

A Study among Pregnant Women Regarding Danger Signs of Pregnancy

**A dissertation submitted to Department of Pharmacy, East West
University, in Partial fulfillment of the requirements for the Degree of
Bachelor of Pharmacy**

Submitted by

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I, Monia Begum, hereby declare that this dissertation, entitled “**A Study among Pregnant Women Regarding Danger Signs of Pregnancy**” is an authentic and genuine researchwork carried out by me under the guidance of Nigar Sultana Tithi, Senior Lecturer, Department of Pharmacy, East West University, Dhaka. I, further certify that all sources of information in this connection are duly acknowledged.

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List of Abbreviations

Abbreviation	Elaboration
UNFPA	The United Nations Population Fund
WHO	World Health Organization
PIH	Pregnancy induced hypertension
ACOG	American Congress of Obstetricians and Gynecologists
HIV	Human immune deficiency virus
STIs	Sexually transmitted infections
HG	Hyperemesis gravidarum
HBV	Hepatitis B virus
GFR	Glomerular filtration rate
DBP	Diastolic blood pressure
SBP	Systolic blood pressure
ADHD	Attention Deficit Hyperactivity Disorder
IDA	Iron deficiency anemia
UNIMAP	United Nations Multiple Micronutrient Preparation
UNICEF	United Nations Children's Fund
RNI	Recommended nutrient intake
TSH	Thyroid stimulating hormone
TPOAb	Thyroid peroxides antibody
CBC	Complete blood count
PPT	Postpartum thyroiditis
MDG	Millennium development goal
IUGR	Intra uterine growth retardation
GDM	Gestational diabetes mellitus

Abstract

Pregnancy related complications are among the greatest killers of women of reproductive age in developing countries. Many pregnant women may face the risk of sudden, unpredictable complications that could end in death or injury to herself or to her baby. To assess the level of awareness on danger signs, complications, pattern of antenatal care of 300 women of greater than 34 weeks of gestation were interviewed in Dhaka city. Majority of them were found between age range of 20 to 25 years (46.33%) but about 9% was around the age of 14 to 19 years which is very risky for pregnancy. Moreover most of them were housewives and about 85.33% have an educational level of primary or above. About 99.33% respondent knew about warning signs from which water break (97.67%), severe nausea and vomiting (87.67%), vaginal bleeding (85%) were prominent ones and they were informed about at least one abortifacient food. Majority of the respondents got information from their doctor during their current pregnancy (74%). A great portion of women were taken antenatal care and they were provided mostly the information of diet and nutrition as well as how to care the baby. Although most of the women were conscious about danger signs of pregnancy, the rate of consulting with doctor before pregnancy was very poor (20%). In fact most of them were unaware about rubella virus vaccination. However, majority of the pregnant women (76.66%) developed obstetric complications, but growth of the baby (86.33%) were not affected much by these complications. To prevent the pregnancy complications it should be brought down the rate of early age marriage. To increase awareness regarding warning signs of pregnancy educational level and frequency of antenatal care should be encouraged by the health care authority.

Keywords: Awareness, pregnancy, danger signs, complication

CHAPTER 1
INTRODUCTION

1.1 Overview

Pregnancy occurs when a sperm fertilizes an egg after it is released from the ovary (ovulation). Ovulation occurs at the midpoint of menstrual cycle, and results in the egg's migration into one of fallopian tubes where it may be fertilized by sperm. The fertilized egg then travels down into the uterus where implantation occurs. A successful implantation results in pregnancy, a process that lasts an average of 40 weeks. While the process sounds straightforward, there are many factors that can affect a pregnancy. Women who receive an early diagnosis and prenatal care are more likely to experience a healthy pregnancy and give birth to a healthy baby (Mayo Clinic, 2013).

1.2 Symptoms of Pregnancy

Before taking a pregnancy test, women may notice early symptoms. Some of the most notable signs of early pregnancy may include:

- Fatigue
- morning sickness
- swollen or tender breast
- mood swing
- constipation or increased urination

Some women may also experience cramps and light bleeding. This light bleeding is called implantation bleeding, and most often occurs within one to two weeks of fertilization. Spotting may ensue, but the bleeding is not as heavy as a typical period. In some cases, implantation bleeding is mistaken for menstruation. Women may also experience spotting later in the first trimester as their uterus stretches. Symptoms vary between women. Some women may experience different symptoms between pregnancies. For example, one might experience morning sickness with one baby and not the other. Early pregnancy symptoms should not be sole source of pregnancy confirmation (Mayo Clinic, 2013).

1.3 Diagnosis of Pregnancy

Pregnancy is diagnosed by measuring human chorionic gonadotropin (HCG) levels in the body. Also referred to as pregnancy hormone, HCG is produced upon implantation, but it may not be detected until after missing a period. Levels of the hormone increase rapidly after missing period, which is why many pregnancy tests are more accurate at this stage.

HCG is detected through either a urine or blood test. Urine tests may be provided at a doctor's office, but these are the same as home pregnancy tests. For the most accurate results, the Office on Women's Health recommends taking a home pregnancy test a week after missing period. This reduces the chance of false positives and negatives. The biggest advantages to doing this type of test is privacy as well as affordability. A blood test is another option. HCG may be measured at a lab through a blood sample, and the results are about as accurate as a home pregnancy test. The difference is that HCG is detected through the blood easier, even in miniscule amounts. A blood test may be ordered as soon as six days after ovulation (Womenshealth, 2006).

1.4 Risk Factors for Pregnancy Complication

Most women in their early 30s or younger have a higher chance for normal pregnancies. According to the National Institutes of Health (NIH), women over the age of 35 are at higher risk for health problems during pregnancy (NIH). High risk pregnancies are monitored even more closely to detect potential problems (Khaskheli, Baloch and Baloch, 2010). Other risks that can affect an otherwise healthy pregnancy include:

- giving birth to multiples
- high blood pressure (hypertension)
- cardiovascular disease
- diabetes
- cancer
- kidney disease
- infections

1.5 Danger signs of pregnancy

World Health Organization (WHO) estimates that about 300 million women in the developing countries suffer from short and long term illnesses due to complications related to pregnancy and childbirth. About 529,000 mothers die each year from maternal causes, out of which 99% of deaths being from the developing world. As literatures indicate about 75% of maternal deaths are due to direct obstetric complications such as hemorrhage, sepsis, hypertensive disorders of pregnancy, obstructed and prolonged labor, and unsafe abortion .Maternal morbidity and mortality could be prevented significantly if women and their families recognize obstetric danger signs and promptly seek health care. The

commonest danger signs during pregnancy include severe vaginal bleeding, swollen hands and face and blurred vision. Key danger signs during labor and childbirth include severe vaginal bleeding, prolonged labor, convulsions, and retained placenta. Danger signs during the postpartum period include severe bleeding following childbirth, loss of consciousness after childbirth, and fever. Raising awareness of pregnant women on the danger signs would improve early detection of problems and reduces the delay in deciding to seek obstetric care (Mengesha and Taye, 2014).

1.6 Food avoided during Pregnancy

A mother's nourishment during pregnancy is vitally important for her and for her baby at all stages of fetal development. Research has shown that diet and healthy lifestyle is directly related to the baby's weight at birth, his health in childhood and even after he has grown up. Pregnant mothers always wonder that what they should eat & what not. Some says a mother should take the diet of two people because she needs to take care of one more life. It is essential to follow a proper and healthy diet when pregnant, and although there is a lot of information available about what a woman should eat during pregnancy, there is not always a lot of information of what foods to avoid during pregnancy. It is equally important to emphasize on what not to eat during pregnancy. There are a number of foods to avoid during pregnancy (Harsoliya *et al.*, 2011).

These foods should be avoided as these have slight traces of harmful bacteria or other substances which could harm the pregnant women and the baby. Even traces of these substances could prove hazardous. The risks posed by those foods vary from potentially fatal reactions to the fetus, to minor problems during birth or pregnancy (Harsoliya *et al.*, 2011).

Table 1.1 Awareness about abortifacient food during pregnancy

Foods	Constituent	Causes
Coffee	Caffeine	Avoid caffeine during the first trimester to reduce the likelihood of a miscarriage and premature birth. Caffeine is a diuretic, which means it helps eliminate fluids from the body. This can result in water and calcium loss. During pregnancy may slow fetal growth.
Raw Eggs	Salmonella bacteria	Causes food borne illness
Whisky, brandy	Alcohol	Mothers who drink alcohol have a higher risk of miscarriage and stillbirth. Too much alcohol during pregnancy may result in fetal alcohol syndrome, or developmental disorder. Including low body weight, learning disabilities, visual problems, deformed organs and other abnormalities.
Fish: shark, swordfish, king mackerel, and tile fish	Mercury	Mercury consumed during pregnancy has been linked to developmental delays and brain damage.
Smoked Seafood	Contaminated with Listeria	It can cause miscarriage. Listeria has the ability to cross the placenta and may infect the baby leading to infection or blood poisoning, which can be life threatening.
Fish Exposed to Industrial Pollutants: bluefish, striped bass, salmon, pike, trout and walleye	polychlorinated biphenyls	These may cause retarded growth of the unborn child
Soft Cheese: such as Feta,	Listeria, bacteria	It can cause miscarriage. Listeria has the ability to cross the placenta and may infect

Gorgonzol, Queso Blanco, Queso		The baby leading to infection or blood poisoning, which can be life threatening.
Unpasteurized Milk	Listeria, bacteria	It can cause miscarriage. Listeria has the ability to cross the placenta and may infect the baby leading to infection or blood poisoning, which can be life-threatening.
Artificial Sweeteners: Aspartame	–	It may increase risk of preterm delivery. Long term use of the clinical food aspartame has been linked with cancer and immune-toxicity
Deli Meat	Listeria	It can cause miscarriage. Listeria has the ability to cross the placenta and may infect the baby leading to infection or blood poisoning, which may be life threatening.
Liver	Excessive amounts of vitamin A in non-beta-carotene	Can cause birth defects
Papaya	Papein	Generate heat may cause abortion
Pineapple	Bromelain, high sugar	Induce abortion or menstruation increased risk of developing gestational diabetes
Castor oil	Ricinoleic acid	It interferes with body's ability to absorb nutrients also causes irregular and painful contraction

(Harsoliya *et al.*, 2011)

1.7 Antenatal care

Antenatal care, the care that women receive during pregnancy, helps to ensure healthy outcomes for women and newborns. The traditional approach to antenatal care, which is based on European models developed in the early 1900s, assumes that more is better in care for pregnant women. Frequent routine visits are the norm, and women are classified by risk category to determine the likelihood that they will experience complications and the level of care they need. Individual interaction is an essential component of focused antenatal care visits. This is a time for providers and women to talk about important issues

affecting the woman's health, her pregnancy, and her plans for childbirth and the newborn period (Villar and Bergsjg, 1997). Discussions should include the following:

- How to recognize danger signs, what to do, and where to get help
- Good nutrition and its importance to the health of the mother and baby; how to get enough calories and essential macronutrients and micronutrients
- Good hygiene and infection prevention practices
- Risks of using tobacco, alcohol, medications, local drugs, and traditional remedies
- Rest and avoidance of heavy physical work
- Benefits of child spacing to mother and child; options for family planning services following the baby's birth
- Benefits (to mother and baby) of breastfeeding; importance of early and exclusive breastfeeding
- Protection against HIV and other sexually transmitted diseases through individualized risk reduction; availability and benefits of HIV testing; and specific issues related to mother-to-child transmission and living with AIDS (Gillespie, 1999).

Antenatal visits-area time-when women are particularly receptive to messages about pregnancy. Antenatal care can detect anemia, hypertensive disease, infections and other existing conditions and diseases that lead to high-risk pregnancy. Antenatal visits should take place:

- To 28th weeks gestation - every 4 weeks
- 28th-36th weeks - every 2 weeks
- Thereafter - every week

In a normal pregnancy, with no complications, a minimum of three antenatal visits is acceptable in the first 20 weeks

Examination of the Pregnant Woman During Antenatal Care- At each visit the following examinations should be done.

General-

- Blood pressure
- Body weight

Abdominal-

- Fundal level
- Fetal lie
- Fetal presentation
- Fetal heart sounds (FHS)
- Record any new complaints

Urine examination:

- By dipstick for protein, glucose and ketones
- Assessment of fetal well-being
- Fetal size through assessment of fundal level (FL)
- Fetal kick count: at least 10 movements every 12 hours
- Fetal movements: absence precedes intrauterine fetal death (IUFD) by 48 hours
- Fetal heart sounds
- Ultrasound if it is available
- At 37 Weeks-Assessment of fetal size, lie, presentation (Gillespie, 1999).

1.8 Prognosis

A healthy pregnancy typically lasts for 40 weeks, but some women deliver sooner or later. Premature births can result in many health problems, from low birth weight and jaundice, to a lack of development of the organs. While women may be anxious to meet their baby, induced labor should generally only be used if a doctor deems it medically necessary (Khaskheli, Baloch and Baloch, 2010).

1.9 Stages of pregnancy

1.9.1 First trimester (week 1-week 12)

During the first trimester women body undergoes many changes. Hormonal changes affect almost every organ system in the body. These changes can trigger symptoms even in the very first weeks of pregnancy. Other changes may include:

- Extreme tiredness

- Tender, swollen breasts
- Upset stomach with or without throwing up (morning sickness)
- Cravings or distaste for certain foods
- Mood swings
- Constipation (trouble having bowel movements)
- Need to pass urine more often
- Headache
- Heartburn
- Weight gain or loss (Womenshealth, 2015).

1.9.1.1 Prenatal Tests

First Trimester Here are some tests women may undergo during the first trimester of pregnancy.

- **3D and 4D Ultrasounds** : 3D and 4D ultrasounds are optional. They're not standard prenatal tests.
- **Chorionic Villus Sampling (CVS):** Chorionic villus sampling (CVS) is a type of prenatal test done during the first trimester to look for problems with the fetus (Webmd, 2015).

1.9.1.2 Health Concerns

Dealing with Morning Sickness: For many women, the toughest part of early pregnancy is morning sickness.

Hyperemesis Gravidarum: Hyperemesis gravidarum is extreme, persistent nausea and vomiting during pregnancy. It can lead to dehydration, weight loss, and electrolyte imbalances.

Blighted Ovum: A blighted ovum occurs when a fertilized egg implants in the uterus but doesn't develop into an embryo. It is also referred to as an anembryonic (no embryo) pregnancy and is a leading cause of early pregnancy failure or miscarriage. Often it occurs so early that women don't even know they are pregnant. A blighted ovum causes about one out of two miscarriages in the first trimester of pregnancy. A miscarriage is when a pregnancy ends on its own (Webmd, 2015).

Abdominal Separation: Abdominal Separation (also called Diastasis Recti) can make a vaginal birth difficult.

Common Pregnancy Pains B: Body is constantly changing during pregnancy, which may cause discomfort.

Bleeding During Pregnancy: Bleeding during pregnancy is common, especially during the first trimester, and usually it's no cause for alarm, but sometimes can be a sign of something more serious.

Anemia: It's normal to have mild anemia when women are pregnant. But they may have more severe anemia from low iron or vitamin levels or from other reasons.

Ectopic Pregnancy: An ectopic pregnancy is a life-threatening condition that requires emergency treatment. It predominantly occurs when the embryo implants in one of the fallopian tubes instead of the uterus.

Multiple Pregnancy: If women are pregnant with more than one fetus, one can expect to have the same symptoms as those of a pregnancy with one fetus (called a singleton pregnancy). But the symptoms may happen earlier and may be worse.

Gestational Diabetes: Diabetes that develops during pregnancy is a relatively common complication of pregnancy, affecting about 4% of all pregnant women.

Miscarriage: Most miscarriages happen during the first three months of pregnancy (Webmd, 2015).

1.9.2 Second trimester (week 13-week 28)

Most women find the second trimester of pregnancy easier than the first. But it is just as important to stay informed about pregnancy during these months. Women might notice that symptoms like nausea and fatigue are going away. But other new, more noticeable changes to body are now happening. As body changes to make room for growing baby, women may have:

- Body aches, such as back, abdomen, groin, or thigh pain
- Stretch marks on abdomen, breasts, thighs, or buttocks
- Darkening of the skin around nipples
- A line on the skin running from belly button to pubic hairline

- Patches of darker skin, usually over the cheeks, forehead, nose, or upper lip. Patches often match on both sides of the face. This is sometimes called the mask of pregnancy
- Numb or tingling hands, called carpal tunnel syndrome
- Itching on the abdomen, palms, and soles of the feet (Womenshealth, 2015).

1.9.2.1 Prenatal Tests

Here are the prenatal tests women may face in the second trimester of pregnancy.

- Amniocentesis
- Amniocentesis is performed to look for certain types of birth defects.
- Quad Marker Screen
- The quad marker screen predicts the likelihood of certain problems occurring with a pregnancy.
- Glucose Screening
- All women should be screened for gestational diabetes during pregnancy (Webmd, 2015).

1.9.2.2 Health Concerns

Back Pain in Pregnancy: At some point in pregnancy between morning sickness and labor pains, women may experience another unwelcome aspect of being pregnant which is back pain.

Preeclampsia and Eclampsia: Formerly called toxemia, preeclampsia is a condition that pregnant women develop. It is marked by high blood pressure and a high level of protein in the urine. Preeclamptic women will often also have swelling in the feet, legs, and hands. This condition usually appears during the second half of pregnancy, often in the latter part of the second or in the third trimesters, although it can occur earlier. If undiagnosed, preeclampsia can lead to eclampsia, a serious condition that can put women and their baby at risk, and in rare cases, cause death. Women with preeclampsia who have seizures are considered to have eclampsia (Webmd, 2015).

Heartburn During Pregnancy: Heartburn is an irritation of the esophagus that is caused by stomach acid and is a common part of pregnancy.

Placenta Previa : When the placenta blocks the cervix, it is called placenta previa.

Round Ligament Pain: Round ligament pain is a sharp pain or jabbing feeling often felt in the lower belly or groin area on one or both sides (Womenshealth, 2015).

1.9.3 Third trimester (week 29-week 40)

Some new body changes women might notice in the third trimester include:

- Shortness of breath
- Heartburn
- Swelling of the ankles, fingers, and face.
- Hemorrhoids
- Tender breasts, which may leak a watery pre-milk called colostrum
- Trouble sleeping
- The baby "dropping", or moving lower in abdomen
- Contractions, which can be a sign of real or false labor (Womenshealth, 2015).

1.9.3.1 Prenatal Tests

Third Trimester Tests: During Pregnancy These tests are common in the third trimester of pregnancy (Webmd, 2015).

Urine Tests

At every appointment, women'll give a urine sample to be screened for glucose (elevated levels can be a sign of gestational diabetes) and protein (a possible indication of preeclampsia or a urinary tract infection). If either shows up in their urine, their doctor will likely order additional testing.

Ultrasound

A more detailed ultrasound anatomy scan (also called a level two ultrasound) is performed between weeks 18 and 22. The ultrasound technician will also check amniotic fluid levels, placenta location and fetal heart rate. If necessary, a late-pregnancy ultrasound can check for pre-term labor by measuring cervix length.

Amniocentesis

Recommended for women over age 35, this test, performed between weeks 15 and 20, analyzes amniotic fluid from the uterus for Down syndrome, genetic diseases such as Tay-Sachs and sickle cell anemia, and neural tube defects like spina bifida. It also can be used

after week 32 to determine if baby's lungs are mature enough to function outside the womb.

Glucose Tolerance Test

Between weeks 24 and 28, almost all women are screened for gestational diabetes mellitus (GDM). If women have specific risks, they might take it earlier. The test can't diagnose GDM, but will determine whether further testing is necessary.

Group B Step Test

This test, given to all women around week 36, screens for harmless bacteria in the rectum and vagina that can be dangerous if transmitted to baby during delivery.

Nonstress Test

If they are overdue or at risk of premature labor, or if there are signs of fetal distress, doctor may perform a nonstress test to measure fetal heart rate and movement and uterine activity. This test can be done anytime after 24 to 26 weeks, but is most commonly performed late in the third trimester.

Biophysical Profile

Usually performed with the nonstress test in the third trimester, this profile shows the baby's heart rate, activity level, breathing movements, muscle tone and the amount of amniotic fluid in the uterus (Webmd, 2015).

1.9.3.2 Health Concerns

Braxton Hicks contractions Before "true" labor begins, women may have "false" labor pains, also known as Braxton Hicks contractions (Womenshealth, 2015).

1.10 Prenatal Complications: If women experience any of the following symptoms during early pregnancy, contact a doctor or health care provider:

- any vaginal bleeding
- swelling of the face or fingers
- severe or continuous headache
- dimness or blurring of vision
- abdominal pain

- persistent vomiting
- chills or fever
- burning or pain during urination
- leaking of fluid from vagina and
- swollen extremities.

Although most women do not experience significant complications during pregnancy, women should be aware of the complications that can occur so women can quickly recognize the symptoms and seek treatment. Complications that may occur during the first trimester of pregnancy include miscarriage, hyperemesis gravidarum (extreme vomiting), ectopic pregnancy, and molar pregnancy (Khaskheli, Baloch and Baloch, 2010).

1.11 Pregnancy Complication

Some women experience health problems during pregnancy. These complications can involve the mother's health, the fetus, or both. Even women who were healthy before getting pregnant can experience complications. These complications make the pregnancy a high risk pregnancy. Getting early and regular prenatal care can help decrease the risk for problems by enabling health care providers to diagnose, treat, or manage conditions before they become serious (Khaskheli, Baloch and Baloch, 2010). The following are some common maternal health conditions or problems a woman may experience during pregnancy—

1.11.1 Anaemia in Pregnancy

Anaemia has long been recognized as a major public health problem especially in developing countries like India. During pregnancy, level of haemoglobin below 11 gms /dl, is labelled as anaemia.(Before women were pregnant, they needed about 15 mg of Iron per day, now women need twice this amount. i.e. approximately 30 mg per day.40 – 60% of are pregnant woman, suffer from anaemia (Planababy, 2015).

1.11.1.1 Causes of Anaemia

Physiological anaemia: During pregnancy, the volume of plasma (fluid portion of blood) increases dramatically by 45% while the red blood cells (cells, which contain haemoglobin, i.e. the iron content) increases by 15% only, causing a dilution of blood, also called dilutionalanaemia or physiological anaemia (Planababy, 2015).

Nutritional anaemia: Iron deficiency is the commonest reason for the development of anaemia. Deficiency of iron in food, poor reserves of iron in the body, excessive blood loss, poorly spaced pregnancies. Prolonged lactation for more than 6 months all contribute to the occurrence of nutritional anaemia. Prevention can be achieved by the simple practice of a well balanced diet and regular intake of iron. Poor absorption of iron from the intestines is due to worm infestation like hookworm. There is intestinal hurry causing less iron absorption. The average diet would appear adequate in iron content (20 – 22mg) for a non-pregnant adult woman. But various factors inhibit iron absorption such as phytates, deficiency of ascorbic acid (Vit C), calcium and proteins, which tend to lower the iron absorption, causing nutritional anaemia. During pregnancy, there is increased demand of iron. The iron is taken for:

- Expansion of Red blood cells
- Iron transferred to foetus
- Blood loss at Delivery
- Basal Iron requirement
- Chronic infection of gastro intestinal tracts, urinary tract can cause anaemia

Deficiency of folic acid and Vit B 12 (Cyano-cobalamine) leads to megaloblastic anaemia (type of anaemia). Improper supplementation in pregnancy and lactation due to:

- Late registration for antenatal clinics
- No regularity in taking drugs (non compliance)
- Poor follow up (Planababy, 2015).

1.11.1.2 Sign and Symptom

- Loss of appetite.
- Fatigue – weakness.
- Restlessness.
- Breathlessness – difficulty in breathing.
- Chronic urinary tract infection.
- Oedema – swelling all over the body.

NOTE: These are primarily symptoms of the mother. The foetus is an excellent parasite. In spite of low levels of haemoglobin in blood of the mother, the foetus draws required amount of iron for himself, putting the mother's condition at risk (Planababy, 2015).

1.11.1.3 Diagnosis

Haemoglobin estimation is the basic test and gives clue regarding the severity of anaemia.

Table 1.2: Levels of haemoglobin

8.5% gm – 10% gm.	Mild form of anaemia.
7.0gms – 8.5 gm.	Moderate form anaemia.
Less than 7.0 gm.	Severe form anaemia.

The severity of anaemia is directly proportional to the occurrence of complications during pregnancy, (labor) delivery and in later period (Planababy, 2015).

Peripheral Blood Smear

- It gives information regarding the type of anaemia and the red blood cells characteristics. Others tests done are: Red blood cell count – Normal is 3.5 to 4.5 million/cubicmm
- Packed cell volume-normal more than 32%
- Mean corpuscular haemoglobin concentration (MCHC) more than 30%.
Serum iron concentration
- Total Iron-binding capacity
- Stool examination to rule out worm infections.
- Ultrasonography to rule out intrauterine growth retardation. amniotic fluid abnormalities, etc (Planababy, 2015).

1.11.1.4 Treatment

- Pre-planned pregnancy with adequate antenatal care.
- Healthy dietary habits with ingestion of vegetables and fruits daily.
- Widely spaced pregnancies, in case of multiple pregnancies.
- Treatment of any menstrual problems for example excessive amount of bleeding during menses (menorrhagia), bleeding for prolong period of time, etc.

- Replenishing the iron stores by taking iron supplementation during pregnancy and lactation.
- Treatment of worm infestations, if any
- Treatment of bleeding through rectum (piles), etc.
- Treatment of anaemia consists of taking oral iron pills daily, usually 2nd half of pregnancy. The common iron preparations are Fefol.2, Solteron, Autrin, Fecontin etc. Depending upon the severity of anaemia, the dose of the pills are adjusted as once, twice or thrice a day. It is advisable to take pills after meals to reduce the common side effects like nausea, vomiting, constipation, diarrhoea occasionally joint pains etc. To prevent Iron deficiency anaemia, it is generally recommended that expectant mothers should eat a diet rich in iron (Planababy, 2015).

1.11.2 Preeclampsia

Preeclampsia is a condition characterized by high blood pressure, protein in the urine, and swelling of the hands and face that occurs after 20 weeks of pregnancy. It occurs in about 10 to 15% of pregnancies and is more common with the first pregnancy, in teenagers, and in women over 35. While it can occur in the late second trimester, preeclampsia is much more common in the third trimester, near term. Preeclampsia can lead to eclampsia (seizures), kidney failure, and rarely death in the mother and fetus (Healthline, 2015).

1.11.2.1 Cause of Preeclampsia

Despite years of scientific study, the true cause of preeclampsia is not known, nor is there any effective prevention. The cure, however, has been known for many decades, and that is delivery of the baby. For that reason, timely diagnosis and delivery is the best way to avoid serious problems for the mother and for the fetus (Healthline, 2015).

1.11.2.2 Signs and Symptoms

Initially, preeclampsia causes

- high blood pressure (hypertension)
- protein in urine (proteinuria)

High blood pressure affects 10-15% of all pregnant women, so this alone doesn't suggest preeclampsia. However, if protein in the urine is found at the same time as high blood

pressure, it's a good indicator of the condition (Healthline, 2015). As preeclampsia progresses, it may cause:

- severe headaches
- vision problems, such as blurring or seeing flashing lights
- severe heartburn
- pain just below the ribs
- nausea or vomiting
- excessive weight gain caused by fluid retention
- feeling very unwell
- sudden increase in oedema – swelling of the feet, ankles, face and hand

Without immediate treatment, preeclampsia may lead to a number of serious complications, including:

- convulsions (eclampsia)
- HELLP syndrome (a combined liver and blood clotting disorder)
- stroke

However, these complications are rare (Healthline, 2015).

1.11.2.3 Diagnosis

Many women have no symptoms at first. Others have headaches, vision changes, and upper abdominal pain. These signs may suggest severe preeclampsia. The first sign that doctor usually sees is high blood pressure during a routine prenatal visit. Protein may be detected in urine, and may have gained excessive weight. Sometimes hands and face are swollen, but this is frequently absent in mild disease. Blood tests, such as liver and kidney function tests and blood clotting tests, may confirm the diagnosis and can detect severe disease (Healthline, 2015).

1.11.2.4 Treatment

- Inducing labor is recommended for term pregnancies and for preterm pregnancies that are unstable or in which the baby's lungs are mature
- If mild preeclampsia develop long before due date, doctor may monitor mother and the fetus and allow the fetus to mature more. If mother is near term, if the baby's lungs are mature, or if severe disease develops, labor is induced. All women

with preeclampsia should be put on magnesium sulfate therapy during labor and after delivery for about 24 hours to reduce the risk of seizures.

- If severe preeclampsia occurs when the fetus is very preterm (about 24 to 32 weeks), doctor may try to prolong pregnancy to allow fetal growth. Women are hospitalized, monitored carefully, and given steroids to help mature the baby's lungs. If doctor sees signs of worsening disease, she might induce labor or deliver baby by cesarean section. Magnesium sulfate is also used to help prevent seizures. In severe preeclampsia, doctor will focus on preventing eclampsia, controlling blood pressure, and delivering the baby (Healthline, 2015).

1.11.2.5 Complications of preeclampsia

Problems affecting the mother

Fits (eclampsia) Eclampsia describes a type of convulsion or fit (involuntary contraction of the muscles) that pregnant women can experience, usually from week 20 of the pregnancy or immediately after the birth. During an eclamptic fit, the mother's arms, legs, neck or jaw will twitch involuntarily in repetitive, jerky movements. The fits usually last less than a minute. While most women make a full recovery after having eclampsia, there's a small risk of permanent disability or brain damage if the fits are severe. Of those who have eclampsia, around 1 in 50 will die from the condition. Unborn babies can suffocate during a seizure and 1 in 14 may die. Research has found that a medication called magnesium sulfate can halve the risk of eclampsia and reduce the risk of the mother dying. It's now widely used to treat eclampsia after it has occurred, and to treat women who may be at risk of developing it (Healthline, 2015).

HELLP syndrome HELLP syndrome is a rare liver and blood clotting disorder that can affect pregnant women. It's most likely to occur immediately after the baby is delivered, but can appear any time after 20 weeks of pregnancy, and in rare cases before 20 weeks. (Healthline, 2015) The letters in the name HELLP stand for each part of the condition:

- **"H" is for haemolysis**– this is where the red blood cells in the blood break down
- **"EL" is for elevated liver enzymes (proteins)** – a high number of enzymes in the liver is a sign of liver damage
- **"LP" is for low platelet count** – platelets are substances in the blood that help it to clot

HELLP syndrome is potentially as dangerous as eclampsia, and is slightly more common. The only way to treat the condition is to deliver the baby as soon as possible. Once the mother is in hospital and receiving treatment, it's possible for her to make a full recovery.

Stroke The blood supply to the brain can be disturbed as a result of high blood pressure. This is known as a cerebral haemorrhage, or stroke. If the brain doesn't get enough oxygen and nutrients from the blood, brain cells will start to die, causing brain damage and possibly death (Healthline, 2015).

Organ problems

- **Pulmonary oedema**– where fluid builds up in and around the lungs. This stops the lungs from working properly by preventing them from absorbing oxygen.
- **Kidney failure** – when the kidneys cannot filter waste products from the blood. This causes toxins and fluids to build up in the body.
- **Liver failure** – disruption to the functions of the liver. The liver has many functions, including digesting proteins and fats, producing bile and removing toxins. Any damage that disrupts these functions could be fatal. (Healthline, 2015)

Blood clotting disorder The mother's blood clotting system can break down. This is known medically as "disseminated intravascular coagulation". This can either result in too much bleeding because there aren't enough proteins in the blood to make it clot, or in blood clots developing throughout the body because the proteins that control blood clotting become abnormally active. These blood clots can reduce or block blood flow through the blood vessels and possibly damage the organs (Healthline, 2015).

Problems affecting the baby

Babies of some women with preeclampsia may grow more slowly in the womb than normal, because the condition reduces the amount of nutrients and oxygen passed from the mother to her baby. These babies are often smaller than usual, particularly if the preeclampsia occurs before 37 weeks. If preeclampsia is severe, a baby may need to be delivered before they're fully developed. This can lead to serious complications, such as breathing difficulties caused by the lungs not being fully developed (neonatal respiratory distress syndrome). In these cases, a baby usually needs to stay in a neonatal intensive care unit so they can be monitored and treated. Some babies of women with preeclampsia can even die in the womb and be stillborn. It's estimated that around 1,000 babies die each

year because of preeclampsia. Most of these babies die because of complications related to early delivery (Healthline, 2015).

Preeclampsia rapidly disappears after delivery. In rare cases, a woman needs blood pressure medication for a short time or diuretics to treat pulmonary edema (fluid in the lungs). While preeclampsia is primarily a disease of first pregnancies, there is an increased risk of recurrence with future pregnancies (Healthline, 2015).

Table 1.3: Indications for delivery in women with preeclampsia or gestational hypertension

Maternal	Fetal
Gestational age ≥ 37 weeks	Placental abruption
Inability to control hypertension	Severe FGR
Deteriorating platelet count	Non-reassuring fetal status
Intravascular haemolysis	
Deteriorating liver function	
Deteriorating renal function	
Persistent neurological symptoms	

(Lowe *et al.*, 2014)

1.11.3 Gestational hypertension

Gestational hypertension formerly known as pregnancy-induced hypertension, refers to hypertension occurring for the first time during pregnancy. Diagnosis of gestational hypertension requires a blood pressure that is greater than or equal to 140/90 mm Hg. The blood pressure should be elevated on at least two occasions 4–6 hours apart. The diagnosis is made after 20 weeks' gestation and is characterized by a blood pressure that returns to normal by 12 weeks postpartum. Patients with gestational hypertension do not present with proteinuria, which is a characteristic of preeclampsia. However, gestational hypertension may progress to preeclampsia. If gestational hypertension does not progress

to preeclampsia, it is reclassified as transient hypertension. This category includes essential hypertension as well as hypertension secondary to a range of conditions. Essential hypertension is defined by a blood pressure greater than or equal to 140 mmHg systolic and/or 90mmHg diastolic confirmed before pregnancy or before 20 completed weeks gestation without a known cause. It may also be diagnosed in women presenting early in pregnancy taking antihypertensive medications where no secondary cause for hypertension has been determined. Some women with apparent essential hypertension may have white coat hypertension (raised blood pressure in the presence of a clinical attendant but normal blood pressure otherwise as assessed by ambulatory or home blood pressure monitoring). These women appear to have a lower risk of superimposed preeclampsia than women with true essential hypertension but are still at an increased risk compared with normotensive women. Important secondary causes of chronic hypertension in pregnancy include:

- Chronic kidney disease e.g. glomerulonephritis, reflux nephropathy, and adult polycystic kidney disease
- Renal artery stenosis
- Systemic disease with renal involvement e.g. diabetes mellitus, systemic lupus erythematosus
- Endocrine disorders e.g. pheochromocytoma, Cushing's syndrome and primary hyperaldosteronism
- Coarctation of the aorta (Lowe *et al.*, 2014).

1.11.3.1 Classifications of Hypertension

Table 1.4 : Classification of the hypertensive disorders of pregnancy

Primary diagnosis	Definition of preeclampsia
Pre-existing hypertension	
With comorbid conditions	
With preeclampsia	Resistant hypertension, <i>or</i>
(after 20 weeks' gestation)	New or worsening proteinuria, <i>or</i> One/more adverse condition(s)
Gestational hypertension	
With comorbid conditions	
With preeclampsia	New proteinuria, <i>or</i>
(after 20 weeks' gestation)	One/more adverse condition(s)

(Lowe *et al.*, 2014)

1.11.3.2 Diagnosis

Blood test abnormalities should be interpreted using pregnancy-specific ranges, some of which are gestation dependent. If features of preeclampsia are present, additional investigations should include:

- Urinalysis for protein and urine microscopy on a carefully collected mid-stream urine sample. If there is thrombocytopenia or a falling haemoglobin, investigations for disseminated intravascular coagulation and/or haemolysis (coagulation studies, blood film, LDH, fibrinogen) are indicated.
- Patients with severe, early onset preeclampsia warrant investigation for associated conditions e.g. systemic lupus erythematosus, underlying renal disease or antiphospholipid syndrome. The timing of these investigations will be guided by the clinical features.
- Although a very rare disorder, undiagnosed pheochromocytoma in pregnancy is potentially fatal and may present as preeclampsia. In the presence of very labile or severe hypertension measurement of free plasma in fasting condition metanephrines/normetanephrines or 24 hour urinary catecholamines should be undertaken.

- Amongst women referred for assessment of new onset hypertension, a number will have normal blood pressure and investigations. These women are considered to have transient or labile hypertension. Repeat assessment should be arranged within 3-7 days as some of these women will subsequently develop preeclampsia.
- Subsequent investigation and management will be based on the results of ongoing blood pressure measurement and these investigations (Lowe *et al.*, 2014).

Table 1.5: Ongoing investigation of women with hypertension in pregnancy

Modality		Frequency
Chronic hypertension	Assess for proteinuria	Each visit
	Preeclampsia bloods	If sudden increase in BP or new proteinuria
Gestational hypertension	Assess for proteinuria	1-2x/week
	Preeclampsia bloods	Weekly
Preeclampsia	Assess for proteinuria	At time of diagnosis: if non-proteinuric repeat daily
	Preeclampsia bloods	Twice weekly or more frequent if unstable

(Lowe *et al.*, 2014)

1.11.3.3 Maternal and Fetal Implications Hypertension in pregnancy places patients and their fetuses at great risk for a variety of complications. Some of the most significant maternal complications of hypertension in pregnancy include cerebral vascular accident (CVA, or stroke), disseminated intravascular coagulation (DIC), and placental abruption from the elevated blood pressure. Additionally, patients are at risk for the development of *HELLP* syndrome in the presence of gestational hypertension. Just as its name implies, *HELLP* syndrome causes great dysfunction within the body and requires immediate intervention. It is characterized by:

- Hemolysis of red blood cells, which leads to anemia
- Elevated liver enzymes leading to epigastric pain
- Low platelets, which cause abnormal bleeding and clotting as well as petechiae

Patients whose function continues to decline without intervention can develop eclampsia and are at risk for cerebral hemorrhage, DIC, and placental abruption. Fetal complications include intrauterine growth retardation and premature delivery resulting from decreased placenta perfusion (Carson and Chen, 2013).

1.11.3.4 Medical Treatment

Medical treatment for patients with pregnancy-related hypertension greatly depends on the severity of hypertension and the gestational age of the fetus, as well as the potential risk to the patient and fetus. During early pregnancy, outpatient management is usually appropriate; these patients are monitored at home for blood pressure and proteinuria. Regular fetal monitoring is necessary to evaluate fetal well-being. In addition, placental perfusion tests can also be performed to assess and monitor uteroplacental sufficiency. Patients with evidence of severe dysfunction such as seizures, oliguria, renal failure, or *HELLP* syndrome are usually delivered immediately. Since delivery is the only known cure for pregnancy-related hypertension, many healthcare practitioners will recommend immediate induction and delivery if the patient is near-term and shows signs of severe preeclampsia or eclampsia. However, if the healthcare practitioner determines that the fetus is too premature for delivery, antihypertensive medications may be administered to decrease blood pressure, thereby prolonging fetal growth in utero. Glucocorticoids are administered to enhance fetal lung maturity. Healthcare practitioners may prescribe magnesium sulfate ($MgSO_4$) during labor and delivery to prevent seizures. Magnesium sulfate is not used to control hypertension. Magnesium sulfate is administered intravenously via an infusion delivery device during delivery and for 24 hours post delivery. Since $MgSO_4$ can cause fetal respiratory depression following delivery, arrangements should be made for specialized neonatal care (Lowe *et al.*, 2014).

1.11.4 Mental Health Conditions

Some women experience depression during or after pregnancy. Symptoms of depression are:

- A low or sad mood

- Loss of interest in fun activities
- Changes in appetite, sleep, and energy
- Problems thinking, concentrating, and making decisions
- Feelings of worthlessness, shame, or guilt
- Thoughts that life is not worth living

When many of these symptoms occur together and last for more than a week or two at a time, this is probably depression. Depression that persists during pregnancy can make it hard for a woman to care for herself and her unborn baby. Having depression before pregnancy also is a risk factor for postpartum depression. Getting treatment is important for both mother and baby. If women have a history of depression, it is important to discuss this with their health care provider early in pregnancy so that a plan for management can be made (Cdc, 2015).

1.11.5 Gestational diabetes

Gestational diabetes mellitus occurs with the onset of pregnancy and is characterized by the inability of the pregnant patient to tolerate glucose. Patients who develop gestational diabetes may develop diabetes later in life. However, gestational diabetes often resolves after delivery. The cause of gestational diabetes is largely unknown. However, it is believed that as the fetus grows, glucose demands increase for the pregnant patient. In addition, the “insulin-antagonistic” properties of placental hormones affect the patient by causing insulin resistance (Lowdermilk & Perry, 2010). As a result, the pregnant patient is unable to process glucose in the body and hyperglycemia occurs.

1.11.5.1 Incidence and Risk Factors

According to the American Diabetes Association (2013), gestational diabetes affects 18% of pregnancies. Factors that place patients at risk for developing gestational diabetes mellitus include:

- Maternal obesity
- Advanced maternal age
- Member of a minority population
- GDM in previous pregnancies
- Presence of glycosuria

- History of a macrosomic infant(s) (birthweight>4500 g)
- History of spontaneous abortion or fetal demise
- Family history of diabetes mellitus or GDM (Lowdermilk & Perry, 2010).

1.111.5.2 Symptoms of gestational diabetes

Gestational diabetes often doesn't cause any symptoms. This means you may be screened for the condition at your first antenatal appointment by a venous glucose sample, at around weeks 8-12 of pregnancy. If women are at increased risk of gestational diabetes they will be offered a full test, which takes place during weeks 24-28 of pregnancy. High blood glucose (hyperglycaemia) can cause some symptoms, including:

- a dry mouth with increased thirst
- needing to urinate frequently, especially at night
- tiredness
- recurrent infections, such as thrush (a yeast infection)
- blurred vision (Nhs.uk, 2015).

1.11.5.3 Diagnosis

Screening identifies otherwise healthy people who may be at increased risk of a condition, such as diabetes (Nhs.uk, 2015).

Screening Women may be screened for gestational diabetes at first antenatal appointment with doctor which takes place around weeks 8-12 of pregnancy. At this time, doctor will find out if women are at increased risk of gestational diabetes. They will ask about any known risk factors for gestational diabetes, such as whether they have a family history of diabetes. This may also include a glucose tolerance test (GTT) (Nhs.uk, 2015).

Glucose tolerance test (GTT) A GTT takes place during weeks 24-28 of pregnancy. This involves a morning blood test, before you have eaten breakfast. If women had gestational diabetes in a previous pregnancy, the GTT will be carried out at weeks 16-18 of pregnancy – or sooner, if indicated by the first blood glucose sample (Nhs.uk, 2015).

1.11.5.4 Medical Treatment

Pregnant patients are routinely screened for gestational diabetes mellitus between 24 and 29 weeks' gestation. In order to diagnose gestational diabetes, patients drink 50 grams of oral glucose solution. After one hour, a blood sample is obtained and tested for glucose tolerance. A glucose level of 140 mg/dL or higher is considered a positive screen and further investigation is warranted. A 3-hour glucose tolerance test is then typically performed. Most patients with gestational diabetes are treated through diet. They are encouraged to consume a proper diet and obtain adequate exercise. Patients with gestational diabetes should consume a diet that provides 30 kcal/kg/day. Furthermore, patients with a body mass index greater than 30 kg/m² may benefit from a 30%–33% caloric restriction. Besides proper diet and exercise, some patients may require insulin or oral hypoglycemia agents to manage gestational diabetes mellitus. Resistance exercise can help overweight patients with gestational diabetes avoid insulin therapy (De Barros *et al.*, 2010).

1.11.5.4 Complications of gestational diabetes

- Most women with gestational diabetes go on to have normal pregnancies with healthy babies.
- The risk of complications is reduced if gestational diabetes is diagnosed and managed properly throughout pregnancy.
- This involves monitoring and controlling the level of glucose in blood during pregnancy (Nhs.uk, 2015).

1.11.5.6 Maternal and Fetal Complications

A variety of maternal and fetal complications are associated with gestational diabetes mellitus. Patients have a significant chance of delivering via cesarean section due to the large size of infants born to patients with gestational diabetes. Patients also have an increased frequency of hypertension. Infants born to patients with gestational diabetes mellitus are usually macrosomic (birthweight > 4.5 kg). This occurs due to fetal hyperinsulinemia as a result of maternal hyperglycemia, which stimulates excessive growth. These large infants may have difficulty maneuvering the birth canal, and a cesarean section may be required. If vaginal delivery is attempted, the infant is at risk for shoulder dystocia or other birth injuries. After delivery, the newborn infant's blood

glucose must be monitored regularly due to the sharp decrease in available glucose after the umbilical cord is cut. The newborn's pancreas continues to produce insulin after delivery despite the decrease in serum glucose. This adds to the potential instability of the infant's blood glucose. Infants are also at risk for hypocalcemia, hyperbilirubinemia, and respiratory distress syndrome as a result of gestational diabetes (Aleppo, 2015).

1.11.6 Thyroid Disease in Pregnancy

The thyroid diseases hyperthyroidism and hypothyroidism are relatively common in pregnancy and important to treat. The thyroid is an organ located in the front of neck that releases hormones that regulate metabolism (the way your body uses energy), heart and nervous system, weight, body temperature, and many other processes in the body.(Aleppo, 2015) During pregnancy, if women have pre-existing hyperthyroidism or hypothyroidism, they may require more medical attention to control these conditions during pregnancy, especially in the first trimester. Occasionally, pregnancy may cause symptoms similar to hyperthyroidism in the first trimester. If anyone experience palpitations, weight loss, and persistent vomiting, they should contact physician (Aleppo, 2015). Untreated thyroid diseases in pregnancy may lead to premature birth, preeclampsia (a severe increase in blood pressure), miscarriage, and low birth weight among other problems (Aleppo, 2015).

1.11.6.1 Causes of Thyroid Disorder during Pregnancy

The most common cause of maternal hyperthyroidism during pregnancy is the autoimmune disorder Grave's disease. In this disorder, the body makes an antibody (a protein produced by the body when it thinks a virus or bacteria has invaded) called thyroid-stimulating immunoglobulin (TSI) that causes the thyroid to make too much thyroid hormone. The most common cause of hypothyroidism is the autoimmune disorder known as Hashimoto's thyroiditis. In this condition, the body mistakenly attacks the thyroid gland cells, leaving the thyroid without enough cells and enzymes to make enough thyroid hormone (Aleppo, 2015).

1.11.6.2 Symptoms of Hyperthyroidism and Hypothyroidism in Pregnancy

Hyperthyroidism

Symptoms of hyperthyroidism may mimic those of normal pregnancy, such as an increased heart rate, sensitivity to hot temperatures, and fatigue. Other symptoms of hyperthyroidism include the following:

- Irregular heartbeat
- Nervousness
- Severe nausea or vomiting
- Slight tremor
- Trouble sleeping
- Weight loss or low weight gain for a typical pregnancy (Aleppo, 2015)

Hypothyroidism

Symptoms of hypothyroidism, such as extreme tiredness and weight gain, may be easily confused with normal symptoms of pregnancy. Other symptoms include:

- Constipation
- Difficulty concentrating or memory problems
- Sensitivity to cold temperatures
- Muscle cramps (Aleppo, 2015)

1.11.6.3 Diagnosis of Thyroid Disorder

Hyperthyroidism and hypothyroidism in pregnancy are diagnosed based on symptoms, physical exam, and blood tests to measure levels of thyroid-stimulating hormone (TSH) and thyroid hormones T4, and for hyperthyroidism also T3 (Aleppo, 2015).

1.11.6.4 Treatment of Thyroid Disorder

For women who require treatment for hyperthyroidism, an antithyroid medication that interferes with the production of thyroid hormones is used. This medication is usually propylthiouracil or PTU for the first trimester, and if necessary, methimazole can be used also, after the first trimester. In rare cases in which women do not respond to these medications or have side effects from the therapies, surgery to remove part of the thyroid may be necessary. Hyperthyroidism may get worse in the first 3 months after give birth,

and doctor may need to increase the dose of medication (Aleppo, 2015). Hypothyroidism is treated with a synthetic (manmade) hormone called levothyroxine, which is similar to the hormone T4 made by the thyroid. The doctor will adjust the dose of levothyroxine at diagnosis of pregnancy and will continue to monitor thyroid function tests every 4-6 weeks during pregnancy. If women have hypothyroidism and are taking levothyroxine, it is important to notify doctor as soon as they know they are pregnant, so that the dose of levothyroxine can be increased accordingly to accommodate the increase in thyroid hormone replacement required during pregnancy. Because the iron and calcium in prenatal vitamins may block the absorption of thyroid hormone in your body, women should not take their prenatal vitamin within 3-4 hours of taking levothyroxine (Aleppo, 2015).

1.11.6.5 Complications of thyroid disease

Uncontrolled hyperthyroidism during pregnancy can lead to

- congestive heart failure
- preeclampsia—a dangerous rise in blood pressure in late pregnancy
- thyroid storm—a sudden, severe worsening of symptom
- miscarriage
- premature birth
- low birth weight

If a woman has Graves' disease or was treated for Graves' disease in the past with surgery or radioactive iodine, the TSI antibodies can still be present in the blood, even when thyroid levels are normal. The TSI antibodies she produces may travel across the placenta to the baby's bloodstream and stimulate the fetal thyroid. If the mother is being treated with antithyroid medications, hyperthyroidism in the baby is less likely because these medications also cross the placenta. Women who have had surgery or radioactive iodine treatment for Graves' disease should inform their health care provider, so the baby can be monitored for thyroid-related problems later in the pregnancy. Hyperthyroidism in a newborn can result in rapid heart rate, which can lead to heart failure; early closure of the soft spot in the skull; poor weight gain; irritability; and sometimes an enlarged thyroid that can press against the windpipe and interfere with breathing. Women with Graves' disease and their newborns should be closely monitored by their health care team (Niddk.nih,

2015).Some of the same problems caused by hyperthyroidism can occur with hypothyroidism. Uncontrolled hypothyroidism during pregnancy can lead to

- preeclampsia
- anemia—too few red blood cells in the body, which prevents the body from getting enough oxygen
- miscarriage
- low birth weight
- stillbirth
- congestive heart failure, rarely

Because thyroid hormones are crucial to fetal brain and nervous system development, uncontrolled hypothyroidism especially during the first trimester can affect the baby's growth and brain development (Niddk.nih, 2015).

1.11.7 Obesity and Weight Gain

Recent studies suggest that the heavier a woman is before she becomes pregnant, the greater her risk of pregnancy complications, including preeclampsia, GDM, stillbirth and cesarean delivery. Also, CDC research has shown that obesity during pregnancy is associated with increased use of health care and physician services, and longer hospital stays for delivery. Overweight and obese women who lose weight before pregnancy are likely to have healthier pregnancies (Cdc, 2015).

1.11.8 Infections

During pregnancy,baby is protected from many illnesses, like the common cold or a passing stomach bug. But some infections can be harmful to women and their baby, or both. Easy steps, such as hand washing, and avoiding certain foods, can help protect from some infections (Cdc, 2015).

1.11.9 Hyperemesis Gravidarum

Many women have some nausea or vomiting, or "morning sickness," particularly during the first 3 months of pregnancy. The cause of nausea and vomiting during pregnancy is believed to be rapidly rising blood levels of a hormone called HCG (human chorionic gonadotropin), which is released by the placenta. However, hyperemesis gravidarum

occurs when there is severe, persistent nausea and vomiting during pregnancy more extreme than "morning sickness." This can lead to weight loss and dehydration and may require intensive treatment (Cdc, 2015). Every pregnancy has some risk of problems. The causes can be conditions women already have or conditions develop. They also include being pregnant with more than one baby, previous problem pregnancies, or being over age 35. They can affect health and the health of baby. Examples of common conditions that can complicate a pregnancy include

- Heart disease
- High blood pressure
- Kidney problems
- Autoimmune disorders
- Sexually transmitted diseases
- Diabetes
- Cancer
- Infections

Other conditions that can make pregnancy risky can happen while women are pregnant for example, gestational diabetes and Rh incompatibility. Good prenatal care can help detect and treat them. Some discomforts, like nausea, back pain, and fatigue, are common during pregnancy (Cdc, 2015).

1.11.10 Urinary Tract Infection (UTI)

A UTI is a bacterial infection in the urinary tract. Women may have a UTI if they have—

- Pain or burning when use the bathroom.
- Fever, tiredness, or shakiness.
- An urge to use the bathroom often.
- Pressure in lower belly.
- Urine that smells bad or looks cloudy or reddish.
- Nausea or back pain.

Treatment with antibiotics to kill the infection will make it better, often in one or two days. Some women carry bacteria in their bladder without having symptoms. The health

care provider will likely test urine in early pregnancy to see if this is the case and treat with antibiotics if necessary (Cdc, 2015).

1.12 Maternal Mortality Condition of the World

Improving maternal health is one of the eight Millennium Development Goals (MDG) adopted at the 2000 Millennium Summit. The two targets for assessing progress in improving maternal health (MDG 5) are reducing the maternal mortality ratio (MMR) by three quarters between 1990 and 2015, and achieving universal access to reproductive health by 2015. With only five years left until the 2015 deadline to achieve the MDGs, closer examination of maternal mortality levels is needed to inform planning of reproductive health programmes and to guide advocacy efforts and research at the national level. These estimates are also needed at the international level, to inform decision-making concerning funding support for the achievement of MDG 5. To be useful for the latter purpose, the country estimates must be internationally comparable (Mengesha and Taye, 2014).

1.13 Maternal mortality in Bangladesh

Bangladesh was one of eleven countries that, when combined, were responsible for approximately 65% of maternal deaths around the world. Bangladesh has reduced maternal mortality by 40% over the last nine years. It is estimated that in Bangladesh maternal mortality ratio is at 194 per 100,000 live births dropping from 322 per 100,000 in 2001. The maternal mortality ratio in Bangladesh is among the highest in the world, about 600 deaths per 100,000 live births and recent studies conducted in Bangladesh suggest that the number of acute maternal morbidities may be as high as 67 episodes for every maternal death. Even in light of these alarming estimates, few published data exist on postpartum morbidity, experiences of illness during the puerperium, or local beliefs and customs relating to postpartum morbidity (Hossain *et al.*, 2014).

1.14 Importance of Awareness regarding pregnancy complications

Maternal morbidity and mortality could be prevented significantly if women and their families recognize obstetric danger signs and promptly seek health care. The commonest danger signs during pregnancy include severe vaginal bleeding, swollen hands/face and blurred vision. Key danger signs during labor and childbirth include severe vaginal bleeding, prolonged labor, convulsions, and retained placenta. Danger signs during the

postpartum period include severe bleeding following childbirth, loss of consciousness after childbirth, and fever. Raising awareness of pregnant women on the danger signs would improve early detection of problems and reduces the delay in deciding to seek obstetric care (Alemseged and Hailu, 2010).

CHAPTER 2
LITERATURE REVIEW

2.1 Risk and Predictors for Pregnancy-Related Complications in Women With Heart Disease

The physiological changes of pregnancy can result in cardiovascular complications in the mother, which in turn may have fetal implications. Prior studies have focused on specific cardiac lesions or identified univariate predictors. There is a need to refine the risk stratification of women with heart disease so they can receive appropriate obstetrical counseling and care. We examined the outcomes of 221 women with heart disease who underwent 276 pregnancies and received their obstetrical care at three Toronto hospitals from 1986 through 1994. Those who underwent therapeutic abortions were excluded. Among the study participants, there were 24 miscarriages and 252 completed pregnancies (pregnancies not ending in miscarriage). Maternal heart failure, arrhythmia, or stroke occurred in 45 completed pregnancies (18%). There were no maternal deaths. Poor maternal functional class or cyanosis, myocardial dysfunction, left heart obstruction, prior arrhythmia, and prior cardiac events were predictive of maternal cardiac complications. These predictors were incorporated into a point score that can be used to estimate the probability of a cardiac complication in the mother. The rate of cardiac complications for a patient with 0, 1, and >1 of the above factors was 3%, 30%, and 66%, respectively. Neonatal complications occurred in 42 completed pregnancies (17%). Neonatal events included death, respiratory distress syndrome (16), intraventricular hemorrhage (2), premature birth and small-for-gestational-age birth weight. Poor maternal functional class or cyanosis was predictive of neonatal events. Despite low maternal and neonatal mortality, pregnancy in women with heart disease is associated with significant cardiac and neonatal morbidity. The probability of maternal cardiac or neonatal events can be predicted from baseline characteristics of the mother (SM *et al.*, 1997).

2.2 Pregnancy complication and outcome among teenager

To evaluate the obstetrical complications and neonatal outcome of teenage pregnancies in comparison with older group. This study included 116 primigravida women aged 15-19 year as a case group & 116 rimigravida women aged 20-24 year as a control group admitted to labor ward during the period of study, all women received standared labor management including history & complete general & obstetric examination. Both groups were compared for the presence of any pregnancy complication & for the mode of delivery and Neonatal outcome also compared between the two groups. Teenage mothers

had a higher proportion (15.5%) of preterm deliveries compared to (4.3%) in the adult mothers and had higher proportion of low birth weight babies (19,8%) compared to adult mothers(6.89%) (Alwahab, 2011).

2.3 Gestational Diabetes: Infant and Maternal Complications of Pregnancy in Relation to Third-Trimester Glucose Tolerance in the Indians

A modified oral glucose tolerance test was done during the third trimester in 811 pregnancies in Pima Indian women over a 13-yr period, and maternal and fetal complications were documented. Diabetes was known to be present in 51 pregnancies. Among those who were not previously known to have diabetes, rates of perinatal mortality, macrosomia, toxemia, and cesarean section varied directly with glucose concentration, but congenital malformation and prematurity rates did not. Rates of all of these complications were higher in known diabetic women than in the remainder of the population. In addition to glucose concentrations, maternal weight and age were predictive of macrosomia and toxemia. Third-trimester glucosuria was found to be of very limited value as a screening procedure for gestational diabetes. In 233 women followed for 4–8 yr, the third-trimester glucose concentration was highly predictive of the subsequent incidence of diabetes (Pettitt *et al.*, 1980).

2.4 Pregnancy complications and birth outcomes of pregnant women with urinary tract infections and related drug treatments

Maternal urinary tract infections in pregnancy showed an association with a higher rate of preterm birth in previous studies. The aim of this study was to check this relationship, and in addition to evaluate the efficacy of recent medical treatments. The population-based large control (without any defects) data set of the Hungarian Case-Control Surveillance System of Congenital Abnormalities was evaluated. Of 38,151 newborn infants, 2188 (5.7%) had mothers with urinary tract infections during pregnancy, and 90% of these maternal diseases were prospectively and medically recorded. The prevalence of pre-eclampsia and polyhydramnios showed an association with urinary tract infections during pregnancy. Pregnant women with urinary tract infections in pregnancy had a somewhat shorter gestational age (0.1 week) and a higher proportion of preterm births (10.4% vs 9.1%). These differences were correlated with the severity of urinary tract infections. However, the preterm-inducing effect of maternal urinary tract infections is preventable by some antimicrobial drugs such as ampicillin, cefalexin and cotrimoxazole. In conclusion,

maternal urinary tract infections during pregnancy increase preeclampsia and polyhydramnios, and in addition the rate of preterm birth; however, the latter is preventable by appropriate drug treatments (Bánhidý *et al.*, 2007).

2.5 Prepregnancy dietary patterns and risk of developing hypertensive disorders of pregnancy: results from the Australian Longitudinal Study on Women's Health

Hypertensive disorders of pregnancy (HDPs), including gestational hypertension and preeclampsia, are common obstetric complications associated with adverse health outcomes for the mother and child. It remains unclear how dietary intake can influence HDP risk. We investigated associations between prepregnancy dietary patterns and risk of HDPs. We selected 3582 women participating in the Australian Longitudinal Study on Women's Health, which is an observational population-based study. Diet was assessed by using a validated 101-item food-frequency questionnaire in 2003, and factor analysis was used to identify dietary patterns. Generalized estimating equation models were used to estimate RRs (95% CIs) adjusted for dietary, reproductive, sociodemographic, and lifestyle factors. During 9y of follow-up of 3582 women, 305 women (8.5%) reported a first diagnosis of HDPs in 6149 pregnancies. We identified 4 dietary patterns labeled as meat, high-fat, and sugar; Mediterranean-style; fruit and low-fat dairy; and cooked vegetables. In the adjusted model, the meat, high-fat, and sugar, fruit and low-fat dairy, and cooked vegetable dietary patterns were not associated with HDP risk. The Mediterranean-style dietary pattern (characterized by vegetables, legumes, nuts, tofu, rice, pasta, rye bread, red wine, and fish) was inversely associated with risk of developing HDPs (quartile 4 compared with quartile 1: RR, 0.58; 95% CI, 0.42, 0.81). In this population-based study of Australian women, we observed an independent protective dose-response association between prepregnancy consumption of a Mediterranean-style dietary pattern and HDP risk. Additional studies are recommended to confirm our findings by prospectively examining whether the implementation of the Mediterranean-style dietary pattern before pregnancy has a role in the prevention of HDPs (Schoenaker *et al.*, 2015).

2.6 Pregnancy complications in women with polycystic ovary syndrome

The great majority of studies performed so far concerning women diagnosed with polycystic ovary syndrome (PCOS) have focused on diagnosis, menstrual cycle abnormalities, hirsutism and infertility. Although progress has been made in developing methods for achieving a pregnancy and reducing multiple gestations in women with PCOS, little attention has been paid to pregnancy complications and subsequent child outcomes. This review aims to summarize current knowledge regarding the clinical and pathophysiological features of pregnancy and children in women with PCOS. Women with PCOS exhibit a clinically significant increased risk of pregnancy complications compared with controls. Data which were not adjusted for BMI or other confounders demonstrated in PCOS a 3–4-fold increased risk of pregnancy-induced hypertension and preeclampsia, a 3-fold increased risk of gestational diabetes and 2-fold higher chance for premature delivery. Features characteristic of PCOS, such as hyperandrogenism, obesity, insulin resistance and metabolic abnormalities, may contribute to the increased risk of obstetric and neonatal complications. Limited available data suggest that offspring of women with PCOS have an increased risk for future metabolic and reproductive dysfunction. Underlying pathophysiological mechanisms of pregnancy complications along with its association with health of offspring remain uncertain. To date, the strategies for prevention and management of pregnancy complications in women with PCOS, and whether long-term health of these women is influenced, and to what extent, by pregnancy and/or pregnancy complications, remain to be elucidated. Women with PCOS show an increased risk of pregnancy complications. Heterogeneous aetiological factors involved in PCOS and associated co-morbidities may all be involved in compromised pregnancy and child outcomes. In women with PCOS, a possible relationship with genetic, environmental, clinical and biochemical factors involved in this complex condition, as well as with pregnancy complications and long-term health for both mother and child, remains to be established (Boomsma, Fauser and Macklon, 2008).

2.7 Preeclampsia: pathophysiology, diagnosis, and management

The incidence of preeclampsia ranges from 3% to 7% for nulliparas and 1% to 3% for multiparas. Preeclampsia is a major cause of maternal mortality and morbidity, preterm birth, perinatal death, and intrauterine growth restriction. Unfortunately, the pathophysiology of this multisystem disorder, characterized by abnormal vascular

response to placentation, is still unclear. Despite great polymorphism of the disease, the criteria for preeclampsia have not changed over the past decade (systolic blood pressure >140 mmHg or diastolic blood pressure \geq 90 mmHg and 24-hour proteinuria \geq 0.3 g). Clinical features and laboratory abnormalities define and determine the severity of preeclampsia. Delivery is the only curative treatment for preeclampsia. Multidisciplinary management, involving an obstetrician, anesthetist, and pediatrician, is carried out with consideration of the maternal risks due to continued pregnancy and the fetal risks associated with induced preterm delivery. Screening women at high risk and preventing recurrences are key issues in the management of preeclampsia (Ayoubi, 2011).

2.8 Anaemia in pregnancy: A survey of pregnant women in Abeokuta, Nigeria

Anaemia in pregnancy is a common problem in most developing countries and a major cause of morbidity and mortality especially in malaria endemic areas. In pregnancy, anaemia has a significant impact on the health of the foetus as well as that of the mother. 20% of maternal deaths in Africa have been attributed to anaemia. This study was therefore carried out to determine the prevalence of anaemia among pregnant women receiving antenatal care in two hospitals and a traditional birth home in order to obtain a broader prevalence data. Pregnant women were enrolled in the study at their first antenatal visit and were monitored through pregnancy for anaemia. Packed cell volume (PCV) was used to assess level of anaemia; Questionnaires were also administered to obtain demographic information. Three hundred and sixty five (76.5%) of the women were anaemic at one trimester of pregnancy or another. Anaemia were more prevalent among primigravidae (80.6%) than the multigravidae (74.5%). Two hundred and eleven women (57.8%) had moderate anaemia while 147 (40.3%) had mild anaemia and 7 (1.9%) were severely anaemic (71.4%) of which were primigravidae). All severely anaemic women were under 30 years old. Women attending TBH for antenatal care were found to be more anaemic (81.2%) (Even at various trimesters of pregnancy) than those attending the hospitals (72.5%) ($P < 0.05$). However, in all the antenatal centers more women were anaemic in the 2nd trimester of pregnancy. Forty-seven (9.8%) of the enrolled women booked for antenatal care in the first trimester, while 303 (63.5%) booked in the second trimester and 127 (26.6%) in the 3rd trimester of their pregnancies. 62.5% of these women were already anaemic at the time of antenatal booking, with a higher prevalence among the primigravidae (69.7%) ($P < 0.05$). Absence of symptoms of ill health was the major reason

for late antenatal booking. Anaemia was higher among unemployed women and those with sickle cell traits (Idowu, Sotiloye and Mafiana, 2005).

2.9 Anemia in pregnancy in India

Anemia is one of the most commonly encountered medical disorders during pregnancy. In developing countries it is a cause of serious concern as, besides many other adverse effects on the mother and the fetus it contributes significantly high maternal mortality. According to world Health Organization estimates, up to 56% of all women living in developing countries are anemic . In India, National Family Health Survey -2 in 1998 to 99 shows that 54% of women in rural and 46% women in urban areas are anemics. Iron deficiency anemia (IDA) is the commonest type of anemia in pregnancy. As most women start their pregnancy with anemia or low iron stores, so prevention should start even before pregnancy. The Ministry of Health, Government of India has now recommended intake of 100 mg of elemental iron with 500 mg of folic acid in the second half of pregnancy for a period of at least 100 days. Women who receive daily antenatal iron supplementation are less likely to have iron deficiency anemia at term. This review is an effort to appraise about the various types of anemia in pregnancy, their implications on the maternal and fetal outcome, and long-term effects on the woman (Sharma and Shankar, 2010).

2.10 Hypothyroidism and Pregnancy

Hypothyroidism is a common endocrine disorder affecting women of reproductive age. On a global level, iodine deficiency is still the most common cause of hypothyroidism. Also genetic variations, in particular SNP rs4704397 in the PDE8B gene, are responsible for a significant proportion of TSH variations. Untreated hypothyroidism has significant adverse effects on pregnancy and fetal outcome. Most international guidelines suggest targeted thyroid testing in pregnant women with risk factors for thyroid disturbances. In a case-control study, an association between homozygous A/A as well as homozygous G/G carriers of SNP as 4704397 in PDE8B and recurrent miscarriage was found. The explanation for this association is unknown. In a nationwide survey, all guidelines for thyroid testing and management of hypothyroidism during pregnancy in Sweden were collected and compared with international guidelines. The local guidelines were variable and poorly compliant with the international guidelines. In a follow-up in one district, 5,254 pregnant women were included for subsequent review of their medical reports. We found a targeted thyroid testing rate of 20.1% in clinical practice, with an overall

frequency of women with trimester-specific elevated TSH of 18.5%. More disturbingly, half of the women who were on levothyroxine treatment at the time of conception had an elevated TSH level at thyroid testing. In a subsequent cohort study of the 5,254 women, we found the prevalence of trimester-specific elevated TSH and overt hypothyroidism to be equal in targeted thyroid tested and untested women. In a cross-sectional study, a median urinary iodine concentration (UIC) of 98 µg/l was found in the study population. According to WHO/UNICEF/IGN criteria, the population-based median UIC during pregnancy should be 150-249 µg/l. In conclusion, genetic variations may contribute to adverse pregnancy outcomes. In clinical practice, thyroid testing and the management of hypothyroidism during pregnancy is unsatisfactory, regarding the whole chain from development of local guidelines to their implementation and to targeted thyroid testing. Moreover, our results indicate insufficient iodine status in the pregnant population of Sweden (Michaela, 2015).

2.11 European Thyroid Association Guidelines for the Management of Subclinical Hypothyroidism in pregnancy and in children

This guideline has been produced as the official statement of the European Thyroid Association guideline committee. Subclinical hypothyroidism (SCH) in pregnancy is defined as a thyroid-stimulating hormone (TSH) level above the pregnancy-related reference range with a normal serum thyroxine concentration. Isolated hypothyroxinaemia (defined as a thyroxine level below the 2.5th centile of the pregnancy-related reference range with a normal TSH level) is also recognized in pregnancy. In the majority of SCH the cause is autoimmune thyroiditis but may also be due to iodine deficiency. The cause of isolated hypothyroxinaemia is usually not apparent, but iodine deficiency may be a factor. SCH and isolated hypothyroxinaemia are both associated with adverse obstetric outcomes. Levothyroxine therapy may ameliorate some of these with SCH but not in isolated hypothyroxinaemia. SCH and isolated hypothyroxinaemia are both associated with neuro-intellectual impairment of the child, but there is no evidence that maternal levothyroxine therapy improves this outcome. Targeted antenatal screening for thyroid function will miss a substantial percentage of women with thyroid dysfunction. In children SCH (serum TSH concentration >5.5-10 mU/l) normalizes in >70% and persists in the majority of the remaining patients over the subsequent 5 years, but rarely worsens. There is a lack of studies examining the impact of SCH on the neuropsychological development of children under the age of 3 years. In older children, the evidence for an association between SCH

and impaired neuropsychological development is inconsistent. Good quality studies examining the effect of treatment of SCH in children are lacking (Lazarus *et al.*, 2014).

2.12 Risk of preeclampsia in first and subsequent pregnancies

To investigate whether preeclampsia is more common in first pregnancies solely because fewer affected women, who presumably have a higher risk of recurrence, go on to have subsequent pregnancies. The risk of preeclampsia was 4.1% in the first pregnancy and 1.7% in later pregnancies overall. However, the risk was 14.7% in the second pregnancy for women who had had preeclampsia in their first pregnancy and 31.9% for women who had had preeclampsia in the previous two pregnancies. The risk for multiparous women without a history of preeclampsia was around 1%. The incidence of preeclampsia associated with delivery before 34 weeks' gestation was 0.42% in primiparous women, 0.11% in multiparous women without a history of preeclampsia, and 6.8% and 12.5% in women who had had one or two previous pregnancies affected, respectively. The proportion of women who went on to have a further pregnancy was 4-5% lower after having a pregnancy with any preeclampsia but over 10% lower if preeclampsia was associated with very preterm delivery. The estimated risk of preeclampsia in primiparous women did not change with standardization for pregnancy rates. Having preeclampsia in one pregnancy is a poor predictor of subsequent pregnancy but a strong predictor for recurrence of preeclampsia in future gestations. The lower overall risk of preeclampsia among parous women was not explained by fewer conceptions among women who had had preeclampsia in a previous gestation. Early onset preeclampsia might be associated with a reduced likelihood of a future pregnancy and with more recurrences than late onset preeclampsia when there are further pregnancies. Findings are consistent with the existence of two distinct conditions: a severe recurrent early onset type affected by chronic factors, genetic or environmental, and a milder sporadic form affected by transient factors (Hernandez, Toh and Cnattingius, 2009).

2.13 Awareness of danger signs of obstetric complications among pregnant women attending antenatal care in East Wollega, Ethiopia

A quantitative, descriptive and cross sectional study was conducted in four (4) health care facilities to determine whether pregnant women attending antenatal care are aware of danger signs of obstetric complications. The objectives of the study were to assess awareness of danger signs of obstetric complications and to associate demographic and

obstetric factors with awareness of danger signs of obstetric complications among pregnant women attending antenatal care in Eastern Wollega zone. Data was collected by means of structured questionnaire from 384 pregnant women attending antenatal care in the 4 health facilities and analysed using the Statistical Package for Social Sciences (SPSS) 16 computer program. The findings revealed that the proportion of women who were aware of danger signs of obstetric complications was inadequate (Kassa, 2015).

2.14 Women's Awareness of Danger Signs of Obstetrics Complications

An exploratory descriptive study was conducted at two Maternal and Child Health Centers (MCH) selected randomly in Albeheira Governorate to assess women's awareness of danger signs of obstetric complications. The study subjects consisted of 200 pregnant women attending the previously mentioned setting for tetanus toxoid immunization during pregnancy was enrolled in the study (100 from each). A structured interview schedule was developed by the researcher after reviewing of the relevant literature and used to collect the necessary data. Socio-demographic data such as age, level of education, occupation and number of family members etc. Obstetric characteristics such as gravidity, parity, abortions, antenatal follow up and presence of any complications etc. questions related to knowledge about signs of obstetric complications, complaining of any obstetric complication, what to do if the woman has any of these signs. The study revealed that slightly more than one quarter of the study subjects (26.5 %) were unaware of obstetric danger signs compared to almost the same proportion (26.0 %) that had good awareness about such signs, while 47.5 % of the study subjects exhibited fair awareness. Lack of awareness about obstetric danger signs was related younger age, low level of education, gravidity and parity, previous experiences with any obstetric complications and lack of antenatal care. This study reflects the need for strategic plan to increase the awareness to shape health seeking behavior of the public related to signs of obstetric complications (Pembe *et al.*, 2009).

2.15 Maternal Awareness of Pregnancy Normal and Abnormal Signs: An Exploratory Descriptive Study

Most pregnant women complain to some degree of minor discomfort. These discomforts are not serious in themselves, but their presence detracts from the mother feeling of comfort and wellbeing. Maternal morbidity and mortality could be prevented significantly if women recognize abnormal signs and promptly seek health care. The main aim of this

study was to evaluate Jordanian women's awareness of pregnancy normal and abnormal signs. This was a descriptive exploratory study. 340 pregnant women recruited from two MCH centers, were selected randomly between March and June 2011, which took place in the north region of Jordan. A structured interview questionnaire form, consisting mostly of closed questions, was developed to collect needed data. The study revealed a good degree of awareness about normal signs associated with pregnancy, and to a less extent about abnormal signs. The commonest complaints of the studied group during their pregnancy were nausea and vomiting, fatigue, back pain, heartburn and vaginal discharge. The use of home remedies for these signs was high. The study recommended the need to include information about abnormal signs of pregnancy by health care providers, particularly the maternity nurses and midwives as a routine care during antenatal visits (Amasha, 2013).

2.16 Awareness of Pregnant Women Regarding Pregnancy and Safe Delivery in Selected Rural Area

This community based cross sectional descriptive study was carried out at Ullapara Upazila, Sirajgonj District among 120 pregnant women in a rural community. Non probability sampling technique and pretested semistructured questionnaire was used to collect data. Majority of the respondents (65 %) were between 20-34 years of age group. Most of the respondents were housewives (85%). Majority (65%) of the respondents received antenatal care, and among them only 5% respondents received complete antenatal care and 25% received postnatal care. Majority (75%) of the respondents had not received postnatal care (PNC). Majority (85 %) of the respondent planning their delivery in the home and 15% respondent planning their delivery in the delivery center. About 50% of the respondents got information regarding pregnancy and delivery care through health workers. Besides 35% of respondents got information through doctor. Moreover 50% participants knew about the obligatory indications and 50% did not. Sixty percent participants did not know follow-up regarding PNC. Only 25% received PNC. Besides 60% participants did not know about warning sign during delivery while 40% faced complications during their last delivery. About 55% participants did not have knowledge regarding baby care. Moreover 55% participants did not take contraceptive method after their delivery. Attention should be given to improve education level and employment status of the people, as well as supply of all of the necessary equipment and EOC should also be incorporated. Regular awareness program may have to be conducted; Government and non-government organizations should be integrated more in pregnancy issue and post-

delivery care. Development and strengthen behavioral change of communications and activities in order to create awareness about pregnant women are also important indeed (Azmol *et al.*, 2014).

Aim and Objectives

The aims and objectives of this study were to-

- To find out respondents socio demographic data
- To identify awareness of danger signs regarding pregnancy complications
- To find out prevalence and current pregnancy complications

Significance of the Study

Worldwide, about 287,000 women die from pregnancy and childbirth related complications in 2010. It is estimated to be about 99 percent of these deaths occur in Sub-Saharan Africa. According to World Health Organization (WHO), maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental causes. Maternal death could be prevented if action is taken early and promptly. Most countries within Sub-Saharan region have high rates of maternal mortality for example Tanzania stands at a rate of 454 deaths per 100,000 live birth. The major complications that account for 80 percent of all maternal deaths are severe bleeding, infections, high blood pressure during pregnancy, obstructed labor and unsafe abortion. Women are expected to receive health education about pregnancy including outcomes, danger signs during pregnancy, nutrition and family planning as well as other services when they attend clinic for antenatal care. However other women do not attend antenatal clinic and they may receive the information about danger signs through media or close friends/relatives (Mengesha and Taye, 2014).

Bangladesh has a high maternal mortality ratio, with 320 deaths per 100,000 births. This means there are about 11,000 to 12,000 women dying from pregnancy or childbirth complications every year in Bangladesh. And because maternal and newborn health is inextricably linked, of those women who die, only one in four of their babies will survive their first week of life. Moreover, a malnourished mother is very likely to give birth to a low birth weight baby. Bangladesh has one of the world's highest rates of adolescent motherhood, based on the proportion of women younger than 20 giving birth every year. One in three teenage girls in Bangladesh is already a mother. Another 5 per

cent are pregnant with their first child .Maternal mortality for adolescents is double the national figure. This Study will help in the efforts of reducing maternal and child morbidities and mortalities by increasing awareness among pregnant women which also help to reduce the maternal mortality ratio in the country (UNICEF, 2001).

CHAPTER 3

METHODOLOGY

3.1 Study Area

The study of Complication during pregnancy was conducted in different areas of Bangladesh which was listed below-

- Dhaka Paediatric Neonatal and General Hospital, House-4/4-A,Block-E,Lalmatia, Dhaka.
- Bangabandhu Sheikh Mujib Medical University,Shahbagh Rd 1000 Dhaka, Bangladesh.
- Surjer Hashi Clinic, Aftabnagar Main Road, Dhaka, Bangladesh.
- Surjer Hashi Clinic, South Kafrul, Dhaka cantonment, Dhaka, Bangladesh.
- Dhaka Medical College
- Bangabandhu Sheikh Mujib Medical University
- Lab Aid Hospital
- Central Hospital
- Shaheed Suhrawardy Medical College

3.2 Total number of Respondent

Data was collected from 300 pregnant women.

3.3 Inclusion Criteria of Respondent

Pregnant women with greater than 34 weeks of pregnancy period

3.4 Exclusion Criteria

Unwilling to participate or unable to comply with protocol requirements

3.5 Procedure

For collecting data a questionnaire was prepared according to required information of type of complication, awareness, treatment pattern and medication taken by the pregnant women. The collected data were analyzed with the help of Microsoft Office Excel and filtered out accordingly for analysis. Some graphical representations were made from those analysis statuses.

CHAPTER 4

RESULTS

4.1 Age Distribution

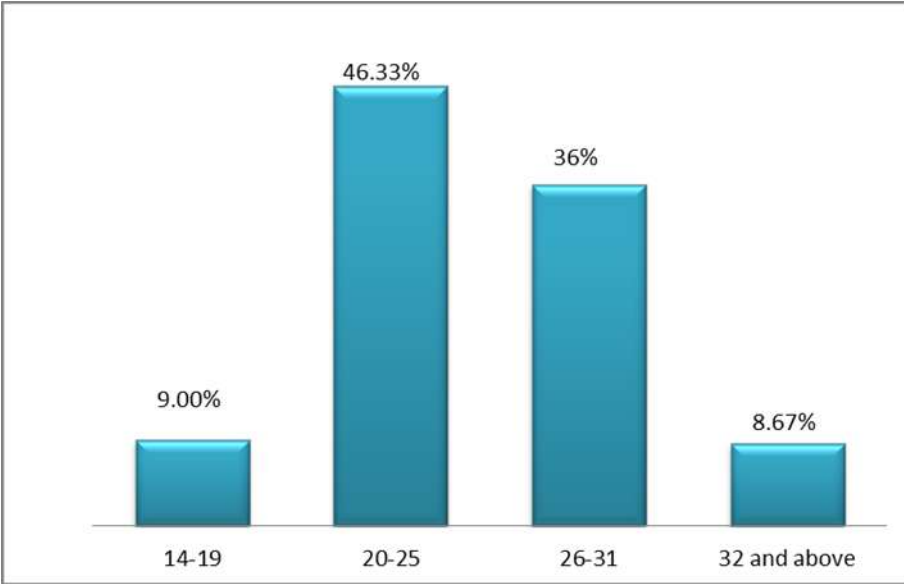


Figure 4.1: Age distribution (by year) among respondents

In this study, among 300 pregnant women in which the highest number of respondent were found within age group of 20-25 years (46.33%) where 9% were below 20 years, 36% were within 26 to 31 years and about 8.67% were above 32 years.

4.2 Educational Status of the respondents

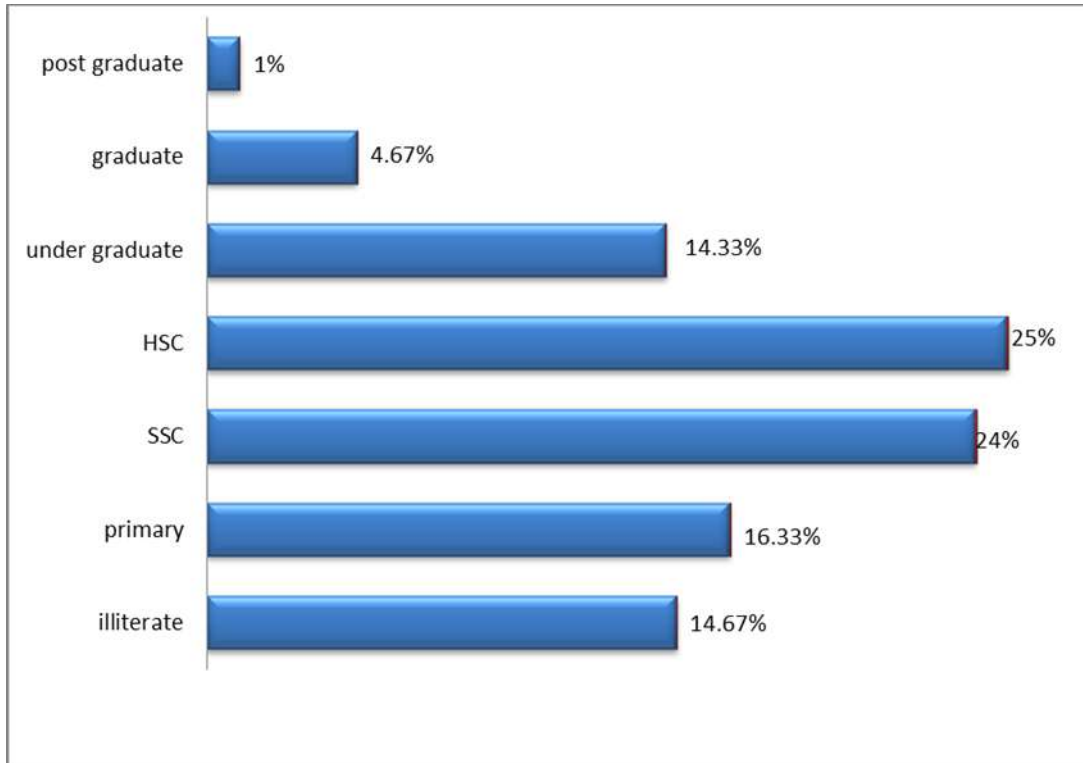


Figure 4.2: Percentage of the Educational status of sample population

The recorded data shows that 14.67% were illiterate or they had no schooling, 16.33% passed primary, 24% passed SSC, 25% passed HSC, 14.33% passed under graduate, 4.67% passed graduate and 1% were post graduate.

4.3 Obstetric history of respondents

We calculated the total obstetric history of our sample population with the abnormality they had during and before pregnancy. The total gravida or number of total pregnancy of the women is given in figure.

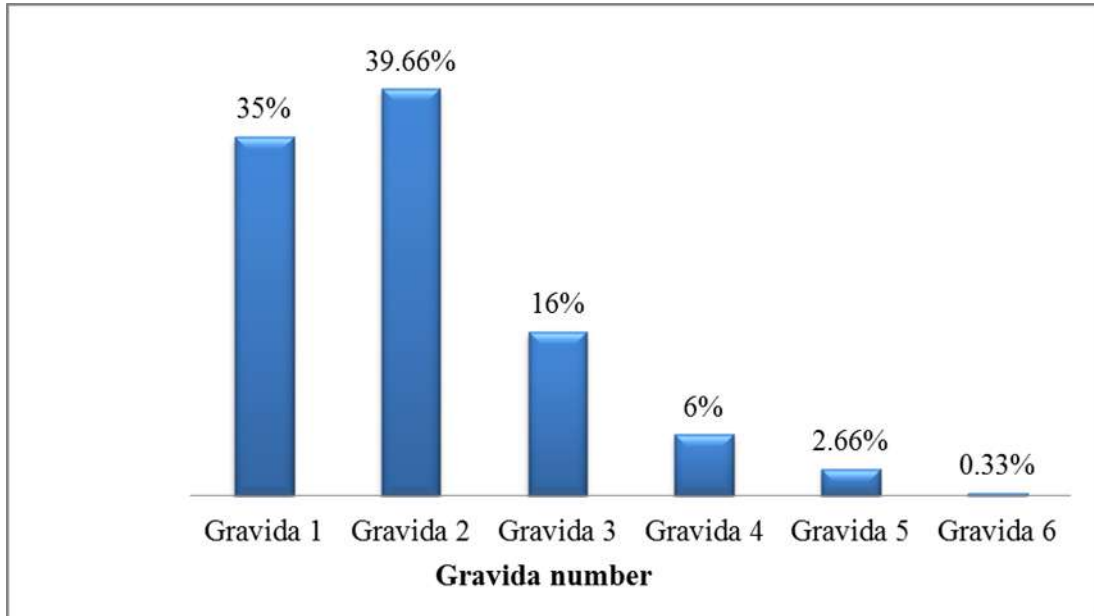


Figure 4.3: Total number of pregnancy in sample women

In our recorded data maximum women had in their second (39.66%) gravida. The proportion of others were first gravida (35%), gravida 3 (16%), gravida 4 (6%), gravida 5 (2.66%), gravida 6 (0.33%). We have also shown the abnormalities that the sample women faced before or during pregnancy in figure 4.5. Abortion occurred in 5.66%, miscarriage 8%, ectopic pregnancy 0.33%, stillbirth 5.66% and convulsion did not find which was shown below:

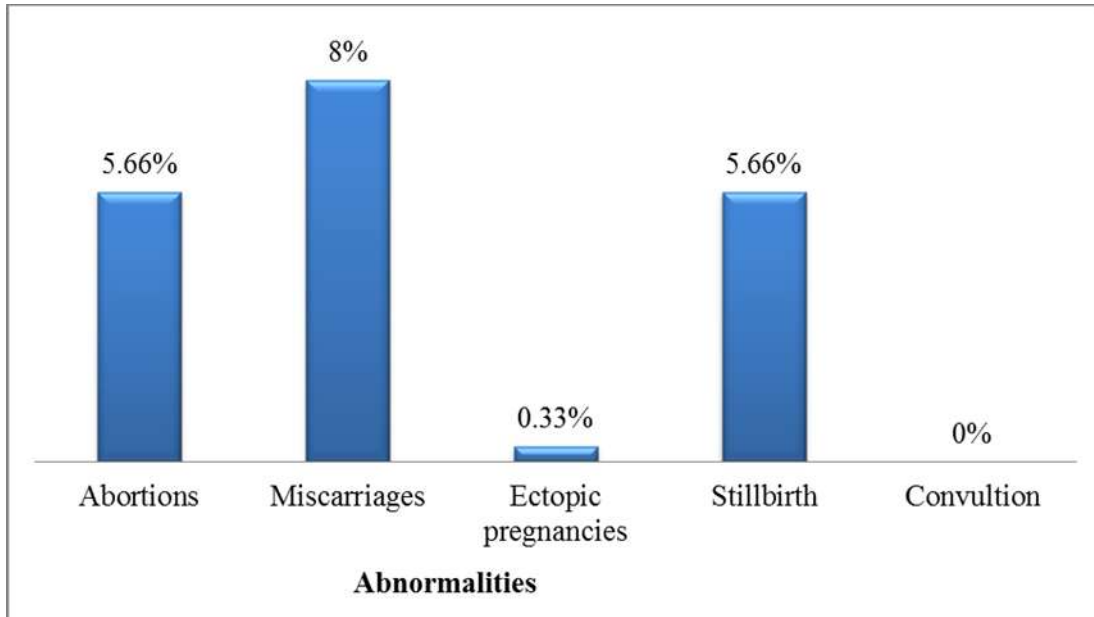


Figure 4.5: Percentages of pregnancy abnormalities in sample population

4.4 Consultation with doctor for improving health before pregnancy

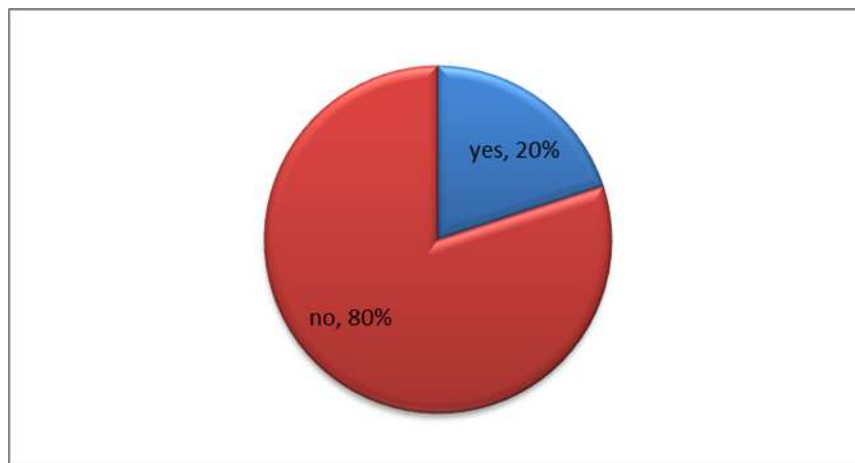


Figure 4.6: Percentage of improving health before pregnancy by consulting a doctor

Majority of the respondent (80%) did not consult any doctor to improve their health before pregnancy while a little portion of the respondent (20%) did it.

4.5 Taking multivitamin before being pregnant

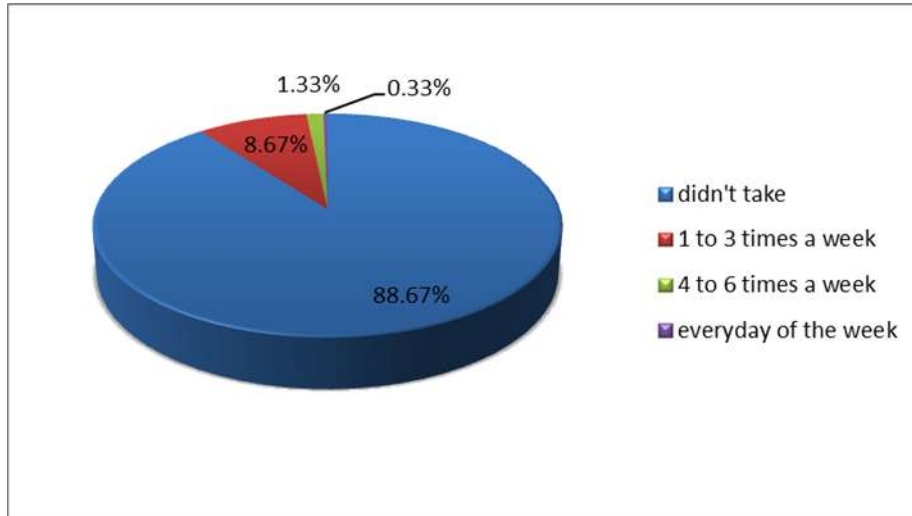


Figure 4.7: Percentage of taking multivitamin before pregnancy

Most of the respondent (88.67%) did not take multivitamin before being pregnant, at the same time only 8.67% took multivitamin 1 to 3 times a week or 4 to 6 times (1.33%) a week.

4.6 Respondents Occupation

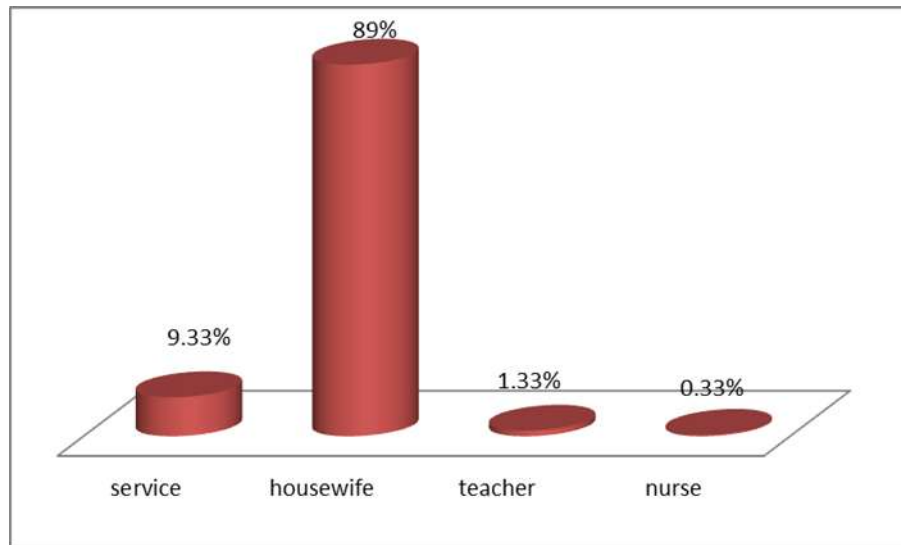


Figure 4.6: Respondents occupational status

Among 300 respondent most of them were housewife (89%), others prominent occupation were service (9.33%), teacher (1.33%) and nurse (0.33%).

4.7 Chemical exposer of the respondents

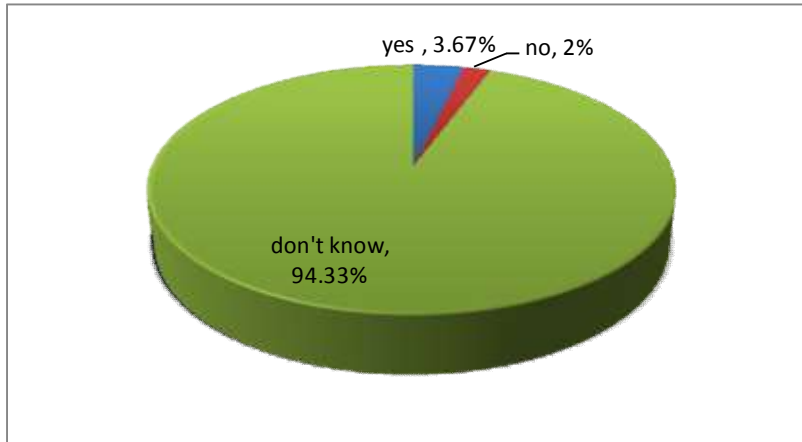


Figure 4.7: Percentage of chemical exposer of the respondent

We found that about 94.33% respondent did not know about any chemical name they may be exposed in their working areas in which only few of them (3.67%) knew it.

4.8 Knowing about rubella virus and vaccination

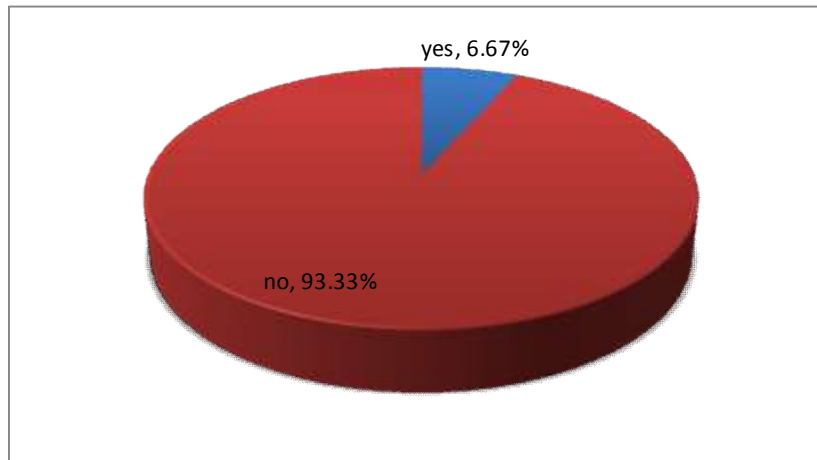


Figure 4.8: Respondents knowledge about rubella virus

Among 300 respondent 93% were not know about rubella virus and did not take any vaccine as a preventive purpose during pregnancy period.

4.9 Awareness of warning signs of pregnancy

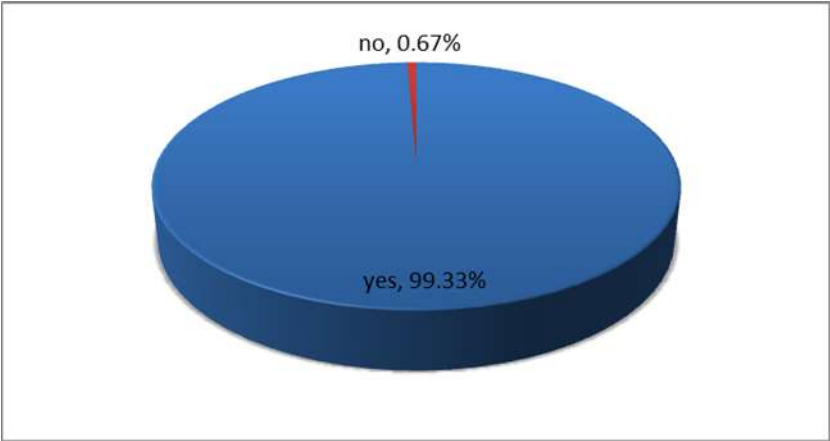


Figure 4.9: Respondents awareness of warning signs of pregnancy

From the recorded data we found that majority of the(99.33%) pregnant women were aware of at least one warning signs of pregnancy and only 0.67% did not aware of these signs.

4.10 Warning signs of pregnancy

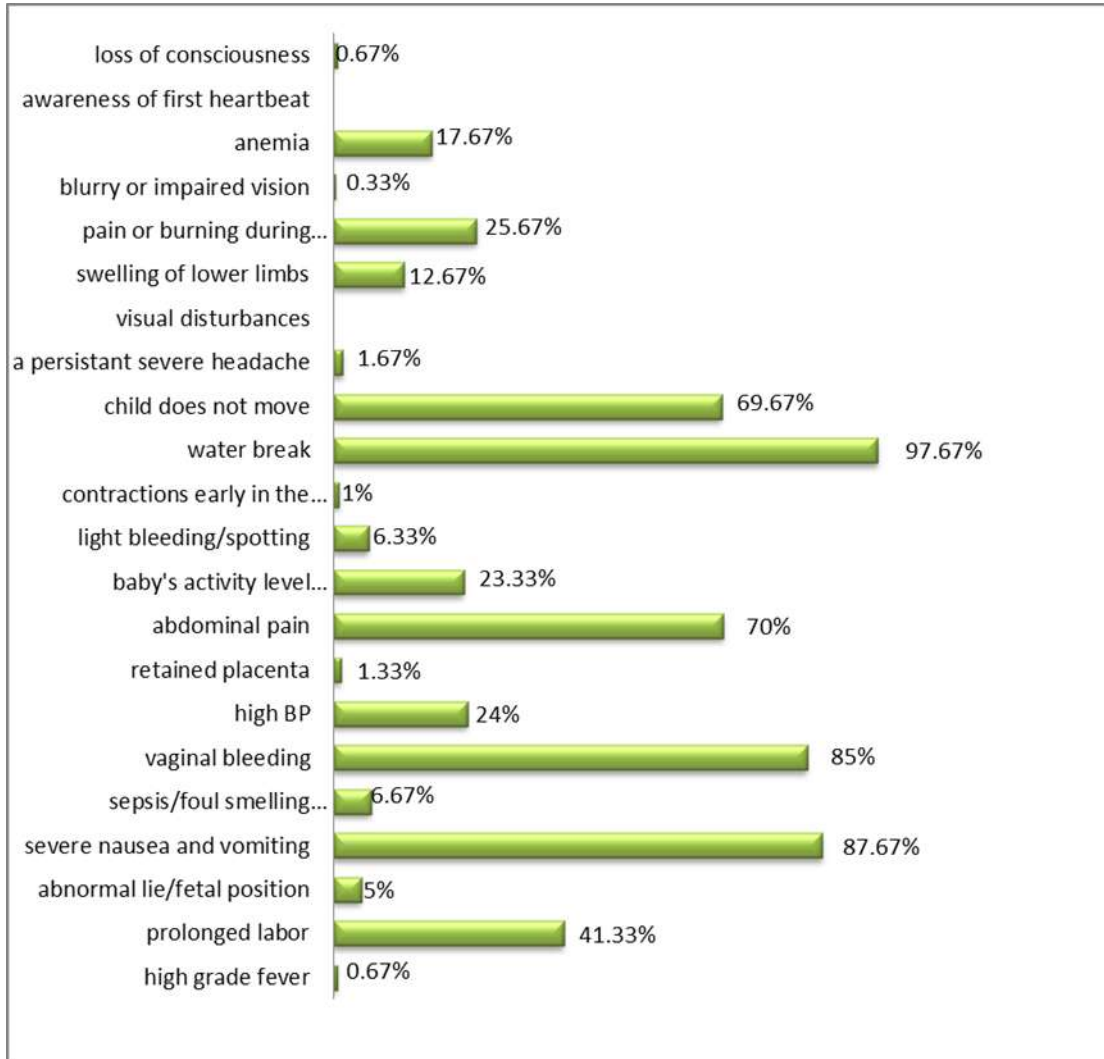


Figure 4.10: Percentage of Warning signs of pregnancy

About 99.33% respondent knew about warning signs of pregnancy and we found that 97.67% knew about water break as a warning sign during pregnancy. Others warning signs most of the respondents knew that were severe nausea and vomiting(87.67%), vaginal bleeding (85%), abdominal pain (70%),child does not move (69.67%), prolonged labor (41.33%). This data shows that most of the respondent were aware about at least one of the warning signs of pregnancy which were most important.

4.11 Aware of danger signs during pregnancy

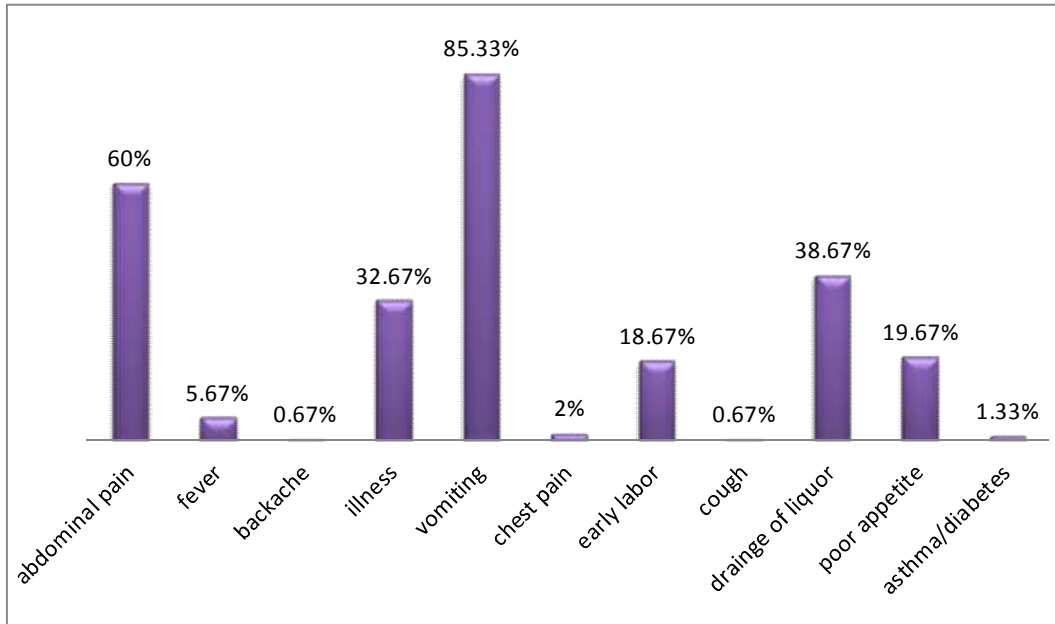


Figure 4.11: Respondents awareness of danger sign during pregnancy

As recorded data shows that among 300 pregnant women 85.33% of them were aware of vomiting as a danger sign. Others danger signs known by the respondent include abdominal pain (60%), illness (32.67%), drainage of liquor (38.67%), poor appetite (19.67%), early labor (18.67%) which were most prominent among the respondent.

4.12 Source of information

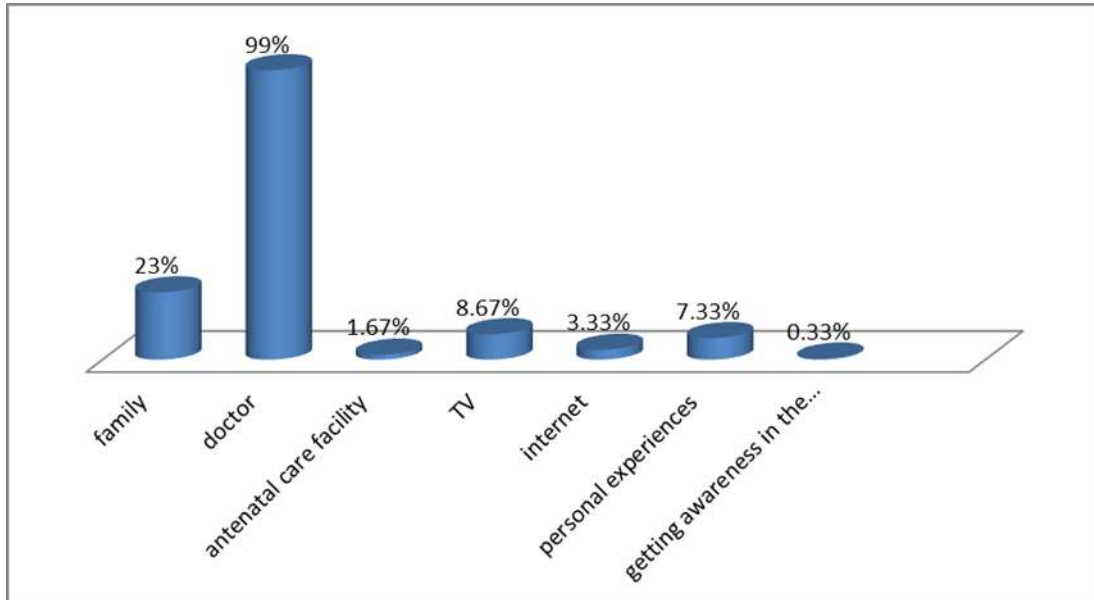


Figure 4.12: Percentage of source of information

Majority of respondents knew information about the obstetric danger sign from doctor (99%) and others sources were family (23%), TV (4.67%), personal experiences (7.33%), internet (3.33%).

4.13 Time of getting information

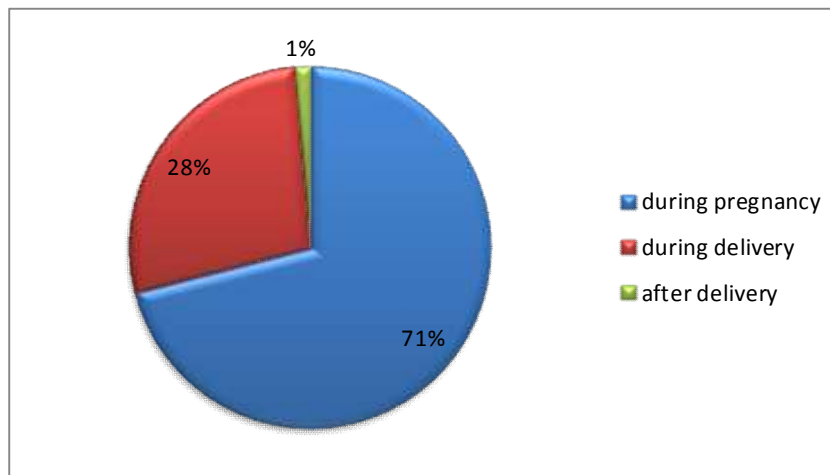


Figure 4.13: Respondents time of getting information

About 81% of the respondent knew about the warning signs of pregnancy during their pregnancy period where 31.33% knew it during delivery period and 1.67% knew these sigs after delivery.

4.14 Providing information during antenatal visit

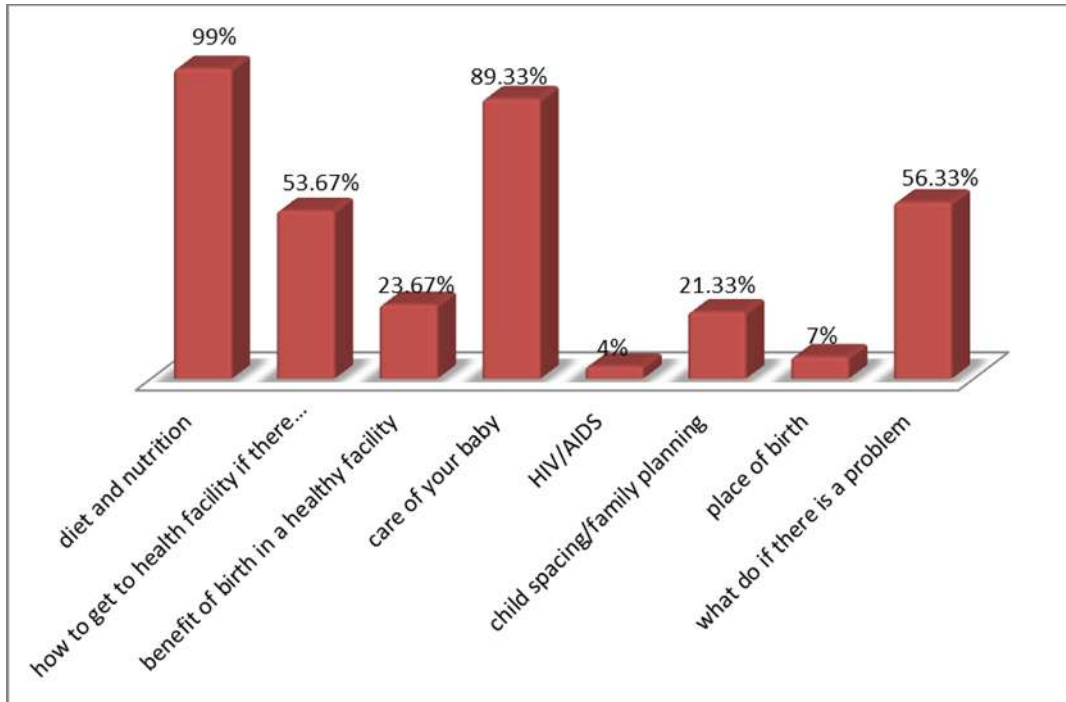


Figure 4.14: Information provided during antenatal visit

At antenatal visit with the health care provider about 99% respondents were provided information about diet and nutrition. Other information which were provided by the health care provider were care of baby (89.33%), getting health facility where there were an emergency (53.67%), what to do if there is a problem (56.33%).

4.15 Quality of antenatal care

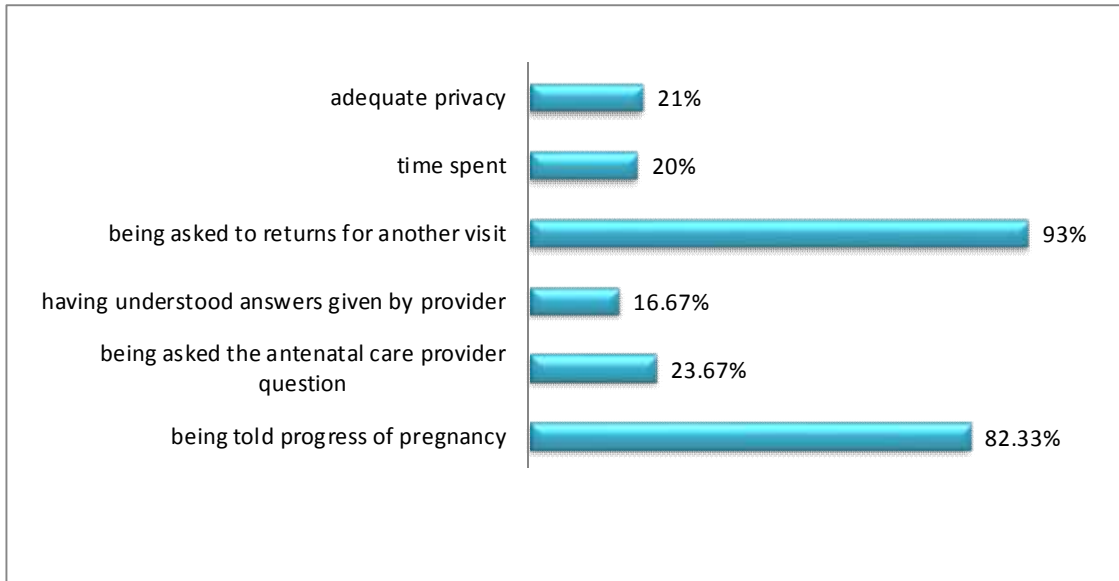


Figure 4.15: Quality of antenatal care among sample population

About 93% of respondent were asked to return for another visit when they communicate with health workers during antenatal visit. During their visit they also told about progress of pregnancy (82.33%) and about 23.67% respondent asked the care provider question regarding their problem.

4.16 Consciousness about abortifacient foods

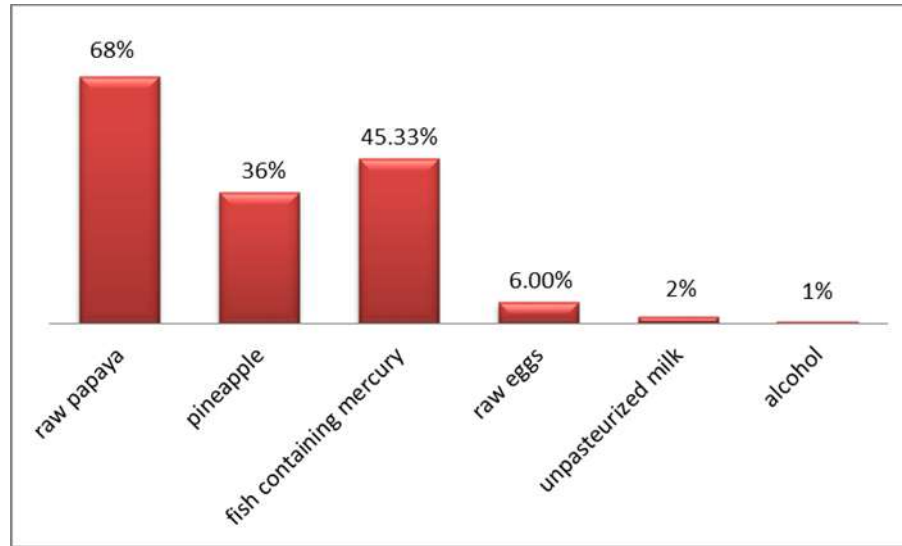


Figure 4.16: Respondents knowledge about abortifacient foods

Among 300 of the respondent,68% knew about raw papaya as an abortefacient food which may create any harmful effect during pregnancy. They also knew about these abortefacient foods fish containing mercury (45.33%), pineapple (36%), raw eggs (6%) and unpasteurized milk(2%).none of them have mentioned caffeine, uncooked meat, soft cheese, unwashed vegetables as an abortifacient foods.

4.17 Types of Medical problems during pregnancy and current condition

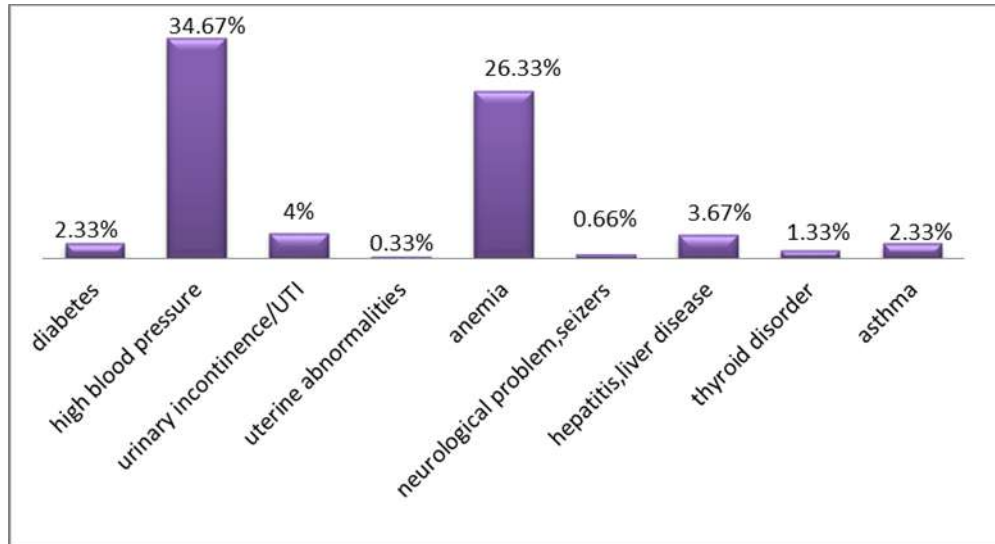


Figure 4.17 : Types of medical problems during pregnancy

The proportion of the pregnant women who developed medical complications among the entire sample is given in figure. We found 230(76.66%) women with various pregnancy related complications and 70(23.33%) women without any complications. We also found most prevailed complications in our respondents were high blood pressure and preeclampsia (34.67%), anemia (26.33%), urinary incontinence or UTI (4%). Few women were facing problems with diabetes (2.33%), 3.67% with hepatitis or liver disease, 2.33% with asthma. Women with other medical problems were insignificant. When asked whether they had experienced any danger signs of obstetric complications during the current pregnancy, the majority of the respondents 75.67% indicated that they had.

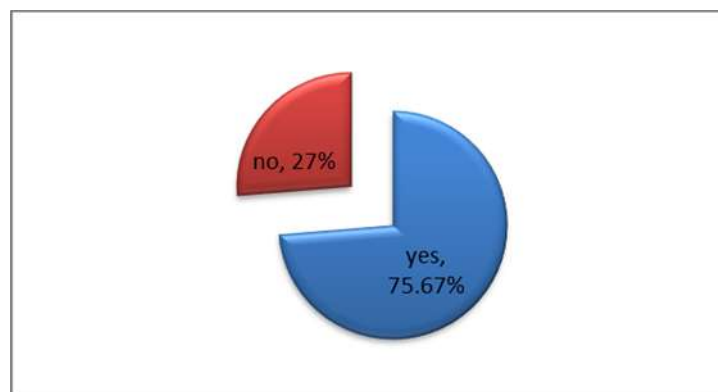


Figure 4.18: Respondents medical problems in current pregnancy

4.18 Growth Status of the baby

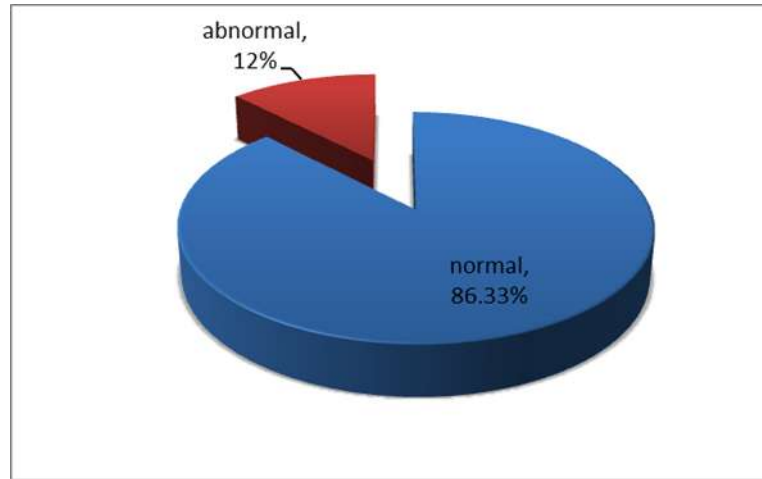


Figure 4.19: Percentage of growth status of the baby

Babies with the normal growth were 86.33% and growth of babies that affected by the complications were 13.66%.

4.19 Type of abnormality of the growth of the baby

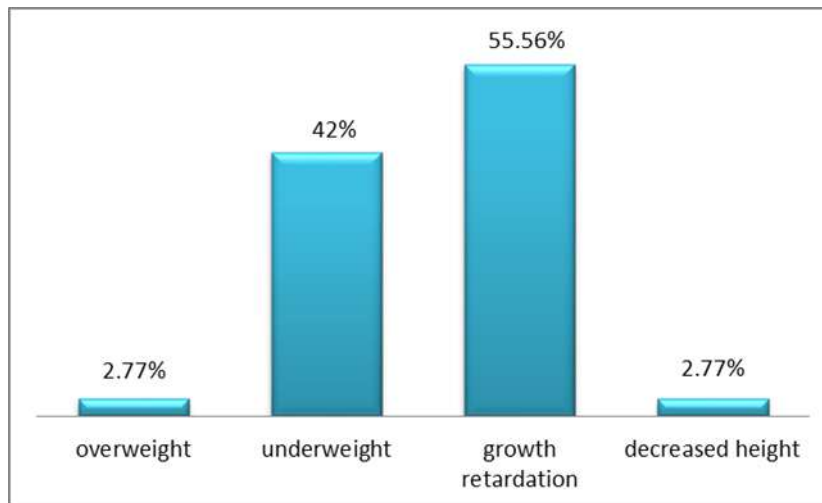


Figure 4.20: Type of abnormality of the growth of the baby

Our recorded data shows that about 55.56% baby of the respondent shows growth retardation as an abnormality during their pregnancy period. Other abnormality which were shown include underweight (42%), overweight (2.77%) and decreased height (2.77%).

4.20 Medication of the respondents during pregnancy

Table 4.1: Medication of the respondents

Sample population status	Medications
Sample population without any complications	Anti inflammatory drugs, Proton pump inhibitors, Pain killer, Antibiotics, Vitamin tablets and supplement, Calcium, Folic acid
Patients with Hypertension	Methyldopa, Hartsol solution, Nefidipine
Patients with Preeclampsia	Hartsol solution, Nefidipine, Magnesium sulfate
Patients with Anemia	Iron supplement, Folic acid supplement, calcium
Patients with Diabetes	Insulin
Patients with Hepatitis	Anti retroviral drug, Antibiotic
Patients with Asthma	Zafirlucast, Lukotrine inhibitors, Inhaled corticosteroid
Patients with Urinary tract infections	Broad spectrum antibiotics
Patients with Thyroid disorder	Levothyroxin

CHAPTER 5
DISCUSSION

Globally, approximately 358,000 women still die annually as a result of complications of pregnancy and childbirth. The main burden of these deaths is shouldered by two of the developing regions, sub-Saharan Africa and South Asia. These two regions together bear 87% of the global maternal deaths with 57% of the maternal deaths occurring in the sub-Saharan Africa region alone (Akililu *et al.*, 2015). This situation is worse in developing countries like ours in Bangladesh due to inadequate access to modern health services and poor utilization and lack of awareness of the population about the complications and also for not likely to practicing some factors that is important to follow in pregnancy. So, We have done a survey among 300 pregnant women (above 34 weeks of gestation) for knowing their awareness about danger signs of pregnancy.

Majority of them were found between age range of 20 to 25 years (46.33%) but about 9% were around the age of 14 to 19 years, Though this two age range had prominent risk of pregnancy related complications.

Among 300 respondent majority of them were housewives (89%) and they had a good knowledge about warning signs of pregnancy. The study result also showed that 74% have good awareness during pregnancy but 1.33% has poor awareness about danger signs after delivery respectively. Accordingly, 97.67% mentioned water break, 85% vaginal bleeding, 69.67% child does not move, 70% abdominal pain, 87.67% severe nausea and vomiting and 41.33% prolonged labor during pregnancy. The danger signs of pregnancy is the key parameter for assessing awareness of pregnancy complications. In this study, the majority of the pregnant women mentioned vaginal bleeding as abnormal symptoms associated with pregnancy, which is much higher than the findings in Burkina Faso (39.4%) and Guatemala (31.0%) This difference might be due to socio-cultural difference. Moreover, in this study only 41.33% of the respondents were aware of prolonged labour as a danger sign of obstetric complications. We found that most of the respondent knew about multiple warning sign as if they were completed their secondary level of education.

From the study we found that the women with higher educational status like undergraduate, graduate or post graduate were more conscious about their pregnancy period, danger signs of pregnancy complications and also very much positive in taking care of those factors that could minimize the threat to their baby as well as to them. In Egypt, Rashad and Essa found that occupation appeared to influence women's awareness of danger signs of obstetric complications. For example, traders or working women have

better opportunity to share experiences with others than farmers and housewives (Rashad and Essa, 2010).

About 297 of them (99%) went to the doctor or consulted with the doctor properly during their antenatal visit. They were also very much concerned about the medication they were taking, about their physical activity, about the warning and dangerous signs of pregnancy, about various abortifacient foods. If they gave stillbirth or if they had miscarriage, abortion they even did not know the reasons behind this. They did not concern at all to avoid these situations. But it was a shock that only 31% of the sample population either illiterate or had a poor educational background and about 69% had higher educational status. It is also seen that women with poor educational background possessed a lower economic status. So if they wanted to take a proper care to their health as well as to their baby, they could not because of shortage of money. A study of American women (Rashad and Essa, 2010) study of eastern Ethiopia (Mutiso *et al.*, 2008) and study of Tanzanian women (Pembe *et al.*, 2009) found the similar result as ours. This is in agreement with study of Gambia who stated that, educated women have better pregnancy outcome compared with uneducated women; this may be partly because they are better informed and make better choices (Anya *et al.*, 2008).

About 81% respondent getting information about warning signs of pregnancy during their current pregnancy from antenatal visit by a doctor (99%). In Tanzania, found that women who made four or more antenatal care visits were more aware of danger signs of obstetric complications than those who made less than four ANC visits, independent of gestational age (Pembe *et al.*, 2009). In our study, as the number of pregnancy was more than one, so we can observe that the respondent were enough knowledge about danger signs of pregnancy complications from their previous pregnancy period.

In our study we can see that most prevailed complications in our respondents were high blood pressure and preeclampsia (34.67%), anemia (26.33%), urinary incontinence or UTI (4%). When asked whether they had experienced any danger signs of obstetric complications during the current pregnancy, the majority of the respondents 75.67% indicated that they had. The respondent who had hypertension and preeclampsia (104) in their current pregnancy, the growth of their baby had some abnormality where (9.67%) underweight was prominent one. Those women who had anemia (79), the recorded data shows that the growth of the baby also abnormal where overweight (6.33%) and growth

retardation (2.53%) were most prominent abnormality. Underweight (16.67%), growth retardation(16.67%)of the baby also seen among the women who had urinary incontinence and liver disease.

CHAPTER 6
CONCLUSION

This study indicated that the knowledge level of pregnant women greater than 34 weeks of gestation about obstetric danger signs was quite good. From this study it can be concluded that women awareness on danger signs during pregnancy is affected by their educational level and antenatal care. Conducting survey we found a small portion was in risky pregnancy age among the sample pregnant women, basically the tender age pregnancy have much more possibility of pregnancy impediment. Majority of the women knew about water break, vaginal bleeding, prolonged labor, child does not move as a danger signs regarding pregnancy complications. If we can widen our study into other localities of Bangladesh and also into the pregnant women of first trimester, a clear idea regarding awareness of pregnancy complications should be provided by health care provider with the help of the authority. Accordingly, relevant educational programs to improve the knowledge level of women regarding awareness are needed.

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