Nurses' Knowledge and Performance Towards Postpartum Women' Care in Obstetrics and Gynecology Teaching Hospital, Wad Medani, Gezira State, Sudan (2013)

Somia Adam Abdelgadir Saad

B.Sc. in Nursing
University of Gezira (2006)

A Dissertation
Submitted to University of Gezira in Partial Fulfillment of the Requirements for the Award of Degree of Master of Science in Community Health Nursing
Department of Nursing
Faculty of Applied Medical Sciences

April, 2014
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Supervision Committee:

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<th>Name</th>
<th>Position</th>
<th>Signature</th>
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<tr>
<td>Dr. Ietimad Ibrahim Abd Elrahman Kambal</td>
<td>Main supervisor</td>
<td></td>
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<tr>
<td>Dr. Bothyna Bassyonie Elssyed Etewa</td>
<td>Co-supervisor</td>
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Examination Committee

Name: Dr. Ietimad Ibrahim Abd Elrahman Kambal, Dr. Fiza Ali Nasor Taha, Dr. Syadia Idris Abd Elrhman Fad Allah
Position: Chair Person, External Examiner, Internal Examiner
Signature: ………………..

Date of Exmination: 14, April, 2014
Dedication

To My be loved My Mother

To My Father

To my brothers and sisters

Somia
Acknowledgment

Firstly I wish to thank God for Affording me the time and the ability needed to face difficulty.

I am heartedly thankful to my main supervisor Dr. Ietimad Ibrahim Abd-Elrhman Kambal and my Co-advisor Dr. Bothyna Bassyonie Elssyed Etewa whose encouragement, guidance and support from the initial to the final level enabled me to develop an understanding of the subject.

Thanks for all those who helped me in collection, analysis and typing of this thesis.

I Thanks for my team work in Obstetrics and Gynecology Teaching Hospital in Wad Medani who tolerated me.

Lastly my thanks and appreciation to my family whose showed tolerance and supported me emotionally and financially.
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Abstract

Postpartum period is a critical period, the women affecting by serious complications are a leading causes of maternal deaths, prevent of these complications through correctly postpartum care is essential in decreasing maternal morbidity and mortality. A descriptive hospital based study was done aimed at assessing nurses' knowledge and performance regarding postpartum women' care at Obstetrics and Gynecology Teaching Hospital, Gezira state, Sudan 2013. The sample size consisted of the available nurses (50) in Obstetrics and Gynecology Teaching Hospital in all wards and units during the study period from (March to April 2013). The data were collected by using a questionnaire designed for the study and observation checklist was used to observe and monitor nurses' performance in caring of puerperal women. Data analysis was performed by using statistical package for social sciences (SPSS). The results revealed that only (4%) of nurses responded with correct answers regarding definition of postpartum period, (40%) of participants responded with correct answers regarding immediate postpartum care, (10%) and (18%) of nurses managed puerperal sepsis and after pain correctly. Only (6%) of the study sample perform wound dressing for cesarean section correctly. The study concluded that nurses' knowledge and practices regarding postpartum care were inadequate. The study recommended that design log books about postpartum care must be available for nurses in hospitals. Continuous training, supervision and evaluation of the nurses’ performance in caring of puerperal women are essential.
ملخص الدراسة

تعتبر فترة ما بعد الولادة فترة حرجة تؤثر على النساء بحدود مضاعفات خطيرة، هذه المضاعفات الحادة هي الأسباب الرئيسية لوفيات الأمهات، ومنع حدوث هذه المضاعفات من خلال عناية صحية بفترة النفاس بعد الولادة أمر ضروري في خفض معدلات الاعتلال والوفيات النفاسية. أجريت هذه الدراسة الوصفية في مستشفى ود مدني التعليمي لأمراض النساء والتوليد، ولاية الجزيرة، السودان خلال الفترة من مارس وحتى أبريل 2013، وعدد الممرضين والممرضات في جميع العناصر والوحدات بالمستشفى، تكونت عينة الدراسة من (50) من الممرضين والممرضات في جميع العناصر والوحدات بالمستشفى. تم جمع البيانات باستخدام استمارة صممت من أجل الدراسة، كما تم استخدام قائمة الملاحظة لمراقبة أداء الممرضين والممرضات جاهزية للعناية بالسيدات. تم إجراء تحليل البيانات باستخدام برنامج الحزمة الإحصائية (SPSS). أظهرت النتائج أن (4%) فقط من الممرضين والممرضات كانت اجابتهم صحيحة عن تعريف فترة ما بعد الولادة، (40%) من المشاركين في الدراسة كانت إجابتهم صحيحة عن الرعاية التمريضية للسيدات بعد الولادة مباشرة، (10%) و(18%) فقط من الممرضين والممرضات قالوا بمعالجة حمى النفاس وألم ما بعد الولادة بطريقة صحية. وأن (6%) فقط منهم كان أدائهم صحيح في الخياز على الجروح القيصرية. خلصت الدراسة إلى أن معرفة وممارسات الممرضين والممرضات عن العناية بالسيدة في فترة ما بعد الولادة غير كافية. أوصت الدراسة بتوصيم كتبات عن الرعاية بالسيدات في فترة ما بعد الولادة تكون متاحة للممرضين والممرضات في المستشفى وتدريب المستمر للممرضين والممرضات وتقييم أداءهم في العناية بالسيدات في فترة ما بعد الولادة أمر ضروري.
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<td>PPC</td>
<td>Postpartum Care</td>
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<td>MMR</td>
<td>Maternal Mortality Ratio</td>
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<td>NSAIDs</td>
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<td>Prothrombin Time</td>
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<td>ICU</td>
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<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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1. Introduction

1.1 Background:

The immediate postpartum care is very important to mother to prevent occurrence of serious complications such as postpartum hemorrhage, infections. This period is used to make sure the mother is stable and to educate her in the care of her baby (especially the first-time mother), monitoring for blood loss, abnormal blood pressure, contraction of the uterus, and ability to void. Routine practices include a check of the baby's blood type. At minimum, the mother's hematocrit level is checked on the first postpartum day. Women are encouraged to ambulate and to eat a regular diet. (Kaimal A, et al, 2008).

Postpartum care remains a vital process and service of the childbearing period. Seimyr et al, Cf Yelland et al. (2004) states that this period is an opportunity for women to rest and recuperate following delivery, to receive guidance, support, and information on baby care. The postpartum period is a time of reflection, of relieving the birth experiences, a time of adjustment to the new roles and accommodation of the family to the new member. This period also involves the involution of the uterus back to non-pregnant state. It is a very special phase in the life of a woman and her newborn. (Seimyr, et al, 2004).

Nunnerley (2006) describes postpartum care as a vital part of the childbearing process that the midwife has to provide for the mother and the baby immediately following birth to the end of puerperium. Postpartum examination is very important in that it confirms the mother’s recovery from effects of pregnancy, labour and delivery, or if there are problems, interventions can be done. Also puerperium as a time of reflection of the pregnancy and the birth experiences, a time of adjustment to the new roles. Health workers who provide care to families during this transitional and disruptive period may have unique skills and expertise to offer. Information and support families receive during this period is important in augmenting the coping strategies they have used in previous times of change. (Nunnerley R, 2006)
1.2 Problem Statements:

In worldwide: fatigue or tiredness had a high prevalence rate. The prevalence of fatigue was 55% in Canada in (2005) and 76% in the United States in (2002), many mothers also experienced pain in various parts of their bodies: for example, the perineum (45.9% in 2005), cesarean-section incisions (83% in 2002), the back (54.5% in 2005), or head (23% in 2005). The prevalence rate of backaches and headaches remains high over the first postpartum year in (2000). In addition to fatigue, tiredness, and pain, other physical conditions of lower prevalence have a significant impact on mothers' physical and social health. Such conditions include hemorrhoids, constipation, urinary incontinence, disturbed sleep, sleeping disorders, lack of sexual desire, and painful intercourse (2005). The prevalence rate of postpartum depression varies across reports. In (2001) study, about 37% (297 out of 802) of new mothers had the potential to be depressed; however, only about 10% of participants in (1998) study had the potential for depression. In (2005) the prevalence for major depression was only 1.0% to 5.9% for mothers within 1 year postpartum, while it was 6.5% to 12.9% for both major and minor depressions. (Ching-Y, et al, 2006).

In developed countries: in the United States, the National Maternal and Infant Health Survey in 1988 and its Longitudinal Follow Up in 1991 showed that poor maternal physical health was related to children's reduced general physical health, frequent tantrums, and difficulty in playing with other children, as well as mothers' feeling of difficulties in managing children's behaviors at 3 years of age in (2002). In addition, mothers who perceived their health as poor did not initiate timely vaccination for children in (2003), which increased health risks for children. Despite the importance of maternal physical health, many gaps exist in the availability and scope of maternal postpartum health. (Ching-Y, et al, 2006)

In developing countries: there is a better understanding of conditions contributing to deaths, such as postpartum hemorrhage, which occurs shortly after birth. In a recent worldwide review, hemorrhage was by far the single most important cause of maternal deaths for Africa, at 34% of all causes, rate which was also the highest among all regions of the world. [Khan, K. S., et al, 2006] Skilled attendance at delivery and postpartum care (PPC) have been advocated as critical to preventing and managing this condition, and generally to reduce maternal deaths. However, there is little information on a wide scale about the occurrence and timing of postpartum care, especially in that region. [WHO/ICM/FIGO. 2004]
In Sudan: estimated maternal mortality ratio (MMR) at 2054/100,000 live births. Given the current estimated population of 9.7 million and a rate of natural growth of approximately 4%, this translates to severe complications in 76,000 young Sudanese mothers during pregnancy and child birth, with close to 10,600 dying every year. For each of these mothers, the risk of their baby dying within the first year of life is three times that of other babies. Yet the causes of these deaths are nearly all preventable. Preventive and promotive maternal and child health services are essential. (Nahla Abdel-Tawab, 2010).

1.3 Justification:

During the postpartum period the women affecting by serious complications such as hemorrhage, infections, hepatitis, obstetric fistula, uterine prolapse, infertility, that leading to increasing maternal and neonatal deaths and disabilities among the women, the main direct causes of maternal death are hemorrhage and infections. These severe complications which arises in postpartum period leading to maternal deaths and also fetal deaths, the causes of these deaths are preventable. Preventive and promotive maternal deaths are essential.

The nurse is in ague position to disseminate and to provide essential care for mothers, babies and their families. So, current investigation of nurses' knowledge and practices care for puerperal women is mandatory to prevent and control postpartum complications result in decrease maternal and neonatal morbidity and mortality.

1.4 Objectives:

1.4.1 General Objective:

- To study nurses' knowledge and performance regarding postpartum women' Care in Obstetrics and Gynecology Teaching Hospital ,Wad Medani, Gezira State, Sudan during the period of the study from March to April 2013.

1.4.2 Specific Objectives:

- To assess nurses' knowledge regarding various aspects of postpartum care.
- Monitoring nurses' performance during care of postpartum women.
- To identify nurses' needs to perform postpartum care correctly.
2.1 Definition of puerperium:

Puerperium is defined as the time from the delivery of the placenta through the first few weeks after the delivery. This period is usually considered to be 6-8 weeks in duration. By 6 weeks after delivery, most of the changes of pregnancy, labor, and delivery have resolved and the body has reverted to the nonpregnant state. An overview of the relevant anatomy and physiology in the postpartum period follows. (Dinsmoor M, et al, 2009).

2.2 Physiological changes:

2.2.1 Uterus:

The pregnant term uterus (not including baby, placenta, fluids, etc) weighs approximately 1000 g. In the 6 weeks following delivery, the uterus recedes to a weight of 50-100 g. Immediately postpartum, the uterine fundus is palpable at or near the level of the maternal umbilicus. Thereafter, most of the reduction in size and weight occurs in the first 2 weeks, at which time the uterus has shrunk enough to return to the true pelvis. Over the next several weeks, the uterus slowly returns to its nonpregnant state, although the overall uterine size remains larger than prior to gestation. The endometrial lining rapidly regenerates, so that by the seventh day endometrial glands are already evident. By the 16th day, the endometrium is restored throughout the uterus, except at the placental site. (Owens S, 2009).

The placental site undergoes a series of changes in the postpartum period. Immediately after delivery, the contractions of the arterial smooth muscle and compression of the vessels by contraction of the myometrium (“physiologic ligatures”) result in hemostasis. The size of the placental bed decreases by half, and the changes in the placental bed result in the quantity and quality of the lochia that is experienced. Immediately after delivery, a large amount of red blood flows from the uterus until the contraction phase occurs. Thereafter, the volume of vaginal discharge (lochia) rapidly decreases. The duration of this discharge, known as (lochia rubra), is variable. The red discharge progressively changes to brownish red, with a more watery consistency (lochia serosa). Over a period of weeks, the discharge continues to decrease in amount and color and eventually changes to yellow (lochia alba). (Dinsmoor M, et al, 2009). The period of time the lochia can last varies, although it averages approximately 5 weeks. (Owens S, 2009).
The amount of flow and color of the lochia can vary considerably. Fifteen percent of women have continue to have lochia 6 weeks or more postpartum. Often, women experience an increase in the amount of bleeding at 7-14 days secondary to the sloughing of the eschar on the placental site. This is the classic time for delayed postpartum hemorrhages to occur. (Dinsmoor M, et al, 2009).

2.2.2 Cervix :

The cervix also begins to rapidly revert to a nonpregnant state, but it never returns to the nulliparous state. By the end of the first week, the external os closes such that a finger cannot be easily introduced. (Owens S, 2009).

2.2.3 Vagina :

The vagina also regresses but it does not completely return to its prepregnant size. Resolution of the increased vascularity and edema occurs by 3 weeks, and the rugae of the vagina begin to reappear in women who are not breastfeeding. At this time, the vaginal epithelium appears atrophic on smear. This is restored by weeks 6-10; however, it is further delayed in breastfeeding mothers because of persistently decreased estrogen levels. (Owens S, 2009).

2.2.4 Perineum :

The perineum has been stretched and traumatized, and sometimes torn or cut, during the process of labor and delivery. The swollen and engorged vulva rapidly resolves within 1-2 weeks. Most of the muscle tone is regained by 6 weeks, with more improvement over the following few months. The muscle tone may or may not return to normal, depending on the extent of injury to muscle, nerve, and connecting tissues. (Owens S, 2009).

2.2.5 Abdominal wall :

The abdominal wall remains soft and poorly toned for many weeks. The return to a prepregnant state depends greatly on maternal exercise.
2.2.6 Ovaries:

The resumption of normal function by the ovaries is highly variable and is greatly influenced by breastfeeding the infant. The woman who breastfeeds her infant has a longer period of amenorrhea and anovulation than the mother who chooses to bottle-feed. The mother who does not breastfeed may ovulate as early as 27 days after delivery. Most women have a menstrual period by 12 weeks; the mean time to first menses is 7-9 weeks. In the breastfeeding woman, the resumption of menses is highly variable and depends on a number of factors, including how much and how often the baby is fed and whether the baby's food is supplemented with formula. The delay in the return to normal ovarian function in the lactating mother is caused by the suppression of ovulation due to the elevation in prolactin. Half to three fourths of women who breastfeed return to periods within 36 weeks of delivery. (Owens S, 2009).

2.2.7 Breasts:

The changes to the breasts that prepare the body for breastfeeding occur throughout pregnancy. If delivery ensues, lactation can be established as early as 16 weeks' gestation. Lactogenesis is initially triggered by the delivery of the placenta, which results in falling levels of estrogen and progesterone, with the continued presence of prolactin. If the mother is not breastfeeding, the prolactin levels decrease and return to normal within 2-3 weeks. The colostrum is the liquid that is initially released by the breasts during the first 2-4 days after delivery. High in protein content, this liquid is protective for the newborn. The colostrum, which the baby receives in the first few days postpartum, is already present in the breasts, and suckling by the newborn triggers its release. The process, which begins as an endocrine process, switches to an autocrine process; the removal of milk from the breast stimulates more milk production. Over the first 7 days, the milk matures and contains all necessary nutrients in the neonatal period. The milk continues to change throughout the period of breastfeeding to meet the changing demands of the baby. (Owens S, 2009).

2.3 Immediate Routine Postpartum Care:

The immediate postpartum period most often occurs in the hospital setting, where the majority of women remain for approximately 2 days after a vaginal delivery and 3-5 days after a cesarean delivery. During this time, women are recovering from their delivery and are beginning to care for the newborn. This period is used to make sure the mother is stable and to
educate her in the care of her baby (especially the first-time mother). While still in the hospital, the mother is monitored for blood loss, signs of infection, abnormal blood pressure, contraction of the uterus, and ability to void. Routine practices include a check of the baby's blood type. At minimum, the mother's hematocrit level is checked on the first postpartum day. Women are encouraged to ambulate and to eat a regular diet. (Kaimal A, et al, 2008).

2.3.1 Vaginal delivery:

After a vaginal delivery, most women experience swelling of the perineum and consequent pain. This is intensified if the woman has had an episiotomy or a laceration. Routine care of this area includes ice applied to the perineum to reduce the swelling and to help with pain relief. Conventional treatment is to use ice for the first 24 hours after delivery and then switch to warm sitz baths. However, little evidence supports this method over other methods of postpartum perineum treatment. Pain medications are helpful both systemically as nonsteroidal anti-inflammatory drugs (NSAIDs) or narcotics and as local anesthetic spray to the perineum. Hemorrhoids are another postpartum issue likely to affect women who have vaginal deliveries. Symptomatic relief is the best treatment during this immediate postpartum period because hemorrhoids often resolve as the perineum recovers. This can be achieved by the use of corticosteroid creams, witch hazel compresses, and local anesthetics.

Tampon use can be resumed when the patient is comfortable inserting the tampon and can wear it without discomfort. This takes longer for the woman who has had an episiotomy or a laceration than for one who has not. The vagina and perineum should first be fully healed, which takes about 3 weeks. Tampons must be changed frequently to prevent infection. (Kaimal A, et al, 2008).

2.3.2 Cesarean delivery:

The woman who has had a cesarean delivery usually does not experience pain and discomfort from her perineum but rather from her abdominal incision. This, too, can be treated with ice to the incision and with the use of systemic pain medication. Women who have had a cesarean delivery are often slower to begin ambulating, eating, and voiding; however, encourage them to quickly resume these and other normal activities. (Kaimal A, et al, 2008).
2.4 Sexual intercourse:

Sexual intercourse may resume when bright red bleeding ceases, the vagina and vulva are healed, and the woman is physically comfortable and emotionally ready. Physical readiness usually takes about 3 weeks. Birth control is important to protect against pregnancy because the first ovulation is very unpredictable. (Yildirim G, et al, 2009).

2.5 Patient education:

Substantial education takes place during the hospital stay, especially for the first-time mother. The mother (and often the father) is taught routine care of the baby, including feeding, diapering, and bathing, as well as what can be expected from the baby in terms of sleep, urination, bowel movements, and eating. Provide education, support, and guidance to the breastfeeding mother. Breastfeeding is neither easy nor automatic. It requires much effort on the part of the mother and her support team. Breastfeeding should be initiated as soon after delivery as possible; in a normal, uncomplicated vaginal delivery breastfeeding is possible almost immediately after birth. Encourage the mother to feed the baby every 2-3 hours (at least while she is awake during the day) to stimulate milk production. Long feedings are unnecessary, but they should be frequent. Milk production should be well established by 36-96 hours. (Yamaguchi M, 2009).

In women who choose not to breastfeed, the care of the breasts is quite different. Care should be taken not to stimulate the breasts in any way in order to prevent milk production. Ice packs applied to the breasts and the use of a tight brassiere or a binder can also help to prevent breast engorgement. Acetaminophen or NSAIDs can alleviate the symptoms of breast engorgement (eg, tenderness, swelling, fever) if it occurs. Bromocriptine was formerly administered to suppress milk production; however, its use has diminished because it requires 2 weeks of administration, does not always work, and can produce adverse reactions. (Yamaguchi M, 2009).

2.6 Discharge instructions:

2.6.1 The mother must be given discharge instructions:

The most important information is who and where to call if she has problems or questions. She also needs details about resuming her normal activity. Instructions vary, depending on whether the mother has had a vaginal or a cesarean delivery. The woman who
has had a vaginal delivery may resume all physical activity, including using stairs, riding or
driving in a car, and performing muscle-toning exercises, as long as she experiences no pain or
discomfort. The key to resuming normal activity is not to overdo it on one day to the point that
the mother is completely exhausted the next day. Pregnancy, labor, delivery, and care of the
newborn are strenuous and stressful, and the mother needs sufficient rest to recover. The
woman who has had a cesarean delivery must be more careful about resuming some of her
activities. She must avoid overuse of her abdomen until her incision is well healed in order to
prevent an early dehiscence or a hernia later on. (Jackson E, et al, 2011).

Women typically return for their postpartum visit at approximately 6 weeks after
delivery. No sound reason for this exists; the time has probably become the standard so that
women who are returning to work can be medically cleared to return. Anything that must be
done at a 6-weeks' postpartum visit can be done earlier or later than 6 weeks. An earlier visit
can often aid a new mother in resolving problems she may be having or in providing a time to
answer her questions.

The mother must be counseled about birth control options before she leaves the
hospital. She may not be ready to decide about a method, but she needs to know the options.
Her decision will be based on a number of factors, including her motivation in using a
particular method, how many children she has, and whether she is breastfeeding. A systemic
review of ovulation and menses in nonlactating women found that although most women begin
ovulation at least 6 weeks postpartum, with mean day of first ovulation occurring 45-94 days
postpartum, a limited number ovulate sooner.—Two studies reporting earliest day of first
ovulation reported it occurring on days 25 and 27 postpartum, emphasizing the need for early
postpartum contraception discussion and method initiation to decrease the risk of pregnancy

2.6.2 Many options are available, as follows:

- Natural methods can be used in highly motivated couples, to include the use of
  monitoring the basal body temperature and the quality and quantity of the cervical
  mucus to determine what phase of the menstrual cycle the woman is in and if it is safe
to have intercourse.
- Barrier methods of contraception, such as condoms, are widely available, as are vaginal
  spermicides. Condoms are available over-the-counter, while diaphragms and cervical
caps must be fitted.
Hormonal methods of contraception are numerous. Combined estrogen-progestin agents are taken daily by mouth or monthly by injection. Progestin-only agents are available for daily intake or by long-acting injections that are effective for 12 weeks. Intrauterine devices can be placed a few weeks after delivery. Permanent methods of birth control (ie, tubal ligation, vasectomy) are best for the couple who has more than one child and who are sure that they do not want more.

2.7 Complications of Puerperium:

2.7.1 Hemorrhage:

Postpartum hemorrhage is defined as excessive blood loss during or after the third stage of labor. The average blood loss is 500 mL at vaginal delivery and 1000 mL at cesarean delivery. Since diagnosis is based on subjective observation, it is difficult to define clinically. Objectively, postpartum hemorrhage is defined as a 10% change in hematocrit level between admission and the postpartum period or the need for transfusion after delivery secondary to blood loss. Early postpartum hemorrhage is described as that occurring within the first 24 hours after delivery. Late postpartum hemorrhage most frequently occurs 1-2 weeks after delivery but may occur up to 6 weeks postpartum. (Combs C, 2007).

2.7.1.1 Etiology:

Early postpartum hemorrhage may result from uterine atony, retained products of conception, uterine rupture, uterine inversion, placenta accreta, lower genital tract lacerations, coagulopathy, and hematoma. Causes of late postpartum hemorrhage include retained products of conception, infection, subinvolution of placental site, and coagulopathy. Uterine atony and lower genital tract lacerations are the most common causes of postpartum hemorrhage. Factors predisposing to uterine atony include overdistension of the uterus secondary to multiple gestations, polyhydramnios, macrosomia, rapid or prolonged labor, grand multiparity, oxytocin administration, intra-amniotic infection, and use of uterine-relaxing agents such as terbutaline, magnesium sulfate, halogenated anesthetics, or nitroglycerin. In uterine atony, lack of closure of the spiral arteries and venous sinuses coupled with the increased blood flow to the pregnant uterus causes excessive bleeding. (Combs C, 2007).

Active management of the third stage of labor with administration of uterotonics before the placenta is delivered (oxytocin still being the agent of choice), early clamping and cutting
of the umbilical cord, and traction on the umbilical cord have proven to reduce blood loss and
decrease the rate of postpartum hemorrhage. Lower genital tract lacerations, including cervical
and vaginal lacerations (e.g., sulcal tears), are the result of obstetrical trauma and are more
common with operative vaginal deliveries, such as with forceps or vacuum extraction. Other
predisposing factors include macrosomia, precipitous delivery, and episiotomy. (Combs C,
2007).

2.7.1.2 Incidence :

Vaginal delivery is associated with a 3.9% incidence of postpartum hemorrhage.
Cesarean delivery is associated with a 6.4% incidence of postpartum hemorrhage. Delayed
postpartum hemorrhage occurs in 1-2% of patients. (Combs C, 2007).

2.7.1.3 Morbidity and mortality :

In the United States, postpartum hemorrhage is responsible for 5% of maternal deaths.
Other causes of morbidity include the need for blood transfusions or surgical intervention that
may lead to future infertility.

2.7.1.4 History :

The antepartum or early intrapartum identification of risk factors for postpartum
hemorrhage allows for advanced preparation and possible avoidance of severe sequelae. Every
patient must be interviewed upon admission to the labor floor. Request information about
parity, multiple gestation, polyhydramnios, previous episodes of postpartum hemorrhage,
history of bleeding disorders, and desire for future fertility. Note the use of prolonged oxytocin
administration, as well as the use of magnesium sulfate during the patient's labor course.

2.7.1.5 Physical examination :

Physical examination is performed simultaneously with resuscitative measures. Perform
a vigorous bimanual examination, which may reveal a retained placenta or a hematoma of the
perineum or pelvis, and which also allows for uterine massage. Closely inspect the lower
genital tract in order to identify lacerations. Closely examine the placenta to determine if any
fragments are missing.
2.7.1.6 Investigations :

The onset of postpartum hemorrhage is acute, intervention is immediate, and resolution is generally within minutes; consequently, laboratory studies or imaging in the management of the immediate course of this process has little role. However, it is important to check a patient's CBC count and prothrombin time/activated partial thromboplastin time (PT/aPTT) to exclude resulting anemia or coagulopathy, which may require further treatment. Upon admission of each patient to the labor ward, obtain ABO and D blood type determinations, and acquire adequate intravenous access.

2.7.1.7 Treatment :

Initial therapy includes oxygen delivery, bimanual massage, removal of any blood clots from the uterus, emptying of the bladder, and the routine administration of dilute oxytocin infusion (10-40 U in 1000 mL of lactated Ringer solution [LRS] or isotonic sodium chloride solution). If retained products of conception are noted, perform manual removal or uterine curettage. If oxytocin is ineffective, carboprost in an intramuscularly administered dose of 0.25 mg can be administered every 15 minutes, not to exceed 3 doses. Studies indicate a 75-88% success rate when carboprost is used alone and a 95% success rate when it is used in combination with other oxytocic agents. Methylergonovine can also be intramuscularly administered in a dose of 0.2 mg. Because this agent causes intense vasoconstriction and may cause transient hypertension, it is contraindicated in patients with hypertensive disease. Check blood pressure prior to administration. Misoprostol has been used clinically for the treatment of postpartum hemorrhage. However, further research is needed to determine the effectiveness, optimal dosage, and route of administration. (Hofmeyr G, 2004). (Sutherland T, 2010). A 2010 Monte Carlo simulation indicated that both sublingual and prophylactic oral misoprostol lowered mortality but raised costs (estimated incremental costs per disability-adjusted life year were $6 and $170, respectively). (Chaudhuri P, 2010). Also, a 2010 prospective, randomized, double-blind trial of rectal misoprostol vs intravenous oxytocin to prevent blood loss after cesarean delivery revealed that blood loss was significantly lower in the misoprostol group. (Chaudhuri P, 2010).
When postpartum hemorrhage is not responsive to pharmacological therapy and no vaginal or cervical lacerations have been identified, consider the following more invasive treatment methods:

- Uterine packing is now considered safe and effective therapy for the treatment of postpartum hemorrhage. Use prophylactic antibiotics and concomitant oxytocin with this technique. The timing of removal of the packing is controversial, but most physicians favor 24-36 hours. This treatment is successful in half of patients. If unsuccessful, it still provides time in which the patient can be stabilized before other surgical techniques are employed. (Allam M, et al, 2005)

- A Foley catheter with a large bulb (24F) can be used as an alternative to uterine packing. This technique can be highly effective, is inexpensive, requires no special training, and may prevent the need for surgery. (Clark S, 2008).

- Uterine artery embolization, which is performed under local anesthesia, is a minimally invasive technique. The success rate is greater than 90%. This procedure is believed to preserve fertility. Complications are rare (6-7%) and include fever, infection, and nontarget embolization. In patients at high risk for postpartum hemorrhage, such as those with placenta previa, placenta accreta, coagulopathy, or cervical pregnancy, the catheter can be placed prophylactically. (Hansch E, et al, 2009).

- The B-Lynch suture technique: A suture is passed through the anterior uterine wall in the lower uterine segment approximately 3 cm medial to the lateral edge of the uterus. The suture is wrapped over the fundus 3–4 cm medial to the cornual and inserted into the posterior uterine wall again in the lower uterine segment approximately 3 cm medial to the lateral edge of the uterus and brought out 3 cm medial to the other edge of the uterus. The suture is wrapped over the fundus and directed into and out of the anterior uterine wall parallel to the previous anterior sutures. The uterus is compressed in an accordionlike fashion and the suture is tied across the lower uterine segment. The B-Lynch suture technique and other compression suture techniques are operative approaches to postpartum hemorrhage that have proven to preserve fertility. As practitioners become proficient in this technique, it may be considered before uterine artery or hypogastric artery ligation and hysterectomy. (El-Hamamy E, 2005).

When conservative therapy fails, the next step is surgery with either bilateral uterine artery ligation or hypogastric artery ligation. Uterine artery ligation is thought to be successful in 80-95% of patients. If this therapy fails, hypogastric artery ligation is an option. However, this
approach is technically difficult and is only successful in 42-50% of patients. Instead, stepwise devascularization of the uterus is now thought to be the next best approach, with possible ligation of the utero-ovarian and infundibulopelvic vessels. (Olsen M, 2010).

When all other therapies fail, emergency hysterectomy is often a necessary and lifesaving procedure.

2.7.2 Infections:

2.7.2.1 Endometritis:

Endometritis is an ascending polymicrobial infection. The causative agents are usually normal vaginal flora or enteric bacteria. (Combs C, 2007).

2.7.2.1.1 Etiology:

Endometritis is the primary cause of postpartum infection. The most common organisms are divided into 4 groups: aerobic gram-negative bacilli, anaerobic gram-negative bacilli, aerobic streptococci, and anaerobic gram-positive cocci. Specifically, *Escherichia coli*, *Klebsiella pneumoniae*, and *Proteus* species are the most frequently identified organisms. (Combs C, 2007).

Endometritis occurring on postpartum day 1 or 2 most frequently is caused by group A streptococci. If the infection develops on day 3 or 4, the causative organism is frequently enteric bacteria, most commonly *E. coli*, or anaerobic bacteria. Endometritis that develops more than 7 days after delivery is most frequently caused by *Chlamydia trachomatis*. Endometritis following cesarean delivery is most frequently caused by anaerobic gram-negative bacilli, specifically *Bacteroides* species.

Known risk factors for endometritis include cesarean delivery, young age, low socioeconomic status, prolonged labor, prolonged rupture of membranes, multiple vaginal examinations, placement of an intrauterine catheter, preexisting infection or colonization of the lower genital tract, twin delivery, and manual removal of the placenta. It has also been shown that manual removal of the placenta at cesarean delivery increases the incidence of endometritis.

2.7.2.1.2 Incidence:
Endometritis complicates 1-3% of all vaginal deliveries and 5-15% of scheduled cesarean deliveries. The incidence of endometritis in patients who undergo cesarean delivery after an extended period of labor is 30-35% and falls to 15-20% if the patient receives prophylactic antibiotics. (Combs C, 2007).

2.7.2.1.3 Morbidity and mortality:

Following 48-72 hours of intravenous antibiotic therapy, 90% of women recover. Fewer than 2% of patients develop life-threatening complications such as septic shock, pelvic abscess, or septic pelvic thrombophlebitis.

2.7.2.1.4 History:

A patient may report any of the following symptoms: fever, chills, lower abdominal pain, malodorous lochia, increased vaginal bleeding, anorexia, and malaise. (Combs C, 2007).

2.7.2.1.5 Physical examination:

A focused physical examination is important and should include vital signs, an examination of the respiratory system, breasts, abdomen, perineum, and lower extremities. A patient with endometritis typically has a fever of 38°C, tachycardia, and fundal tenderness. Some patients may develop mucopurulent vaginal discharge, whereas others have scant and odorless discharge. (Combs C, 2007).

2.7.2.1.6 Investigations:

- Laboratory tests: The appropriate tests for a febrile postpartum patient may include a CBC count with differential, urinalysis, urine culture, and blood cultures.
- Imaging: If a respiratory process is high on the differential, obtain a chest radiograph.

2.7.2.1.7 Treatment:

Treatment of endometritis is with intravenous antibiotics. Parenteral antibiotics are usually stopped once the patient is afebrile for 24-48 hours, tolerating a regular diet, and ambulating without difficulty. In general, an extended course of oral antibiotics has not been found to be beneficial, although 2 exceptions have been noted. In patients who respond quickly...
to intravenous antibiotics and who desire early discharge, a short course of oral antibiotics may be substituted for continued intravenous therapy. The other exception includes patients with staphylococcal bacteremia requiring an extended period of treatment. (Combs C, 2007).

No consensus exists regarding the antibiotic regimen for treatment of endometritis, although gentamicin in combination with clindamycin has become the standard by which all other regimens are judged.-Gentamicin and clindamycin have a cure rate of approximately 90%. A once daily dose of gentamicin and clindamycin antibiotics has a similar success rate to the standard every 8 hour dose schedule. This combination is not effective against Enterococcus faecalis, which may be the cause in up to 25% of these infections. The addition of ampicillin (or vancomycin for patients with a penicillin allergy), is considered when the patient does not respond to the initial therapy of gentamicin and clindamycin to cover this organism. (Combs C, 2007).

Alternatively, broad-spectrum second- and third-generation cephalosporins, extended spectrum penicillins, and combination beta-lactamase inhibitors with penicillins have been used in an attempt to avoid polypharmacy and its associated toxicities. In general, these alternative therapies have a cure rate of 80-90%. The most accepted among this category of drugs are cefoxitin or moxalactam. The high rate of endometritis following cesarean delivery raises the question of whether there is a role for antibiotic prophylaxis at cesarean delivery and, if so, what antibiotic to use. Olsen et al note that awareness of risk factors for infection can guide the decision to use prophylactic antibiotics. In emergency cesarean deliveries, use of prophylactic cefazolin has been shown to reduce the rate of postpartum endometritis and wound infection. Other studies have demonstrated that ampicillin/sulbactam, cefazolin, and cefotetan are all acceptable choices for single-dose antibiotic prophylaxis. (Dinsmoor M, 2009).

Controversy still exists with regard to the need for prophylactic antibiotics during elective deliveries. The Cochrane Database demonstrated a two-thirds reduction in endometritis in women undergoing elective or nonelective cesarean delivery who receive prophylactic antibiotics; this was supported by a secondary analysis of an observational study in 2009. Other studies have shown that prophylactic antibiotic therapy at elective cesarean delivery was not associated with decreased incidence of endometritis. (Owens S, 2009).

The timing of prophylaxis is also an issue; 2 recent studies showed lower rates of infection when antimicrobial prophylaxis occurred before skin incision vs after cord clamping.
However, another trial that studied the same timing issue found that the timing of prophylaxis did not affect maternal infectious morbidity.

2.7.2.2 Urinary Tract Infections:

A urinary tract infection (UTI) is defined as a bacterial inflammation of the bladder or urethra. Greater than 105 colony-forming units from a clean-catch urine specimen or greater than 10,000 colony-forming units on a catheterized specimen is considered diagnostic of a UTI. (Kaimal A, 2008).

2.7.2.2.1 Etiology:

Risk factors for postpartum UTI include cesarean delivery, forceps delivery, vacuum delivery, tocolysis, induction of labor, maternal renal disease, preeclampsia, eclampsia, epidural anesthesia, bladder catheterization, length of hospital stay, and previous UTI during pregnancy. The most common pathogen is *E coli*. In pregnancy, group B streptococci are a major pathogen. Other causative organisms include *Staphylococcus saprophyticus, E faecalis, Proteus,* and *K pneumoniae*. (Kaimal A, 2008).

2.7.2.2.2 Incidence:

Postpartum bacteruria occurs in 3-34% of patients, resulting in a symptomatic infection in approximately 2% of these patients.

2.7.2.2.3 History:

A patient may report frequency, urgency, dysuria, hematuria, suprapubic or lower abdominal pain, or no symptoms at all.

2.7.2.2.4 Physical examination:

On examination, vital signs are stable and the patient is afebrile. Suprapubic tenderness may be elicited on abdominal examination. (Kaimal A, 2008).
2.7.2.2.5 Investigations :

Appropriate laboratory tests include urinalysis, urine culture from either a clean-catch or catheterized specimen, and CBC count.

2.7.2.2.6 Treatment :

Treatment is started empirically in uncomplicated infection because the usual organisms have predictable susceptibility profiles. When sensitivities are available, use them to guide antimicrobial selection. Treatment is with a 3- or 7-day antibiotic regimen. Commonly used antibiotics include trimethoprim/sulfamethoxazole, ciprofloxacin, and norfloxacin. Amoxicillin is often still used, but it has lower cure rates secondary to increasing resistance of \textit{E coli}. The quinolones are very effective but are considerably more expensive than amoxicillin and trimethoprim/sulfamethoxazole and should not be used in breastfeeding mothers. (Kaimal A, 2008).

2.7.2.3 Mastitis :

Mastitis is defined as inflammation of the mammary gland.

2.7.2.3.1 Etiology :

Milk stasis and cracked nipples, which contribute to the influx of skin flora, are the underlying factors associated with the development of mastitis. Mastitis is also associated with primiparity, incomplete emptying of the breast, and improper nursing technique. The most common causative organism, isolated in approximately half of all cases, is \textit{Staphylococcus aureus}. Other common pathogens include \textit{Staphylococcus epidermidis}, \textit{S saprophyticus}, \textit{Streptococcus viridans}, and \textit{E coli}. (Yildirim G, 2009).

2.7.2.3.2 Incidence:

In the United States, the incidence of postpartum mastitis is 2.5-3%. Mastitis typically develops during the first 3 months postpartum, with the highest incidence in the first few weeks after delivery. (Yildirim G, 2009).
2.7.2.3.3 Morbidity and mortality:

Neglected, resistant, or recurrent infections can lead to the development of an abscess, requiring parenteral antibiotics and surgical drainage. Abscess development complicates 5-11% of the cases of postpartum mastitis and should be suspected when antibiotic therapy fails. Mastitis and breast abscess also increase the risk of viral transmission from mother to infant. The diagnosis of mastitis is solely based on the clinical picture. (Yildirim G, 2009).

2.7.2.3.4 History:

Fever, chills, myalgias, erythema, warmth, swelling, and breast tenderness characterize this disease.

2.7.2.3.5 Physical examination:

Focus examination on vital signs, review of systems, and a complete examination to look for other sources of infection. Typical findings include an area of the breast that is warm, red, and tender. When the exam reveals a tender, hard, possibly fluctuant mass with overlying erythema, a breast abscess should be considered. (Yildirim G, 2009).

2.7.2.3.6 Investigations:

No laboratory tests are required. Expressed milk can be sent for analysis, but the accuracy and reliability of these results are controversial and aid little in the diagnosis and treatment of mastitis.

2.7.2.3.7 Treatment:

Milk stasis sets the stage for the development of mastitis, which can be treated with moist heat, massage, fluids, rest, proper positioning of the infant during nursing, nursing or manual expression of milk, and analgesics. When mastitis develops, penicillinase-resistant penicillins and cephalosporins, such as dicloxacillin or cephalaxin, are the drugs of choice. Erythromycin, clindamycin, and vancomycin may be used for infections that are resistant to penicillin. Resolution usually occurs 48 hours after the onset of antimicrobial therapy. (Yildirim G, 2009).

2.7.2.4 Wound Infection:
Wound infections in the postpartum period include infections of the perineum developing at the site of an episiotomy or laceration, as well as infection of the abdominal incision after a cesarean birth. Wound infections are diagnosed on the basis of erythema, induration, warmth, tenderness, and purulent drainage from the incision site, with or without fever. This definition can be applied both to the perineum and to abdominal incisions. (Yamaguchi M, 2009).

2.7.2.4.1 Etiology:

Perineal infections: Infections of the perineum are rare. In general, they become apparent on the third or fourth postpartum day. Known risk factors include infected lochia, fecal contamination of the wound, and poor hygiene. These infections are generally polymicrobial, arising from the vaginal flora. Abdominal wound infections: Abdominal wound infections are most frequently the result of contamination with vaginal flora. However, *S. aureus*, either from the skin or from an exogenous source, is isolated in 25% of these infections. Genital *Mycoplasma* species are commonly isolated from infected wounds that are resistant to treatment with penicillins. Known risk factors include diabetes, hypertension, obesity, treatment with corticosteroids, immunosuppression, anemia, development of a hematoma, chorioamnionitis, prolonged labor, prolonged rupture of membranes, prolonged operating time, abdominal twin delivery, and excessive blood loss.

2.7.2.4.2 Incidence:

The incidence of perineal infections is 0.35-10%. The incidence of incisional abdominal wound infections is 3-15% and can be decreased to approximately 2% with the use of prophylactic antibiotics.

2.7.2.4.3 Morbidity and mortality:

The most common consequence of wound infection is increased length of hospital stay. About 7% of abdominal wound infections are further complicated by wound dehiscence. More serious sequelae, such as necrotizing fasciitis, are rare, but patients with such conditions have a high mortality rate.
2.7.2.4.4 History:

Patients with perineal infections may complain of an inordinate amount of pain, malodorous discharge, or vulvar edema. Abdominal wound infections develop around postoperative day 4 and are often preceded by endometritis. These patients present with persistent fever despite antibiotic treatment. (Yamaguchi M, 2009).

2.7.2.4.5 Physical examination:

Perineal infections: An infected perineum often looks erythematous and edematous and may be accompanied by purulent discharge. Perform an inspection to identify hematoma, perineal abscess, or stitch abscess. Abdominal wound infections: Infected incisions may be erythematous, warm, tender, and indurated. Purulent drainage may or may not be obvious. A fluid collection may be appreciated near the wound, which, when entered, may release serosanguineous or purulent fluid. (Yamaguchi M, 2009).

2.7.2.4.6 Investigations:

The diagnosis of wound infection is often made based on the clinical findings. Serial CBC counts with differentials may be helpful, especially if a patient does not respond to therapy as anticipated.

2.7.2.4.7 Treatment:

Perineal infections: Treatment of perineal infections includes symptomatic relief with NSAIDs, local anesthetic spray, and sitz baths. Identified abscesses must be drained, and broad-spectrum antibiotics may be initiated. Abdominal wound infections: These infections are treated with drainage and inspection of the fascia to ensure that it is intact. Antibiotics may be used if the patient is afebrile. Most patients respond quickly to the antibiotic once the wound is drained. Antibiotics are generally continued until the patient has been afebrile for 24-48 hours. Patients do not require long-term antibiotics unless cellulitis has developed. Studies have shown that closed suction drainage or suturing of the subcutaneous fat decreases the incidence of wound infection when the subcutaneous tissue is greater than 2 cm in depth. (Yamaguchi M, 2009).
2.7.2.5 Septic Pelvic Thrombophlebitis:

Septic pelvic thrombophlebitis is defined as venous inflammation with thrombus formation in association with fevers unresponsive to antibiotic therapy. (Vermillion S, 2009).

2.7.2.5.1 Etiology:

Bacterial infection of the endometrium seeds organisms into the venous circulation, which damages the vascular endothelium and in turn results in thrombus formation. The thrombus acts as a suitable medium for proliferation of anaerobic bacteria. Ovarian veins are often involved because they drain the upper half of the uterus. When the ovarian veins are involved, the infection is most often unilateral, involving the right more frequently than the left. Occasionally, the thrombus has been noted to extend to the vena cava or to the left renal vein. Ovarian vein involvement usually manifests within a few days postpartum. Disease with later onset more commonly involves the iliofemoral vein. Risk factors include low socioeconomic status, cesarean birth, prolonged rupture of membranes, and excessive blood loss.

2.7.2.5.2 Incidence:

Septic pelvic thrombophlebitis occurs in 1 of every 2000-3000 pregnancies and is 10 times more common after cesarean birth (1 per 800) than after vaginal delivery (1 per 9000). The condition affects less than 1% of patients with endometritis.

2.7.2.5.3 Morbidity and mortality:

Septic thrombophlebitis may result in the migration of small septic thrombi into the pulmonary circulation, resulting in effusions, infections, and abscesses. Only rarely is a thrombus large enough to cause death.

2.7.2.5.4 History:

Septic pelvic thrombophlebitis usually accompanies endometritis. Patients report initial improvement after an intravenous antibiotic is initiated for treatment of the endometritis. The patient does not appear ill. Patients with ovarian vein thrombosis may describe lower abdominal pain, with or without radiation to the flank, groin, or upper abdomen. Other
symptoms include nausea, vomiting, and bloating. Frequently, patients with enigmatic fever are asymptomatic except for chills. (Vermillion S, 2009)

2.7.2.5.5 Physical examination:

Vital signs demonstrate fever greater than 38°C and resting tachycardia. If pulmonary involvement is significant, the patient may be tachypneic and stridulous. On abdominal examination, 50-70% of patients with ovarian vein thrombosis have a tender, palpable, ropelike mass extending cephalad beyond the uterine cornu.

2.7.2.5.6 Investigations:

- Important laboratory studies included urinalysis, urine culture, and CBC count with differential.
- Imaging: CT scan and MRI are the studies of choice for the diagnosis of septic pelvic thrombophlebitis. MRI has 92% sensitivity and 100% specificity, and CT imaging has a 100% sensitivity and specificity for identifying ovarian vein thrombosis. These imaging modalities are capable of identifying both ovarian vein and iliofemoral involvement. (Vermillion S, 2009)

2.7.2.5.7 Treatment:

The standard therapy after diagnosis of septic pelvic thrombophlebitis includes anticoagulation with intravenous heparin to an aPTT that is twice normal and continued antibiotic therapy. A therapeutic aPTT is usually reached within 24 hours, and heparin is continued for 7-10 days. In general, long-term anticoagulation is not required. Antibiotic therapy is most commonly with gentamicin and clindamycin. Other choices include a second- or third-generation cephalosporin, imipenem, cilastin, or ampicillin and sulbactam. All of these antibiotics have a cure rate of greater than 90%. Initially, it was thought that patients defervesce within 24-28 hours. More recent studies show that it takes 5-6 days for the fevers to resolve. In a 1999 prospective randomized study, women who were treated with heparin in addition to antibiotics responded no faster than patients treated with antibiotics alone. These findings do not support the empiric practice of heparin therapy for septic pelvic thrombophlebitis and raise the question of whether a new standard protocol should be developed. (Vermillion S, 2009)
2.7.3 Psychiatric Disorders:

Three psychiatric disorders may arise in the postpartum period: postpartum blues, postpartum depression (PPD), and postpartum psychosis.

- Postpartum blues is a transient disorder that lasts hours to weeks and is characterized by bouts of crying and sadness.
- PPD is a more prolonged affective disorder that lasts for weeks to months. PPD is not well defined in terms of diagnostic criteria, but the signs and symptoms do not differ from depression in other settings.
- Postpartum psychosis occurs in the first postpartum year and refers to a group of severe and varied disorders that elicit psychotic symptoms. (Lucas A, 2008)

2.7.3.1 Etiology:

The specific etiology of these disorders is unknown. The current view is based on a multifactorial model. Psychologically, these disorders are thought to result from the stress of the peripartum period and the responsibilities of child rearing. Other authorities ascribe the symptoms to the sudden decrease in the endorphins of labor and the sudden fall in estrogen and progesterone levels that occur after delivery. Low free serum tryptophan levels have been observed, which is consistent with findings in major depression in other settings. Postpartum thyroid dysfunction has also been correlated with postpartum psychiatric disorders.

Risk factors include undesired pregnancy, feeling unloved by mate, age younger than 20 years, unmarried status, medical indigence, low self-esteem, dissatisfaction with extent of education, economic problems with housing or income, poor relationship with husband or boyfriend, being part of a family with 6 or more siblings, limited parental support (either as a child or as an adult), and past or present evidence of emotional problems. Women with a history of PPD and postpartum psychosis have a 50% chance of recurrence. Women with a previous history of depression unrelated to childbirth have a 30% chance of developing PPD.

2.7.3.2 Incidence:

- Approximately 50-70% of women who have given birth develop symptoms of postpartum blues.
- PPD occurs in 10-15% of new mothers.
- The incidence of postpartum or puerperal psychosis is 0.14-0.26%.
2.7.3.3 Morbidity and mortality:

Psychiatric disorders can have deleterious effects on the social, cognitive, and emotional development of the newborn. These ailments can also lead to marital difficulties. (Lucas A, 2008)

2.7.3.4 History:

- Postpartum blues is a mild, transient, self-limited disorder that usually develops when the patient returns home. It commonly arises during the first 2 weeks after delivery and is characterized by bouts of sadness, crying, anxiety, irritation, restlessness, mood lability, headache, confusion, forgetfulness, and insomnia.
- PPD: Patients suffering from PPD report insomnia, lethargy, loss of libido, diminished appetite, pessimism, incapacity for familial love, feelings of inadequacy, ambivalence or negative feelings toward the infant, and an inability to cope. Consult a psychiatrist when PPD is associated with comorbid drug abuse, lack of interest in the infant, excessive concern for the infant's health, suicidal or homicidal ideations, hallucinations, psychotic behavior, overall impairment of function, or failure to respond to therapeutic trial.
- Postpartum psychosis: The signs and symptoms of postpartum psychosis typically do not differ from those of acute psychosis in other settings. Patients with postpartum psychosis usually present with schizophrenia or manic depression, which signals the emergence of preexisting mental illness induced by the physical and emotional stresses of pregnancy and delivery.

2.7.3.5 Treatment:

- Postpartum blues, which has little effect on a patient's ability to function, often resolves by postpartum day 10; therefore, no pharmacotherapy is indicated. Providing support and education has been shown to have a positive effect.
- PPD generally lasts for 3-6 months, with 25% of patients still affected at 1 year. PPD greatly affects the patient's ability to complete activities associated with daily living.
  - Supportive care and reassurance from healthcare professionals and the patient's family is the first-line therapy for patients with PPD. Research on pharmacological treatment for PPD is limited because postpartum women are
often excluded from large clinical trials. Empirically, the standard treatment modalities for major depression have been applied to PPD.

- First-line agents include selective serotonin reuptake inhibitors (SSRIs) or secondary amines. Studies on these drugs show that they can be used by nursing mothers without adverse effects on the infant. Consider electroconvulsive therapy for patients with PPD because it is one of the most effective treatments available for major depression. Treatment is recommended for 9-12 months beyond remission of symptoms, with tapering over the last 1-2 months.

- Postpartum psychosis: Treatment of postpartum psychosis should be supervised by a psychiatrist and should involve hospitalization. Specific therapy is controversial and should be targeted to the patient's specific symptoms. Patients with postpartum psychosis are thought to have a better prognosis than those with nonpuerperal psychosis. Postpartum psychosis generally lasts only 2-3 months.

- Secondary to the overlap between the normal sequelae of childbirth and the symptoms of PPD, the former is often underdiagnosed. Screening for PPD increases the identification of women suffering from this disorder. The Edinburgh Postnatal Depression Scale has proven to be an effective tool for this type of screening. It requires little extra time and is acceptable to both patients and physicians. (Lucas A, 2008)

2.8 Postnatal exercises:

2.8.1 Benefits of exercise:

- Reduces the risk of developing and/or dying from heart disease, diabetes, colon cancer and breast cancer.
- Reduces high blood pressure or the risk of developing high blood pressure, high cholesterol or the risk of developing high cholesterol.
- Reduces body weight or body fat, depression and anxiety, improves psychological well-being and sleep quality.
- Builds and maintains healthy muscles, bones, and joints. (Women and Newborn Health Service, 2008).
2.8.2 When to do exercise:

Two days after normal delivery, the mother can get off the bed to walk around and doing postnatal exercise and if she had caesarean section she should begin until advice is sought physiotherapist or a doctor.

2.8.3 Types and how to do exercise:

1. Pelvic floor exercise:
   - Lie on your back.
   - Bend your knees.
   - Put your feet together with your knees about 1 feet apart.
   - Tighten the vaginal, urthral and anal muscles as if trying to without urination or defecation.
   - You can also do this exercise in sitting or standing position.

2. Back and abdominal exercise I:
   - Lie on your back and bend your knees with your feet slightly apart.
   - Breath out and tighten your abdomen, press your pelvic downwards to flatten your low back against the bed.

3. Back and abdominal exercise II:
   - Lie on your back and bend your knees, keeping your feet together.
   - Tighten your abdomen, and press your pelvic downwards to flatten your low back against the bed.
   - Lift your head and shoulders just off the bed with both hands touching the knees, hold for a while, and lie down slowly. (Family Health Services, 2012).

2.9 Previous Studies:

In Worldwide: At 1 year postpartum, a study showed the rate of maternal fatigue remained >50% in France and Italy in (2000). Fatigue was found to positively relate to postpartum depressive symptoms and breastfeeding problems in (2005). However, McQueen and Mander's in (2003) critical review reported only a few articles focused on tiredness and fatigue in the postpartum period. Studies revealed that at 2 months postpartum. After childbirth, new mothers undergo the process of attaining their maternal identity that consists of developing an attachment with their baby, having competence in mothering behaviors, and
experiencing pleasure when interacting with the baby in (1986). The process of becoming a mother is described as a process of appreciation, discovery, learning, and acceptance of the woman's new role, which results in a positive and worthwhile experience in ( 2001). However, because of new mothers' lack of baby-care skills, they feel a loss of control in their lives and lack of time and space for themselves. Child-care responsibilities and lack of knowledge and preparation are sources of frustration and fatigue for new mothers in (2002). (Ching-Y, et al, 2006)

**In developed countries**: Women's evaluation of hospital postpartum care has consistently been more negative than their assessment of other types of maternity care. The need to further explore what is wrong with postpartum care, in order to stimulate changes and improvements, has been stressed. The principal aim of this study was to describe women's negative experiences of hospital postpartum care, expressed in their own words. Characteristics of the women who spontaneously gave negative comments about postpartum care were compared with those who did not. Data were taken from a population-based prospective longitudinal study of 2783 Swedish-speaking women surveyed at three time points: in early pregnancy, at two months, and at one year postpartum. At the end of the two follow-up questionnaires, women were asked to add any comment they wished. Content analysis of their statements was performed. Altogether 150 women gave negative comments about postpartum care, and this sample was largely representative of the total population-based cohort. The women gave a diverse and detailed description of their experiences, for instance about lack of opportunity to rest and recover, difficulty in getting individualised information and breastfeeding support, and appropriate symptom management. The different statements were summarised in six categories: organisation and environment, staff attitudes and behaviour, breastfeeding support, information, the role of the father and attention to the mother. The findings of this study underline the need to further discuss and specify the aims of postpartum care. The challenge of providing high-quality follow-up after childbirth is discussed in the light of a development characterised by a continuous reduction in the length of hospital stay, in combination with increasing public demands for information and individualized care. (Rudman A, 2007)

**In developing countries**: Only about one-third of women in Palestine (West Bank and Gaza) obtain postpartum care. Therefore, the goal of this study was to assess factors associated with lack of postnatal care, women's reasons for not obtaining postnatal care, and their attitudes towards its importance. In early 2006, a cross-sectional survey was conducted at three clinics
run by the Ministry of Health providing Mother and Child Health Care in West Bank, Palestine. A total of 264 postpartum women attending the clinics were interviewed face-to-face, using a structured questionnaire. Although the majority of women considered postnatal care necessary (66.1%), only 36.6% of women obtained postnatal care. The most frequent reason for not obtaining postnatal care was that women did not feel sick and therefore did not need postnatal care (85%), followed by not having been told by their doctor to come back for postnatal care (15.5%). Based on a multivariable analysis, use of postnatal care was higher among women who had experienced problems during their delivery, had a cesarean section, or had an instrumental vaginal delivery than among women who had a spontaneous vaginal delivery. Use of postnatal care was also higher among women who delivered in a private hospital as compared to those who delivered in a public hospital. In addition, we found regional differences. The higher use of postnatal care among high-risk women is appropriate, but some clinically dangerous conditions can also occur in low-risk women. Future efforts should therefore focus on providing postnatal care to a larger number of low-risk women. (Enas Dhaher, et al 2008)

In Africa: South Africa is performing well on certain selected maternal health process indicators; antenatal care attendance has remained over 90% since 1998; deliveries conducted by skilled health workers have increased from 84% in 1998 to 92% in 2003. Despite this, maternal mortality is on the increase, with the latest Saving Mothers Report showing that maternal mortality in the 2002-2004 triennium increased from the previous three years. The non pregnancy related infections, particularly HIV have impacted heavily on maternal mortality rates. Therefore, antenatal care, delivery and postnatal care need to place a particular focus on screening for and appropriate management of communicable diseases such as HIV infection during pregnancy and beyond. Although antenatal care attendance is high, the services rendered such as timing of the first visit and providers’ attitudes need to be critically assessed as they are also important if optimum quality of care is to be achieved. Staff shortages, training and staff motivation appear to be particular issues in maternal health care services. The introduction of the prevention of mother-to-child transmission of HIV programme and more recently, the recommendation that women should be initiated into the antiretroviral programme during antenatal care have placed additional challenges on the maternal health services. Postnatal care in South Africa has not been adequately prioritised as a maternal health care service. With high maternal and perinatal mortality rates found in the postnatal period there needs to be guidelines and systems put in place to ensure that care of the
woman and her newborn goes beyond the delivery. (Mags Beksinsk A, Busi Kunene, Sa iqa Mullick, 2006).

**In Sudan:** With a maternal mortality ratio of 1,107 per 100,000 live births, Sudan has one of the highest maternal death rates in the world (Sudanese Government of National Unity and Government of Southern Sudan, 2006). Moreover, for every woman who dies, approximately 20 more suffer long lasting injuries, or disabilities such as obstetric fistula, uterine prolapse, infertility and depression. The main direct causes of maternal death in Sudan are hemorrhage, infection, Pregnancy induced hypertension and unsafe abortion, while malaria, anemia and hepatitis contribute indirectly (Sudanese Government of National Unity and Government of Southern Sudan, 2006; Kinaro et al., 2009). Maternal death is often associated with neonatal death. The infant mortality rate in Sudan is estimated at 81 per 1000 live births and about half of those are neonatal deaths that occur during the first month of life. Neonatal deaths are caused mainly by asphyxia, preterm birth and sepsis. (Sudanese government of National Unity and Government of Southern Sudan, 2006)
3. Materials and Methods

3.1 Study Design:

A descriptive hospital based study aimed at assessing nurses’ knowledge and performance regarding postpartum women’ care in Obstetrics & Gynecology Teaching Hospital, Wad Medani during the period from March to April 2013.

3.2 Study Area:

The study was carried out at Obstetrics & Gynecology Teaching Hospital in Wad Medani town, the capital of Gezira State, which is a large agricultural area located in the central region of Sudan. The locality is about 186Km South Khartoum state. It receives the patients from the whole state and neighboring state e.g Algadarif, Sinner. The hospital units consisted of: intensive care unit (ICU) 7 beds, (7) wards (294 beds), Ultra Sound (US), and X-ray unit.
### Table (3.1): Distribution of manpower in Obstetrics & Gynecology Teaching Hospital:

<table>
<thead>
<tr>
<th>Position</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>12</td>
</tr>
<tr>
<td>Registrars</td>
<td>23</td>
</tr>
<tr>
<td>Medical officers</td>
<td>32</td>
</tr>
<tr>
<td>Technical anesthesia</td>
<td>15</td>
</tr>
<tr>
<td>Midwives</td>
<td>61</td>
</tr>
<tr>
<td>Nurses</td>
<td>54</td>
</tr>
<tr>
<td>Auxiliary Nurses</td>
<td>29</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>2</td>
</tr>
<tr>
<td>Assistant Pharmacists</td>
<td>5</td>
</tr>
<tr>
<td>Nutritionists</td>
<td>7</td>
</tr>
<tr>
<td>Psychologists and socialistic</td>
<td>6</td>
</tr>
<tr>
<td>Statistics</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>267</td>
</tr>
</tbody>
</table>

**Source:** Statistical Department of Obstetrics & Gynecology Teaching Hospital. 2013

### Table (3.2): Distribution of wards, beds and admission during 2010 to 2012 in Obstetrics
### Gynecology Teaching Hospital:

<table>
<thead>
<tr>
<th>Position</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wards</td>
<td>7</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>2</td>
</tr>
<tr>
<td>Laboratories</td>
<td>2</td>
</tr>
<tr>
<td>Beds</td>
<td>301</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Admission</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1121</td>
</tr>
<tr>
<td>2011</td>
<td>1642</td>
</tr>
<tr>
<td>2012</td>
<td>1590</td>
</tr>
<tr>
<td>Total</td>
<td>4353</td>
</tr>
</tbody>
</table>

Source: Statistical Department of Obstetrics & Gynecology Teaching Hospital. 2013

### 3.3 Study Population:

The population of the present study includes all nurses who have direct contact with postnatal women in all wards and units during the period of the study from March to April 2013.

### 3.4 Sample Size:

The available nurses (50) who at the Obstetrics & Gynecology Teaching Hospital in all the wards and units during the period of the study from March to April 2013.

### 3.4.1 Inclusion Criteria:

All postnatal nurses who have direct contact with postnatal patients in pervious setting in the Obstetrics & Gynecology Teaching Hospital at Wad Madani in March to April 2013.
3.4.2 Exclusion Criteria:

- Nurses who have not direct contact with postnatal patients.
- Postnatal nurses have experiences less than 1 year in postnatal wards and units.

3.5 Data Collection Tool:

Two tools of data collection:
1. Structured questionnaire was designed by the researcher and utilized to collect data about socio-demographic characteristics of the sample, their knowledge about postpartum women’ care.
2. Observation Check List.

3.6 Ethical consideration:

1. Official letters was taken to collect the data of this research from the director of the target hospital.
2. Pilot study was done to test the reliability of the selected questionnaire.
3. Permission was taken from the target subjects and simple explanation was carried out.
4. The research was filled the tool from each nurses through Questionnaire and Observation check list.

3.7 Data analysis:

Data was analyzed and entered to the statistical package for social sciences (SPSS). The data was tabulated in number and percentage.
4. Results and Discussion

4.1 Results:

Table (4.1): Distribution of the study sample according to their gender and age groups:

<table>
<thead>
<tr>
<th>Gender</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>92%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age groups</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 – 25 years</td>
<td>19</td>
<td>38%</td>
</tr>
<tr>
<td>26 – 30 years</td>
<td>19</td>
<td>38%</td>
</tr>
<tr>
<td>&lt; 30 years</td>
<td>12</td>
<td>24%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table (4.1) showed that (92%) of the study sample were females, while (8%) of the study sample were males. Regarding to the age groups this table showed that (38%) of the study sample their aged range between 25 – 30 years, while (24%) their age range < 30 years.
Table (4.2): Distribution of the study sample according to their educational level and working area:

<table>
<thead>
<tr>
<th>Educational level</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical diploma</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>Bachelor</td>
<td>43</td>
<td>86%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working area</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wards</td>
<td>24</td>
<td>48%</td>
</tr>
<tr>
<td>Nursery</td>
<td>12</td>
<td>24%</td>
</tr>
<tr>
<td>Intensive care unit</td>
<td>14</td>
<td>28%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

This table revealed that (86%) of the study sample their level of education were bachelor, while (14%) technical diploma, also this table showed that (48%) of the study sample their working area in wards, while (28%), (24%) of them worked at intensive care unit and nursery.
Figure (4.1): Distribution of the study sample according to their years of experience:

(62%) of the study sample their years of experience range from 1 to 4 years.
Figure (4.2): Distribution of the study sample according to their source of knowledge:

(70%) of the study sample their source of knowledge were from college.
Figure (4.3): Distribution of the study sample according to receiving training program on postpartum care before:

(70%) of the study sample didn't attended any training programs before.
Table (4.3) Distribution of study sample according to their knowledge about postpartum care:

<table>
<thead>
<tr>
<th>Nurses' knowledge</th>
<th>Correct complete answer</th>
<th>Correct incomplete answer</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Definition of postpartum period</td>
<td>2</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Physiological changes</td>
<td>2</td>
<td>4%</td>
<td>47</td>
<td>94%</td>
</tr>
<tr>
<td>Vaginal discharges</td>
<td>1</td>
<td>2%</td>
<td>49</td>
<td>98%</td>
</tr>
<tr>
<td>Advice given to the mother about breastfeeding</td>
<td>50</td>
<td>100%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Benefits of breastfeeding</td>
<td>0</td>
<td>0%</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table (4.3) Illustrated that (4%) of the study sample responded with correct answers regarding definition of postpartum period and physiological changes, while all of the study sample (100%) responded with correct answers regarding advice to the mother about breastfeeding.
Table (4.4): Distribution of study sample according to their knowledge about postpartum care regarding control of infections:

<table>
<thead>
<tr>
<th>No (50)</th>
<th>Correct complete answer</th>
<th>Correct incomplete answer</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No %</td>
<td>No %</td>
<td>No %</td>
<td>No %</td>
<td>No %</td>
</tr>
<tr>
<td>Doing by nurse during and after any procedures: wash hands, wear mask, wear gown, wear and change gloves between patients.</td>
<td>49 98%</td>
<td>1 2%</td>
<td>0 0%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Prevention of sepsis during delivery: use aseptic technique.</td>
<td>49 98%</td>
<td>1 2%</td>
<td>0 0%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Prevention of sepsis during postnatal period: use aseptic technique during procedures.</td>
<td>49 98%</td>
<td>1 2%</td>
<td>0 0%</td>
<td>50 100%</td>
</tr>
</tbody>
</table>

Table (4.4) Illustrated that (98%) of the study sample responded with correct answers regarding infections control.
Table (4.5) Distribution of study sample according to their knowledge about postpartum care regarding hemorrhage:

Table (4.5) Illustrated that (98%) of the study sample responded with correct answers regarding definition of postpartum hemorrhage, while all of the study sample (100%) responded with correct incomplete answers regarding causes, signs and symptoms, management, and (94%) responded with correct incomplete answers regarding complications.
Table (4.6) Distribution of study sample according to their knowledge about postpartum care regarding puerperal sepsis:

<table>
<thead>
<tr>
<th>Nurses' knowledge</th>
<th>Correct complete answer</th>
<th>Correct incomplete answer</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Signs and symptoms of puerperal sepsis</td>
<td>1</td>
<td>2%</td>
<td>49</td>
<td>98%</td>
</tr>
<tr>
<td>The causes of puerperal sepsis</td>
<td>1</td>
<td>2%</td>
<td>49</td>
<td>98%</td>
</tr>
<tr>
<td>Management of puerperal sepsis</td>
<td>5</td>
<td>10%</td>
<td>45</td>
<td>90%</td>
</tr>
<tr>
<td>Advice given to the mother about puerperal sepsis</td>
<td>48</td>
<td>96%</td>
<td>2</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table (4.6) Illustrated that only (2%) of the study sample responded with correct answers regarding signs and symptoms of puerperal sepsis and its causes, and (10%) of them responded with correct incomplete answers regarding management of puerperal sepsis.
Table (4.7) Distribution of study sample according to their knowledge about postpartum care regarding breast problems:

<table>
<thead>
<tr>
<th>Nurses' knowledge</th>
<th>Correct complete answer</th>
<th>Correct incomplete answer</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Breastfeeding problems experience during the first weeks</td>
<td>20</td>
<td>40%</td>
<td>30</td>
<td>60%</td>
</tr>
<tr>
<td>Breasts problems during examination</td>
<td>49</td>
<td>98%</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Management of breasts engorgement</td>
<td>22</td>
<td>44%</td>
<td>28</td>
<td>56%</td>
</tr>
</tbody>
</table>

Table (4.7) Revealed that (98%) of the study sample responded with correct answers regarding breasts problems during examination, while (44%) of the study sample responded with correct answers regarding management of breasts engorgement.
Table (4.8) Distribution of study sample according to their knowledge regarding postpartum care:

No (50)

<table>
<thead>
<tr>
<th>Nurses' knowledge</th>
<th>Correct complete answer</th>
<th>Correct incomplete answer</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (%)</td>
<td>No (%)</td>
<td>No (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>The immediate postpartum care</td>
<td>40%</td>
<td>60%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Examination the mother for prior to discharge</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Doing to the mother during home visits</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table (4.8) Revealed that (40%) of the study sample responded with correct answers regarding the immediate postpartum care, while all of the study sample (100%) responded with correct answers regarding examination the mother for prior to discharge.
Table (4.9): Distribution of the study sample according to their knowledge regarding to postnatal exercises:

<table>
<thead>
<tr>
<th>Do you discuss or teach mothers for postnatal exercises prior to discharge?</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>49</td>
<td>98%</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100%</td>
</tr>
</tbody>
</table>

No (50)
Table (4.10) Distribution of study sample according to their knowledge regarding to postnatal exercises:

<table>
<thead>
<tr>
<th>Nurses' knowledge</th>
<th>Correct complete answer</th>
<th>Correct incomplete answer</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postnatal exercises</td>
<td>15 30%</td>
<td>34 68%</td>
<td>1 2%</td>
<td>50 100%</td>
</tr>
</tbody>
</table>
Table (4.11): Distribution of the study sample according to their performance regarding nursing role for immediate postpartum care:

<table>
<thead>
<tr>
<th>Nurses' Performance</th>
<th>Done correctly</th>
<th>Done incomplete</th>
<th>Not done</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Emotional support to mother and their family</td>
<td>30</td>
<td>60%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Explanation of care and examination to mother</td>
<td>20</td>
<td>40%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Nursing management after pain</td>
<td>9</td>
<td>18%</td>
<td>41</td>
<td>82%</td>
</tr>
<tr>
<td>Check the blood pressure</td>
<td>19</td>
<td>38%</td>
<td>31</td>
<td>62%</td>
</tr>
<tr>
<td>Check the temperature</td>
<td>14</td>
<td>28%</td>
<td>36</td>
<td>72%</td>
</tr>
<tr>
<td>Check the pulse rate</td>
<td>17</td>
<td>34%</td>
<td>33</td>
<td>66%</td>
</tr>
<tr>
<td>Check the respiration rate</td>
<td>14</td>
<td>28%</td>
<td>36</td>
<td>72%</td>
</tr>
</tbody>
</table>

This table revealed that (18%) of the study sample done correctly management after pain.
Table (4.12): Distribution of the study sample according to their performance regarding nursing role for mothers' examinations:

<table>
<thead>
<tr>
<th>Nurses' Performance</th>
<th>Done correctly</th>
<th>Done incomplete</th>
<th>Not done</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Check or examine the breasts</td>
<td>12</td>
<td>24%</td>
<td>38</td>
<td>76%</td>
</tr>
<tr>
<td>Check or examine the vaginal flow/discharges</td>
<td>27</td>
<td>54%</td>
<td>23</td>
<td>46%</td>
</tr>
<tr>
<td>Check or examine the perineum area</td>
<td>13</td>
<td>26%</td>
<td>37</td>
<td>74%</td>
</tr>
<tr>
<td>Check or examine the abdominal incision</td>
<td>38</td>
<td>76%</td>
<td>12</td>
<td>24%</td>
</tr>
<tr>
<td>Check or examine the lower extremities</td>
<td>15</td>
<td>30%</td>
<td>35</td>
<td>70%</td>
</tr>
<tr>
<td>Check or examine the ability to void</td>
<td>5</td>
<td>10%</td>
<td>45</td>
<td>90%</td>
</tr>
<tr>
<td>Check and care of urine catheter</td>
<td>8</td>
<td>16%</td>
<td>42</td>
<td>84%</td>
</tr>
<tr>
<td>Check or examine if there is signs of infection</td>
<td>9</td>
<td>18%</td>
<td>41</td>
<td>82%</td>
</tr>
</tbody>
</table>
Table (4.13): Distribution of the study sample according to their performance regarding nursing role for advice the mother:

<table>
<thead>
<tr>
<th>Nurses' Performance</th>
<th>Done correctly</th>
<th>Done incomplete</th>
<th>Not done</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advice or educate the mother about how to care her baby &quot;especially the first-time mother&quot;</td>
<td>21 42%</td>
<td>18 36%</td>
<td>11 22%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about breasts care</td>
<td>22 44%</td>
<td>28 56%</td>
<td>0 0%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about the benefits of the breastfeeding</td>
<td>27 54%</td>
<td>12 24%</td>
<td>11 22%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about immunization of the baby</td>
<td>17 34%</td>
<td>2 4%</td>
<td>31 62%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother to ambulate</td>
<td>38 76%</td>
<td>10 20%</td>
<td>2 4%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about postnatal exercises</td>
<td>4 8%</td>
<td>40 80%</td>
<td>6 12%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about who and where to call if she has problems</td>
<td>50 100%</td>
<td>0 0%</td>
<td>0 0%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about when resuming her normal activity</td>
<td>21 42%</td>
<td>3 6%</td>
<td>26 52%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about 6 weeks examination</td>
<td>47 94%</td>
<td>0 0%</td>
<td>3 6%</td>
<td>50 100%</td>
</tr>
<tr>
<td>Advice the mother about family planning</td>
<td>19 38%</td>
<td>1 2%</td>
<td>30 60%</td>
<td>50 100%</td>
</tr>
</tbody>
</table>
Table (4.14): Distribution of the study sample according to their performance regarding nursing role for postpartum management:

<table>
<thead>
<tr>
<th>Nurses' Performance</th>
<th>Done correctly</th>
<th>Done incomplete</th>
<th>Not done</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Nursing management of fever</td>
<td>1</td>
<td>2%</td>
<td>49</td>
<td>98%</td>
</tr>
<tr>
<td>Wound dressing</td>
<td>3</td>
<td>6%</td>
<td>47</td>
<td>94%</td>
</tr>
</tbody>
</table>

This table revealed that only (2%) of the study sample done correctly management of fever, while (98%) of the study sample done incomplete. Also this table illustrated that only (6%) of the study sample done correctly wound dressing, while (94%) of them done incomplete.
4.2 Discussion:

The immediate postpartum care is very important to mother to prevent occurrence of serious complications such as postpartum hemorrhage, infections. This period is used to make sure the mother is stable and to educate her in the care of her baby. Women are encouraged to ambulate and to eat a regular diet. The study was carried out in Obstetrics & Gynecology Teaching Hospital in Wad Medani town, the capital of Gezira State, Sudan, during the period of the study from March to April 2013 to study nurses' knowledge and performance regarding postpartum women's care. Data was analyzed and entered to the statistical package for social sciences (SPSS). The data was tabulated in number and percentage. The results revealed that more than four-fifth (92%) of the study sample were females. Regarding to the age groups (38%) of the study sample their aged range between 25 – 30 years, while (28%) their age range < 30 years. Also the study implies that (86%) of the study sample their level of education were bachelor, also this table showed that (48%) of the study sample their working area in wards, while (28%) of them worked at intensive care unit. (62%) of the study sample their years of experience range from 1 to 4 years. (70%) of the study sample their source of knowledge were from college. (70%) of the study sample didn't attended any training programs before.

Table (4.3) illustrated that (4%) of the study sample responded with correct answers regarding definition of postpartum period and physiological changes, while all of the study sample (100%) responded with correct answers regarding advice to the mother about breastfeeding.

Table (4.4) illustrated that (98%) of the study sample responded with correct answers regarding infection control. Table (4.5) showed that (98%) of the study sample responded with correct answers regarding definition of postpartum hemorrhage, while all of the study sample (100%) responded with correct incomplete answers regarding causes, signs and symptoms, management, and (94%) responded with correct incomplete answers regarding complications.

Also table (4.6) revealed that (98%) of the study sample responded with correct incomplete answers regarding signs and symptoms of postpartum puerperal sepsis and causes, while (90%) of the study sample responded with correct incomplete answers regarding management of puerperal sepsis and (96%) of the study sample responded with correct answers regarding advice to the mother on puerperal sepsis.

Table (4.7) showed that (98%) of the study sample responded with correct answers regarding breasts problems during examination, while (44%) of the study sample responded with correct answers regarding management of breasts engorgement. Table (4.8) showed that
(40%) of the study sample responded with correct answers regarding the immediate routine postpartum care after delivery, while all of the study sample (100%) responded with correct answers regarding examination the mother for prior to discharge.

Table (4.11) revealed that (18%) of the study sample done correctly management after pain, while (82%) of the study sample done incomplete. Table (4.14) revealed that only (2%) of the study sample done correctly management of fever, while (98%) of the study sample done incomplete. Also this table illustrated that only (6%) of the study sample done correctly wound dressing, while (94%) of them done incomplete

5.1 Conclusion

Based on the results of this study, the researcher concluded that most of the knowledge and practices of nurses regarding postpartum care were inadequate, especially definition, nursing care during postpartum period and how to prevent the complications and how to manage it.
5.2 Recommendations:
Based on results of this study the following recommendations are suggested:

- Nurses staff need facilities to perform postpartum care correctly.
- Training program for all nurses working in the Obstetric and Gynecology Teaching Hospital for postpartum care and practical in using infections control measures.
- Proper and continuous supervision and evaluation to assess the nurses’ performance is essential.
- Designing long-term educational programs and conducting research focused on postpartum maternal health.
References:


Appendixes

Questionnaire to assess nurses' knowledge regarding women's care in postpartum period

Section One:
Personal Data:

1. Gender:
   a. Male ( )
   b. Female ( )

2. Age:
   a. 20 – 25 years ( )
   b. 26 – 30 years ( )
   c. 31 – 35 years ( )
   d. More than 35 years ( )

3. Educational level:
   a. Secondary ( )
   b. Technical diploma ( )
   c. Bachelor ( )
   d. Post graduate ( )
   e. Others mention …………………………………………………….

4. Working area:
   a. ward ( )
   b. Theatre ( )
   c. Labour room ( )
   d. Intensive care unit ( )
   e. Others mention …………………………………………………….

5. Years of experience:
   a. 1 year - 4 years ( )
   b. 5 – 7 years ( )
   c. 8 – 10 years ( )
   d. More than 10 years ( )

6. Source of knowledge:
   a. From college ( )
   b. From internet ( )
   c. Books ( )
   d. Educational programs ( )
   e. Others mention …………………………………………………….

7. If receive any training programs on postpartum care:
   a. Yes ( )
   b. No ( )
Section Two:

Put (√) to right answer (×) to wrong answer:

Knowledge and practice on postpartum period:

1. Postpartum period defined as:
   a. The time from the delivery of the placenta through the first few weeks after delivery ( )
   b. The period is usually considered to be 6 – 8 week after delivery ( )
   c. All of the above ( )
   d. None of the above ( )

2. After delivery the physiological changes occur into:
   a. Uterus, cervix and vagina ( )
   b. Perineum, vagina and abdominal wall ( )
   c. Vagina, ovaries and the breasts ( )
   d. All of the above ( )
   e. None of the above ( )

3. After delivery the vaginal discharges known as:
   a. Lochia rubra, red in colour ( )
   b. Lochia serosa, brownish red in colour ( )
   c. Lochia alba, yellow in colour ( )
   d. All of the above ( )
   e. None of the above ( )

4. After delivery what advice would you give to the mother to promote breast-feeding?
   a. Benefits of breastfeeding and colostrum ( )
   b. Exclusive breastfeeding ( )
   c. Avoid baby formula ( )
   d. Give no fluid until 6 months ( )
   e. Continue breastfeeding for 24 months ( )

5. Could you mention the benefits of breastfeeding?
Section Three:

Knowledge on how to prevent infections in postpartum period:

1. During and after any procedures the nurses must be:
   a. Wash hands (          )
   b. Wear mask (           )
   c. Wear gown (           )
   d. Wear and change gloves between patients (         )
   e. Wear over shows (     )
   f. Wear goggles, eyes glasses (       )

2. How would you prevent sepsis in a woman during delivery?
   a. Use sterile gloves during delivery (       )
   b. Use sterile delivery pack during delivery (  )
   c. Avoid frequent vaginal examination (       )
   d. Good management of 3rd stage of labour (     )
   e. Detect and treat genital infections (       )

3. How would you prevent sepsis in a woman during postnatal period?
   a. Follow aseptic technique during any procedures (   )
   b. Changing the gloves between patients (         )
   c. Change all personnel protective equipment between patients (  )
   d. All of the above (           )
   e. None of the above (         )

Section Four:

Knowledge and practice on postpartum hemorrhage:

Ixx
1. **Postpartum hemorrhage defined as:**
   a. Excessive blood loss during or after the third stage of labour, blood loss 500ml at vaginal delivery, 1000ml at cesarean delivery ( )
   b. Objectively defined as a 10% change in hematocrit level between admission and the postpartum period ( )
   c. All of the above ( )
   d. None of the above ( )

2. **When would suspect that a woman has or is developing postpartum hemorrhage?**
   a. Vaginal bleeding more than 500ml after delivery ( )
   b. Rapid pulse ( )
   c. Sudden drop in blood pressure ( )
   d. Soaking of more than one pad per hour ( )
   e. Bright red bleeding with or without clots after delivery ( )

3. **Mention the causes of postpartum anemia:**
   a. Ante or postpartum bleeding ( )
   b. Uterine rupture ( )
   c. Retained products of conception ( )
   d. Placenta accreta ( )
   e. Others mention .................................................................

4. **When would you suspect that a woman is anemic?**
   a. History of postpartum hemorrhage ( )
   b. Complains of persistent headache ( )
   c. Excessive fatigue ( )
   d. Complains of dizziness ( )
   e. Breathlessness ( )
   f. Investigations to confirm the diagnosis ( )

5. **How do you manage post delivery severe anemia?**
   a. Blood transfusion + i.v. fluids ( )
   b. Give oxytocic drugs ( )

lxxi
c. Removal of any blood clots from the uterus  

d. Admission for further investigations  

e. All of the above  

f. None of the above  

6. Could you mention complications of anemia in postpartum period?  

a. Infections  

b. Hemorrhage  

c. Maternal death  

d. Anemic heart failure  

e. Others mention …………………………………………………  

Section Five:  

Knowledge and practice on postpartum infections:  

1. How would you know that a mother has puerperal sepsis?  

a. Pain and redness on the perineum  

b. Fundal tenderness  

c. Mucopurulent vaginal discharges  

d. Tachycardia, pulse rate is over 90  

e. Temperature more than 38°C  

2. What are the causes of puerperal sepsis?  

a. Unhygienic delivery practices  

b. Manual removal of the placenta  

c. Premature / prolonged rupture of membranes  

d. Frequent vaginal examination  

e. Delayed / prolonged labour  

3. How do you manage puerperal sepsis?  

a. Give antibiotics  

b. Give i.v fluids if patient in stroke  

c. Good personal hygiene  

lxxii
d. Dietary treatment

e. Encourage patient to ambulating

4. What advice would you give to a mother on puerperal sepsis?

a. Use sitz bath

b. Frequent changing of pads

c. Frequent cleaning of vulva

d. Do postnatal exercises

e. Others mention .................................................................

5. Would you mention the breastfeeding problems that mothers experience during the first weeks?

a. Sore nipples or tissues

b. Tender or swollen breasts

c. Breast abscess

d. Insufficient breast milk

e. Others mention .................................................................

6. What are you main concerns during breasts examination?

a. Breasts engorgement

b. Breasts infection "mastitis"

c. Normality of the breasts

d. Cracked nipples

e. Breasts abscess

7. How do you manage breasts engorgement?

a. Encourage mother to breastfeed frequently

b. Apply Vaseline to prevent cracking and avoid drugs

c. Encourage mother to express after breastfeeding

d. Keep breasts clean

e. Encourage mother to take fluid and rest

Section Six:
Knowledge and practice on postpartum immediate care examination for prior for discharge and home visits:

1. Could you mention the immediate routine postpartum care after delivery?
   a. Monitoring for blood loss ( )
   b. Check for blood pressure and pulse rate ( )
   c. Signs of infection ( )
   d. Contraction of the uterus ( )
   e. Ability to void ( )
   f. Encourage the mother to ambulate and eat regular diet ( )

2. What do you examine the mother for prior to discharge?
   a. Condition of scar ( )
   b. Blood pressure ( )
   c. Vaginal flow and perineum ( )
   d. Breasts and milk secretion ( )
   e. Hemoglobin level ( )

3. What do you examine the baby for prior to discharge?
   a. Vaccination status ( )
   b. Skin colour ( )
   c. Congenital abnormalities ( )
   d. Feeding pattern ( )
   e. Presence of infections ( )

4. Do you discuss or teach mothers for postnatal exercises prior to discharge?
   a. Yes ( )
   b. No ( )

5. If yes, what do you discuss or teach?
   a. Benefits of exercises ( )
   b. When to do exercises ( )
   c. Types of postnatal exercises ( )
   d. How to do postnatal exercises ( )
6. **What to do to the mother during home visits?**

   a. Check the blood pressure (  
   b. Vaginal flow or bleeding (  
   c. Examine for perineal healing, pain, redness (  
   d. Check the temperature (  
   e. Check for vaginal foul discharge (  
   f. Check for condition of the breasts (  
   g. Advice on 6 weeks examination and family planning (  

7. **What to do to the baby during home visits?**

   a. Examine the umbilical cord (  
   b. Check for jaundice and eyes infection (  
   c. Feeding methods and problems (  
   d. Immunization status (  
   e. Check for any abnormalities (  

Observation check list to monitoring nurses' performance during care of postpartum mothers

<table>
<thead>
<tr>
<th>Items</th>
<th>Done correctly</th>
<th>Done incorrectly</th>
<th>Not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Emotional support to mother and their family</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Explanation of care and examination to mother</td>
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<td>4. Check the blood pressure</td>
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<td>6. Check the pulse rate</td>
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<tr>
<td>7. Check the respiration rate</td>
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<td>15. Advice or educate the mother about how to care her baby &quot;especially the first-time mother&quot;</td>
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<tr>
<td>20. Advice the mother about postnatal exercises</td>
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<td>21. Advice the mother about who and where to call if she has problems</td>
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<tr>
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<tr>
<td>23. Check or examine if there is signs of infection</td>
<td></td>
<td></td>
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<tr>
<td>24. Nursing management of fever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Wound dressing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Advice the mother about 6 weeks examination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Advice the mother about family planning</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>