An-Najah National University
Faculty of Graduate Studies

Miscarriage among Women in Nablus Governorate

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Governorate

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Dedication

To My Beloved Family for their Patience and Encouragement, with Love and Respect
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<td>HLA</td>
<td>Human leucocytes antigens</td>
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<td>PROM</td>
<td>Premature rupture of membranes</td>
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<td>AIDS</td>
<td>Acquired immune deficiency syndrome</td>
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<tr>
<td>D&amp;C</td>
<td>Dilatation and curettage</td>
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<td>D&amp;E</td>
<td>Dilatation and evacuation</td>
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<td>HCG</td>
<td>Human chorionic gonadotropin</td>
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<td>CRH</td>
<td>Cortico-tropic releasing hormone</td>
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<td>CDC</td>
<td>Center for disease control and prevention</td>
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Abstract

The current study was aimed at evaluating status of miscarriage among women in Nablus governorate. The study investigated the miscarriage categories, causes and possible associated risk factors. The study population included all pregnant women, suffering from vaginal bleeding, admitted to Rafedia Hospital for the years 1999, 2003 (hospital records) and all cases admitted all hospital concerned in obstetric and gynecology in the city of Nablus during the period January-April 2004. Total number of admitted cases for the year 1999 and 2003 was 412 and 672, respectively. While, total number of women admitted during the first 3 month of the year were 202.

The findings of the current study clearly showed a dramatic increase in abortion rate in association with increased maternal age. It was also found that incomplete (43.6%) and missed (23.8%)
miscarriage categories were the most prominent categories among current study population (2004). Similar findings in this regard were observed among admitted cases for the years 1999 and 2003.

Differences in miscarriage rates according place of residence were statistically significant ($P = 0.001$). It was also found that 70.3% of the current study population suffered from previous abortions. Although consanguineous marriages were represented by 46%, none seems to suffer from recurrent abortions, thus excluding a significant role of either genetic or immunological factors. History of chronic disease including diabetes, hypertension and endocrine disorders was found among 45% of current study population. Complications from previous abortions included bleeding; infections and surgery were represented by 20%, 16.8% and 5.8%, respectively.

Although 91.6% of the study population reported that they have had medical follow up during pregnancy, the findings strongly indicates low level of pregnancy awareness as 49% reported to have unplanned pregnancies, 40% did not take folic acid and 76.2% report the use of medications. With respect to possible risk factors, 28.7%, 91.1%, 66.3%, 83.7% and 74.3% reported active smoking, passive smoking, recurrent genitourinary tract infection, caffeine consumption and exposure to stress, respectively. Such findings
again confirm the lack of awareness about possible risk factors for miscarriage.

In conclusion our findings on miscarriage causes, awareness and risk factors strongly indicates the urgent need for further investigation as well as the implementation of specially designed health promoting programs targeted towards this group.
Chapter I

Introduction
1.1 Miscarriage

Today WHO defines miscarriage as being up to 23 weeks of the pregnancy and 500 grams in weight or less; loss that occurs prior to full term before the fetus is able to survive outside the womb. Most miscarriages occur in the first trimester or 12 weeks of pregnancy. As many as 50 percent of all pregnancies may end in miscarriage, because many losses occur before a woman realizes she is pregnant (Wilcox, Weinberg and O'Conner, 1988). Most early miscarriages (as many as 60% of first trimester ones) are unexplained and it is usually assumed that these losses are due to genetic factors, where the chromosomes simply did not replicate correctly (Hill, 1998). Many people will assume that something that happened recently, such as an illness, fall, or exposure to something will have caused the miscarriage. This is rarely true, since by the time a miscarriage is diagnosed or begins, the baby has been lost for quite some time. There are several categories of miscarriage causes:

1. Hormones
2. Chromosome Defects
3. Physical Problem with the Uterus or Cervix
4. Immune Disorders
5. Premature Rupture of Membranes
6. Other
7. Unknown
8. Blighted ovum, ectopic pregnancy, molar pregnancy, and stillbirth
1.1.1 Hormones

When a hormone problem exists it is more likely that miscarriage will take place in less than 10 weeks as the placenta takes over hormone production and any normal deficiency is not a factor. Low progesterone is considered as the most common problem which is not as easy to treat. In such situations, progesterone suppositories are usually prescribed, however, they are not proven to be helpful and often actually cause a nonviable pregnancy to last longer than it should (Lewis, 1997).

The only situation where progesterone is a sure solution is with a luteal phase defect, where the corpus luteum, which is formed along with egg at ovulation, does not produce the hormones needed to sustain a pregnancy. For most women, however, this is usually not an every-month problem. Usually the situation rights itself with the next egg and the next corpus luteum. This problem, if it is a permanent one, can be diagnosed through two separate endometrial biopsies. Progesterone must be started 48 hours after ovulation to work. By the time a period missed, it is too late to save a pregnancy with luteal phase defect. Low progesterone; however, is usually a symptom of a nonviable pregnancy, and not the cause.

Clomid is a common treatment for suspected hormonal problems, a pill taken for five days early in the cycle found to stimulate hormone production and ovulation. Not every woman is a candidate for Clomid, and 25% of
women will have decreased cervical mucus, which can actually reduce fertility. Other hormone problems may be created especially when thyroid disorders untreated. The thyroid function can easily be tested, and this problem is very treatable.

1.1.2 Chromosomal defects

There are many factors that come in to play when the egg and sperm unite and form that first cell. Even if both the egg and sperm come with perfect chromosomes, the first few cell divisions can see an abnormality crop up that would certainly be devastating. The main chromosomal abnormalities are autosomal trisomies, polyploidy, and monosomy X. Most trisomies show a maternal age effect, with chromosomes 16 and 22 most commonly involved, triploidy and tetraploidy accounts for 30% of chromosomal abnormal abortions. Chromosomal abnormalities are less likely to occur in spontaneous abortions for women younger than age 36 with a history of recurrent abortion (Stephenson, Awartani and Robinson 2002). Numeric chromosomal abnormalities, however, might be involved in both recurrent and sporadic losses.

Couples who are predisposed toward chromosomal abnormal conceptions will also be at increased risk for -aneuploid live-born infants. In fact, women with a previous trisomy 18 or 21 pregnancy have an increased
risk for a subsequent affected fetus (Snijders, Sundberg, and Holzgreve, 1999). Data from pre-implantation embryos support the concept of recurrent aneuploidy in women with recurrent abortion (Rubio, Vidal and Minguéz, 2002). Chromosomal translocation is the most common structural rearrangement involved in recurrent miscarriage. Cytogenetic screening of couples with recurrent abortion reveals that the prevalence of translocation in either parent is 3% to 5%, with the wife being affected twice as frequently as the husband (Stenchever et al., 2001).

1.1.3 Uterine and cervix abnormalities

Abnormalities of the uterus cause 10 to 15 percent of repeated miscarriages. These losses can occur in the first or second trimester. Some women have a uterus that does not have the usual shape. Others have a cervix that may be weakened by a number of causes, including multiple D&C procedures or their mother taking DES during pregnancy. Both of the mentioned problems can cause early labor, usually during a critical period from 12-24 weeks. This cause is responsible for 12 percent of miscarriages during this time period. As the baby grows, especially during the very rapid growth spurt during this time frame, the irregularly shaped uterus may not be able to expand or the weak cervix may start to open up and let the baby out.
Corrective surgery on the uterus and a cervical stitch that holds the cervix closed are effective treatments for such conditions.

A uterine abnormality often causes miscarriage and may also cause fetal demise. The uterine usually have various levels of septums and some of these septa are thin and simply move out of the way for the baby, causing no problems, while others thick and increase the chance of miscarriage significantly. High-level sonogram or an HSG dye test can reveal this problem (Scott, 1999).

1.1.4 Immune disorders

While many experienced and well respected reproductive endocrinologists specialize in this field now, many obstetric and gynecologists are resistant to the idea of this type of miscarriage cause and its treatment. Specialists in immune disorders claim up to an 80% success rate with women who have had three or more miscarriages, but there is still much skepticism even among infertility and reproductive specialists.

1.1.5 Antiphospholipid antibodies

Such antibodies can cause blood clots in the placenta that block or slow down the baby's blood supply, causing growth to slow or the baby to die altogether. Blood can be tested for these antibodies using anticardiolipins or the associated lupus anticoagulant and in case of high levels; treatment with
baby aspirin or any blood thinner such as heparin may solve this problem. A miscarriage due to this problem can happen at any time; often the baby will grow past the first trimester. 10 to 15% of recurring miscarriages are caused by these antibodies (Empson et al., 2002; Farquharson, Quenby and Greaves, 2002).

1.1.6 Antinuclear antibodies

Antinuclear antibodies are caused by an auto-immune problem, in Lupus or a Lupus-like syndrome, where the body attacks itself. The treatment for this problem is Prednisone, a corticosteroid, which calms down the inflammatory process of auto-immune disease. Prednisone, however, has many side effects including swelling, bruise marks on the face, and discomfort (Empson et al., 2002).

1.1.7 Fetal-blocking antibodies

Fetal blocking antibodies work to protect the baby from the mother's immune system, which will recognize the father's genetic material as foreign to her body and attack it. When the sperm penetrate the egg, it provides foreign material, but it also contains histocompatibility locus antigens (HLA). The sperm's HLA will "talk" to the mother's HLA, which would normally attack the baby, and stimulate the mother's body to protect the baby. In some cases, however, the father's genetic material is too similar to
the mother's. In that case, the mother's response is weak and insufficient to prevent her white blood cells from attacking the new cells. This type of problem usually causes an early miscarriage, well before 12 weeks, and is often suspected when several miscarriages have occurred at the exact same time in the pregnancy (Aldrich, Stephenson and Karrison, 2001; Pfeiffer, Fimmers and Engels, 2001).

1.1.8 Premature rupture of membranes

Many miscarriages begin with cramping and labor-like symptoms, but true PROM and early labor are usually associated with babies that are in the second or third trimester. Early labor can often be treated with drugs that relax the uterus and women are placed on bed rest either at home or in the hospital. Sometimes, however, the baby comes anyway. This is one of the most traumatic of losses, technically a stillbirth and not a miscarriage after 20 weeks. PROM is defined as water breaking prior to 37 weeks, the age that is considered full term. Most women who have leaking or gushing amniotic fluid will be placed on antibiotics because of the risk of infection is very high. Once an infection occurs, the baby will almost always have to be delivered. Babies must weigh 500 grams, or about a pound, to survive. Such treatment is used in order to prolong the gestational age which will ensure an increased weight of the baby and hence its survival. PROM is
thought largely to be caused by infections or inflammation of the uterus or fetal membranes. How these infections come or why they cause the membrane rupture is not completely understood. Pelvic exams and yeast infections are not considered as a risk for PROM.

Fortunately, even though PROM cannot always be treated or prevented, most babies are able to make it far enough to survive and lead normal lives.

1.1.9 Other causes: infections, age and chronic disease

Many infections can cause miscarriage, but they are the big ones like syphilis, mycoplasma, toxoplasmosis, and malaria. An upper respiratory infection is NOT going to cause a miscarriage, even though it may worry you to death. Viruses are the same. Normal illnesses like the common cold will not cause a problem, but AIDS and German measles can. Infections that directly affect the uterus are bigger risk. This does NOT include yeast infections, which are extremely common in pregnancy.

There are a few common illnesses that can cause a miscarriage or fetal malformation if a woman gets them for the first time during pregnancy, including Chicken Pox and Fifth Disease. The vast majority of women already has immunity to these diseases, however, and should not be concerned about exposure to them during pregnancy. If a woman thinks that she may not have immunity, she should run an antibody titer to see if she has
a live antibody or only an old antibody to the disease in her blood. Only the live antibody without the old antibody present is a danger.

**Over age 35:** Most women over age 35 have healthy pregnancies and healthy babies. Recent studies suggest an increasing risk of fetal death, in particular spontaneous abortion, with increasing maternal age (Abdella, Burton and Kirkland, 1993; Andersen, Wohlfahrt and Christens, 2000). The association of age of the mother and the increased likelihood of chromosomal abnormalities is manifested by the age-related increase of trisomy 21 and cytogenetic studies on preimplantation embryos (Munné, Alikani and Tomkin, 1995). The rate of miscarriage in older women is significantly greater than that in younger women. A 2000 Danish study found that about 9 percent of recognized pregnancies for women aged 20 to 24 ended in miscarriage. The risk rose to about 20 percent at age 35 to 39, and more than 50 percent by age 42 (Anderson, *et al.*, 2000). The increased incidence of chromosomal abnormalities contributes to the age related risk of miscarriage. Increasing age seems to be also associated with an increased risk of placental problems and some studies suggest that women having their first baby at age 35 or older are at increased risk of premature labor, low birth weight baby, ectopic pregnancy and stillbirth.

**Health problems** in the mother can create problems with the pregnancy. Diabetes, heart problems, and thyroid disorders are just a few that may
complicate the pregnancy. Having these does NOT mean you will certainly have a miscarriage.

Women simply have to be more careful and make sure that her treatments are adapted if needed during pregnancy.

**Accidents** typically do not cause a miscarriage. The baby is well protected in its amniotic sac, surrounded by fluid, and even a hard blow to the abdomen will likely only rock it. Most women who have a car accident, even with a certain amount of trauma, have their babies’ just fine.

1.1.10 *The unknown*

The hardest thing to accept is no reason at all. Women usually live in fear, wondering if the same terrible cause of first baby's death will cause another one to die and they scare to try again. One miscarriage hardly raises the chances to miscarry again at all.

1.1.11 *Blighted ovum, ectopic pregnancy, molar pregnancy, and stillbirth*

Sometimes a pregnancy ends unhappily, but it is not technically a miscarriage. This section will touch on these types of situations.

**Blighted ovum** is a condition (with a terrible, unfortunate name) where the gestational sac grows, the woman gets all the pregnancy symptoms, but the
baby itself never develops. The sac will continue to grow, and most women do not know there is no baby until an ultrasound is done. The bleeding, if that happens before the blighted ovum discovered by ultrasound, is slight and brown in color and pregnancy symptoms will go away. A blighted ovum is believed to be caused by an egg or sperm with poor genetic material. When the egg is fertilized, instead of creating both a sac and a baby, the part that should be a baby never grows.

A D&C is almost always needed to empty the uterus, because the body is very slow to realize there is no baby. Some women do experience more than one blighted ovum, but most women go on to later have a baby.

An **ectopic pregnancy** is a normal fertilized egg that gets stuck in the fallopian tube or fall into the abdominal cavity and implants there. This type of pregnancy cannot survive to term and increases risk for severe hemorrhage and possibly even death to pregnant women. When the ectopic is discovered, it is essential to surgically and immediately remove the baby. Symptoms associated with this situation include: sharp, intense pain in abdomen or possibly in shoulders; a pregnancy test that is positive, then turns negative a few days later; and spotty red bleeding that continues.

Ectopics are usually caused by scar tissue in the fallopian tubes that could have been caused by previous surgery in the pelvic region, uterus, or
tubes; a pelvic infection such as chlamydia or pelvic inflammatory disease; or endometriosis that blocks the entrance to the tubes.

A **molar pregnancy** is a very rare type of pregnancy where an abnormal mass forms inside the uterus after the egg is fertilized. The baby usually does not form, but the uterus is filled with big bubble clusters. A molar pregnancy is caused when a sperm fertilizes an empty egg (called a complete molar pregnancy) and no baby grows, or when two sperm fertilize an egg and both the baby grows a little as well as an abnormal placenta (called a partial molar). Even if a baby does grow, it cannot survive for more than three months on average and in most cases diagnosed molars removed by D&C before the end of the first trimester.

In about 15% of molar pregnancies (usually complete molars and not partial), the moles spread to other parts of the body like cancer. In this case a mild form of chemotherapy is used (with methotrexate), with a very high cure rate. The signs of a molar pregnancy include: bleeding in the 12th week of pregnancy, a uterus that is larger than normal, and hCG levels that are too high. Women who have had a molar pregnancy are usually advised not to get pregnant again for at least a year to ensure the cancerous form is not present.
A **stillbirth** is technically any pregnancy that ends after the 20th week and
the baby does not survive. Some babies die in utero and are discovered
when the heartbeat is not found (intrauterine death). The most common
causes of this are: uterine abnormalities, a knot or other umbilical cord
accident, infections of the lining of the gestational sac or cord, and placental
abruptions that cause the placenta to pull away from the uterine wall. In
such cases fetal expulsion is induced, although some cases fetuses are
removed D&C or D&E procedures depending on fetal size. The causes of
miscarriages are PROM, uterine abnormalities that make the uterus too small
to hold the baby, and an incompetent cervix, which opens up and lets the
baby out. Sometimes a stillbirth occurs during the birth, by an umbilical cord
that gets pinched between the baby's head and the cervix, or the cord wraps
around the baby's neck. Repeat stillbirths are extremely rare and are almost
all related to uterine or cervix problems, which can be fixed or treated once
found.

**1.2 Recurrent miscarriage**

Pregnancy loss, more commonly referred to as "miscarriage", is the
most common complication of pregnancy. Approximately 10-15% of all
first-time pregnancies result in miscarriage. In most instances, a similar
miscarriage rate in subsequent pregnancies is expected. Recurrent
pregnancy loss is commonly defined as 3 or more miscarriages.
Approximately 5% of couples attempting pregnancy have recurrent pregnancy loss. In the past, few couples were diagnosed with a specific cause for miscarriage. Recently, progress has been made in understanding recurrent pregnancy loss (Stenchever, 2001).

1.3 Signs and symptoms of miscarriage

The followings are considered the main signs:

1. Strong cramps that cause breathe in a huffy way followed by quick bleeding.
2. Heavy bleeding that soaks a pad in a few hours or less.
3. Passage of tissue, resembling large thick blood clots in the earliest weeks up to pinkish/grayish material, with or without cramps or pain.

Other possible signs include:

- Bleeding that starts and stops is often a sign of decreasing hormonal levels and it is of great importance at this stage to monitor blood hCG levels.
- Cramping is usually frequent and random during the whole pregnancy and it becomes of concern if breathing becomes in a labor-like huff, or if it is associated with bleeding.
- Loss of pregnancy symptoms: while the complete and sudden loss of pregnancy symptoms can signal a pending miscarriage, usually it is not the first sign. Women at this stage may not feel pregnant for many days when nausea abates for a day or two and the breasts are less sore. Around weeks 10 to 14, this is completely normal, as hormone levels even out and the
placenta take over. The loss of pregnancy symptoms during a miscarriage is usually something you see in hindsight, not ahead of time.

• A pregnancy test that is positive, then negative: this is a classic sign of an ectopic and often associated with spotting.

1.4 Diagnosis miscarriage

1.4.1 hCG level information

Human Chorionic Ganadotropin (hCG) is produced after implantation and can be used to detect pregnancy between 8 and 10 days after fertilization. A level over 5 indicates positive pregnancy. The normal miscarriage rate is very high at this point, still over 30%. Home pregnancy tests typically require 14 days, when the period would normally be due. The level for these tests ranges between 50 and 80. By this point, the normal miscarriage rate is down to 10% since the baby is clearly well implanted and producing proper hormones. The rate of hCG usually double every 2-3 days.

The numbers in the chart below are only a guideline, and are so broad as to be almost useless, however, they give a small measure of reassurance, although the only true way to know hCG level is rising appropriately is to carry out two tests about three days apart and failure to double every few days is not a good sign.

<table>
<thead>
<tr>
<th>Week since last period began</th>
<th>hCG in mIU/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.4.2 Sonograms

Sonograms are considered to be a safer way of checking the status of embryos producing black and white images and are not useful, until five to six weeks of pregnancy. Prior to that point, only a sac can be measured, but at least an ectopic pregnancy can be ruled out. Measurements of produced images are considered to be of great diagnostic value.

1.5 Prevention measures and treatment

1.5.1 Prevention

It is well known that there are very few miscarriages that are preventable as over half of all miscarriages are caused by random genetic problems in the baby that could not be avoided. When a miscarriage is occurring, there is no way to stop it from happening and by the time bleeding begins, the baby has almost always already died. The few types of preventable miscarriages involve the following causes: hormone deficiencies, physical problem with the uterus or cervix and immunological problems.
1.5.2 Treatment
1.5.2.1 First trimester treatment

There are two treatment choices in this stage; drugs and surgery depending on pregnancy status. The drug methotrexate as an example is used in diagnosed ectopic pregnancies as it inhibits the growth of the embryo and hence stimulates the natural expelling of the gestational sac. This drug is considered as a much safer option than surgery, since no incisions have to be made to the delicate fallopian tubes. 44 However, surgery on the other hand is often done in emergency circumstances when a pregnancy that seems to have been progressing suddenly causes terrible pain as it grows too large for the tube.

Treatment choices once bleeding have begun depends on the nature of the bleeding and the associated circumstances. If bleeding is already heavy and the miscarriage is progressing, then women probably will be allowed a natural miscarriage. If bleeding has been going on too heavily for more than 10 days, women may need a D&C to avoid excessive hemorrhaging, however, if bleeding appears to be spotty and the level of hCG are steady women usually offered a D&C. In certain cases, depending on hCG levels and size of the baby women may be offered drugs that induce natural miscarriage and this can only be done if the pregnancy is less than seven weeks in measurement.
1.5.2.2 Treatment during the second trimester

Miscarriage in the second trimester is usually without any warning signs. In such cases, an ultrasound shows a baby with no heartbeat or a sudden labor. If bleeding precedes diagnosis, then women may be allowed to miscarry naturally if the gestational age is less than 15 weeks along. The followings are the available treatment options during this stage.

1. Natural Miscarriage (not common unless 15 weeks or less)
2. D&C (for babies up to about 15 weeks in growth size, regardless of how far along the pregnancy progressed.)
3. D&E (for babies over 15 weeks in growth size, but less than 24 weeks, which is the cutoff for most countries, age of viability. Once the age of viability has passed induction to labor and deliver is required.
4. Induction (for babies over 15 weeks in growth size or beyond the pregnancy age of viability for your country, state, or region). Pregnant women will be given a drug called Pitocin to start contractions. If baby is lost during the third trimester, usually the loss is diagnosed via ultrasound or a routine heartbeat check. This usually is a result of sever placental abruption associated with heavy bleeding. The only option at this point is an induction and stillbirth.

1.6 Gestational age and episodes of miscarriage
It is well known that with an increasing gestational age, miscarriage rates decrease dramatically. It has been reported that 75% of miscarriage cases during the first two weeks of pregnancy resulted from eggs that never grow past fertilization. Miscarriage rate seems to show a sharp drop 10%, 5%, 3% and 1% during the first 6 weeks, 12 weeks, second trimester and third trimester, respectively (Snijders, Sundberg and Holzgreve, 1999).

1.7 Categories of spontaneous abortion

The followings represent a brief description of the various recognized categories of spontaneous abortions, these include:

1. Threatened abortion: it is a clinically descriptive term that applies to women who are at less than 20 weeks' gestation, have vaginal spotting or bleeding, a closed cervical os, and possibly, mild uterine cramping. Threatened abortions may progress to inevitable, spontaneous, incomplete, or complete abortions. With good medical management, most of these cases can reach full term and normal pregnancy. Vaginal spotting or frank bleeding is very common and is experienced in approximately 25% of clinically apparent pregnancies. The bleeding and pain that accompany threatened abortion are not usually intense. Threatened abortion rarely manifests with severe vaginal bleeding. Often, the bleeding is temporary and self-limited and probably due to trophoblastic implantation within the
decidualized endometrium. Approximately half the women with threatened abortions abort, and the remainder continue to have viable pregnancies. Approximately 15% of clinically recognized pregnancies spontaneously abort, and 75% of the losses occur in the first 8 weeks of gestation. The loss rate is estimated to be 2-3 times higher with very early and, often, clinically unrecognized pregnancies.

2. Inevitable abortion: this category represented with vaginal bleeding accompanied by dilatation of the cervical canal, no passage of fetal tissue, and, occasionally, gross rupture of the membranes. Bleeding is usually severe than in threatened abortion and often associated with abdominal pain.

3. Incomplete abortion: characterized by heavy vaginal bleeding accompanied by abdominal pain. The cervical os is open, with passage of only part of the products of conception. Incomplete abortion is more likely to occur at 6-14 weeks of pregnancy. Ultrasonography usually reveals that some products of conception are still present in the uterus.

4. Complete abortion: women usually present with a history of bleeding, abdominal pain, and passing of tissue. By the time miscarriage is complete, bleeding and pain have usually subsided and the cervix is closed. Diagnosis may be confirmed by observation of the aborted fetus with the complete placenta. Ultrasound reveals a vacant uterus.

5. Missed abortion: it is known for its retention of dead products of conception in utero for several days or weeks.
6. Habitual abortion: defined as 3 or more consecutive losses of pregnancy. Various etiological factors have been recognized in this category as reported by Stray-Pedersen B, Stray-Pedersen S. (1984) who conducted a study on the reproductive performance in 195 couples with a prior history of habitual abortion. Table 1.1 represents a summary of their findings in this respect.

Table 1.1 Etiologic factors of habitual abortion.

<table>
<thead>
<tr>
<th>Causative factor</th>
<th>1st trimester (%)</th>
<th>2nd trimester (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine defects</td>
<td>12</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>Cervical incompetence</td>
<td>3</td>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td>Endocrine</td>
<td>7</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Endometrial infection</td>
<td>16</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Chromosomal</td>
<td>4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Systemic disorder</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sperm factor</td>
<td>6</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Excessive smoking</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unknown</td>
<td>51</td>
<td>31</td>
<td>44</td>
</tr>
</tbody>
</table>


1.8 Predisposing factors of fetal loss

1.8.1 Caffeine and cocaine

Caffeine easily passes from mother to fetus through the placenta. A developing fetus may have higher, sustained blood levels of caffeine than its
mother because of immature metabolism (Klebanoff, et al., 1999). Some studies have found that pregnant women who consumed large quantities of caffeine (five or more cups of coffee a day) were twice as likely to miscarry as those who consumed less. High caffeine intake at this stage is believed to increase the risks of fetal loss, preterm delivery and low birth weight (Bolumar, et al., 1997; Ford, et al., 1998 and Eskenazi, 1999).

Cocaine use during pregnancy can affect a pregnant woman and her unborn baby in many ways. During the early months of pregnancy, it may increase the risk of miscarriage due to the fact that it causes blood vessels to constrict, thus, decreases the flow of nutrients and oxygen to the baby. It also may cause other problems for the unborn baby, including stroke, which can result in irreversible brain damage, heart attack, serious birth defects or death (Blatt, et al., 2000).

Many women who use cocaine also smoke cigarettes, which may contribute to their increased risk of abruption. Women who smoke cigarettes during pregnancy also are at increased risk of placental abruption.

1.8.2 Toxic substances

Certain minerals, organic solvents, pesticide and many chemicals have weak, estrogen-like qualities called endocrine disrupters. Exposure to high levels of such substances during pregnancy seems to contribute to
miscarriage, preterm delivery, low birth weight and developmental delays in the infant (Khattak, et al., 1999; Lappe, M. and Chalfin, 2002). A 1999 Canadian study found women workers in semiconductor plants exposed to high levels of solvents called glycol ethers were almost three times more likely to miscarry than unexposed women (Correa, et al., 1996).

1.8.3 Food-borne risks

A healthy, well-balanced diet includes: protein foods (meats, poultry, fish, beans); grains (cereals, bread, pasta, rice); dairy products (milk, cheese); fruits and vegetables. Most of these foods are safe and should be part of a healthy pregnancy diet. However, there are a few foods including certain fish, some soft cheeses, and ready to eat meats and raw sprouts that may pose risks during pregnancy. A pregnant woman should be aware of these risks.

Certain soft cheeses, ready-to-eat meats and un-pasteurized milk (and products made from it) can cause a form of food poisoning called listeriosis (FDA Consumer Advisory, 2001). Listeriosis results from contamination by a bacterium (Listeria monocytogenes) and is especially dangerous during pregnancy (National Institute of Allergy and Infectious Diseases, 2002). When a pregnant woman is infected with listeriosis, she may have a miscarriage, premature delivery or stillbirth, or her newborn baby may become seriously ill and may die. Most people do not become ill when they
eat listeria-contaminated foods. However, pregnant women are 20 times more likely than other healthy adults to get listeriosis and more likely to become dangerously ill from it.

1.8.4 Placental and umbilical cord problems

Placental as well as umbilical cord problems are among the most common complications of the second half of pregnancies (Craven and Ward, 1999). The placenta forms connections with the mother’s blood supply, from which it transfers oxygen and nutrients to the baby. It also connects with the baby’s blood supply, from which it removes wastes and transfers them to the mother’s blood. The placenta also has other functions that are crucial for normal pregnancy. These include production of hormones that play a role in triggering labor and delivery and protection of the unborn baby from infections and potentially harmful substances.

18.4.1 Placental problems

The followings are some of the most frequent placental problems (Craven and Ward, 1999).

1. Placental abruption: it is a condition in which the placenta peels away from the uterine wall, partially or almost completely, before delivery. It can deprive the baby of oxygen and nutrients and cause bleeding in the mother that, in severe cases, can endanger both her and the baby. Placental
abruption also increases the risk of preterm delivery. It was reported that women with abruptions were about 4 times more likely than women without abruptions to deliver prematurely and also with increases the risk of stillbirth (Anath, et al., 1999). Abruption occurs in about 1 in 100 pregnancies. It occurs most often in the third trimester, but it can happen any time after about 20 weeks of pregnancy.

2. Placenta previa: placenta previa, which occurs in about 1 in 200 pregnancies, is a low-lying placenta that covers part or all of the inner opening of the cervix. This placement of the placenta can block the baby’s exit from the uterus. And, as the cervix begins to thin and dilate in preparation for labor, blood vessels that connect the abnormally placed placenta to the uterus may tear, resulting in bleeding. During labor and delivery, bleeding can be severe, endangering mother and baby. As with placental abruption, placenta previa can result in the birth of a premature baby.

3. Abnormal insertion of Placenta: placenta accreta is a placenta that implants too deeply and too firmly into the uterine wall. Similarly, placenta increta and percreta are placentas that imbed themselves even more deeply, into uterine muscle or through the entire thickness of the uterine. In some cases, the placenta may not develop correctly or function as well as it should. It may be too thin, too thick, have an extra lobe, connect abnormally
to the umbilical cord, or attach abnormally to the fetal membranes. And
problems can occur during pregnancy that damage the placenta, including
infections, blood clots and areas struction (infarcts). These placental
abnormalities can contribute to various complications, including
miscarriage, poor fetal growth, pre-maturity, excessive maternal bleeding at
delivery, and possibly certain birth defects.

1.8.4.2 Umbilical cord abnormalities

The umbilical cord is a narrow, tube-like structure that connects the
developing fetus to the placenta. The umbilical cord begins to form about
five weeks after conception. There are three blood vessels inside the
umbilical cord—two arteries and one vein. The vein carries oxygen-rich
blood and nutrients from the placenta to the baby, while the two arteries
transport waste from the baby back to the placenta where waste is transferred
to the mother’s blood and disposed of by her kidneys. A number of
abnormalities can affect the umbilical cord. Sometimes the cord is too long,
too short, connects improperly to the placenta or becomes knotted or
compressed. Cord abnormalities can lead to problems during pregnancy or
during labor and delivery. In some cases, cord problems can affect mother
and baby. The followings are some of the most frequent umbilical cord
problems and how they can affect mother and baby (Cunningham, et al.,
2001).
1. Single umbilical artery: About 1 percent of singleton and about 5 percent of multiple pregnancies have an umbilical cord that contains only two blood vessels, instead of the normal three, as one artery is missing. The cause of this abnormality is unknown. Studies suggest that about 25 percent of babies with single umbilical artery have birth defects, including chromosomal and/or other abnormalities such as preterm delivery and stillbirth (Catanzarite, et al., 1997).

2. Umbilical cord prolapse: Umbilical cord prolapse occurs when the cord slips into the vagina after the membranes have ruptured, before the baby descends into the birth canal. This complication usually results from bad medical management and affects about 1 in 300 births. The baby can then put pressure on the cord as he passes through the cervix and vagina during labor and delivery, reducing or cutting off his oxygen supply. Umbilical cord prolapse can result in stillbirth unless the baby is delivered promptly (Dildy and Clark,, 1993).

3. Vasa previa: Vasa previa is an uncommon cord abnormality (occurring in about 1 in 3,000 births) that can be life-threatening for the unborn baby. This complication occurs when the umbilical cord inserts abnormally in the fetal membranes of the placenta, instead of in the center of the placenta (which may be abnormally shaped or positioned). When vasa previa occurs unexpectedly at delivery, more than half of affected babies are stillborn.
4. **Nuchal loops:** Up to 25 percent of babies are born with their umbilical cords wrapped one or more times around their necks. This rarely causes any problems, and babies with nuchal loops, also called “nuchal cords,” are generally healthy. Less frequently, the umbilical cord becomes wrapped around other parts of the baby’s body, such as a foot or hand. Generally, this doesn’t harm the baby.

5. **Umbilical cord knots:** About 1 percent of babies are born with one or more knots in the umbilical cord. Some knots form during delivery when a baby with a nuchal loop is pulled through the loop, it generally does not harm the baby. However, sometimes the knot or knots can be pulled tight, cutting off the baby’s oxygen supply. Cord knots result in miscarriage or stillbirth in 5 percent to 10 percent of cases.

### 1.8.5 Stress

Pregnancy is a special time for a woman and her family. It is a time of many changes in a pregnant woman’s body, in her emotions and in the life of her family. These changes often add new stresses to the lives of busy pregnant women who already face many demands at home and at work. However, when physical or emotional stress builds up to uncomfortable levels, it can be harmful for pregnant women. A high level of stress can cause fatigue, sleeplessness, anxiety, poor appetite or overeating, headaches and backaches. When a high level of stress continues for a long period, it
may contribute to potentially serious health problems, such as lowered resistance to infectious diseases, high blood pressure and heart disease.

A number of studies have suggested that very high levels of stress may increase the risk of preterm labor and low birth weight. A study from USA reported that women under high levels of stress at 18 to 20 weeks of pregnancy are more likely to have high levels of a hormone called corticotrophin releasing hormone (CRH) in their blood and an increased level of this hormone seems to be associated with preterm labor.

CRH, which is produced by the brain and the placenta, is closely tied to labor. It prompts the body to release prostaglandins, which interne trigger uterine contractions. It is also believed that elevated levels of CRH set the placental clock for early delivery (Glynn, et al., 2001). Studies also suggest that high levels of stress may contribute to other pregnancy complications. A few studies suggest that women with stressful jobs may be slightly more likely than women with low-stress jobs to develop pre-eclampsia (a pregnancy-related disorder that includes high blood pressure and can result in poor fetal growth and other problems).

There also is a concern that high levels of stress may increase the risk of miscarriage (McCubbin, et al., 1996; Hobel, et al., 1999; Walker, et al., 2001).
1.8.6 Alcohol and smoking

Drinking alcohol during pregnancy can cause physical and mental birth defects. According to the Centers for Disease Control and Prevention (CDC, 2002), each year between 1,300 and 8,000 babies in the United States are born with fetal alcohol syndrome (FAS), a combination of physical and mental birth defects. Consuming alcohol during pregnancy increases the risk of miscarriage, low birth weight and stillbirth. Heavy drinkers are two to four times more likely to have a miscarriage between the fourth and sixth months of pregnancy than are nondrinkers (Kesmodel, et al., 2002). Today it is estimated that about 12 percent of women worldwide smoke cigarettes (CDC, 2001). This is a major public health problem because not only can smoking harm a woman’s health, but smoking during pregnancy can lead to serious health problems in newborns (Samet and Yoon, 2001). Smoking has been associated with a number of pregnancy complications. Early in pregnancy smoking appears to increase a woman’s risk of having an ectopic pregnancy, placental complications, thus increasing the risk of miscarriage (Wang, et al., 2002).

1.9 Exposure to infectious disease

Certain childhood illnesses such as chickenpox (varicella), fifth disease and rubella can pose risks to the fetus if a mother came in contract with these diseases during pregnancy (Gershon, 1995). Affected pregnant women may
develop a dangerous form of pneumonia and as a result a congenital varicella syndrome, a group of birth defects that can include scars, defects of muscle and bone, malformed and paralyzed limbs, a smaller-than-normal head, blindness, seizures and mental retardation, may developed. This syndrome affects only about 2 percent of babies whose mothers were infected with chickenpox during the first 20 weeks of pregnancy.

The fifth disease (erythema infectiosum), usually mild illness spread by airborne respiratory droplets, causes a mild fever, headache, sore throat and joint pain in children. Fortunately, most fetuses are unaffected when their mothers contract the virus. However, when a fetus does become infected, the virus can disrupt production of red blood cells, leading to a dangerous form of anemia, heart failure, and up to a 9 percent risk of fetal death resulting in miscarriage (Harger, et al., 1998; Valeur-Jensen, et al., 1999).

Several studies showed that untreated pregnant woman affected by asexually transmitted diseases such as HIV, genital herpes, gonorrhea, and syphilis are at high risk of miscarriage, ectopic, still birth, birth defect and death (Andrews, et al., 2000). Other genitourinary tract infections, such as cytomegalovirus, group B-streptococcus, and bacterial vaginosis were found to be associated with preterm delivery and rupture of membranes (Bodeus, et al., 2000; Feiken, et al., 2001).
Chapter II
Methodology
2.1 The tools

For current miscarriage cases, the main used tool for data collection was a self-admitted questionnaire. It consisted of three main parts; the first part contains questions regarding socio-demographic status of the respondents, the second part contains questions about women's health in general and the clinical picture with respect to previous abortions and the third part concerned with respondents awareness, knowledge and attitude towards the problem of miscarriage and fetal loss. For previous miscarriage cases, hospital records were reviewed and data were collected for statistical analysis.

2.2 Study population

The sample consisted of 202 respondents represented all admitted abortion cases in all hospitals concerned with obstetric and gynecology in the city of Nablus. The majority of cases were admitted to Rafedia Hospital, only governmental hospital in the governorate, concerned with obstetric and gynecology.

2.3 Statistical methods

Data were analyzed using the SPSS (Statistical Package for Social Sciences).
Chapter III

Results
Data presented in Table 3.1 shows number of aborted cases, place of residence and maternal age reported for the years 1999 and 2003, according to the Rafedia Hospital records, and for the year 2004 according to data collected in the current study for comparison reason. Comparing total reported cases within the same hospital for the years 1999 and 2003 shows around 30% increase in the rate of aborted cases. Collected data for total aborted cases in all hospitals concerned with obstetric and gynecology, only for three months period, also confirms an increase in the number of aborted cases in this district. Findings for the various studied periods show that incomplete category is the most prevalent category of miscarriage. Figure 3.1 shows a percentage representation of aborted cases for over the studied periods according to maternal age groups where abortion rates show a dramatic increase in association with maternal age. The majority of these aborted cases were village residents women.
Table 3.1 Categories of aborted cases distributed according to place of residence and maternal age groups over different periods

<table>
<thead>
<tr>
<th>Year</th>
<th>Categories of miscarriage cases</th>
<th>Place of Residence</th>
<th>Maternal Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Missed</td>
<td>Threatened</td>
<td>Complete</td>
</tr>
<tr>
<td>1999</td>
<td>91</td>
<td>54</td>
<td>29</td>
</tr>
<tr>
<td>2003</td>
<td>174</td>
<td>56</td>
<td>32</td>
</tr>
<tr>
<td>2004</td>
<td>48</td>
<td>14</td>
<td>12</td>
</tr>
</tbody>
</table>

Figure 3.1 Percentage representations of aborted cases over a period of three years
### Table 3.2 Clinical description of study population

<table>
<thead>
<tr>
<th>No</th>
<th>Miscarry Category</th>
<th>His. of Abor.</th>
<th>Consanguinity</th>
<th>Compli.</th>
<th>HCD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>Th</td>
<td>C</td>
<td>IC</td>
<td>IV</td>
</tr>
<tr>
<td>1</td>
<td>48</td>
<td>14</td>
<td>12</td>
<td>88</td>
<td>10</td>
</tr>
<tr>
<td>%</td>
<td>23.8</td>
<td>6.9</td>
<td>5.9</td>
<td>43.6</td>
<td>4.9</td>
</tr>
</tbody>
</table>

M: missed; Th: threatened; C: complete; IC: incomplete; IV: inevitable; E: ectopic; M: molar; B: blighted ovum; His. of. Abor.: history of abortion; Compli: complications (B, bleeding; I, infection; S surgery); HCD: history of chronic disease

Data presented in table 3.2 shows the characteristics of the women and the clinical findings on admission. Consanguinity was represented by 93(46%) of the cases. Differences on prevalence of total aborted cases and consanguinity were statistically significant ($\chi^2 = 76.560; \text{df}=9, P = 0.001$). Incomplete miscarriage was the most prevalent category and was represented by 88(43.6%) missed cases were the ranked second and represented by 48(23.8%). Blighted ovum, threatened, complete, inevitable, ectopic and molar were represented by 9.4, 6.9, 5.9, 4.9, 3 and 2.5%, respectively. Women with previous history of abortion were represented by 142(70.3%). Complications associated with previous abortions (310 cases) were presented by 132(42.6%). The most frequent complications were bleeding, infections and surgery. These complications were represented by 20%, 16.8% and 5.8%, respectively. History of chronic disease was reported by 91(45%) of the studied population.
Table 3.3 Distribution of aborted cases according to age groups and gestational age

<table>
<thead>
<tr>
<th>Age group</th>
<th>Gestational age</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16-20</td>
<td>21-25</td>
<td>26-30</td>
<td>31-35</td>
<td>≥ 36</td>
<td>&lt; 1 month</td>
<td>2-3 months</td>
</tr>
<tr>
<td>No.</td>
<td>38</td>
<td>26</td>
<td>39</td>
<td>40</td>
<td>59</td>
<td>45</td>
<td>42</td>
</tr>
<tr>
<td>%</td>
<td>18.8</td>
<td>12.9</td>
<td>19.2</td>
<td>19.8</td>
<td>29.2</td>
<td>22.35</td>
<td>20.7</td>
</tr>
</tbody>
</table>

Maternal age was divided into 5 major groups (16-20, 21-25, 26-30, 31-35 and ≥ 36). Abortions rates among these groups were represented by 38(18.8%), 26(12.9%), 39(19.2%), 40(19.8%) and 59(29.2%), respectively. Differences on prevalence of current abortion cases and maternal age were statistically significant and were in favor of age groups ≥ 36 ($\chi^2 = 265.091; df=3, P=0.001$). The majority of aborted cases was at gestational age of 4-5 months and was represented by 96(47.6%). Gestational ages of 1 month, 2-3 months and 6 months and older were represented by the rates of 22.35%, 20.7%, and 9.4%, respectively (Table 3.3).
Table 3.4 Occurrence of abortion according to place of residence and age groups

<table>
<thead>
<tr>
<th>Age group and place of residence</th>
<th>No. % Aborted before 1st child</th>
<th>No. % Aborted after 1st child</th>
<th>Total aborted cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>City 16-20</td>
<td>4 (3.1)</td>
<td>11(6)</td>
<td>15(9.1)</td>
</tr>
<tr>
<td>Village 16-20</td>
<td>11(8.7)</td>
<td>23(12.6)</td>
<td>34(21.3)</td>
</tr>
<tr>
<td>Camp 16-20</td>
<td>5(3.9)</td>
<td>6(3.3)</td>
<td>11(7.2)</td>
</tr>
<tr>
<td>Total 16-20</td>
<td>20(15.7)</td>
<td>40(21.9)</td>
<td>60(37.6)</td>
</tr>
<tr>
<td>City 21-25</td>
<td>8(6.3)</td>
<td>6(3.3)</td>
<td>14(9.6)</td>
</tr>
<tr>
<td>Village 21-25</td>
<td>7(5.5)</td>
<td>11(6)</td>
<td>18(11.5)</td>
</tr>
<tr>
<td>Camp 21-25</td>
<td>2(1.6)</td>
<td>4(2.2)</td>
<td>6(3.8)</td>
</tr>
<tr>
<td>Total 21-25</td>
<td>17(13.4)</td>
<td>21(11.5)</td>
<td>38(24.9)</td>
</tr>
<tr>
<td>City 26-30</td>
<td>6(4.7)</td>
<td>9(4.9)</td>
<td>15(9.6)</td>
</tr>
<tr>
<td>Village 26-30</td>
<td>13(10.2)</td>
<td>21(11.5)</td>
<td>34(21.7)</td>
</tr>
<tr>
<td>Camp 26-30</td>
<td>1(0.8)</td>
<td>8(4.4)</td>
<td>9(5.2)</td>
</tr>
<tr>
<td>Total 26-30</td>
<td>20(15.7)</td>
<td>38(20.8)</td>
<td>58(36.5)</td>
</tr>
<tr>
<td>City 31-35</td>
<td>13(10.2)</td>
<td>4(2.2)</td>
<td>17(12.4)</td>
</tr>
<tr>
<td>Village 31-35</td>
<td>16(12.6)</td>
<td>19(10.4)</td>
<td>35(23)</td>
</tr>
<tr>
<td>Camp 31-35</td>
<td>3(2.4)</td>
<td>7(3.8)</td>
<td>10(6.2)</td>
</tr>
<tr>
<td>Total 31-35</td>
<td>32(25.2)</td>
<td>30(16.4)</td>
<td>62(41.6)</td>
</tr>
<tr>
<td>City ≥36</td>
<td>10(7.9)</td>
<td>8(4.4)</td>
<td>18(12.3)</td>
</tr>
<tr>
<td>Village ≥36</td>
<td>20(15.7)</td>
<td>34(18.6)</td>
<td>54(34.3)</td>
</tr>
<tr>
<td>Camp ≥36</td>
<td>8(6.3)</td>
<td>12(6.5)</td>
<td>20(12.8)</td>
</tr>
<tr>
<td>Total ≥36</td>
<td>38(29.9)</td>
<td>54(29.5)</td>
<td>92(59.4)</td>
</tr>
</tbody>
</table>

Table 3.4 represents abortion cases according to place of residence and age groups. Age group ≥36 showed the highest rate of abortion and represented by 92(59.4%) of the study population. Age groups 16-20, 21-25, 26-30 and 31-35 were represented by 60(37.6%), 38(24.9%), 58(36.5%) and 62(41.6%), respectively. Differences on prevalence of previous and current abortion rates and maternal age were statistically significant and in favor of those in age group ≥36 ($\chi^2 = 48.783$, df =12, $P = 0.001$).

The number of aborted fetuses before 38(29.9%) and after 54(29.5%) the birth of the first child was also the highest among age group ≥36. With respect to number of aborted fetuses before the birth of the first child, age
groups 16-20, 21-25, 26-30 and 31-35 were represented by 20(15.7%), 17(13.4%), 20(15.7%) and 32(25.2%), respectively. The number of aborted fetuses after the birth of the first child among age groups 16-20, 21-25, 26-30 and 31-35 was represented by 40(21.9%), 21(11.5%), 38(20.8%) and 30(16.4%), respectively. Village residents were almost with the highest rates of abortion before and after the birth of the first child in all age groups.

Figure 3.2 Diagram representation of the percentage of previous aborted cases before and after the birth of first child according to place of residence (1, City; 2, Village, 3, Refugee camp)
Table 3.5 Current and previous history of abortion among study population according to place of residence.

<table>
<thead>
<tr>
<th>Place of residence</th>
<th>No. &amp; % of cases</th>
<th>No. % Aborted before 1st child</th>
<th>No. % Aborted after 1st child</th>
<th>Total aborted cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>64(31.7)</td>
<td>41(13.2)</td>
<td>38(12.3)</td>
<td>79(25.5)</td>
</tr>
<tr>
<td>Village</td>
<td>107(53)</td>
<td>67(21.6)</td>
<td>108(34.8)</td>
<td>175(56.5)</td>
</tr>
<tr>
<td>Refugee camp</td>
<td>31(15.3)</td>
<td>19(6.1)</td>
<td>37(11.9)</td>
<td>56(18)</td>
</tr>
<tr>
<td>Total</td>
<td>202(100)</td>
<td>127(40.9)</td>
<td>183(59.1)</td>
<td>310(100)</td>
</tr>
</tbody>
</table>

Out of 202 aborted cases 107(53\%) were village residents, 64(31.7\%) were city residents and 31(15.3\%) were refugee camp residents. Village residents were also with the highest rates of abortion before 67(21.6\%) and after 108(34.8) the birth of the first child. Abortion rates, before the birth of first child, of 13.2\% and 6.1\% were observed among residents of city and refugee camp, respectively. Rates of abortion among both city and refugee camp inhabitants after the birth of first child were represented by 38(12.3\%) and 37(11.9\%), respectively (Table 3.5). Both village and refugee camp residents showed an almost two fold increase in the rate of aborted cases after the birth of first child in the family while, city residents showed a slight decrease in this rate after the birth of first child.
**Figure 3.3** Diagram representation of the percentage of previous aborted cases before and after the birth of first child according to maternal age group.

**Table 3.6a** Abortion awareness among study population.

<table>
<thead>
<tr>
<th></th>
<th>Planned Pregnancy</th>
<th>Uptake of Iron and Folic acid</th>
<th>Medical Follow up</th>
<th>Use of Medications</th>
<th>Family Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Yes 103</td>
<td>No 99</td>
<td>Yes 120</td>
<td>No 82</td>
<td>Yes 185</td>
</tr>
<tr>
<td>%</td>
<td>51</td>
<td>49</td>
<td>59.4</td>
<td>40.6</td>
<td>91.6</td>
</tr>
</tbody>
</table>

Data presented in tables 3.6a and b represent pregnancy awareness and possible associated risk factors for abortion. Although 162(80.2%) of the studied population reported that they practiced family planning, 99(49%) reported that the current pregnancy was not planned. Medical follow up, intake of folic acid and iron and the use of other medications were reported
in the following rates 185(91.6%), 120(59.4%) and 154(76.2%), respectively. Differences on prevalence of current abortions and folic acid intake were statistically significant and were in favor of those who were taking folic acid during pregnancy ($\chi^2 = 82.403; \text{df} = 3, P = 0.001$).

Table 3.6b Abortion predisposing factors among study population.

<table>
<thead>
<tr>
<th>Abortion predisposing factors</th>
<th>Active Smoking</th>
<th>Passive Smoking</th>
<th>Recurrent GUTI</th>
<th>Caffeine Consumption</th>
<th>Exposure to Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>58</td>
<td>144</td>
<td>184</td>
<td>18</td>
<td>134</td>
</tr>
</tbody>
</table>

With respect to possible risk factors, the rates of 28.7, 91.1, 66.3, 83.7 and 74.3% were reported for active smoking, passive smoking, recurrent genitourinary tract infections, caffeine consumption and exposure to stress, respectively. Differences on prevalence of current abortions and both active and passive smoking status were statistically significant and were in favor of smoking group ($\chi^2 = 37.020; \text{df} = 3, P = 0.001$; $\chi^2 = 31.680; \text{df} = 3, P = 0.001$, respectively). Statistically significant differences were also observed in favor of those with recurrent genitourinary tract infections, caffeine consumption and exposure to stress ($\chi^2 = 9.766; \text{df} = 3, P = 0.021$; $\chi^2 = 44.548; \text{df} = 3, P = 0.001$, and $\chi^2 = 10.737; \text{df} = 3, P = 0.013$, respectively).
Chapter IV
Discussion
4.1 Miscarriage status in Palestine

Improvement of pregnancy outcome is considered as an important area of action for those concerned with the improvement of women’s health and pregnancy outcome in any given community as the probability of a terminating in a full-term, healthy live birth, is a powerful indicator of health status of its women.

In recent years many health programs were concerned with promotion of women’s and community health and several of these programs were run by non governmental organizations in the occupied territories of Palestine. However, none were concerned with miscarriage categories, causes and associated risk factors. Although, this health sector is considered to be a priority is most countries, the Palestinian Ministry of Health is not including miscarriage in any of its annual registry reports and studies in this area were lacking.

The current study is the first of its kind trying to study miscarriage status and possible associated risk factors. The idea was generated due to a noticeable increase in the number of abortions admitted to gynecologists and obstetric words in major hospitals in the city of Nablus.

Data obtained from Rafedia Hospital records, the only major surgical governmental hospital concerned with gynecology and obstetric in the city of Nablus, showed a dramatic increase in the rates of abortion (around 30%)
between the years 1999 (412 cases) and 2003 (672 cases) (Table 3.1). Records were chosen (1999 and 2003 before and after the second Intifad) in order to see if any noticeable effect on the rate of miscarriage generated due to the prevailing political situation in the area, however due to the lack of any specific registry in this respect, the current study designed a special questionnaire and collected data on all admitted abortion cases in all concerned hospitals in this city.

Although, this study was limited to three months period the, findings on abortion rates strongly indicates a dramatic increase in the abortion rate in Nablus district over the three studied periods (see Table 3.1). Having in mind that we are talking about one single hospital for the years 1999 and 2003 and all concerned hospitals in the current study in addition to the limited access to health services in the city, the current rates were underestimated.

Our findings with respect to maternal age shows that the rate of miscarriage at age 16-20 is slightly higher than that observed at ages 20-25 and 26-30 (appropriate age of reproduction), however a dramatic increase in the rate of abortion was observed with increased maternal age. This pattern was observed in all studied periods (see Figure 3.1). The findings of the current study is consistent with previous reports on abortion rates and maternal age as negative pregnancy outcomes among teenagers are biological due to the fact that this age group represented with immature
reproductive organs and may be competing for nutrients with fetus. Other possible reason for the high rate of miscarriage among this group is the fact that pregnancy within few years after menarche is a risk factor for miscarriage, stillbirth and preterm delivery (Fraser, Brackert and Ward, 1999). Women aged 20-30 were considered to be in their best reproductive age, thus, with much less chance of negative pregnancy outcome. Women aged 35 and older are known for their increased chance of chromosomal abnormalities and increased risk of likelihood of medical conditions such as hypertension and diabetes, thus, rendering them at high risk of negative pregnancy outcome (Fraser, Brackert and Ward, 1999). Another explanation that might be applicable to increased rate of miscarriage in our region could be multiple pregnancies as the average family size was 5.5.

4.2 Clinical status of study population
Reviewed collected data for aborted cases admitted to gynecology and obstetric words in all concerned hospitals during the study period identified all medically diagnosed categories of miscarriage. The most prevalent categories were incomplete 88(43.6%) and missed 48(23.8%). The finding of a high rate of incomplete cases (Table 3.2) among our study population (43.6%) proposes a real threat to women’s reproductive health in our community. High rates of incomplete abortion typically indicates that the fetus has passed, bits of the placenta remain, cervix remain open, and heavy bleeding (Regan, and Rai, 2000). Incomplete is often preceded by the
missed or inevitable types as a result of retained parts of the placental tissues, which deeply penetrates uterine endometrial layers. This situation requires medical intervention (D&C), thus, rendering women at high risk of infection and in certain cases may lead to uterine perforation, severe bleeding, cervix trauma, scar tissue. Such complications are accused in infertility.

Missed abortion refers to the clinical situation were intrauterine pregnancy is present, but no longer developing normally. Lack of early diagnosis and treatment (D&C) of this condition may lead to disseminated intravascular coagulation (DIC) syndrome which is strongly associated with maternal mortality (Pridjian, and Moawad, 1989). Being the second major category among our study population is a good indicator of medical follow up (good diagnosis, referral system and awareness).

The rate of physical complications during and after miscarriages among study population was 132(42.6%) and the most common complications were bleeding (20%), infection (16.8%) and surgical intervention (5.8%) (Table 3.2). Such finding is consistent with findings regarding both categories of miscarriage (incomplete and missed) were medical intervention is required and as a consequence complications may arise. Such high complication rate might be due to lack of active management during treatment (D&C and E&C) or lack of medical follow up post hospital discharge and most probably due to lack of health education about self caring post miscarriage.
(Ankum, et al., 2001). Restrictions on movement and limited access to health facilities generated by the prevailing political situation in the area play an important role in this respect.

It is well known that history of previous miscarriage may increase the risk for a future miscarriage. The finding of 142 (70.3%) cases with history of previous abortion among our study population (total 310; 35.9% once, 59.3% twice and 4.8% three times) and non with recurrent abortion is an indication that the majority were at risk due to previous history of abortion (Table 3.2). This finding is consistent with previous reports by Regan and Rai, 2000 were the risk of miscarriage in future pregnancy for those who had previous abortions was estimated to be 20% after one miscarriage, 28% after two miscarriage, and increases up to 43% after three or more miscarriages. By comparison, only 5% of women whose previous pregnancy was successfully miscarried in the next pregnancy and it is believed that the hormonal disturbances, mainly those responsible for maintaining pregnancy, is frequent in miscarriage cases (Regan and Rai, 2000).

Significant relation between chronic diseases and adverse outcome of pregnancy especial fetal loss were recognized (Casson et al., 1997; Rosemary, et al., 2001, Rochat, et al., 1988). A four fold increase in the rate of spontaneous abortions were reported in association with type I diabetes (Casson et al., 1997; Rosemary et al., 2001). Studies by Rochat, et
1988 also showed a significant maternal and fetal loss due to uncontrolled hypertension induced or aggravated by pregnancy. Strong association between fetal loss and endocrine thyroid disorders were also evident (Surry et al., 2002). Our findings in this respect showed that 45% were reported to suffer from various chronic diseases of which 34.1% were suffering from diabetes, 26.4% suffering from hypertension and 8.8% were suffering from thyroid disorders. Since previous reports on such chronic diseases strongly indicates its association with miscarriage, one should expect that those who suffer from these diseases in our population to be at high risk for fetal loss.

Consanguineous marriage is a major social problem in our society, especially in rural areas and most common among families with low level of education. Thus, the finding of high rate of consanguineous marriages among the study population 93(46%) is expected. It is often thought that such marriages reduce fertility, either by altering the prevalence of primary sterility, or through increasing abortion rates. However, several reports from various parts of the world have confirmed reduced levels of sterility and increased fertility rates in consanguineous marriages. This is thought to be due to increased immunological compatibility between mother and fetus (Schull et al., 1970; Rao and Inbaraj, 1977). Thus, consanguineous marriages seem to have no significant adverse influence on the incidence of
recognized fetal loss at the population level (Thomas et al., 1985). Since none of our studied cases were reported to have recurrent spontaneous abortion, our data in this respect confirms the lack of association between abortion and consanguineous marriages. It also excludes any possible role for immunologic factor among the study population. No statistically significant correlation was observed between consanguineous marriages and number of abortions before the birth of first child in the concerned families ($\chi^2 = 11.025; \text{df} = 6, P = 0.088$).

Aborted cases at gestational age 1-3, 4-5 and >6 months were represented with a prevalence rates 43%, 47% and 9.4%, respectively (Table 3.3). These findings somehow differ from the international trend were first trimester miscarriage rates were expected to be around 10% and around 50% of these cases were believed to be either chromosomal or immunological. As our findings on consanguinity, recurrent abortions and number of aborted cases before the birth of first child strongly indicates the lack of association between abortion and genetic factors, the most probable explanation of such discrepancy in the rate of abortion in the first trimester among our population and the international levels is most likely due to environmental factors. On the other hand, absence of previous studies regarding the status of abortion makes it difficult to judge the exact reason behind such observation.
Second trimester abortion rates usually the highest rates compared to first and third trimesters and mostly are believed to be due to physical and environmental factors including; incompetent weakened cervix, multiple pregnancies, infections, malnutrition, stress, chronic disease as well as many other factors (Pebley, et al., 1985; Sundari, 1993).

4.3 Abortion health awareness and predisposing factors

Involvement of exaggerated environmental factors rather than chromosomal and immunological reasons can be deduced from findings on a number of previous abortions before and after the birth of first child in the concerned families. Total number of aborted fetuses after the birth of first child 183(59%) shows an almost 20% increase in the rate of abortion compared to the rate of 127(41%) before the birth of first child (Table 3.4; Figure 3.2). Findings among both village and refugee camp residents also provide an additional support for the role of environmental factors on abortion as an almost two folds increase in this rate was observed after the birth of first child among refugee camp residents (11.9% after; 6.1% before) and an increase from (21.6% before; to 34.8% after) among village residents (Table 3.5; Figure 3.2). According to the last enumeration of population census of 1997, Nablus governorate amounted to 261,340 persons. They were distributed according to place of residence as follows: city inhabitants 41.6%; village inhabitants 47.9% and refugee camp inhabitants 10.5%
(Hasseba, 2002). A comparison of the number of abortion observed in the three studied periods according to place of residence showed an almost two folds increase in the number of aborted cases among village inhabitance compared to that observed among city inhabitance (Tables 3.1 and 3.5). When compared with percentage representation of population, according to place of residence, one can see huge gap in number of aborted cases between the inhabitance of rural and urban areas in this district. High rates of abortion among village inhabitance most likely a reflection of a worse socioeconomic status as well as the availability and access to health facilities.

Findings on abortion rates among refugee camp inhabitance were also higher than that among city inhabitance and could be also due to socioeconomic status, access to health facilities and prevailing political situation. It is of great importance to note that many pregnancies are lost at home without aid of medical facilities. These losses may go un reported, thus the number of aborted cases in relation to population size in the current study is most likely to be under estimated.

The above findings again confirm the lack of any association between consanguinity and miscarriage. It also excludes the possibility of the involvement of chromosomal abnormalities at first trimester. Excluding chromosomal as well as immunological factors one is left with the possible
involvement of both physical and environmental factors including; incompetent weakened cervix, multiple pregnancies, infections, malnutrition, stress, chronic disease as well as many other factors (Pebley, et al., 1985; Sundari, 1993).

In 2002 the Palestinian Ministry of Health launched an educational program concerning women reproductive health through training qualified team included: physicians, nurses and midwifery’s in the West Bank, to increase women awareness about risk pregnancy during antenatal visits (Palestinian Ministry of Health, annual report 2002). In addition to this program many programs were launched by several none governmental bodies including UNERWA and all were directed towards women’s health. The current study included certain questions in that might shed the light on the effectiveness of such programs.

The study findings showed that out 202 miscarriage cases 99(49%) were reported to be unplanned pregnancies, although 162(80.2) reported the practice of family planning, thus, indicating a large gap between family planning and the reported unplanned pregnancy. This might be explained by either lack of awareness or misused contraceptives methods were both contribute to late detection of pregnancy. Late detection of pregnancy is also expected to effect good medical follow up management, thus increasing the chance of negative pregnancy outcomes. It also reflects a limited effect
of the launched health promotion programs directed towards women health in the area.

Although 185(91.6%) of the study population reported the practice of medical follow up for their pregnancy, 82(40.6%) did not use ferrogratfolic acid. Lack of use ferrogratfolic acid especially during the first trimester is considered to be a major risk factor in miscarriage and fetal malformations mainly neural tube defects (Ref). This finding reflects a lack of good health management as well as poor awareness among study population in this respect (Table 3.6).

Several drugs are known for their adverse effects on fetal health especially during the early stages of pregnancy and their use is restricted under medical supervision. The finding of 154(76.2%) cases of the study population using medication during their pregnancies, irrespective of medical supervision, indicates lack of awareness, lack of good medical health management and or the presence of health problems during pregnancy among studied cases (Table 3.6). The finding of 91(45%) of the studied cases suffering from chronic disease (Table 3.2) confirms the improbable use of medications during pregnancy and provide more evidence on the lack of awareness and good medical health management.
4.4 Recommendations and concluding remarks

1. It is of great importance that the Palestinian Ministry of Health include miscarriage cases (number, causes, categories, etc.) in their registry forms as pregnancy outcome is considered as a powerful indicator of health status of women in the community.

2. As findings of the current study seems to indicate limited importance of genetic and immunologic factors and a pronounced effect of physical and environmental factors on abortion rates, we believe that more attention should be paid to health educational programs. This can be achieved through specially designed health promotional programs.

3. In order to reduce negative adverse effects of miscarriage, due to lack of access to health services in certain areas, it is essential that the Ministry of Health expand its outreach services.

4. Special concern should be paid for couples with recurrent miscarriage should be tested for genetic abnormalities, immunologic and other physical abnormalities in women reproductive system.
References


Centers for Disease Control and Prevention (2002). Atlanta, GA,
April 8.


and During Pregnancy: A Decision Tree Action Plan. Report to the March of Dimes, Center for Ethics and Toxics (CETOS), Gualala, CA.


National Institute of Allergy and Infectious Diseases (2002). Food borne Diseases Fact Sheet, Bethesda, Maryland, July 3.


Miscarriage among Women in Nablus Governorate

By

Mohanad Mahmoud Zakarneh

Supervisor

Dr. Nael S. Abu-Hasan

Abstract

The current study was aimed at evaluating status of miscarriage among women in Nablus governorate. The study investigated the miscarriage categories, causes and possible associated risk factors. The study population included all pregnant women, suffering from vaginal bleeding, admitted to Rafedia Hospital for the years 1999, 2003 (hospital records) and all cases admitted all hospital concerned in obstetric and gynecology in the city of Nablus during the period January-April 2004. Total number of admitted cases for the year 1999 and 2003 was 412 and 672, respectively. While, total number of women admitted during the first 3 month of the year were 202.

The findings of the current study clearly showed a dramatic increase in abortion rate in association with increased maternal age. It was also found that incomplete (43.6%) and missed (23.8%)
miscarriage categories were the most prominent categories among current study population (2004). Similar findings in this regard were observed among admitted cases for the years 1999 and 2003.

Differences in miscarriage rates according place of residence were statistically significant ($P = 0.001$). It was also found that 70.3% of the current study population suffered from previous abortions. Although consanguineous marriages were represented by 46%, none seems to suffer from recurrent abortions, thus excluding a significant role of either genetic or immunological factors. History of chronic disease including diabetes, hypertension and endocrine disorders was found among 45% of current study population. Complications from previous abortions included bleeding; infections and surgery were represented by 20%, 16.8% and 5.8%, respectively.

Although 91.6% of the study population reported that they have had medical follow up during pregnancy, the findings strongly indicates low level of pregnancy awareness as 49% reported to have unplanned pregnancies, 40% did not take folic acid and 76.2% report the use of medications. With respect to possible risk factors, 28.7%, 91.1%, 66.3%, 83.7% and 74.3% reported active smoking, passive smoking, recurrent genitourinary tract infection, caffeine consumption and exposure to stress, respectively. Such findings again confirm the lack of awareness about possible risk factors for
miscarriage.

In conclusion our findings on miscarriage causes, awareness and risk factors strongly indicates the urgent need for further investigation as well as the implementation of specially designed health promoting programs targeted towards this group.
جامعة النجاح الوطنية
كلية الدراسات العليا

الإجهاض التلقائي لدى النساء
في محافظة نابلس

إعداد
مهند محمود رفيق الحاج حسن

إشراف
الدكتور نائل أبو الحسن

قدمت هذه الأطروحة استكمالاً لمتطلبات درجة الماجستير في الصحة العامة بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.

٢٠٠٤م
الإجهاض التقليدي لدى النساء في محافظة نابلس

إعداد
مھند مھمود رفيق الحاج حسن

إشراف
الدكتور نائل أبو الحسن

الملخص

هدفت الدراسة الحالية لتقديم الإجهاض التقليدي عند النساء في محافظة نابلس، حيث تناولت الإجهاض وأنواعه ومسبيقاته وعوامل الخطورة المرتبطة به، شملت الدراسة مراجعة لملفات المرضى الحوامل واللوتات أدخلن إلى مستشفى رفيديا الحكومي في المدينة، وفي الفترة الزمنية 1999(1412 حالة) و2003 (172) بسبب العسل المهبل ومن ثم كذلك جميع الحالات المماثلة التي أدخلت إلى جميع مستشفيات المدينة والتي تعني بحالات الحمل والولادة في الفترة الزمنية يناير - نيسان 2004 حيث تم جمع معلومات دقيقة وتفصيلية من هذه المجموعة ومتعلقة بالإجهاض.

لقد بنت نتائج الدراسة زيادة مطردة في نسبة الإجهاض مع تقدم عمر الأم في جميع السنوات التي شملت الدراسة، وكانت تكرارات الإجهاض المتكررة (43,5%) وكذالك الإجهاض الفاقد (23,8%) من أكثر الأنواع حدوثاً في جميع سنوات الدراسة، أما فيما يتعلق بالإجهاض ومكان السكن فقد كانت أعلى النسب عند النساء في الريف حيث بلغت 43% وكانت الفروقات بين كل من سكان الريف والمدينة والمخيم ذات قيم إحصائية هامة. وتبين كذلك أن 70.3% من حالات الدراسة الحالية كانت قد عانت من اجهاضات سابقة. وعلى الرغم من أن 46% من هذه الحالات كانت من زواجات الأقارب إلا أنه لم تعاني أي ملتها من الإجهاضات المتكررة مما يشير إلى حدودية دور كل من العوامل الوراثية والمناعية في الإجهاض، ولقد بين كذلك أن ما نسبته 45% من الحالات قد عانت من أمراض مزمنة كان منها السكري، ارتفاع ضغط الدم واضطرابات خشنة.
أما فيما يتعلق بالمضاعفات والنتائج عن الإجهاضات السابقة فقد تبين أن معتبرته 20% قد عانى من نزيف محلي في حين عانى ما نسبته 16.8% عانى من الالتهابات في الجهاز البولي والتناسلي واضطر ما نسبته 5.8% للخضوع لعمليات جراحية.

على الرغم من أن ما نسبة 91.6% من عينة الدراسة أدت بمتابعة الحمل في المراكز الصحية إلا أن النتائج تشير وبشكل عام أن هناك تدني كبير في مستوى الوعي لدى هذه الفئة فيما يتعلق بالحمل وكان هذا جليا من خلال ما أظهرته نتائج هذه الدراسة فيما يتعلق بالحمل الغير مخطط له (49%), وعمد تناول حمض الفوليك (19.1%) وكذلك تناول الأدوية خلال فترة الحمل (76.2%), ولقد تبين كذلك أن العديد من هذه الفئة قد تعرض لعوامل خطورة مثل مسببات الإجهاض مثل التدخين المباشر (28.7%), التدخين غير المباشر (91.1%), التهاب الجهاز البولي التناسلي المتكرر (26.3%), الاستهلاك المفرط للمنبهات (83.7%), والتعرض للضغوطات النفسية والجسدية (4.3%).

تشير نتائج هذه الدراسة المتعلقة بالإجهاض يوجد تدني كبير في مستوى الوعي الصحي لدى الحوامل مما يستدعي ضرورة تدخل الجهات المعنية لحل هذه المشكلة، وذلك من خلال إعداد برامج تعليمية وإرشادية لتعزيز الوعي الصحي لدى هذه الفئة.
الإجهاض التلقائي لدى النساء في محافظة نابلس

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الملخص

هدفت الدراسة الحالية لتقييم الإجهاض التلقائي عند النساء في محافظة نابلس، حيث تناولت الإجهاض وأنواعه وسبباته وعوامل الخطر المرتبطة به، شملت الدراسة مراجعة لملفات المرضى الحوامل واللواتي أدخلن إلى مستشفى رفيديا الحكومي في المدينة، وفي الفترة الزمنية 1999(141) و2003 (142) بسبب النزيف المهبلي وشملت كذلك جميع الحالات الممتلكة والتي أدخلت إلى جميع مستشفيات المدينة والتي تعني بحالات الحمل والولادة في الفترة الزمنية يناير - نيسان 2004 حيث تم جمع معلومات دقيقة وتفصيلية من هذه المجموعة ومتعلقة بالإجهاض.

لقد بنيت نتائج الدراسة زيادة مطردة في نسبة الإجهاض مع تقدم عمر الأم في جميع السنوات التي شملتها الدراسة، وكانت تكرارات الإجهاضات الغير مكتملة (4.5%) وكذلال الإجهاض الفائت (2.8%) من أكثر الأنواع حدوثاً في جميع سنوات الدراسة، أما فيما يتعلق بالإجهاض ومن مكان السكن فقد كانت أعلى النسب عند النساء في الريف حيث بلغت 53% وكانت الفروقات بين كل من سكان الريف والمدينة والمخيم ذات قيم إحصائية هامه. وتبين كذلك أن 70.3% من حالات الدراسة الحالية كانت قد عانت من اجهاضات سابقة. وعلى الرغم من أن 46% من هذه الحالات كانت من زواجات الأقارب إلا أنه لم تعاني أي منهن من الإجهاضات.
المتكررة مما يشير إلى حدودية دور كل من العوامل الوراثية والمناعية في الإجهاض، ولقد تبين كذلك أن ما نسبته 65% من الحالات قد عانت من أمراض مزمنة كان منها السكري، ارتفاع ضغط الدم واضطرابات غددية.

أما فيما يتعلق بالمضاعفات والنتائج عن الإجهاضات السابقة فقد تبين أن ما نسبته 20% قد عانى من نزيف مهبلي في حين عانى ما نسبته 16,8% عانى من الالتهابات في الجهاز البولي والتناسلي واضطر ما نسبته 5,8% للخصوع لعمليات جراحية.

على الرغم من أن ما نسبة 91,2% من عينة الدراسة أعطت بمتابعة الحمل في المراكز الصحية إلا أن النتائج تشير وبشكل جلي أن هناك تدني كبير في مستوى الوعي لدى هذه القائمة فيما يتعلق بالحمل وكان هذا جليا من خلال ما أظهره نتائج هذه الدراسة فيما يتعلق بالحمل الغير مخطط له (69%), وعدم تناول حمض الفوليك (40,4%) وكذلك تناول الأدوية خلال فترة الحمل (72,6%), ولقد تبين كذلك أن العديد من هذه القائمة قد تعرض لعوامل خطورة من مسببات الإجهاض مثل التدخين المباشر (18,7%), التدخين غير المباشر (11,1%), التهاب الجهاز البولي التناسلي المتكرر (6,3%), الاستهلاك المفرط للمتباثات (83,7%), والتعرض للضغطات النفسية والجسدية (74%).

تشير نتائج هذه الدراسة المتعلقة بالإجهاض بوجود تدني كبير في مستوى الوعي الصحي لدى الحوامل مما يستدعي ضرورة تدخل الجهات المعنية لحل هذه المشكلة، وذلك من خلال إعداد برامج تعليمية وإرشادية لتعزيز الوعي الصحي لدى هذه القائمة.