventive measures (fundal massage, routine use of uterotonic drugs) for active management of the third stage of labor are discussed separately.

Patients with risk factors for PPH should be identified and counseled, as appropriate for their level of risk and gestational age. Planning for these patients involves ensuring availability of resources that might be needed, including personnel, medication, equipment, and blood products.

Development and consistent application of a comprehensive protocol for
management of PPH appears to result in improved outcomes for these women\textsuperscript{[26]}. In an observational study, the initiation of one such protocol was associated with resolution of maternal bleeding at an earlier stage, use of fewer blood products, and a 64 percent reduction in the rate of disseminated intravascular coagulation\textsuperscript{[26]}.

In addition to a protocol, we suggest that labor and delivery units compile kits including medications and instruments that may be needed to manage PPH so that this equipment is readily available when needed (similar to a "code cart"). The Joint Commission on Accreditation of Healthcare Organizations recommends that obstetrical staff periodically conduct clinical drills to help staff prepare for PPH, conduct debriefings to evaluate team performance, and identify areas for improvement\textsuperscript{[9]}.

**COMPLICATIONS**

PPH is a major cause of maternal morbidity, including catastrophic sequelae:

- Death
- Hypovolemic shock and organ failure: renal failure, stroke, myocardial infarction, postpartum hypopituitarism (Sheehan syndrome)
- Fluid overload (pulmonary edema, dilutional coagulopathy)
- Abdominal compartment syndrome
- Anemia
- Transfusion-related complications
- Acute respiratory distress syndrome
• Anesthesia-related complications
• Sepsis, wound infection, pneumonia
• Venous thrombosis or embolism
• Unplanned sterilization due to need for hysterectomy
• Asherman syndrome (related to curettage if performed for retained products of conception)

Sheehan's syndrome (ie, postpartum hypopituitarism) is a rare, but potentially life threatening, complication. The pituitary gland is enlarged in pregnancy and prone to infarction from hypovolemic shock. Damage to the pituitary can be mild or severe, and can affect the secretion of one, several, or all of its hormones. A common presentation is failure to lactate and amenorrhea/oligomenorrhea, but any of the manifestations of hypopituitarism (eg, hypotension, hyponatremia, hypothyroidism) can occur anytime from the immediate postpartum period to years after delivery. If the patient remains hypotensive after control of hemorrhage and volume replacement, she should be evaluated and treated for adrenal insufficiency immediately; evaluation of other hormonal deficiencies can be deferred until four to six weeks postpartum. This evaluation is described in detail separately.

Another rare, but life threatening, complication is abdominal compartment syndrome (organ dysfunction caused by intraabdominal hypertension). The diagnosis should be considered in patients with a tensely distended abdomen and progressive oliguria who are developing multiorgan failure.
In trauma patients, transfusion is an independent risk factor for development of thromboembolism. For this reason, all women who have been transfused for PPH should receive mechanical thromboprophylaxis (graduated compression stockings or pneumatic compression device) as soon as feasible and continue thromboprophylaxis until discharge\textsuperscript{[27]}. Twelve to 24 hours after bleeding has been controlled, pharmacologic thromboprophylaxis should be added, providing coagulation tests are normal or close to normal.

**MANAGEMENT OF PRIMARY PPH:**

The management of primary PPH is multifaceted and requires care by several teams within the hospital (obstetricians, nurses, anesthesiologists, blood bank personnel, laboratory medicine, surgical subspecialists, interventional radiology)\textsuperscript{[28]}. These teams are often summoned and required to work together under conditions of great stress and time pressures. Coordination is essential and can be facilitated by protocols and flow diagrams that anticipate how these teams will communicate and function together.

The obstetrical provider should initiate a sequence of non-operative and operative interventions for control of PPH and promptly assess the success or failure of each measure.

**The goal is to:**

- Restore or maintain adequate circulatory volume to prevent hypoperfusion of vital organs
- Restore or maintain adequate tissue oxygenation

13
• Reverse or prevent coagulopathy
• Eliminate the obstetric cause of PPH

If an intervention does not succeed, the next treatment in the sequence must be swiftly instituted. Indecisiveness delays therapy and results in excessive hemorrhage, which eventually causes dilutional coagulopathy and severe hypovolemia, tissue hypoxia, hypothermia, and acidosis. This will make control of hemorrhage much more difficult and will increase the likelihood of hysterectomy, major morbidity from hemorrhagic shock, and death.

Although there are no data from clinical trials to help guide management of transfusion specifically in PPH, management of blood component therapy is similar to that in other massive hemorrhage\textsuperscript{29}. Development of a standardized institutional approach to management of PPH improves outcome. One component of a standardized institutional approach to management of severe PPH is to implement a standardized massive transfusion protocol for the labor and delivery department. Examples and use of massive transfusion protocols are discussed separately.

The approach to treatment of PPH differs somewhat depending on the cause and whether hemorrhage occurs after a vaginal birth or after a cesarean delivery. Traumatic, hemorrhaging lesions need to be controlled surgically, either transvaginally or transabdominally. Coagulation defects can often be treated medically, with transfusion of blood and blood products. The treatment of atony, the most common cause of PPH, depends on the route of delivery. After
a vaginal birth, treatment begins with less invasive interventions and progresses to more invasive procedures until hemorrhage is controlled. It is usually possible to avoid laparotomy and its associated morbidity. By comparison, after a cesarean delivery where the abdomen is already open and adequate anesthesia has already been administered, there is much less concern about open operative interventions. The frequency of the different causes of hemorrhage also differs by route of birth; retained products are more likely after a vaginal birth than after a cesarean delivery since the uterine cavity is readily accessed and visualized.

The rate and volume of bleeding, vital signs, and laboratory results should be closely monitored to assess the best approach to and aggressiveness of intervention. It is important to not allow the patient to become moribund before initiating life-saving measures.

In settings where there may be a delay in reaching emergency obstetrical care facilities and delay in receiving definitive therapies after arrival, use of an antishock garment may helpful for reversing hypovolemic shock and decreasing obstetric hemorrhage\[^{30,31}\].

**Hemorrhage associated with vaginal versus cesarean delivery**

A variety of techniques are available for control of PPH. The choice of technique depends, in part, on the setting: post-vaginal delivery or at cesarean delivery where the abdomen is already open. The approach to management of PPH after vaginal birth and cesarean delivery are described in detail separately.
Guidelines from professional organizations

Guidelines for diagnosis, management, and prevention of postpartum hemorrhage have been developed by several organizations.

- California Maternal Quality Care Collaborative best practices for management of obstetrical hemorrhage
- Royal College of Obstetricians and Gynaecologists (RCOG) guideline prevention and management of postpartum hemorrhage
- World Health Organization guideline for prevention and treatment of postpartum hemorrhage
- Society of Obstetricians and Gynaecologists of Canada guideline prevention and management of postpartum hemorrhage
- American College of Obstetricians and Gynecologists practice bulletin postpartum hemorrhage[32]
- New York health advisory recommendations for reducing the risk of maternal death from hemorrhage

SECONDARY POSTPARTUM HEMORRHAGE

Secondary PPH refers to excessive uterine bleeding occurring between 24 hours and six weeks postpartum. It affects 0.5 to 2 percent of women in developed countries. The pathogenesis may be diffuse uterine atony or subinvolution of the placental site secondary to retained products of conception and/or infection. A bleeding diathesis may also be responsible. Pseudoaneurysm of the uterine artery and arteriovenous malformations are rare causes of secondary PPH
described in case reports. Choriocarcinoma is rare, but may present as prolonged, new, or increased bleeding postpartum. Sometimes the cause cannot be determined[33-39].

Unlike primary PPH, bleeding usually is not catastrophic. A previous history of secondary PPH appears to predispose to a recurrence, as with primary PPH[40].

A thorough history and physical examination should be performed. Evaluation for a bleeding diathesis, such as von Willebrand disease, should be considered, especially in women with a history of menorrhagia or other personal or family history of excessive or unusual bleeding. A quantitative pregnancy test is useful for evaluating for choriocarcinoma, retained products of conception, or even a new pregnancy (if the secondary hemorrhage occurs several weeks after delivery). Serial determinations of hCG may be needed to distinguish among these entities when the test is positive. In addition, ultrasound examination (including color and spectral flow Doppler) of the uterus may detect the cause of bleeding, and will exclude some potential bleeding sources in the differential diagnosis. If this work-up is negative, then further evaluation versus expectant management should depend on patient-specific factors, such as the amount and duration of bleeding.

There are no data from randomized controlled trials to guide management[9]. If the uterus is atonic, uterotonic agents are given. Options include oxytocin infusion, methylergonovine (0.2 mg intramuscularly, repeated every two to four hours up to three doses), or intramuscular carboprost tromethamine (Hemabate,
250 mcg intramuscularly; up to eight doses at intervals of no less than 15 minutes). However, these agents will not be useful if the uterus is firm.

If bleeding is not massive and fever, uterine tenderness, and/or a foul-smelling discharge are present, then endometritis should be suspected. Under these circumstances, we prescribe broad spectrum antibiotic therapy. However, some clinicians administer antibiotics to all patients with secondary PPH, including those without obvious signs of infection.

Surgical procedures (D & C, suction curettage) are directed at evacuation of retained products of conception, which is more common after vaginal than cesarean delivery. These procedures are often efficacious if the uterus is firm (ie, no atony), or when medical management fails, even if retained placental or membrane fragments cannot be identified preoperatively\(^{[41]}\). As an example, a study of 132 consecutive women with secondary PPH reported 75 (57 percent) were initially treated with surgical evacuation, which was successful in 67 (90 percent). Of the 57 women initially managed medically, treatment was successful in 41 (72 percent), 16 women had continuing symptoms of whom 12 subsequently underwent surgical evacuation. Tissue specimens were obtained at surgery in only 38 women and just one-third of these had histological confirmation of placental tissue\(^{[9]}\).

Curettage should be performed under ultrasound guidance. This is likely to reduce the rate of perforation, will allow identification of placental tissue, and confirm that this tissue has been evacuated\(^{[42]}\). Fluid in the cavity or a mixed-
echo pattern is more consistent with normal involution, although a mixed-echo pattern is sometimes associated with retained placental tissue.

Suction curettage should be employed when bleeding is over 500 mL and is not controlled by medical measures. The size of the suction cannula is determined by the size of the uterus. We use the diameter cannula corresponding to the uterine size by gestational age (eg, a 12 mm cannula for a uterus of 12 weeks size) with a minimum diameter of 10 mm and a maximum diameter of 16 mm.

Uterine perforation and formation of intrauterine adhesions are the major complications of surgery. In the series described above, perforation occurred in 3 percent of cases. Unfortunately, sonographic evidence of accumulation of fluid and debris in the uterine cavity is a common finding in the involuting uterus and does not distinguish patients requiring surgical versus medical therapy\textsuperscript{[43,44]}.

**Immediate Care**

One person should be assigned to evaluate and record vital signs. Blood pressure and pulse should be assessed every 3 to 5 minutes. The location and consistency of the fundus, amount of lochia, skin temperature and color, and capillary return also are assessed. Oxygen may be administered by tight face mask at 8 to 10 L/min to increase the saturation of fewer red blood cells. Oxygen saturation levels are carefully monitored. Nurses often follow facility protocols that allow them to draw blood for hemoglobin, hematocrit, clotting studies, and type and cross-match. Nurses administer fluids, whole blood, and
medications as directed and report their effectiveness. A urinary catheter is inserted to measure hourly urinary output. The catheter is also necessary if a surgical procedure to control the hemorrhage is required. In addition, nurses must make every effort to provide information and emotional support to the woman and her family\footnote{45}.

**APPLICATION OF THE NURSING PROCESS IN EXCESSIVE BLEEDING:**

**Woman with Excessive Bleeding**

**Nursing assessment**

The initial postpartum assessment includes a chart review to determine if risk factors for hemorrhage are present. This alerts the nurse to a woman at increased risk for hemorrhage.

**Uterine Atony**

Priority assessments for uterine atony include the fundus, bladder, lochia, vital signs, skin temperature, and color. Assess the consistency and the location of the uterine fundus. The fundus should be firmly contracted at or near the level of the umbilicus and midline. If the fundus feels soft (boggy), the uterus is not firmly contracted and bleeding from the placental site is rapid and continuous. If the fundus is above the level of the umbilicus and displaced, a full bladder may be the cause of excessive bleeding\footnote{45}. When inspecting for blood loss, remember to check under the woman’s legs, buttocks and back for lochia drainage by asking the woman to turn on her side. This allows visibility of any blood that may not be obvious from the front. Obese women have an increased risk for
uterine atony with subsequent postpartum hemorrhage; however, assessment of the fundus is difficult in this population\textsuperscript{46}.

Monitor these women frequently for other signs of uterine atony and attempt to assess the uterine fundus while watching for increased lochia flow or clots to be expelled. It is difficult to estimate the volume of lochia by visual examination of peripads. More accurate information is obtained by weighing peripads, linen savers, and, if necessary, bed linens before and after use and subtracting the difference. One gram (weight) equals approximately 1 mL (volume)\textsuperscript{46}.

Measure vital signs at least every 15 minutes or more often if necessary. Apply a pulse oximeter to determine oxygen saturation levels. This helps to detect trends, such as tachycardia or a decrease in pulse pressure that may reveal a deteriorating status in a woman with significant blood loss. Because the body initially compensates for excessive bleeding, the vital signs may remain normal even when the woman is becoming hypovolemic. The skin should be warm and dry, mucous membranes of the lips and mouth should be pink, and capillary return should occur within 3 seconds when the nails are blanched. These signs confirm adequate circulating volume to perfuse the peripheral tissue\textsuperscript{43}.

**Trauma**

If the fundus is firm but bleeding is excessive, the cause may be lacerations of the cervix or birth canal. If the mother complains of deep, severe pelvic or rectal pain or if vital signs or skin changes suggest hemorrhage but excessive bleeding is not obvious, the cause may be concealed bleeding and the formation
of a hematoma. Examine the vulva for bulging masses or discoloration of the skin. However, a hematoma developing in the vagina or in the retroperitoneal area will not be obvious when the vulva is examined. This sign warrants examination of the vaginal walls and the cervix by the health care provider. Table 28-1 summarizes assessments, abnormal signs and symptoms, and nursing implications\textsuperscript{[45]}.  

<table>
<thead>
<tr>
<th>TABLE 28-1 NURSING ASSESSMENTS FOR POSTPARTUM HEMORRHAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSESSMENTS</strong></td>
</tr>
<tr>
<td>Chart review</td>
</tr>
<tr>
<td>Fundus</td>
</tr>
<tr>
<td>Lochia</td>
</tr>
<tr>
<td>Vital signs</td>
</tr>
<tr>
<td>Urine output</td>
</tr>
<tr>
<td>Comfort level</td>
</tr>
<tr>
<td>Skin</td>
</tr>
</tbody>
</table>

**Nursing Diagnosis**

Postpartum hemorrhage is a complication that requires the efforts of all members of the health care team to control the hemorrhage and prevent further complications such as hypovolemic shock\textsuperscript{[45]}.  

**Nursing planning**

Client-centered goals are inappropriate for this potential complication because the nurse cannot manage postpartum hemorrhage independently but must use orders from the physician or nurse-midwife to treat the condition. Planning should reflect the nurse’s responsibility to:

- Monitor for signs of postpartum hemorrhage.
Perform actions that minimize postpartum hemorrhage and prevent hypovolemic shock.

Notify the provider if signs of excessive blood loss are observed or if the woman does not respond as desired[45].

Nursing intervention

The key to successful management of early postpartum hemorrhage is early recognition and response. All postpartum women are at risk for hemorrhage. However, be aware of factors that increase this risk further and be particularly vigilant in monitoring these women so that excessive bleeding can be anticipated and minimized. When predisposing factors are present, initiate frequent assessments. Many hospitals and birth centers have a standard of care that calls for assessments every 15 minutes during the first hour after birth, every 30 minutes for the next 2 hours, and hourly for the next 4 hours. This plan may not be adequate for the woman at known risk for postpartum hemorrhage because bleeding occurs rapidly[45].

Collaborating with the Health Care Provider

When excessive bleeding is suspected and the fundus is boggy, begin uterine massage. Check the woman’s bladder for distention and have her empty it if necessary. If she is not able to void and the bladder is distended, catheterize the woman. Weigh blood-soaked pads, linen savers, and linens to accurately determine the amount of blood lost. If massage is not effective in controlling
bleeding promptly, notify the physician or nurse-midwife. Save any tissue or clots passed\textsuperscript{45}.

Most facilities also have protocols which permit nurses to catheterize patients and initiate specific laboratory studies, such as hemoglobin and hematocrit levels and type and crossmatch of blood, so that blood is available if transfusions become necessary. Coagulation studies that may be ordered include fibrinogen, prothrombin time, partial thromboplastin time, fibrin split products, fibrin degradation products, platelets, D-dimer, and blood chemistry. Many protocols also allow the nurse to increase the flow rate of an existing IV or insert a large-bore catheter to start IV fluids while the health care provider is being informed of the mother’s condition. These actions do not substitute for notifying the provider, but they do allow nurses to make initial interventions quickly.

Keep the woman on bed rest to increase venous return and maintain cardiac output. The full Trendelenburg’s position may interfere with cardiac and pulmonary function and is not advised. A modified Trendelenburg’s position may be used with the legs elevated 10 to 30 degrees to increase blood return from the legs, the trunk horizontal, and the head slightly elevated. Continue assessments, call for assistance, and save all blood-soaked materials so that an accurate estimation of blood loss can be made. Assistance is necessary because one nurse must continue to massage the uterus and perform and record assessments while another notifies the health care provider of the mother’s
condition and gathers medications and supplies needed. When notifying the provider, document the time and content of each communication. For example, “1300: Dr. X notified of implementation of postpartum hemorrhage protocol due to difficulty maintaining uterine contraction and continued excessive bleeding. Requested Dr. X to see client.”

Administer medications, fluids, and treatments as ordered by the health care provider or as stated in the facility’s protocol. Note the effects and relay the information to the health care provider. Physicians and nurse-midwives base medical management on information relayed by the nurse. The nurse should be familiar with the standing orders and protocols for his or her patient population. Because of oxytocin’s antidiuretic effect, listen to breath sounds to identify signs of pulmonary edema from fluid overload if large amounts of oxytocin are given. Document blood pressure if Methergine is given. If measures fail to control bleeding, notify the health care provider so that additional procedures can be initiated. These may include preparation for operative intervention (surgical preparation, consent signed for operative procedure, or confirmation that blood replacement is available).

Providing Support for the Family

The unusual activity of the hospital staff may make the mother and her family anxious. Be alert to their nonverbal cues, and when they appear frightened, acknowledge their feelings. Keeping the family informed is one of the most effective ways of reducing anxiety. Acknowledge the anxiety and provide
simple appropriate explanations of the activity. “I know all this activity must be frightening. She is bleeding a little more than we would like and we are doing several things at once.”

**Post-hemorrhage Care**

After the hemorrhage is controlled, continue to assess the woman frequently for a resumption of bleeding. The woman may be anemic and fatigued. Allow rest periods and organize work to help her conserve energy. Because the woman may experience orthostatic hypotension, assist her in getting out of bed after dangling her legs and assess for dizziness and low blood pressure. Encourage intake of fluids and foods high in iron. She may need assistance feeding her newborn.

**Home Care**

Nurses who work in home care or nurse-managed postpartum clinics must be aware that women who have had postpartum hemorrhage are subject to a variety of complications. In general, they are exhausted, and it may take weeks for them to feel well again. Anemia often results, and a course of iron therapy may be prescribed to restore an adequate hemoglobin level. Activity may be restricted until strength returns.

Some women need extra assistance with housework and care of the new infant. Fatigue may interfere with bonding and attachment. Because extensive blood loss increases the risk of postpartum infection, the woman must be taught to observe for specific signs and symptoms.
**Evaluation**

Although client-centered goals are not developed for potential complications (collaborative problems), the nurse collects and compares data with established norms and judges whether the data are within normal limits. If problems arise, the nurse acts to minimize hemorrhage and notifies the health care provider.\textsuperscript{[45]}.
3. MATERIAL AND METHODS

**Study design:**
This descriptive hospital-based study among midwives in Omdurman Maternity hospitals and Ribat University Hospital during the period from June – Nov. 2015.

**Study area**
This study was conducted in Omdurman Maternity Hospital which is the largest referral hospital in the Sudan for obstetrics with average number of deliveries 25000 /year. It remained to be the first and largest specialized maternity hospital in Sudan. It was established in 1957 mainly to provide training for midwives from nearby midwifery school as well as delivering maternity services to women from the greater Khartoum area, and cases referred from all Sudan States. The role of the hospital gradually progress and it became a national teaching center in obstetrics, it also provides maternity health care services to women from different states of the Sudan. As its antenatal clinic receiving patients from all over the country and has an effective health awareness unit, HIV\AIDS, Reproductive health including family planning clinic, vaccination, health education and cervical cancer screening program.

Ribat University Hospital is the one of the major hospitals in Sudan with large catchment's area where many patients are in regular visits and it was
established in 2000. The hospital has about 700 beds for different units including the emergency department, the medical surgical wards, dialysis unit, pharmacy, blood bank and laboratory. The hospital also have ophthalmology department, dental, pediatric, obstetric and gynecology department. It serves police community mainly and their families, staff and students of Al Ribat University and general population in addition to public patients.

Study population

- Midwives in Omdurman Maternity Hospital and Ribat University Hospital.

Sample size and sampling technique:

Total number of midwives those graduate from midwifery school, working in maternity hospital and Ribat University Hospital.

Study variables:

Age, duration of work, qualification, courses, definition and classification of PPH, risk factors, management and complications.

Data collection and tools:

Data was collect through standardized questionnaires through direct interview with school midwives in study areas.

Inclusion criteria

- All midwifery school midwives in Omdurman Maternity Hospital and Ribat University who were graduated from midwifery school and agreed to participate in the study.
Exclusion criteria

- The study excluded all professional nurse midwives.
- Midwives who refused to participate in the study.

Data analysis

- Data was gathered into a computer database “Excel sheet”. Post partum hemorrhage was dependent variable and knowledge are independent variables.
- Descriptive analysis by SPSS program, and findings were presented as graphs and tables.

Ethical consideration

- Permission taken from authorities.
- Permission taken from the participant.
- Name of participants will not used in questionnaires.
4.1 RESULTS

Table (1): Distribution of the sample size according to the demographic characteristics of midwives at OMH and Ribat TH, (n = 77)

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - 28</td>
<td>19</td>
<td>24.7</td>
</tr>
<tr>
<td>29 - 37</td>
<td>4</td>
<td>5.2</td>
</tr>
<tr>
<td>38 - 46</td>
<td>15</td>
<td>19.5</td>
</tr>
<tr>
<td>47 - 55</td>
<td>25</td>
<td>32.5</td>
</tr>
<tr>
<td>56+</td>
<td>14</td>
<td>18.2</td>
</tr>
</tbody>
</table>

Educational level

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>22</td>
<td>28.6</td>
</tr>
<tr>
<td>Secondary</td>
<td>27</td>
<td>35.1</td>
</tr>
<tr>
<td>High Education</td>
<td>11</td>
<td>14.3</td>
</tr>
<tr>
<td>Bachelor</td>
<td>17</td>
<td>22.1</td>
</tr>
</tbody>
</table>

Experience

<table>
<thead>
<tr>
<th>Experience</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 yr.</td>
<td>8</td>
<td>10.4</td>
</tr>
<tr>
<td>1 – 10 yrs.</td>
<td>14</td>
<td>18.2</td>
</tr>
<tr>
<td>11 – 20</td>
<td>11</td>
<td>14.3</td>
</tr>
<tr>
<td>21 – 30</td>
<td>21</td>
<td>27.3</td>
</tr>
<tr>
<td>31 – 40</td>
<td>21</td>
<td>27.3</td>
</tr>
<tr>
<td>41+</td>
<td>2</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Table (1): demographic characteristics showed that, 25(32.5%) of midwives in the study had age of 47-55. Secondary graduates represented 27(35.1%), while distribution according to experience showed that, 44(57.2%) had experience of 21 years or more. Nurse midwives mostly had experience of 21 years or more (57.2%), most midwives showed knowledge about mediolateral episiotomy (89.6%). Nurse midwives in the current study showed poor knowledge regarding method assessing the blood loss (26%).
Figure (1): Courses and workshop in postpartum hemorrhage

Midwives who received courses and workshops on postpartum hemorrhage were 27(35.1%)
Correct answer about classification of PPH (two types) was reported by 80.5% of participants.

Figure (2): Knowledge about classification of PPH
Table (2): Distribution of the study sample according to the more suitable definition of PPH, primary PPH and secondary, (N=77)

<table>
<thead>
<tr>
<th>Definition</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PPH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excessive bleeding that makes the patient symptomatic</td>
<td>28</td>
<td>36.4</td>
</tr>
<tr>
<td>Estimated blood loss ≥500 mL after vaginal birth</td>
<td>39</td>
<td>50.6</td>
</tr>
<tr>
<td>Estimated blood loss ≥ 1000 mL after cesarean delivery</td>
<td>10</td>
<td>13.0</td>
</tr>
<tr>
<td><strong>Primary PPH is</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding occur after birth within 24hrs</td>
<td>65</td>
<td>84.4</td>
</tr>
<tr>
<td>Bleeding occur after 24 hrs of birth up to 6 week</td>
<td>10</td>
<td>13.0</td>
</tr>
<tr>
<td>Bleeding occur after 12 weeks of birth</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td><strong>Secondary PPH is</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding occur after 24 hrs of birth up to 6 week</td>
<td>62</td>
<td>80.5</td>
</tr>
<tr>
<td>Bleeding occur after birth within 24hrs</td>
<td>9</td>
<td>11.7</td>
</tr>
<tr>
<td>Bleeding occur after 12 weeks of birth</td>
<td>6</td>
<td>7.8</td>
</tr>
</tbody>
</table>

Knowledge about definitions of PPH, primary PPH and Secondary PPH was reported correctly by 28(36.4%), 65(84.4%) and 62(80.5%) respectively.
Figure (3): Necessity of inserting IV line for all ladies in labour

Necessity of inserting IV line for all ladies was reported by 97.4%
Among participants, 75(97.4%) said the labour should be attended by doctor and midwives.
There was 66(85.7%) who think that there is no need to do episiotomy
Table (3): Distribution of the study sample according to knowledge about assessing of blood loss

<table>
<thead>
<tr>
<th>Knowledge of assessing blood loss</th>
<th>Yes</th>
<th></th>
<th>No</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Pads count and weight</td>
<td>20</td>
<td>26.0</td>
<td>57</td>
<td>74</td>
</tr>
<tr>
<td>Assess blood loss directly by kidney dish</td>
<td>51</td>
<td>66.2</td>
<td>26</td>
<td>33.8</td>
</tr>
<tr>
<td>Observe vital signs</td>
<td>22</td>
<td>28.6</td>
<td>55</td>
<td>71.4</td>
</tr>
</tbody>
</table>

Knowledge about assessment of blood loss was reported correctly by 20(26%), while 51(66.2%) think that it should be assessed directly by kidney dish.
Table (4): Distribution of the study sample according to knowledge about Signs of PPH

<table>
<thead>
<tr>
<th>Knowledge about Signs of PPH</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible outside vaginal bleeding</td>
<td>72</td>
<td>93.5</td>
</tr>
<tr>
<td>Pallor</td>
<td>67</td>
<td>87.0</td>
</tr>
<tr>
<td>Rising pulse rate</td>
<td>64</td>
<td>83.1</td>
</tr>
<tr>
<td>Falling BP</td>
<td>65</td>
<td>84.4</td>
</tr>
<tr>
<td>Enlarge in uterus as it fills with blood or blood clots</td>
<td>67</td>
<td>87.0</td>
</tr>
<tr>
<td>Alter level of consciousness</td>
<td>58</td>
<td>75.3</td>
</tr>
</tbody>
</table>

In regard to signs and symptoms, 72(93.5%) reported visible outside vaginal bleeding, 67(87%) reported pallor, 64(83.1%) reported rising pulse rate, 65(84.4%) reported falling BP, 67(87%) reported Enlarge in uterus as it fills with blood or blood clots and 58(75.3%) reported alter level of consciousness.
Table (5): Distribution of the sample size according to knowledge about observation of mother with PPH

<table>
<thead>
<tr>
<th>observation of mother with PPH</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure PR &amp; BP every 15 minutes up to stability</td>
<td>71</td>
<td>92.2</td>
</tr>
<tr>
<td>Observing blood amount</td>
<td>69</td>
<td>89.6</td>
</tr>
<tr>
<td>Remains in labour room until stable</td>
<td>67</td>
<td>87.0</td>
</tr>
</tbody>
</table>

In regard to criteria of observing mother with PPH, 71(92.2%) mentioned measuring BP, PR every 15 minutes up to stability, 69(89.6%) mentioned observing blood amount and 67(87%) mentioned that, the patient should be remained in labour room until stability.
Table (6): Distribution of the sample size according to knowledge about causes and risk factors of PPH

<table>
<thead>
<tr>
<th>Knowledge about causes and risk factors</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge about causes of PPH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uterine atonia</td>
<td>69</td>
<td>89.6</td>
</tr>
<tr>
<td>Returned tissue</td>
<td>76</td>
<td>98.7</td>
</tr>
<tr>
<td>Tear</td>
<td>69</td>
<td>89.6</td>
</tr>
<tr>
<td>Haemostasis defect</td>
<td>64</td>
<td>83.1</td>
</tr>
<tr>
<td><strong>Knowledge about risk factors of PPH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactive management of 3rd stage of labour</td>
<td>66</td>
<td>85.7</td>
</tr>
<tr>
<td>Fibroids</td>
<td>68</td>
<td>88.3</td>
</tr>
<tr>
<td>Placenta previa</td>
<td>71</td>
<td>92.2</td>
</tr>
<tr>
<td>Previous PPH</td>
<td>70</td>
<td>90.9</td>
</tr>
<tr>
<td>Over-distended uterus</td>
<td>73</td>
<td>94.8</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>70</td>
<td>90.9</td>
</tr>
<tr>
<td>Use of magnesium sulfate in PE</td>
<td>58</td>
<td>75.3</td>
</tr>
<tr>
<td>Induction or augmentation of labour</td>
<td>65</td>
<td>84.4</td>
</tr>
<tr>
<td>Infection</td>
<td>61</td>
<td>79.2</td>
</tr>
</tbody>
</table>
Table (7): Distribution of the sample size according to knowledge about methods for preventing incidence of PPH:

<table>
<thead>
<tr>
<th>methods for preventing incidence of PPH</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make sure the bladder is empty</td>
<td>70</td>
<td>90.9</td>
</tr>
<tr>
<td>Avoid the routine episiotomy</td>
<td>69</td>
<td>89.6</td>
</tr>
<tr>
<td>Slow delivery of the baby with contraction</td>
<td>68</td>
<td>88.3</td>
</tr>
<tr>
<td>Registered time of delivery to know time of placental delivery</td>
<td>67</td>
<td>87.0</td>
</tr>
<tr>
<td>Observe the sign of placenta delivery</td>
<td>72</td>
<td>93.5</td>
</tr>
<tr>
<td>Delivery of placenta after being completely separated and the uterus contract</td>
<td>74</td>
<td>96.1</td>
</tr>
<tr>
<td>Registered time of placenta delivery</td>
<td>68</td>
<td>88.3</td>
</tr>
<tr>
<td>Checking membrane and parts of the placenta after delivery</td>
<td>74</td>
<td>96.1</td>
</tr>
<tr>
<td>Give oxytocic drug</td>
<td>73</td>
<td>94.8</td>
</tr>
<tr>
<td>Assessment of lochia</td>
<td>68</td>
<td>88.3</td>
</tr>
<tr>
<td>Inspection of perineum after delivery</td>
<td>73</td>
<td>94.8</td>
</tr>
</tbody>
</table>

Of the methods for preventing incidence of PPH, 74(96.1%) recommended delivery of placenta after being completely separated and the uterus contract and 74(96.1%) recommended checking membrane and parts of the placenta after delivery.
Table (8): Distribution of the sample size according to knowledge about uterotonic drugs

<table>
<thead>
<tr>
<th>Knowledge about uterotonic drugs</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin</td>
<td>74</td>
<td>96.1</td>
</tr>
<tr>
<td>Ergometrin</td>
<td>73</td>
<td>94.8</td>
</tr>
<tr>
<td>Misoprostol</td>
<td>73</td>
<td>94.8</td>
</tr>
<tr>
<td>Cyntometrin</td>
<td>5</td>
<td>6.5</td>
</tr>
<tr>
<td>Cabitocin</td>
<td>2</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Knowledge about oxytocin as a uterotonic was mentioned by 74(96.1%).
Table (9): Mean of Nurses midwives’ knowledge for the different PPH criteria:

<table>
<thead>
<tr>
<th>Criteria of Knowledge</th>
<th>%</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>The more suitable definition of PPH is: N=77</td>
<td>51.9%</td>
<td></td>
</tr>
<tr>
<td>Knowledge about classification of PPH</td>
<td>80.5%</td>
<td></td>
</tr>
<tr>
<td>Knowledge about definition of primary PPH</td>
<td>97.4%</td>
<td></td>
</tr>
<tr>
<td>Knowledge about definition of secondary PPH is</td>
<td>87.0%</td>
<td></td>
</tr>
<tr>
<td>Differentiate between high and low</td>
<td>96.1%</td>
<td></td>
</tr>
<tr>
<td>Necessity of inserting IV line for all ladies in labour</td>
<td>97.4%</td>
<td></td>
</tr>
<tr>
<td>Who should attended laboring ladies</td>
<td>97.4%</td>
<td></td>
</tr>
<tr>
<td>The need to do episiotomy</td>
<td>85.7%</td>
<td></td>
</tr>
<tr>
<td>Type of episiotomy, if needed</td>
<td>89.6%</td>
<td>84.7%</td>
</tr>
<tr>
<td>Have you even faced with postpartum</td>
<td>93.5%</td>
<td></td>
</tr>
<tr>
<td>knowledge of assessing blood loss</td>
<td>66.2%</td>
<td></td>
</tr>
<tr>
<td>knowledge about Signs of PPH</td>
<td>85.1%</td>
<td></td>
</tr>
<tr>
<td>knowledge about the 1st 4 steps when hemorrhage occur</td>
<td>79.6%</td>
<td></td>
</tr>
<tr>
<td>knowledge about observation of mother with PPH</td>
<td>89.6%</td>
<td></td>
</tr>
<tr>
<td>Knowledge about causes of PPH</td>
<td>90.25</td>
<td></td>
</tr>
<tr>
<td>Knowledge about risk factors of PPH</td>
<td>86.9%</td>
<td></td>
</tr>
<tr>
<td>Knowledge about methods for preventing incidence of PPH</td>
<td>91.6%</td>
<td></td>
</tr>
<tr>
<td>knowledge about uterotonic drugs</td>
<td>59%</td>
<td></td>
</tr>
</tbody>
</table>

General mean of nurses midwives’ knowledge for the different PPH criteria was 84.7%.  

45
4.2 DISCUSSION

The current study involved 77 nurse midwives at Omdurman Maternity Hospital and Ribat University Hospital, and they were assessed for their knowledge towards postpartum hemorrhage in the aspect of management and prevention. Demographic characteristic of participants have shown that, the most common age group was 47-55 years (32.5%), followed by 20-28 years (24.7%). Distribution according to their education indicated that, they were mostly secondary school graduates (35.1%) or intermediate school graduates (28.6%). Bachelor degree holders represented more than fifth of study group (22.1%), while secondary school graduates were less (14.3%). Nurse midwives mostly had experience of 21 years or more (57.2%), followed by those who had 1-10 years (18.2%). Nurse Midwives in the Sudanese study by Faiza. A.N in 2015 have reported that, participants have+ long experience varies from 11 to 30 years\cite{6}.

Most nurse midwives in the current study didn’t receive course or workshops in PPH (64.9%), while others (35.1%) mentioned that they had received such courses. This agrees with findings of Faiza. A.N who reviewed that, only 30% of them received in service training about PPH\cite{6}.

Vast majority of participants found work in the labour room (90.9%), while others work in postnatal ward (9.1%).
Participants showed poor knowledge towards definition of postpartum hemorrhage (36.4%), but they had good knowledge about classification of PPH as well as they showed good knowledge about time of primary and secondary PPH occurrence (84.4% and 80.5% respectively). The study of Faiza AN showed good knowledge primary and secondary PPH (77.6% and 73.5%)\(^6\). Also, the great majority of nurse midwives mentioned that, they can differentiate between mothers with high and low risk of PPH and they believe in necessity of IV line (96.1% and 97.4% respectively).

As reported by most participants (97.4%), laboring mothers were usually attended by doctor and midwife.

Participants showed high knowledge when inquired about necessity of doing episiotomy routinely (85.7%), while the remaining (14.3%) believe that it should be done routinely. A randomized controlled trials suggested the maternal benefits for using of selective episiotomy (when medically indicated) rather than routine use of the procedure\(^6\). However, East-South countries in Asia reported high rate of episiotomy; Thailand in 2005 was 91% and for the Philippines was 64% compared with contemporaneous rates for Australia (17%) and the United states (25%)\(^{3-5}\). The Australian study by Trinh AT and colleagues in 2015 has reported that, most obstetricians (82.6%) and midwives (98.7%) reported performing episiotomies on nulliparous women over 90% of the time\(^{48}\).
When they were inquired about the types of episiotomy, most midwives showed knowledge about mediolateral episiotomy (89.6%), but very few mentioned the media, J-Incision, median and mediolateral (3.9%, 1.3% and 1.3% respectively). This might be due to common usage of mediolateral in Sudan. Trinh AT, et al in Australia reported that, all (100%) respondents (Obstetricians and midwives) perform episiotomies and used the mediolateral (7–8 o’clock) approach\[48\].

Great majority of participants said that, they have been faced by previous cases of PPH (93.5%), which suggests that PPH is very common. This was supported by reported of maternal mortality and maternal near miss by Umbelli T, who reviewed that, hemorrhage was the most common cause of maternal near miss (48.5%)\[12\].

Nurse midwives in the current study showed poor knowledge regarding method assessing the blood loss (26%). Most of them believe that, it should be measured directly by kidney dish (66.2%). This is not compatible with findings of the Sudanese study conducted by Faiza A.N, who has shown that, Assess the blood loss Directly by kidney dish (53.1%), Pads count and weight (77.6)\[6\].

Knowledge about signs of PPH among participants was found high, among which they had the highest knowledge towards visible outside vaginal bleeding (93.5%).

Also, they had good knowledge towards the first 4 steps that should be done when PPH occur, more specifically vast majority of them reported that they should call for help and they doping uterine massage to control the bleeding
(93.5% and 92.2% respectively), but their knowledge was less in regard to resuscitation (53.2%).

When excessive bleeding is suspected and the fundus is boggy Murray SS, Mckinny ES recommended to begin uterine massage, checking the bladder to ensure its emptiness, catheterizing the women if needed, weigh blood-soaked pads, linen savers, and linens to accurately determine the amount of blood lost. If massage is not effective physician should be notified or senior nurse-midwife\textsuperscript{[45]}

Knowledge about mother’s observation was found high with mean percentage of (89.6%) in the aspect of measuring BP and PR, observing blood amount and monitoring the mother to stability. The study of Faiza AN showed that, all midwives mentioned that they do observe amount of blood (100%) and most of them said vital signs should be observed by nurse midwives (65.5%)\textsuperscript{[6]}

Knowledge about causes and risk factors were found high with mean percentages of (90.25 and 86.9% respectively). They had the highest knowledge about returned tissue (98.7%) and over-distended uterus (94.8%). The study in Bangladesh showed similar finding by reporting that, among the respondents half of them could mention the causes of immediate postpartum hemorrhage. Twenty six percent answered that the only reason of postpartum hemorrhage was retained placenta\textsuperscript{[49]}

Midwives require an in depth understanding of all intrapartum risk factors for PPH and constantly need to reassess the woman throughout labor (including;
prolonged labor >12 h, prolonged third stage >30 min, retained placenta, febrile illness, instrumental delivery, cesarean section, especially emergencies in late first, or second stage of labor, amniotic fluid embolism and placental abruption)\textsuperscript{[50]}. 

Nurse midwives’ knowledge about methods used to prevent/ decrease incidence of PPH was found high with mean percentage of (91.6%). The highest knowledge was found regarding delivery of placenta after being completely separated and the uterus contract (96.1%) and checking membrane and parts of the placenta after delivery (96.1%), followed by giving oxytocic drug and inspection of perineum after deliver (94.8% for each). This agrees with what is reported in Nigeria; majority of the study population (85%) had high level knowledge of strategies used in the prevention and control of PPH and strategies used by early cord clamping, bladder emptying, placing the woman in a trendeleburg position, uterine massage after delivery of the placenta and the use of uterotonics with oxytocin being the most commonly used\textsuperscript{[51]}. 

Nurse midwives have high knowledge about oxytocin, ergometrin and misoprostol (96.1%, 94.8% and 94.8% respectively). But very few showed their knowledge about cyntometrin and cabitocin (6.5% and 2.6% respectively). Such limited knowledge might be due to the newly usage of these later drugs. The study of Nigeria found that, use of uterotonics with oxytocin being the most commonly used\textsuperscript{[51]}.
The general evaluation of participants knowledge in the current study was presented as mean of percentages and it was found high in general (84.7%), with some variation as reporting the highest knowledge towards Knowledge about definition of primary PPH, necessity of inserting IV line for all ladies in labour and attending the laboring ladies (97.4%, 97.4%, 97.4%). A similar findings were reported in Nigeria in 2012 by showing that, The study revealed that majority of the study population (85%) had high level knowledge of strategies used in the prevention and control of PPH$^{[51]}$, while the study of Faiza An reported that, Nurse midwives generally had good knowledge about Post partum hemorrhage was (78%)$^{[6]}$. 
5.1 CONCLUSION

The nurse midwives’ knowledge regarding PPH was high (84.7%). Their knowledge towards management and prevention of PPH was high. Knowledge regarding classification, causes and risk factors of PPH was also high, but they showed insufficient knowledge regarding definition of PPH. Participants were mostly secondary school graduates (35.1%) and intermediate school graduates.
5.2 RECOMMENDATIONS

- Updating In-service training should set by health authorities to nurse-midwives on the strategies used in the prevention and management of PPH.
- National management and prevention policies guidelines should be established for midwifery knowledge.
- Further planned studies should be conducted among midwives targeting the different criteria of medical and nursing management and care so as to highlight defect in the aspects of knowledge.
References


Questionnaire

Assessment of Nurse Midwives Knowledge Regarding Post-Partum Hemorrhage at Khartoum State Hospitals

No: ……………..

1. Age: ……………………..

2. Educational level
   - Basic □
   - Secondary □
   - High Education □

3. Duration of work: …………………..

4. Courses and workshop in post partum hemorrhage
   - Yes □
   - No □

5. Place of work (inside the hospital):
   - Labour room □
   - Postnatal ward □
   - Antenatal ward □
   - Outpatients □
   - Family planning Clinic □

6. The more suitable definition of PPH is:
   - i. Excessive bleeding that makes the patient symptomatic □
   - ii. Estimated blood loss ≥500 mL after vaginal birth □
   - iii. Estimated blood loss ≥ 1000 mL after cesarean delivery □

7. PPH is classified into:
   - Two types □
   - Three types □
   - None □

8. Primary PPH is:
   - i. Bleeding occur after birth within 24 hrs □
   - ii. bleeding occur after 24 hrs. of birth up to 12 week □
   - iii. Bleeding occur after 12 weeks of birth □
9. Secondary PPH is:
   i. Bleeding occur after birth within 24 hrs
   ii. bleeding occur after 24 hrs. of birth up to 12 weeks
   iii. Bleeding occur after 12 weeks of birth

10. Can you differentiate between high and low risk patients?
    Yes ☐    No ☐

11. Do you think all ladies in labor should have IV line?
    Yes ☐    No ☐

12. Who should attended laboring ladies?
    Doctor ☐    midwife ☐    doctor and midwife ☐

13. Do you do episiotomy routinely?
    Yes ☐    No ☐

14. If there is a need to do episiotomy, what type:
    Median ☐    Midolateral ☐    J-Incision ☐

15. Have you ever faced with post partum hemorrhage?
    Yes ☐    No ☐

16. How do you assess PPH patients:
    Assess blood loss directly by kidney dish ☐
    Pads count and weight ☐
    Observe vital signs ☐
    All of the above ☐

17. Which of the following considered as sign of PPH:
    • Visible outside vaginal bleeding ☐
    • Pallor ☐
    • Rising pulse rate ☐
    • Falling BP ☐
    • Enlarge in uterus as it fills with blood or blood clots ☐
• Alter level of consciousness

18. The first 3 steps of PPH management are:
• Call for help
• Resuscitation
• Try to control bleeding by uterine massage.
• Pads count and weight.

19. How do you follow up a patient who had PPH:
• Measure PR & BP every 15 minutes up to stability
• Observing blood amount
• Remains in labour room until stable

20. Causes of postpartum hemorrhage include, (can choose > 1 answer)
• Uterine atonia
• Returned tissue
• Tear
• Haemostasis defect

21. Which of the following is risk factor of PPH:
• Inactive management of 3rd stage of labour
• Fibroids
• Placenta previa
• Previous PPH
• Over-distended uterus
• Episiotomy
• Use of magnesium sulfate in PE
• Induction or augmentation of labour
• Infection

22. Which of the following is a method for preventing incidence of PPH:
• Make sure the bladder is empty
• Avoid the routine episiotomy
- Slow delivery of the baby with contraction
- Registered time of delivery to know time of placental delivery
- Observe the sign of placenta delivery
- Delivery of placenta after being completely separated and the uterus contract
- Registered time of placenta delivery
- Checking membrane and parts of the placenta after delivery
- Give oxytocic drug
- Assessment of lochia
- Inspection of perineum after delivery

23. Which of the following are uterotonic drugs

- Oxytocin
- Ergometrin
- Misoprostol
- Cyntometrin
- Cabitocin

62
استبيان
تقييم معرفة وموقف القابلات تجاه نزف ما بعد الولادة

رقم الاستبيان: .................................................................

1. العمر: .................................................................

2. التعليم: 

- أساسى 
- ثانوي 
- بكالوريوس 
- دبلوم

3. الخبرة: .................................................................

4. هل تلقيتي كورسات وورش في مجال نزف ما بعد الولادة؟

- نعم 
- لا

5. مكان العمل داخل المستشفى:

- أ) غرفة الولادة
- ب) عنبر ما بعد الولادة
- ج) عنبر ما قبل الولادة
- د) العيادة الخارجية
- ه) عيادة تنظيم الأسرة

6. إن أصح تعريف لنزف ما بعد الولادة هو:

- أ) نزف شديد يؤدي إلى ظهور أعراض مرضية
- ب) نزف يصل إلى أكثر من 500 مل بعد الولادة الطبيعية
- ج) نزف يصل إلى أكثر من 1000 مل بعد الولادة القيصرية

7. نزف ما بعد الولادة ينقسم إلى:

- لا يوجد تقسيم
- ثلاثة أنواع
- نوعين

8. إن نزف ما بعد الولادة الأولي هو:

- أ) نزف يحدث بعد الولادة خلال الـ 24 ساعة الأولى
- ب) نزف يحدث بعد الـ 24 ساعة الأولى من الولادة وحتى 12 أسبوع
- ج) نزف يحدث بعد 12 أسبوع من الولادة

9. إن نزف ما بعد الولادة الثاني هو:

- أ) نزف يحدث بعد الولادة خلال الـ 24 ساعة الأولى
- ب) نزف يحدث بعد الـ 24 ساعة الأولى من الولادة وحتى 12 أسبوع
- ج) نزف يحدث بعد 12 أسبوع من الولادة

10. هل يمكنك التمييز بين السيدة الأكثر عرضة من الأقل عرضة لنزف ما بعد الولادة:
11. هل تعتقد أنه يجب تركيب قسطرة وريدية (كانيولا) لكل سيدة بغرفة الولادة؟ (أ) نعم (ب) لا
12. أيهم يجب أن يكون بغرفة الولادة: (أ) طبيب (ب) قابلة (ج) طبيب وقابلة
13. هل تقومي عادة بعمل وربة؟ (أ) نعم (ب) لا
14. إذا كانت هناك ضرورة لعمل الوربة، ما نوعها: (أ) أوسط (ب) وسطي-جانبي (ج) على شكل حرف L
15. هل سبق وأن واجهت حالة حدوث نزف ما بعد الولادة (أ) نعم (ب) لا
16. كيف تقيمين حالة نزف ما بعد الولادة:
   - قياس النزف المهبلى عن طريق الحوض الكلوي
   - حساب عدد الفوط وزنها
   - قياس النبض والضغط
17. أي من الآتي يعتبر من علامات نزف ما بعد الولادة:
   - النزف المهبلى الظاهر
   - الشحوب
   - زيادة النبض
   - هبوط الضغط
   - تمدد الرحم
   - تغير في مستوى الوعي
18. أول أربع خطوات من علاج نزف ما بعد الولادة تشمل:
   - الاتصال للمساعدة
   - الإنعاش
   - حساب الفوط وزنها
   - محاولة إيقاف النزف بتثليك الرحم
19. كيف تتبعين مريضة نزف ما بعد الولادة بعد إيقاف النزيف:
   - قياس النبض والضغط كل ربع ساعة لحين استقرار الحالة
   - مراقبة النزف المهبلى
   - بقاء الأم الوليد في غرفة الولادة لحين استقرار الحالة
20. من أسباب نزف ما بعد الولادة:
2. أي من العوامل الآتية تعتبر عوامل مؤهبة لنزف ما بعد الولادة:
- العلاج غير الفعال للمرحلة الثالثة من الولادة
- الحمل المتعدد
- تاريخ مرضي سابق
- التهتك
- مشاكل في استتباب التوازن

3. أي من الطرق التالية طرق للوقاية من حدوث نزف ما بعد الولادة:
- التأكد من تفريغ المثانة
- تجنب عمل الوربة الروتينية
- توليد الجنين ببطء مع تقلصات الرحم
- تسجيل زمن ولادة الوليد لمسافة زمن ولادة المشيمة
- مراقبة علامات ولادة المشيمة
- ولادة المشيمة بعد التأكد الانفصال التام من الرحم وتقلصه
- تسجيل زمن ولادة المشيمة
- اختبار الأغشية وأجزاء المشيمة بعد ولادة المشيمة
- إعطاء أدوية منع النزيف
- تقييم دم النفاس
- النظر لمنطقة العجان بعد الولادة

3. أي من الأدوية أدناه تمثل أدوية (بيروتونيك) مخففة لنزف ما بعد الولادة:
- أوكسيتوبسين
- إرقوميترين
- ميزوبروستول
- سينتوميترين
- كابيتوسين
بسم الله الرحمن الرحيم

إقرار

أنا .................................................. أوافق طواعية بالمشاركة في البحث أدناه بعد أن تم توضيح غرض البحث وهو بعنوان: تقييم معرفة القابلات تجاه نزف ما بعد الولادة.

مقدم من قبل سستر

باسم بلة محمد الفكي
طالبة بكلية الدراسات العليا
جامعة الرباط الوطني