Nurses’ Knowledge Regarding Antenatal Care of pregnant women at Omdurman Maternity Hospital, Khartoum State, Sudan

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

November- 2013
Nurses’ Knowledge Regarding Antenatal Care of pregnant women at Omdurman Maternity Hospital, Khartoum State, Sudan

By
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Examination Date: 5.11. 2013
Nurses’ Knowledge Regarding Antenatal Care of pregnant women at Omdurman Maternity Hospital, Khartoum State, Sudan

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قال تعالى:

وَوَصَيْنَا الإِسْرَآئِيلِيّينَ ِبِولِدَتِهِ حَمِلْتِهِ أَمَّهُ، وَهَذَا عَلَىٰ وَهْيَ وَفَصْلَاهُ، فِي ِعَامِينَ أَنِ أَشْكُرُ لِلَّهِ وَلِوَلِيِّيٍّ إِلَيۡلِيَّةَ الْمَصِيرِمَا

سورة نصمان: الآية 14
Dedication

This study is mainly dedicated

To my Mother, Brothers and My Sisters

Who gave all their best and supported me in all my decisions

To those seeking bright future
Acknowledgement

Like to thanks all contributors who help and participate in this study

I am deeply indebted to and grateful for the first supervisor: Dr. Jetimad Ibrahim Abd-Ehrman Kambaland Co-supervisor

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I would like to thank Faculty of Applied Medical Sciences, Gezira University for giving me this opportunity to continue my postgraduate education and finally I hope for further research with this excellent group as God will.

My deepest thanks to the group of nurses staff in Omdurman Maternity Hospital whom deal with me during data collection.

I express my gratefulness to my teachers and friends for her encouragement which gave me moral support and self confidence.
Nurses’ Knowledge regarding Antenatal Care of Pregnant in Omdurman in Maternity Hospital in Khartoum State, Sudan
Amira Adam Mohammed Ahmed

Abstract
Antenatal care is a special care given to pregnant women. It refers to the regular routine check-up recommended during pregnancy. Knowledge of nurses is very important for antenatal care. Descriptive hospital based study was done aimed at assessing nurses’ knowledge regarding antenatal care in Omdurman Maternity hospital in Khartoum state, Sudan. The sample size consisted of 88 nurses working in antenatal care unit during the period of the study from (July 2012 to May 2013). Data were collected by using a questionnaire designed for the study. Data analysis was performed by statistical package for social sciences (SPSS). Results revealed that (70.5% , and 73.8%) of the study sample responses with correct answers regarding definitions , and the importance of antenatal care respectively, while (51.1%) of them responses with correct answers regarding component of initial, and subsequent antenatal visits. (65.9%) of the study sample responses with correct answers regarding clinical examination during antenatal care, and the number of antenatal visits. (95.5%, and 94.3%) of the study sample responses with correct answers regarding blood tests, and checking blood pressure during antenatal period respectively. (73.8%) of the study sample responses correctly regarding confirming of pregnancy. The study concluded that the nurses’ knowledge were inadequate regarding component of antenatal visits. The study recommended that periodic training program for nurses about antenatal care must be done.
للولاية امدرمان قبل الولادة بمستشفي الممرضين والممرضات تجاه العناية معرفة
الخرطوم، السودان. بولاية
أميرة محمد أحمد

ملخص الدراسة

العناية قبل الولادة هي عناية خاصة تعطي للنساء الحوامل وتشير إلى الفحوصات الروتينية المنتظمة الموصى به أثناء الحمل. معرفة الممرضين والممرضات مهمة جداً تجاه العناية قبل الولادة. أجريت هذه الدراسة الوصفية في مستشفى امدرمان للولادة بولاية الخرطوم، السودان في عام 2013. استمرت العينة على 88 ممرضاً وممرضة في الفترة من يوليو/يوليو 2012 حتى مايو/مايو 2013. تم جمع البيانات باستخدام استمارة استبيان صممتها من أجل الدراسة ثم تحليل البيانات بواسطة الحزمة الإحصائية للعلوم الاجتماعية (SPSS). أوضحت النتائج أن (73.8%) من أفراد العينة كانت أجابتهم صحيحة عن تعريف واهتمام العناية قبل الولادة. كانت أجابتهم صحيحة عن مكونات زيارات قبل الولادة. (65.9%) من أفراد العينة كانت أجابتهم صحيحة عن الفحوصات السريرية وعدد زيارات إغاثة الحمل. (94.3%) من أفراد العينة كانت أجابتهم صحيحة عن اختبارات الدم وفحص ضغط الدم على التوالي خلال العناية قبل الولادة. (73.8%) من أفراد العينة كانت أجابتهم صحيحة عن التأكد من الحمل. وخلصت الدراسة إلى أن معرفة الممرضين والممرضات لم تكون كافية عن مكونات زيارات قبل الولادة. أوصت الدراسة بعمل برامج دورية للممرضين والممرضات عن العناية السابقة للولادة.
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1. Introduction

1.1 Background

Every minute one woman die, from the complications related to pregnancy, child birth and the post-partum period almost all of them are in developing countries in some parts of Africa. Most of maternal deaths could be prevented by ensuring good quality maternal health services including antenatal, natal and postnatal skilled care entailed emergency obstetric care. The main causes of maternal mortality according to are severe bleeding, hemorrhage 25%, infection 13%, eclampsia, 12% obstructed labor 8% complication of abortion 13% other direct causes 8% and indirect causes 20% such as malaria, anemia, HIV/AIDS, CVS diseases complicate pregnancy or aggravated by pregnancy (WHO, 2005).

Other factors which may contribute to maternal death illiteracy, poor socioeconomic status, difficulty to reach the facility, unawareness of the importance of ANC or seeking advice, young ages, civil war, other disabilities The antenatal period presents important opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well-being and that of their infants. Antenatal clinic visits should begin during the first 12 weeks of pregnancy; preferably as soon as possible after the first missed period. (Onah H, 2002).

These visits are essential for the early assessment of risk factors for mother and fetus, early treatment for identified problems (for example STIs), and the education of the mother about dangers to the fetus during this critical period of development. During the initial antenatal clinic visit, the woman will be questioned on her family and personal medical history, as well as undergo various tests and examinations. All follow up visits will consist of routine weight, blood pressure and urine checks, and an overall assessment of baby’s growth, development and movement. The World Health Organization (WHO) recommends a minimum of four antenatal visits. According to WHO guidelines, antenatal care visits should include, at a minimum, the measurement of blood pressure, testing of urine for bacteriuria and proteinuria, and blood tests to detect syphilis and severe anemia. Less than half of all pregnant
women in developing countries benefit from the minimum recommended four antenatal visits. (Onah H, 2002).

In South Asia, just one third of pregnant women receive care at least four times. Importantly, these antenatal care data do not reflect the quality of care, which is difficult to measure. Nonetheless, it is essential to ensure the quality of antenatal care so that services provided contribute to improved maternal health. Pregnant women who do not have adequate and appropriate information about pregnancy and childbirth would be ill-equipped to make choices that will contribute to their own well-being. (Onah H, 2002).

1.2. Problem statement:

Worldwide complications of pregnancy are responsible for a significant proportion of prenatal and maternal morbidity and mortality particularly in under-resourced setting. Based on the estimated in 2005, more than 5000,000 maternal deaths Worldwide occurs as a result complicated pregnancies, more than half occurred in South Africa. The same source estimates lifetime risk of maternal death to be 1 in 6 in subSaharan Africa, as in 2008 in developed regions. Majority of these maternal deaths are considered preventable, as are newborn there is timely access to appropriate interventions when obstetric complications occurs. A WHO systematic analysis of the causes of maternal death has shown that preeclampsia/eclampsia are among the leading causes of developing maternal death in the developing countries particularly in Africa countries continue to record higher rates of maternal and prenatal deaths from complicated pregnancies. It is important for all pregnant women to obtain early and ongoing prenatal care, this allow for the early recognition and treatment of risk conditions. (MoHSW, 2002).

“The Millennium Development Goals have their deadline in 2015. One of the goals that are lagging behind most is Millennium Development Goal 5, which is about maternity mortality rates (Banjul, 2004).

In Sudan It is so sad to say that southern Sudan is one of the worst places in the world when it comes to these figures. Southern Sudan is suffering from a lot of complicated things which are all linked. There is a chronic lack of midwives and they are dramatically needed. We also see that often the first time a woman gives birth she
herself is still a child. And this causes many complicated deliveries and it also means that there is a greater risk of hurting both the mother and the children (Banjul, 2003).

1.3. Justification:

- Proper monitoring and upgraded nurse’s knowledge are mandatory and should go hand in hand with quality improvement of antenatal care programmers.
- No studies among nurse’s knowledge regarding antenatal care but all of studies about knowledge regarding antenatal care among pregnant women studying preventable factors for each major cause of maternal and infant death, experts have estimated that maternal deaths can be reduced by at least 50% the relative contribution of antenatal care is difficult to assess.

1.4 Objectives

1.4.1. General Objective:

To assess nurses’ knowledge regarding antenatal care in Omdurman Maternity Hospital in Khartoum state during (July 2012 to May 2013).

1.4.2 Specific Objectives:

- To identify nurses’ knowledge about various aspects of antenatal care.
- To provide data as a base line for future research for enhancing nurses’ knowledge antenatal care.
CHAPTER TWO

LITERATURE REVIEW
2. Literature Review

2.1. Definition of Pregnancy:

Pregnancy is the fertilization and development of one or more offspring, known as an embryo or fetus, in a woman's uterus. In a pregnancy, there can be multiple gestations, as in the case of twins or triplets. Childbirth usually occurs about 38 weeks after conception; in women who have a menstrual cycle length of four weeks, this is approximately 40 weeks from the start of the last normal menstrual period (LNMP). Human pregnancy is the most studied of all mammalian pregnancies. Conception can be achieved through sexual intercourse or assisted reproductive technology. An embryo is the developing offspring during the first 8 weeks following conception, and subsequently the term *fetus* is used henceforth until birth. 40% of pregnancies in the United States and United Kingdom are unplanned, and between a quarter and half of those unplanned pregnancies were unwanted pregnancies. Of those unintended pregnancies that occurred in the US, 60% of the women used birth control to some extent during the month pregnancy occurred. In many societies’ medical or legal definitions, human pregnancy is somewhat arbitrarily divided into three trimester periods, as a means to simplify reference to the different stages of prenatal development. The first trimester carries the highest risk of miscarriage (natural death of embryo or fetus). During the second trimester, the development of the fetus can be more easily monitored and diagnosed. The beginning of the third trimester often approximates the point of viability, or the ability of the fetus to survive, with or without medical help, outside of the uterus. (Pembe et al., 2009).

One scientific term for the state of pregnancy is gravidity (adjective "gravid"), Latin for "heavy" and a pregnant female is sometimes referred to as a gravida. Similarly, the term parity (abbreviated as "para") is used for the number of times a female has given birth, counting twins and other multiple births as one pregnancy, and usually including stillbirths. Medically, a woman who has never been pregnant is referred to as a nulligravida, a woman who is (or has been only) pregnant for the first time as a primigravida and a woman in subsequent pregnancies as a multigravida or multiparous. Hence, during a second pregnancy a woman would be described as
gravida 2, para 1 and upon live delivery as gravida 2, para 2. An in-progress pregnancy, as well as abortions, miscarriages, or stillbirths account for parity values being less than the gravida number. In the case of twins, triplets etc., gravida number and parity value are increased by one only. Women who have never carried a pregnancy achieving more than 20 weeks of gestation age are referred to as nulliparous (PembeA, et al, 2009).

2.2 Fertilization and implantation in humans:

Although pregnancy begins with implantation, the process leading to pregnancy occurs earlier as the result of the female gamete, or oocyte, merging with the male gamete, spermatozoon. In medicine, this process is referred to as fertilization; in lay terms, it is more commonly known as “conception.” After the point of fertilization, the fused product of the female and male gamete is referred to as a zygote or fertilized egg. The fusion of male and female gametes usually occurs following the act of sexual intercourse, resulting in spontaneous pregnancy. However, the advent of assisted reproductive technology such as artificial insemination and in vitro fertilization have made achieving pregnancy possible without engaging in sexual intercourse. This approach may be undertaken as a voluntary choice or due to infertility. The process of fertilization occurs in several steps, and the interruption of any of them can lead to failure. Through fertilization, the egg is activated to begin its developmental process, and the haploid nuclei of the two gametes come together to form the genome of a new diploid organism. At the beginning of the process, the sperm undergoes a series of changes, as freshly ejaculated sperm is unable or poorly able to fertilize. (Fathalla, 2003).

The sperm must undergo capacitation in the female's reproductive tract over several hours, which increases its motility and destabilizes its membrane, preparing it for the acrosome reaction, the enzymatic penetration of the egg's tough membrane, the zonapellucida, which surrounds the oocyte. The sperm and the egg cell, which has been released from one of the female's two ovaries, unite in one of the two fallopian tubes. The fertilized egg, known as a zygote, then moves toward the uterus, a journey that can take up to a week to complete. Cell division begins approximately 24 to 36 hours after the male and female cells unite. Cell division continues at a rapid rate and
the cells then develop into what is known as a blastocyst. The blastocyst is made up of three layers: the ectoderm (which will become the skin and nervous system), the endoderm (which will become the digestive and respiratory systems), and the mesoderm (which will become the muscle and skeletal systems. (KlusmannA, etal, 2005).

Finally, the blastocyst arrives at the uterus and attaches to the uterine wall, a process known as implantation. The mass of cells, now known as an embryo, begins the embryonic stage, which continues until cell differentiation is almost complete at eight weeks. Structures important to the support of the embryo develop, including the placenta and umbilical cord. During this time, cells begin to differentiate into the various body systems. The basic outlines of the organ, body, and nervous systems are established. By the end of the embryonic stage, the beginnings of features such as fingers, eyes, mouth, and ears become visible. Once cell differentiation is mostly complete, the embryo enters the final stage and becomes known as a fetus. The early body systems and structures that were established in the embryonic stage continue to develop. Sex organs begin to appear during the third month of gestation. The fetus continues to grow in both weight and length, although the majority of the physical growth occurs in the last weeks of pregnancy. (KlusmannA, etal, 2005)

2.3. Duration of pregnancy:
Healthcare professionals name three different dates as the start of pregnancy:

• The first day of the woman's last normal menstrual period, and the resulting fetal age is called the gestational age.

• The date of conception (about two weeks before her next expected menstrual period), with the age called fertilization age.

• The date of implantation (about one week after conception).

Since these are spread over a significant period of time, the duration of pregnancy necessarily depends on the date selected as the starting point chosen. This calculates the expected due date from the first day of the last normal menstrual period (LMP or LNMP) regardless of factors known to make this inaccurate, such as a shorter or longer menstrual cycle length. Pregnancy most commonly lasts for 40 weeks
according to this LNMP-based method, assuming that the woman has a predictable menstrual cycle length of close to 28 days and conceives on the 14th day of that cycle. Accurate dating of pregnancy is important, because it is used in calculating the results of various prenatal tests, (for example, in the triple test). A decision may be made to induce labour if a fetus is perceived to be overdue. Furthermore, if LMP and ultrasound dating predict different respective due dates, with the latter being later, this might signify slowed fetal growth and therefore require closer review. (Jams J, et al., 2008).

2.4. Preterm, term and post term of pregnancy:-

Pregnancy is considered "at term" when gestation has lasted 37 complete weeks (occurring at the transition from the 37th to the 38th week of gestation), but is less than 42 weeks of gestational age (occurring at the transition from the 42st week to the 43rd week of gestation, or between 259 and 294 days since LMP). "Full term" refers to the gestation having lasted 40 weeks from the first day of the mother's last menstrual period. This is the end of gestation on average. Alternatively expressed, this corresponds to a gestational age of 40 weeks and 0 days, or 280 days, or approximately 9 months, and occurs at the transition from the 40th to the 41st week of gestation. On average, it corresponds to an embryonic age of 38 weeks or 266 days. Events before completion of 37 weeks (259 days) are considered preterm; from week 42 (294 days) events are considered post term. When a pregnancy exceeds 42 weeks (294 days), the risk of complications for both the woman and the fetus increases significantly (Jams J, et al., 2008).

2.5 Diagnosis of pregnancy:

Linea nigra in a woman at 22 weeks pregnant. The beginning of pregnancy may be detected in a number of different ways, either by a pregnant woman without medical testing, or by using medical tests with or without the assistance of a medical professional. Most pregnant women experience a number of symptoms, which can signify pregnancy. The symptoms can include nausea and vomiting, excessive tiredness and fatigue, cravings for certain foods that are not normally sought out, and frequent urination particularly during the night. A number of early medical signs are associated with pregnancy. These signs typically appear, if at all, within the first few
weeks after conception. Although not all of these signs are universally present, nor are all of them diagnostic by themselves, taken together they make a presumptive diagnosis of pregnancy. (TelferM and et al, 2005).

These signs include the presence of human chorionic gonadotropin (hCG) in the blood and urine, missed menstrual period, implantation bleeding that occurs at implantation of the embryo in the uterus during the third or fourth week after last menstrual period, increased basal body temperature sustained for over 2 weeks after ovulation, Chadwick's sign (darkening of the cervix, vagina, and vulva), Goodell's sign (softening of the vaginal portion of the cervix), Hegar's sign (softening of the uterus isthmus), and pigmentation of linea alba – Linea nigra, (darkening of the skin in a midline of the abdomen, caused by hyperpigmentation resulting from hormonal changes, usually appearing around the middle of pregnancy). Breast tenderness is common during the first trimester, and is more common in women who are pregnant at a young age. (Jams J, etal, 2008).

Pregnancy detection can be accomplished using one or more various pregnancy tests which detect hormones generated by the newly formed placenta. Clinical blood and urine tests can detect pregnancy 12 days after implantation. Blood pregnancy tests are more sensitive than urine tests (giving less false negatives). Home pregnancy tests are urine tests, and normally cannot detect a pregnancy until at least 12 to 15 days after fertilization. A quantitative blood test can determine approximately the date the embryo was conceived. (TelferM and et al, 2005).

In the post-implantation phase, the blastocyst secretes a hormone named human chorionic gonadotropin, which in turn stimulates the corpus luteum in the woman's ovary to continue producing progesterone. This acts to maintain the lining of the uterus so that the embryo will continue to be nourished. The glands in the lining of the uterus will swell in response to the blastocyst, and capillaries will be stimulated to grow in that region. This allows the blastocyst to receive vital nutrients from the woman. Despite all the signs, some women may not realize they are pregnant until they are quite far along in their pregnancy. (TelferM and et al, 2005).

In some cases, a few women have not been aware of their pregnancy until they begin labour. This can be caused by many factors, including irregular periods (quite
common in teenagers), certain medications (not related to conceiving children), and obese women who disregard their weight gain. Others may be in denial of their situation. An early obstetric ultrasonography can determine the age of the pregnancy fairly accurately.

In practice, medical professionals typically express the age of a pregnancy (i.e., an "age" for an embryo) in terms of "menstrual date" based on the first day of a woman's last menstrual period, as the woman reports it. Unless a woman's recent sexual activity has been limited, she has been charting her cycles, or the conception is the result of some types of fertility treatment (such as IUI or IVF), the exact date of fertilization is unknown. Without symptoms such as morning sickness, often the only visible sign of a pregnancy is an interruption of the woman's normal monthly menstruation cycle, (i.e., a "late period"). Hence, the "menstrual date" is simply a common educated estimate for the age of a fetus, which is an average of 2 weeks later than the first day of the woman's last menstrual period. (Telfer M and et al, 2005).

The term "conception date" may sometimes be used when that date is more certain, though even medical professionals can be imprecise with their use of the two distinct terms. The due date can be calculated by using Naegele's rule. The expected date of delivery may also be calculated from sonogram measurement of the fetus. This method is slightly more accurate than methods based on LMP. Additional obstetric diagnostic techniques can estimate the health and presence or absence of congenital diseases at an early stage. (Telfer M et, al, 2005).

2.6. Physiology of pregnancy:

Breast changes as seen during pregnancy. Note the increase in size and darkening of the areola. Pregnancy is typically broken into three periods, or trimesters, each of about three months. While there are no hard and fast rules, these distinctions are useful in describing the changes that take place over time (Iams J, et al, 2008).

2.7. First trimester of pregnancy:

Traditionally, medical professionals have measured pregnancy from a number of convenient points, including the day of last menstruation, ovulation, fertilization,
implantation and chemical detection. In medicine, pregnancy is often defined as beginning when the developing embryo becomes implanted in the endometrial lining of a woman's uterus. Most pregnant women do not have any specific signs or symptoms of implantation, although it is not uncommon to experience minimal bleeding. After implantation, the uterine endometrium is called the decidua. The placenta, which is formed partly from the decidual and partly from outer layers of the embryo, connects the developing embryo to the uterine wall to allow nutrient uptake, waste elimination, and gas exchange via the mother's blood supply. The umbilical cord is the connecting cord from the embryo or fetus to the placenta. The developing embryo undergoes tremendous growth and changes during the process of fetal development. (IamsJ, et al., 2008).

Morning sickness occurs in about seventy percent of all pregnant women, and typically improves after the first trimester. Although described as "morning sickness", women can experience this nausea during afternoon, evening, and throughout the entire day. Shortly after conception, the nipples and areolas begin to darken due to a temporary increase in hormones. (IamsJ, et al., 2008).

This process continues throughout the pregnancy. The first 12 weeks of pregnancy are considered to make up the first trimester. The first two weeks from the first trimester are calculated as the first two weeks of pregnancy even though the pregnancy does not actually exist. These two weeks are the two weeks before conception and include the woman's last period. The third week is the week in which fertilization occurs and the 4th week is the period when implantation takes place. In the 4th week, the fertilized egg reaches the uterus and burrows into its wall which provides it with the nutrients it needs. At this point, the zygote becomes a blastocyst and the placenta starts to form.

Moreover, most of the pregnancy tests may detect a pregnancy beginning with this week. The 5th week marks the start of the embryonic period. This is when the embryo's brain, spinal cord, heart and other organs begin to form at this point the embryo is made up of three layers, of which the top one (called the ectoderm) will give rise to the embryo's outermost layer of skin, central and peripheral nervous systems, eyes, inner ear, and many connective tissues. The heart and the beginning of
the circulatory system as well as the bones, muscles and kidneys are made up from the mesoderm (the middle layer). The inner layer of the embryo will serve as the starting point for the development of the lungs, intestine and bladder. This layer is referred to as the endoderm. An embryo at 5 weeks is normally between $\frac{1}{16}$ and $\frac{1}{8}$ inch (1.6 and 3.2 mm) in length. In the 6th week, the embryo will be developing basic facial features and its arms and legs start to grow. At this point, the embryo is usually no longer than $\frac{1}{6}$ to $\frac{1}{4}$ inch (4.2 to 6.3 mm). In the following week, the brain, face and arms and legs quickly develop. In the 8th week, the embryo starts moving and in the next 3 weeks, the embryo's toes, neck and genitals develop as well. According to the American Pregnancy Association, by the end of the first trimester, the fetus will be about 3 inches (76 mm) long and will weigh approximately 1 ounce (28 g). Once pregnancy moves into the second trimester, all the risks of miscarriage and birth defects occurring drop drastically. (Anya S, et al 2008).

2.8. Second trimester of pregnancy:

By the end of the second trimester, the expanding uterus has created a visible "baby bump". Although the breasts have been developing internally since the beginning of the pregnancy, most of the visible changes appear after this point. Weeks 13 to 28 of the pregnancy are called the second trimester. Most women feel more energized in this period, and begin to put on weight as the symptoms of morning sickness subside and eventually fade away. Expand up to 20 times its normal size during pregnancy. Although the fetus begins to move and takes a recognizable human shape during the first trimester, it is not until the second trimester that movement of the fetus, often referred to as "quickening", can be felt. This typically happens in the fourth month, more specifically in the 20th to 21st week, or by the 19th week if the woman has been pregnant before. However, it is not uncommon for some women not to feel the fetus move until much later. The placenta fully functions at this time and the fetus makes insulin and urinates. The reproductive organs distinguish the fetus as male or female. During the second trimester, most women begin to wear maternity clothes. (Kempley R, 2003).
2.9. Third trimester of pregnancy:

Comparison of growth of the abdomen between 26 weeks and 40 weeks gestation. Final weight gain takes place, which is the most weight gain throughout the pregnancy. The fetus will be growing the most rapidly during this stage, gaining up to 28 g per day. The woman's belly will transform in shape as the belly drops due to the fetus turning in a downward position ready for birth. During the second trimester, the woman's belly would have been very upright, whereas in the third trimester it will drop down quite low, and the woman will be able to lift her belly up and down. The fetus begins to move regularly, and is felt by the woman. Fetal movement can become quite strong and be disruptive to the woman. The woman's navel will sometimes become convex, "popping" out, due to her expanding abdomen. This period of her pregnancy can be uncomfortable, causing symptoms like weak bladder control and backache. Movement of the fetus becomes stronger and more frequent and via improved brain, eye, and muscle function the fetus is prepared for *ex utero* viability. The woman can feel the fetus "rolling" and it may cause pain or discomfort when it is near the woman's ribs and spine. In the third trimester, the fetal head descends into the pelvic cavity so that only a small part (or none) of it can be felt abdominally. (Dimitrova V, et al, 2007)

The perenium and cervix are further flattened and the head may be felt vaginally. (Head engagement is known colloquially as the baby drop, and in natural medicine as the *lightening* because of the release of pressure on the upper abdomen and renewed ease in breathing. However, it severely reduces bladder capacity, increases pressure on the pelvic floor and the rectum, and the mother may experience the perpetual sensation that the fetus will "fall out" at any moment. It is during this time that a baby born prematurely may survive. The use of survives modern medical intensive care technology has greatly increased the probability of premature babies surviving, and has pushed back the boundary of viability to much earlier dates than would be possible without assistance. In spite of these developments, premature birth remains a major threat to the fetus, and may result in ill health in later life, even if the baby. (Dimitrova V, et al, 2007).
2.10. Embryonic and fetal development and ultrasound imaging:

Prenatal development is divided into two primary biological stages. The first is the embryonic stage, which lasts for about two months. At this point, the fetal stage begins. At the beginning of the fetal stage, the risk of miscarriage decreases sharply, and all major structures including the head, brain, hands, feet, and other organs are present, and they continue to grow and develop. When the fetal stage commences, a fetus is typically about 30 mm (1.2 inches) in length, and the heart can be seen beating via ultrasound; the fetus can be seen making various involuntary motions at this stage. Electrical brain activity is first detected between the 5th and 6th week of gestation, though this is still considered primitive neural activity rather than the beginning of conscious thought, something that develops much later in fetation. Synapses begin forming at 17 weeks, and at about week 28 begin to multiply at a rapid pace which continues until 3 to 4 months after birth. (Kempley R, 2003).

2.11. Maternal physiological changes in pregnancy:

Melasma pigment changes to the face due to pregnancy. During pregnancy, the woman undergoes many physiological changes, which are entirely normal, including cardiovascular, hematologic, metabolic, renal and respiratory changes that become very important in the event of complications. The body must change its physiological and homeostatic mechanisms in pregnancy to ensure the fetus is provided for. Increases in blood sugar, breathing and cardiac output are all required. Levels of progesterone and oestrogens rise continually throughout pregnancy, suppressing the hypothalamic axis and subsequently the menstrual cycle. Many women and medical professionals mistakenly think that breastfeeding causes their breasts to sag (medically referred to as ptosis), and as a result some are reluctant to nurse their infants. In February 2009, Cheryl Cole told British Vogue that she hesitated to breastfeed because of the effect it might have on her breasts. "I want to breastfeed," she said, "but I’ve seen what it can do, so I may have to reconsider. Research shows that breastfeeding is less of a factor than previously thought. The main risk factors for ptosis are cigarette smoking, a woman's body mass index (BMI), her number of pregnancies, her breast cup size before pregnancy, and age. (AnyaS, etal, 2008).
2.12. Management of pregnancy:

2.12.1 Prenatal care and pre-conception counseling:

Prenatal medical care is the medical and nursing care recommended for women before and during pregnancy. The aim of good prenatal care is to identify any potential problems early, to prevent them if possible (through recommendations on adequate nutrition, exercise, vitamin intake etc., and to manage problems, possibly by directing the woman to appropriate specialists, hospitals, etc. if necessary. (NikieaB, et al 2006).

2.12.2. Nutrition during pregnancy:

A balanced, nutritious diet is an important aspect of a healthy pregnancy. Eating a healthy diet, balancing carbohydrates, fat, and proteins, and eating a variety of fruits and vegetables, usually ensures good nutrition. Those whose diets are affected by health issues, religious requirements, or ethical beliefs may choose to consult a health professional for specific advice. Adequate periconceptional folic acid (also called folate or Vitamin B₉) intake has been shown to decrease the risk of fetal neural tube defects such as spina bifida, a serious birth defect. The neural tube develops during the first 28 days of pregnancy, explaining the necessity to guarantee adequate periconceptional folic acid intake. Folate (from folia, leaf) is abundant in spinach (fresh, frozen, or canned), and is found in green leafy vegetables e.g. salads, beets, broccoli, asparagus, citrus fruits and melons, chickpeas (i.e. in the form of hummus or falafel), and eggs. (KlussmannA, etal, 2005).

In the United States and Canada, most wheat products (flour, noodles) are fortified with folic acid. DHA omega-3 is a major structural fatty acid in the brain and retina, and is naturally found in breast milk. It is important for the woman to consume adequate amounts of DHA during pregnancy and while nursing to support her well-being and the health of her infant. Developing infants cannot produce DHA efficiently, and must receive this vital nutrient from the. Several micronutrients are important for the health of the developing fetus, especially in areas of the world where insufficient nutrition is prevalent. In developed areas, such as Western Europe and the
United States, certain nutrients such as Vitamin D and calcium, required for bone development, may require supplementation). (KlusmannA, et al., 2005).

A 2011 study examined cord blood of healthy neonates and found that low levels of vitamin D are associated with increased risk of lower respiratory tract infection the first year of life. Dangerous bacteria or parasites may contaminate foods, including Listeria and Toxoplasma. Careful washing of fruits and raw vegetables may remove these pathogens, as may thoroughly cooking leftovers, meat, or processed meat. Soft cheeses may contain Listeria; if milk is raw, the risk may increase. Cat feces pose a particular risk of toxoplasmosis. Pregnant women are also more prone to *Salmonella* infections from eggs and poultry, which should be thoroughly cooked. Practicing good hygiene in the kitchen can reduce these risks. (KlusmannA, et al., 2005).

### 2.12.3 Weight gain during pregnancy:

Caloric intake must be increased to ensure proper development of the fetus. The amount of weight gained during a single pregnancy varies among women. The Institute of Medicine recommends an overall pregnancy weight gain for women starting pregnancy at a normal weight, with a body mass index of 18.5–24.9, of 25–35 pounds (11.3–15.9 kg) (Royal College, Women underweight, with a BMI of less than 18.5, may need to gain between 28-40 lbs (12.7-18 kg). Overweight women are advised to gain between 15-25 lbs (6.8-11.3) whereas an obese woman may expect to gain between 11-20 lbs (5-9 kg). Doctors and dietitians may make different, or more individual recommendations for specific patients, based on factors including low maternal age, nutritional status, fetal development, and morbid obesity. During pregnancy, insufficient or excessive weight gain can affect the health of the mother and fetus. All women are encouraged to choose a healthy diet regardless of pre-pregnancy weight. Exercise during pregnancy, such as walking and swimming, is recommended for healthy pregnancies. Exercise has notable health benefits for both mother and baby, including preventing excessive weight gain. (TheobaldH, 2007).

### 2.13 Immune tolerance during pregnancy:

The fetus inside a pregnant woman may be viewed as an unusually successful allograft, since it genetically differs from the woman in the same way, many cases of
spontaneous abortion may be described in the same way as maternal transplant rejection. (Lawn J, et al(2005).

2.14. Medication use during pregnancy:

2.14.1. Drugs in pregnancy:

Drugs used during pregnancy can have temporary or permanent effects on the fetus. Therefore many physicians would prefer not to prescribe for pregnant women, the major concern being over teratogenicity of the drugs. Drugs have been classified into categories A, B, C, D and X based on the Food and Drug Administration (FDA) rating system to provide therapeutic guidance based on potential benefits and fetal risks. Drugs, including some multivitamins, that have demonstrated no fetal classified as Category A. On the other hand drugs like thalidomide with proven fetal risks that outweigh all benefits are classified as Category X. (Basile L, &et al (2007).

2.15. Sexual activity during pregnancy:

Most women can continue to engage in sexual activity throughout pregnancy. Most research suggests that during pregnancy both sexual desire and frequency of sexual relations decrease. In context of this overall decrease in desire, some studies indicate a second-trimester increase, preceding a decrease during the third trimester. Some individuals are sexually attracted to pregnant women (pregnancy fetishism, also known as (maiesiophilia). Sex during pregnancy is a low-risk behavior except when the healthcare provider advises that sexual intercourse be avoided for particular medical reasons. Otherwise, for a healthy pregnant woman who is not ill or weak, there is no safe or right way to have sex during pregnancy: it is enough to apply the commonsense rule that both partners avoid putting pressure on the uterus, or a partner's full weight on a pregnant belly (CoryS, 2011).

2.16. Exercise during pregnancy:

The Clinical Practice Obstetrics Committee of Canada recommends that "All women without contraindications should be encouraged to participate in aerobic and strength-conditioning exercises as part of a healthy lifestyle during their pregnancy". Although an upper level of safe exercise intensity has not been established, women
who were regular exercisers before pregnancy and who have uncomplicated, healthy pregnancies should be able to engage in high intensity exercise programs, such as jogging and aerobics for less than 45 minutes, with no adverse effects if they are mindful of the possibility that they may need to increase their energy intake and are careful to not become overheated. In the absence of either medical or obstetric complications, they advise an accumulation of 30 minutes a day of exercise on most if not all days of the week. In general, participation in a wide range of recreational activities appears to be safe, with the avoidance of those with a high risk of falling such as horseback riding or skiing or those that carry a risk of abdominal trauma, such as soccer or hockey. (KramerM,2006).

The American College of Obstetricians and Gynecologists reports that in the past, the main concerns of exercise in pregnancy were focused on the fetus and any potential maternal benefit was thought to be offset by potential risks to the fetus. However, they write that more recent information suggests that in the uncomplicated pregnancy, fetal injuries are highly unlikely. They do, however, list several circumstances when a woman should contact her health care provider before continuing with an exercise program. Contraindications include: Vaginal bleeding, dyspnea before exertion, dizziness, headache, chest pain, muscle weakness, preterm labor decreased fetal movement, amniotic fluid leakage, and calf pain or swell into rule out thrombophlebitis). (BasileL,etal2007).

The Journal for Nurse Practitioners (2007) reports that many pregnant women do not exercise and they recommend that moderate exercise should be advised for pregnant women as part of prenatal care. They advise that exercise has benefits for both mother and fetus as well. At 2006 Cochrane review of prenatal exercise-related studies assessed the effects of regular aerobic exercise on physical fitness, the course of labor and delivery, and the outcome of pregnancy in healthy women. They concluded that regular aerobic exercise during pregnancy appears to improve (or maintain) physical fitness, however the authors noted that the trials were small and not of high methodologic quality and the data was insufficient to infer important risks or benefits for the mother or infant. The authors suggested that larger and better trials
are needed before confident recommendations can be made about the benefits and risk of aerobic exercise in pregnancy. (Kramer M, 2006).

2.17 Complications during pregnancy:

Each year, according to the WHO, ill-health as a result of pregnancy is experienced (sometimes permanently) by more than 20 million women around the world. Furthermore, the "lives of eight million women are threatened, and more than 500,000 women are estimated to have died in 1995 as a result of causes related to pregnancy and childbirth. Pregnancy poses varying levels of health risk for women, depending on their medical profile before pregnancy.

The following are some of the complaints that may occur during and/or after pregnancy due to the many changes which pregnancy causes in a woman's body: (Lawn J, et al 2005).

• Pregnancy induced hypertension.
• Anemia.
• Back pain. A particularly common complaint in the third trimester when the patient's center of gravity has shifted.
• Carpal tunnel syndrome in between an estimated 21% to 62% of cases, possibly due to edema.
• Constipation. A complaint that is caused by decreased bowel mobility secondary to elevated progesterone (normal in pregnancy), which can lead to greater absorption of water.
• Occasional, irregular, and often painless contractions that occur several times per day.
• Edema (swelling). Common complaint in advancing pregnancy. Caused by compression of the inferior vena cava (IVC) and pelvic veins by the uterus leads to increased hydrostatic pressure in lower extremities
• Regurgitation, heartburn, and nausea. Common complaints that may be caused by Gastro esophageal Reflux Disease (GERD); this is determined by relaxation of the lower esophageal sphincter (LES) and increased transit time in stomach (normal in pregnancy), as well as by increased intraabdominal pressure, caused by the enlarging uterus. Haemorrhoids. Complaint that is often noted in advancing pregnancy. Caused
by increased venous stasis and IVC compression leading to congestion in venous system, along with increased abdominal pressure secondary to the pregnant space-occupying uterus and constipation.

- Pelvic girdle pain. PGP disorder is complex and multi-factorial and likely to be represented by a series of sub-groups with different.
- Underlying pain drivers from peripheral or central nervous system, altered laxity/stiffness of muscles laxity to injury of tendinous/ligamentous structures to ‘mal-adaptive’ body mechanics Musculo-Skeletal Mechanics involved in gait and weight bearing. (LawnJ, etal2005).
- Activities can be mild to grossly impair. PGP can begin peri or postpartum. There is pain, instability or dysfunction in the symphysis pubis and/or sacroiliac joints.
- Postpartum depression.
- Postpartum psychosis.
- Round Ligament Pain. Pain experienced when the ligaments positioned under the uterus stretch and expand to support the woman’s growing uterus
- Thromboembolic disorders. The leading cause of death in pregnant women in the USA.
- Increased urinary frequency. A common complaint referred by the gravid, caused by increased intravascular volume, elevated GFR (glomerular filtration rate), and compression of the bladder by the expanding uterus.
- Urinary tract infection.
- Varicose veins. Common complaint caused by relaxation of the venous smooth muscle and increased intravascular pressure.
- PUPPP skin disease that develop around the 32nd week. (Pruritic Urticarial Papules and Plaques of Pregnancy), red plaques, papules, itchiness around the belly button that spread all over the body except for the inside of hands and face. (LawnJ, etal, 2005)

2.18 Ectopic pregnancy:

An ectopic pregnancy is a complication of pregnancy in which the embryo implants outside the uterine cavity. With rare exceptions, ectopic pregnancies are not viable. Most ectopic pregnancies occur in the Fallopian tube (so-called tubal
pregnancies), but implantation can also occur in the cervix, ovaries, and abdomen. It should be considered in any woman with abdominal pain or vaginal bleeding who has a positive pregnancy test. An ultrasound showing gestational sac with fetal heart in a location other than the uterine cavity is clear evidence of an ectopic pregnancy. (Kempley 2003).

Tubal ectopic pregnancy is the most common cause of maternal death in the first trimester of pregnancy. About 1% of pregnancies are in an ectopic location with implantation not occurring inside of the womb, and of these 98% occur in the Fallopian tube. In a typical ectopic pregnancy, the embryo adheres to the lining of the fallopian tube and burrows into the tubal lining. Most commonly this invades blood vessels which cause bleeding resulting in the expulsion of the implantation from the tube. Termed "tubal abortions", about half of ectopic pregnancies will resolve without treatment. (Kempley 2003).

The use of methotrexate treatment for ectopic pregnancy has reduced the need for surgery, but surgical intervention is still required in cases where the Fallopian tube has ruptured or is in danger of doing so. The surgical intervention may be laparoscopic or through a larger incision, known as a laparotomy. A woman who has had a previous ectopic pregnancy is more likely to have another. The majority of women with ectopic pregnancies have had pelvic inflammatory disease or salpingitis, an inflammation of the fallopian tube. A history of gonorrhea or chlamydia can also cause tubal problems that increase the risk. Endometriosis, a condition that causes the tissue that normally lines the uterus to develop outside the uterus may slightly increase the incidence of an ectopic. The risk is increased in women who have unusually shaped fallopian tubes or tubes which has been damaged, possibly during surgery. Taking medication to stimulate ovulation increases the risk of ectopic pregnancy. Although pregnancy is rare when using birth control pills or an intrauterine device (IUD), if it does occur, it's more likely to be ectopic. Although pregnancy is rare after tubal ligation, if it does occur, it's more likely to be ectopic. A recent meta-analysis of clinical outcomes has shown that cigarette smoking significantly increases the risk of tubal ectopic pregnancy. (Kempley R, 2003).
2.18.1. Concomitant diseases during pregnancy:

In addition to complications of pregnancy that can arise, a woman may have other diseases or conditions (not directly caused by the pregnancy) that may become worse or be a potential risk to the pregnancy. Diabetes mellitus and pregnancy deals with the interactions of diabetes mellitus (not restricted to gestational diabetes) and pregnancy. Risks for the child include miscarriage, growth restriction, growth acceleration, fetal obesity (macrosomia), polyhydramnios and birth defects.

• In the case of concomitant systemic lupus erythematosus and pregnancy, there is an increased rate of fetal death in utero and spontaneous abortion (miscarriage), as well as of neonatal lupus.

• Thyroid disease in pregnancy can, if uncorrected, cause adverse effects on fetal and maternal well-being. The deleterious effects of thyroid dysfunction can also extend beyond pregnancy and delivery to affect neurointellectual development in the early life of the child.

• Demand for thyroid hormones is increased during pregnancy which may cause a previously unnoticed thyroid disorder to worsen.

• Both amantidine and rimantidine have been found to be teratogenic and embryotoxic when given at high doses in animal studies. (Nikiema B, et al 2009).

2.18.2. Legal protection for pregnant women:

Many countries have various legal regulations in place to protect pregnant women and their children. Maternity Protection Convention ensures that pregnant women are exempt from activities such as night shifts or carrying heavy stocks. Maternity leave typically provides paid leave from work during roughly the last trimester of pregnancy and for some time after birth. Notable extreme cases include Norway (8 months with full pay) and the United States (no paid leave at all except in some states). Moreover, many countries have laws against pregnancy discrimination. (Pembe A, etal, 2009).

2.18.3. Post-menopausal pregnancies:

With technology developments cases of post-menopausal pregnancies have occurred, and there are several known cases of older women carrying a pregnancy to

2.19. Previous studies:

• A number of studies have shown that light to moderate drinking during pregnancy might not pose a risk to the fetus, although no amount of alcohol during pregnancy can be guaranteed to be absolutely safe. (Kempley 2003).

• Study that 25% of pregnant women gave information about care needed during prenatal period and discuss the progress of their pregnancies. they mentioned that Ninety percent of those interviewed had attended the antenatal clinic more than once and 52% attended four or more times. (Andrea B et al, 2007).

• WHO mentioned that hypertensive disorders in pregnancy were the commonest listed by respondents but only by relatively small proportions of them. Measuring blood pressure in early pregnancy is recommended (WHO, 2007).

• The study they mentioned that many women have little idea of the range of tests they have undertaken, and the opportunity to discuss these arises in first antenatal visit (Pembe, et al., 2009).

• mentioned that most pregnant women undergo ultrasound examination in the late first trimester (UNCIF; WHO, 2003).

• Telfer M, et al they reported that the measurement of weight is important to identify women who are significantly under—or over weight.
CHAPTER THREE

MATERIAL & METHOD
3. Materials and Methods

3.1 Study Design:

This descriptive hospital-based study was conducted in Omdurman Maternity hospital to assess nurses' knowledge regarding antenatal care during July 2012 to May 2013.

3.2 Study Area:

The study was carried out in the antenatal, in Omdurman Maternity hospital in Khartoum State. The hospital consisted of 190 bed and divided in many departments, intensive care unit (ICU), Ultra Sound (US) and X-ray department, Emergency Unit, Antenatal & Postnatal word, 6 Labor Room, 3big Theater, Blood bank, Gynecology Unit & Family Planning. Center Omdurman Maternity Hospital is the one of the well-established heath care centre in Sudan, all patients came from Khartoum state and nearest states.

3.3. Study Population:

The population of the present study included all nurses who have direct contact with pregnant patients in antenatal care.

3.3.1. Inclusion Criteria

- All nurses who have direct contact with antenatal care women in antenatal care in Omdurman Maternity Hospital.
- All nurses with one year experience and more in antenatal care in Omdurman Maternity Hospital.

3.3.2. Exclusion Criteria:

- All nurses working in the setting rather than antenatal care in Omdurman Maternity Hospital.
- Nurses have experience less than 1 year in antenatal care in Omdurman Maternity Hospital.
- All nurses working in antenatal care without contact with pregnant patients.
3.4 Sampling size and Sampling technique:

All nurses with one year experience and more were collected from the available staff included 88 nurse who are responsible for caring of pregnant patient at time of this research execution.

All nurses (88) who work in the antenatal care in Omdurman Maternity Hospital and were responsible for caring of pregnant patients at the hospital were included in the study (total coverage) during the period from July 2012 to May 2013.

3.5. Data collection technique:

Data was collected by asking and explanation for the nurses about the study questionnaire.

3.6. Data collection tools:

Self administered questionnaire was designed by the researcher and utilized for two purposes as follows:

First: To find out the general characteristics of the study sample. It contained the basic data related to their general characteristics such as age, education, and years of experience.

Second: To assess nurses' knowledge regarding variables of antenatal care in Omdurman Maternity Hospital. It includes questions about definition of antenatal care, principles and prescriptions, antenatal management, complications, and nursing role.

3.7. Study variables:

Personal data, definition of ante natal care, goals of ante natal care, first antenatal clinic visits, during care during the initial ante natal clinic visit, schedule of antenatal visits, component of antenatal care visits, general examination, abdominal examination, investigation during antenatal period, role of the nurses during antenatal care, health education during antenatal care, counseling and health promotion.

3.8 Data analysis and processing:

Data was processed and analyzed by computer using the statistical package for social sciences (SPSS).
3.9 Ethical consideration:

Official letters from the academic register for the head manager and Matron of Omdurman Maternity hospital and an oral agreement from the nurses staff.
CHAPTER FOUR

RESULT & DISCUSSION
Table 4.1.1: Distribution of the study sample according to their years of experience and sources of their knowledge.

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of experience</td>
<td>NO</td>
<td>%</td>
</tr>
<tr>
<td>1-5 Years</td>
<td>44</td>
<td>50.0</td>
</tr>
<tr>
<td>6-10</td>
<td>28</td>
<td>31.8</td>
</tr>
<tr>
<td>&gt; 10</td>
<td>16</td>
<td>18.2</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>100.0</td>
</tr>
<tr>
<td>Source of your knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review</td>
<td>11</td>
<td>12.5</td>
</tr>
<tr>
<td>Collage</td>
<td>70</td>
<td>79.5</td>
</tr>
<tr>
<td>Internet</td>
<td>7</td>
<td>7.9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>88</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.1.1 this table shows that and one half (50%) of the study sample their years of experience ranged between 1-5 years and (79.5%) of them their source of knowledge were colleague.
Figure 1: Distribution of the study sample according to their general characteristics from gender.

Figure 1 shows (94%) of the study sample were female and only (6%) male.
Figure 2: Distribution of the study sample according to their general characteristics from age groups.

This Figure shows that (44.0%) of the study sample their ages between (26-30) years, followed by (20%) their ages ranged between (20-25) years.
Figure (3). Distribution of the study sample according to their level of education.

This figure shows that (60.0%) of the study sample were Bachelor degree, followed by (24%) their level of education were post graduate, and only (6%) secondary school.
Table 4.1.2.: Distribution of the study sample according to their knowledge regarding to antenatal care.

(n=88)

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>CORRECT Answers</th>
<th>INCORRECT Answer</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>O</td>
<td>%</td>
</tr>
<tr>
<td>Definitions of antenatal care</td>
<td>62</td>
<td>5</td>
<td>70.</td>
</tr>
<tr>
<td>Goals of antenatal care</td>
<td>65</td>
<td>9</td>
<td>73.</td>
</tr>
<tr>
<td>Component of care at initial antenatal visit</td>
<td>45</td>
<td>1</td>
<td>51.</td>
</tr>
<tr>
<td>Schedule of antenatal clinic visit for low risk Clients</td>
<td>58</td>
<td>9</td>
<td>65.</td>
</tr>
</tbody>
</table>

Table (4.1.2) this table shows that (70.5%) of the study sample responses with correct answers regarding definitions of antenatal care, while only (51.1%) of them know the Component of care at initial antenatal visit.
Table 4.1.3. Distribution of the study sample according to their knowledge regarding investigation during antenatal care.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>CORRECT Answer</th>
<th>INCORRECT Answer</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
</tr>
<tr>
<td>Confirmed pregnancy</td>
<td>65</td>
<td>73.9</td>
<td>23</td>
</tr>
<tr>
<td>Blood tests during antenatal care</td>
<td>84</td>
<td>95.5</td>
<td>4</td>
</tr>
<tr>
<td>Urine tests during antenatal care</td>
<td>77</td>
<td>87.5</td>
<td>11</td>
</tr>
<tr>
<td>Investigation in later visits during antenatal care</td>
<td>77</td>
<td>87.5</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 4.1.3. This table shows that (95.5%) of the study sample responses with correct answers regarding Blood tests during antenatal care while (8.7.5%) of them know urine tests, and Investigation in later visits during antenatal and also (73.9%) of them know confirmed pregnancy.
Table 4.4. Distribution of the study sample according to role of nursing during antenatal care.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>CORRECT Answer</th>
<th>INCORRECT Answer</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
</tr>
<tr>
<td>Clinical examination during antenatal care</td>
<td>58</td>
<td>65.9</td>
<td>30</td>
</tr>
<tr>
<td>Weight assessment during antenatal care</td>
<td>74</td>
<td>84.1</td>
<td>14</td>
</tr>
<tr>
<td>Checking blood pressure during antenatal care</td>
<td>83</td>
<td>94.3</td>
<td>5</td>
</tr>
<tr>
<td>Screening of urine during antenatal care</td>
<td>69</td>
<td>78.4</td>
<td>19</td>
</tr>
</tbody>
</table>

Table (4.4) this table shows that (84.1%) of the study sample responses with correct answers regarding Weight assessment during antenatal care, and about three quarter (78.4%) of them know the Screening of urine during antenatal care.
Table 4.5. Distribution of the study sample according role of nurse during antenatal care.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>CORRECT Answer</th>
<th>INCORRECT Answer</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
</tr>
<tr>
<td>Routine abdominal palpation during antenatal care</td>
<td>62</td>
<td>70.5</td>
<td>26</td>
</tr>
<tr>
<td>Health education during antenatal care</td>
<td>77</td>
<td>87.5</td>
<td>11</td>
</tr>
<tr>
<td>Minor ailments of pregnancy during antenatal care</td>
<td>74</td>
<td>84.1</td>
<td>14</td>
</tr>
<tr>
<td>Counseling and Health promotion during antenatal care</td>
<td>83</td>
<td>94.3</td>
<td>5</td>
</tr>
<tr>
<td>Number of antenatal visits</td>
<td>56</td>
<td>63.6</td>
<td>32</td>
</tr>
</tbody>
</table>

Table (4.5) this table shows that (70.5%) of the study responses with correct answers regarding routine abdominal palpation during antenatal care and (63.6%) of the study sample responses with correct answers regarding number of antenatal visits.
Table 4. 6: Distribution of the study sample according to their knowledge regarding component of antenatal care. (n=88)

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>CORRECT Answers</th>
<th>INCORRECT Answer</th>
<th>Incorrect Answer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO</td>
<td>%</td>
<td>NO.</td>
<td>%</td>
</tr>
<tr>
<td>Component of subsequent antenatal visits</td>
<td>46</td>
<td>52.3</td>
<td>42</td>
<td>47.7</td>
</tr>
<tr>
<td>General examination</td>
<td>79</td>
<td>89.8</td>
<td>9</td>
<td>10.2</td>
</tr>
<tr>
<td>Abdominal examination</td>
<td>55</td>
<td>62.5</td>
<td>33</td>
<td>37.5</td>
</tr>
<tr>
<td>Vaginal examination</td>
<td>46</td>
<td>52.3</td>
<td>42</td>
<td>47.7</td>
</tr>
</tbody>
</table>

Table (4.6) this table shows that about (52.3%) of the study sample responses incorrectly regarding component of care in subsequent antenatal visits, and also about vaginal examination.
4.2 Discussion

Majority of these maternal deaths are considered preventable, as are new born there is timely access to appropriate interventions when obstetric complications occurs and healthy problem in pregnancy. It is important for all nursing staff to attend the educational program in their hospital to help the pregnant women. The study was conducted in Omdurman maternity hospital in Khartoum State.

Figure (3): almost of them tow thrid (60%) holding BSc degree , the majority of them were qualified nurses.

Table (4.1.1) study emphasize that one half (50%) of the study sample their years of experience ranged between 1-5 years, and (79.5%) of them their source of knowledge were college.

Table (4.1.2) this table shows that tow third (70.5%) of the study sample responses with correct answers regarding Definitions of antenatal care , while only have (51.1%) of them know the Component of care at initial antenatal visit .

Table (4.1.3) mentioned the study sample according to their knowledge regarding confirmed pregnancy that (73.9%) of the study sample responses with correct answers regarding to confirmed pregnancy. This is similar to Unicef;WHO they mentioned that most pregnant women undergo US examination in the late first trimester and shows that the most (95.5%)of the study sample responses with correct answers regarding Blood tests during antenatal care . while one have (87.5%) of them know urine tests , and Investigation in later visits during antenatal care. These result differ according to Pembe et al; (2009) they mentioned that many women have a little idea of the tests they have under taken and opportunity to discuss these arises in the first antenatal care visits.

Table (4.1.4) this table shows that four quarter (89.1%) of the study sample responses with correct answers regarding weight assessment during antenatal care. This study agree with Telfer M etal (2002)they mentioned that measuring of body weight is important to identify women who are significantly under- or over weight .And about three quarter (78.4%) of them know the Screening of urine during
antenatal care also only (65.9%) of the sample know clinical examination during antenatal care.

Table (4.1.5) this table mention that about (94.3%) of the study sample correct answers regarding counseling and health promotion during antenatal care beside tow third (63.6%) correct answers regarding about number of antenatal visits. Also I comment the nurse’s low knowledge about number of antenatal visits.

Table (4.1.6) this table revealed that about (52%) of the study sample responses correctly regarding Component of care in subsequent antenatal visits. This study disagree with results of UNCIF;WHO, mention that most pregnant undergo ultrasound examination in the late first antenatal trimester.
CHAPTER FIVE

CONCLUSION, RECOMMENDATION
5.1. Conclusion

- Antenatal care is important health services and its control requires the initial component of the major factors responsible schedule of Antenatal care at visits.
- The knowledge of the nurses in adequate regarding clinical examination during antenatal care.
- The nursing staff had adequate information about counseling and health promotion during antenatal care.
5.2. Recommendation

The study recommended that:
• Periodic training program for all nurses working in Omdurman Maternity hospital on theoretical pack ground for upgrading their knowledge through more qualified nurses.

Research priorities include developing standardized approaches to reporting of outcomes, and information on clinical outcomes relevant to the experiences of nurse’s staff.
References
References


APPENDIX
Nurses’ Knowledge regarding Antenatal Care of Pregnant Women at Omdurman Maternity Hospital, Khartoum State, Sudan (2013)

1-Personal data:
1. Age:
   a. 20----25 ( )  b. 26----30 ( )
   c. 31----35 ( )  d. 36 or more ( )
2. Gender:
   a. male ( )  b. female ( )
3. Level of education:
   a. secondary school ( )  b. technical diploma ( )
   c. bachelor ( )  d. post graduate ( )
4. Years of experience:
   a. less than one year ( )  b. 1----5 years ( )
   c. 6----10 years ( )  d. more ( )
5. Sources of your knowledge through:
   A. review ( )  B. colleague ( )
   C. internet ( )  D. other ( )

2-Definition of Antenatal care:
- Prenatal care is the special care given to pregnant women. ( )
- It refers to the regular routine check-ups recommended before and during pregnancy. ( )

3-Goals of Antenatal care:
1. Detect potential problems early.
2. Provide safe delivery for mother and baby

4-First antenatal clinic visits:
- Antenatal clinic visits should begin during the first 12 weeks of pregnancy.

5-During the initial antenatal clinic visit:
1- the woman will be questioned on her family and personal medical history.
2- as well as undergo various tests and examinations.

6-Schedule of antenatal visits for low risk clients:
1- □ Every 4 weeks until 28 weeks. ( )
2- □ Every 2 weeks until 36 weeks. ( )
3- □ Weekly after 36 weeks until delivery. ( )

7-component of antenatal care:
Step-by-step Instructions
1. The mother should be Attend to nearest community Health Clinic and request a pregnancy test. ( )
2. Must be receiving pregnancy test. ( )
3. Should the results be positive, the mother should receive an appointment for first antenatal clinic visit? (   )

8-If pregnancy is already confirmed.
the nurse must teach women about:
1- Attend Community Health Clinic on Antenatal Clinic Day. (   )
2- Register. (   )
3- Wait for session in waiting area. (   )
4- Supply detailed personal and family medical history. (   )
5- Participate in testing and examination. (   )
6- Obtain follow-up appointment. (   )
7- Follow advice/instructions of their healthcare provider. (   )

9- All follow up visits will consist of:-
1- Routine weight - blood pressure and urine checks. (   )
2- An overall assessment of baby’s growth, development and movement. (   )

10- What the component of care in first visit?
1- Complete history. (   )

2- Examination:
   1 - General examination. (   )
   2- After a general examination, check mother height - estimate of the size of the pelvis. (   )
   3- Check women weight. (   )
   4- and then during each visit to calculate weight gain. (   )
   5- The total average weight gain should be around 10 to 12 kilograms. (   )
   6- The blood pressure recording during the first visit is used to compare it with subsequent readings. (   )
   7- She then checks pulse rate and lungs. (   )
   8- Checks abdomen to assess the growth of the baby. (   )

11- Abdominal examination. (   )

12- Investigations during antenatal period:
1- Blood tests for:
   1- Type of blood group. (   )
   2- Whether may be anemic. (   )
   3- Whether any diseases that could harm the baby, such as German measles, syphilis or hepatitis B. (   )

2- Urine tests for the following:
   1- Sugar - this could be a sign of pregnancy diabetes. (   )
   2- Protein - this may indicate that there is an infection that needs treating. (   )

13- Investigations in Later visits:
1- An ultrasound scan uses sound waves to build up a picture of the baby in the uterus (womb). (   )
2 - Around week 16 of pregnancy you may have a blood test for A.F.P. (Alpha-fetoprotein).

14-Role of the nurse in the antenatal care:

1- in the Clinical examination
   1- Auscultation for maternal heart sounds is vital in those with significant symptoms or a known history of heart disease.
   2- Formal breast examination.

2- in the Weight Assessments:
   1- The measurement of weight is important to identify women who are significantly under- or overweight.

3- in checking blood pressure:
   (BP) should be made as early as possible in pregnancy.

4- in Urinary examination:
   1- Screening of midstream urine for asymptomatic bacteriuria in pregnancy.

5- in abdominal palpation:
   1- Routine abdominal palpation at the antenatal visit is crude screening tool for the assessment of:
      1- growth of the developing pregnancy multiple pregnancy.
      2- failing pregnancy and wrong dates.

6- in health education:
   1- Dietary advice is important in pregnancy
   2- supplementation with folic acid (400 mg daily) pre conceptually and up to 12 weeks’ gestation.

15- in minor ailments of pregnancy:
   1- Nausea and vomiting women should be advised that most cases will resolve by 16–20 weeks of gestation.
   2- Antacids can be used in women with troublesome heartburn.
   3- Varicose veins will not cause harm in pregnancy, and properly fitted compression stockings can improve the symptoms.
   4- Physiological vaginal discharge is common in pregnancy. If the Woman is symptomatic; an infective cause should be investigated and treated as appropriate.
   5- Backache is also common; acupuncture, massage and physiotherapy may help.

16- In Counseling and Health Promotion:
   Focused antenatal care visits should include time for providers and women to talk about important issues related to nutrition and health during pregnancy, including the following:
1-Danger signs of complications during pregnancy and labor: how to recognize them, what to do and where to get help
2-Nutrition: the importance of good nutrition to the health of the mother and baby; how to get enough calories and essential nutrients for a healthy pregnancy; micronutrient supplements; importance of iron intake
3-Risks of using tobacco, alcohol, medications and local drugs
4-Rest and avoidance of heavy physical work
5-Family planning: benefits of child spacing to mother and child; options for family planning services following the baby's birth
6-Breastfeeding: health and practical benefits; exclusive breastfeeding; importance of immediate breastfeeding after birth
7-HIV and other sexually transmitted diseases.