Experiences of Miscarriage

CAROLINE JANSSON
Experiences are unique and both men and women experience grief, anxiety, depressive symptoms after a miscarriage. The overall aim was to describe and measure experiences among women and men after a miscarriage.

Study one was a qualitative study with interviews with Swedish midwives' and nurses' experiences of women's reactions after routine ultrasonographic diagnosis of a missed miscarriage.

Study two concerned validation of "The revised impact of miscarriage scale" for Swedish conditions and a comparison of Swedish and American women's and men's experiences of miscarriage.

Study three was a longitudinal study of Swedish women's and men's emotions.

Study four was a longitudinal study, on women's feelings in relation to diagnosis and treatment.

Scales about experiences, grief, and depressive symptom were used. The results showed that midwives perceived that the women had had a premonition of symptoms of a missed miscarriage and a follow-up was performed. The degree of consistency showed that the questionnaire can be used in a Swedish setting. The Swedish and American women scored similarly in two factors, and the women's experiences were more pronounced than the men's. Grief and depressive symptoms became reduced over time, while experiences persisted. No previous children, miscarriage or infertility treatment prior to miscarriage made the experience worse especially grief reaction. There was no difference between the two diagnosis groups in experiences one week after the miscarriage and their experience improved after four months. Women treated with misoprostol had more depressive symptoms than women treated with misoprostol and subsequent vacuum aspiration. In conclusion, care providers can confirm women's premonition of a missed miscarriage so a diagnosis can be set early in the pregnancy and they can do an individual follow-up. The high consistency between the countries in two factors show that RIMS is reliable for both women and men. Grief and depressive symptoms become reduced, while experiences persist. Previous miscarriage, lack of previous children and an infertility diagnosis can lead to negative feelings as grief. A diagnosis of miscarriage has a limited influence on experiences, and a shorter duration of treatment and treatment with misoprostol and subsequent vacuum aspiration led to a fewer depressive symptom.

Keywords: Miscarriage, spontaneous abortion, missed abortion, pregnancy loss, gender, measurement, emotion, care, stress

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ISSN 1651-6206
ISBN 978-91-513-0454-0
urn:nbn:se:uu:diva-362136 (http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-362136)
To anyone who has experienced a miscarriage
List of Papers

This thesis is based on the following papers, which are referred to in the text by the Roman numerals I-IV.


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Introduction

A pregnancy involves psychical, psychological and emotional changes (1). Feelings such as grief, anxiety and depressive symptoms are common in the months following the miscarriage (2-5). The early pregnancy period is a time of both happiness and also emotional stress due to fear of losing the pregnancy in a miscarriage (6, 7). When a miscarriage takes place both women and men are affected (8), as well as their relationship (9). Women who do not communicate their experience of miscarriage may feel alone and have feelings of guilt and emptiness. However, those who share their experiences of miscarriage with others often discover that they are not alone in having this experience and that others can feel the same (10). Men's experiences have been studied far less than women's experiences after a miscarriage; men seem to struggle with their feelings after a miscarriage, while also trying to support their partners (11, 12). According to the results of previous longitudinal studies, men report negative feelings immediately after a miscarriage, however, in comparison with their partners, men are less affected (4, 13). Because both women and men are affected after a miscarriage (14) they appreciate patient-centered care and follow-up (15, 16). A care provider may be the only person who knows about the miscarriage in cases where the couple has kept the pregnancy a secret, and care providers have a role in emotional supporting those who have experienced a miscarriage (4, 15-17).
Background

Definition of miscarriage

Miscarriage is defined according to the World Health Organization (WHO) criteria as the expulsion of an embryo or extraction of a fetus weighing 500 grams or less (18). Many terms have been used to describe a miscarriage such as "early pregnancy loss", "spontaneous abortion", "miscarriage", "missed miscarriage", "missed abortion", "silent miscarriage", "anembryonic pregnancy", "blighted ovum", "early fetal demise", "nonviable pregnancy", and "embryonic/fetal death" (19, 20). The word miscarriage instead of spontaneous abortion will be used throughout this thesis, a word which Moscrop et al. also recommend as an empathic response towards those who have experienced a miscarriage (21).

Clinical miscarriage is when ultrasonography has confirmed the existence of an intrauterine pregnancy or histological verification. Early clinical miscarriage is classified as being before 12 weeks of pregnancy and late miscarriage between 12 and 22 weeks. Biochemical miscarriage occurs after a positive urinary pregnancy test for human chorionic gonadotropin hormone (hCG) or a raised level of serum beta-hCG (β-hCG) before ultrasonography or histological verification. Sporadic miscarriage is when two or three pregnancy losses occur and according to the European Society of Human Reproduction and Embryology (ESHRE) recurrent miscarriage (RM) is defined as three or more consecutive pregnancy losses before 22 weeks of gestation (20).

Spontaneous miscarriage is divided into two subgroups, namely, complete miscarriage and incomplete miscarriage. A complete miscarriage is defined as an empty uterus confirmed by ultrasonography after a positive pregnancy test result, with the products of conception completely expelled and noted as bleeding. An incomplete miscarriage is defined as the absence of a visible gestational sac or fetus by ultrasonography, with remaining products of conception in the uterine cavity including the cervical canal, ongoing bleeding, and the cervix is open (22, 23). A missed miscarriage is defined by ultrasonography as an empty gestational sac or an embryo/fetus without heart activity, or in the case of a blighted ovum a gestational sac forms and grows but the embryo does not develop brownish or red vaginal spotting discharge, and the cervix is closed (19, 20).
Symptoms of miscarriage

The most common symptom of miscarriage is heavy vaginal bleeding with tissue clots and the cervix is open. Other symptoms are abdominal or low back pain and cramps, caused by uterine contractions. However, some women may notice that their pregnancy symptoms, breast tenderness, nausea, vomiting or fatigue, may disappear (24) and some women may also have a brownish or red vaginal spotting discharge, and the cervix is closed (19).

Prevalence of miscarriage

The reported amount of clinically recognizable miscarriages in the general population is approximately 10-15% of all pregnancies, with variation according to age and previous miscarriage (25, 26). The majority of miscarriages occur before the 12th week of pregnancy and late loss between gestational weeks 12 to 22 and it occurs less often (20). The number of self-reported miscarriages has increased in Sweden because of the availability of new and more sensitive pregnancy tests, with 20% of all multiparous Swedish women reporting that they have experienced at least one miscarriage (27).

Menstrual cycle and early pregnancy period

The menstrual cycle is necessary for reproduction and is regulated by interplay between sex-steroid hormones. The mean length of a menstrual period is three to seven days and the length of a normal menstrual cycle varies between 24 and 35 days, with an average length of 28, days influenced by a number of bodily and environmental factors (28, 29).

The menstrual cycle consists of menstruation, the follicular phase, ovulation, and the luteal phase. The ovulatory menstrual cycle is the result of the integrated action of the hypothalamus, pituitary gland, ovaries, and endometrium. The menstrual cycle begins with the start of menstrual bleeding and the follicular phase begins on the first day of menstruation and ends at ovulation. During this phase, the ovaries produce estrogen, which causes the endometrium to grow and develop so that it can receive a fertilized egg. Decreasing follicle-stimulating hormone (FSH) levels increase competition between follicles, so one of the follicles usually responds better to FSH stimulation and develops into the dominant follicle. A critical concentration of estradiol, produced from a large dominant follicle, causes positive feedback in the hypothalamus, resulting in an increase in gonadotropin-releasing hormone (GnRH) secretion and a luteinizing hormone (LH) surge. The LH surge causes the initiation of the process of ovulation. After ovulation, the follicle is transformed...
into the corpus luteum and if a pregnancy would occur corpus luteum produces progesterone and is essential for establishing and maintaining the pregnancy. An ovulated egg is captured by the fallopian tube and fertilization takes place in the ampullary region of the tube within 24 hours after ovulation. The egg is transported while it divides into a cell stage after two days and at days three-four it develops from the two- and four-cell stages into an eight-cell stage and a morula. Thereafter it develops to a blastocyst and it reaches the uterus after five-six days, and after six-eight days, egg implantation in the endometrium (30). A week after the fertilized egg becomes implanted in the uterus, hCG is one of the hormones produced and it is also this hormone that is measured in the urine and blood during pregnancy tests (31).

Production of hCG from the trophoblast and embryonic cells leads the corpus luteum to continue to produce high levels of progesterone during the luteal phase, which is needed to keep the endometrium thick and vital and the corpus luteum also keeps steroid production intact until a placenta is formed. If implantation does not occur within approximately two weeks the corpus luteum degenerates, resulting in a sharp drop in levels of estrogen and progesterone; degeneration of the endometrium occurs and then menstruation takes place. If a miscarriage occurs, estrogen, progesterone and hCG levels decrease (30).

Causes of miscarriage

There are several causes of first- and second-trimester miscarriages. Approximately 50% of all miscarriages are due to chromosomal abnormalities (26, 32, 33). Uterine malformation and cervical insufficiency are other causes of miscarriage (34).

Risk factors of miscarriage

The risk of miscarriage increases in women over 35 years of age because of chromosomal changes (26, 32) and women with previous miscarriage are at a higher risk of a new miscarriage (26, 34). Lifestyle factors which may have an impact on miscarriage include alcohol consumption (35), drug abuse (36), tobacco and smoking (37, 38) and both overweight and underweight conditions (34). Bacteria, viruses, and parasites can lead to a miscarriage or impact fetal and placental development and function (39-42), and female genital infections can lead to miscarriage and infertility (43). Hormonal factors such as low levels of progesterone can lead to miscarriage (20), as can endometriosis, defined as the presence of endometrial tissue outside the uterine cavity (44, 45). Endocrine disorders such as thyroid disorders (thyroid autoimmunity and thyroid dysfunction) (46) and ovarian disorders such as polycystic ovary
syndrome (PCOS) can lead to miscarriage (20). Immunological disorders in the mother such as natural killer cell dysfunction, and autoantibodies, and hereditary and acquired thrombophilia can lead to miscarriage (20). Chronical illness as diabetes, high blood pressure (47, 48) and some medicines during pregnancy can lead to miscarriage (49).

**Diagnosis of miscarriage**

Diagnoses of miscarriage follow national and international guidelines (50, 51). A diagnosis is made by a bimanual gynecological examination to assess cervix status and uterine size, usually in combination with transabdominal or transvaginal ultrasonography examination, and serum β-hCG can be analyzed as well (19). If an intrauterine pregnancy is not detected, β-hCG is again assayed after two to three days to exclude pregnancy complications such as ectopic pregnancy and molar pregnancy (20). During the ultrasonographic examination, the uterine cavity is checked and endometrial thickness is measured anterior-posterior diameter (AP) - an endometrium of ≤ 15 mm and an empty uterus gives a diagnosis of complete miscarriage, and an endometrium of ≥ 15 mm with remaining products of conception gives a diagnosis of incomplete miscarriage (50, 51). If an embryo is seen without heart activity its crown-rump length (CRL) and the presence of a yolk sac is noted. If no embryo is seen the gestational sac is measured in three perpendicular directions. Criteria for a miscarriage diagnosis include an empty gestational sac with a mean diameter of ≤ 25 mm. An embryo with CRL ≤ 7 mm and showing no heart activity after six weeks of pregnancy gives a diagnosis of missed miscarriage (50, 52). If these criteria are not met, care providers recommend that the women come back after 10-14 days for a new ultrasonographic examination, and if there is still no embryonic heart activity or the gestational sac remains empty a non-viable pregnancy is confirmed, preferably by two care providers competent in ultrasonography. Care providers provide the women with information about the miscarriage progress, bleeding, pain, infections sign and hygiene advice (50).
Treatment

Expectant treatment

There are different methods of treatment after a miscarriage, namely, expectant, medical and surgical treatment, depending on the status of the miscarriage, with individual treatment according to the wishes of the woman and the tradition at the clinic (53). Women with symptoms of early miscarriage do not always call health care providers for advice, and the majority of miscarriages may take place at home within two weeks of expectant treatment (22). Some women prefer expectant treatment; most of these women miscarry spontaneously, resulting in a complete miscarriage. The length of time for the body to completely expel a miscarriage varies depending on the age of the woman and the initial serum β-hCG level, which doubles in approximately two days in viable intrauterine pregnancy and halves in approximately two days in the absence of new production. Gestational age, uterine size and the level of serum progesterone are parameters associated with successful spontaneous completion of miscarriage. In other cases of complications after miscarriage such as pain and bleeding, women call the hospital and may thereafter receive an appointment to a care-provider for an examination (54). Rates of miscarriage after two weeks according to an observational study about expectant management were 71% for incomplete miscarriage, 53% for blighted ovum and 35% for a missed miscarriage (22).

Medical treatment

During the first trimester, medical treatment with misoprostol is often used in cases of incomplete and missed miscarriage. It is a safe and effective treatment, and the use of misoprostol is recommended by guidelines in many countries (23, 55). Because of its effect on uterine contractility and its ability to soften the cervix, 800 μg is usually administered vaginally, or orally (under the tongue), and it is an option for medical treatment of early miscarriage (19, 56). For miscarriages after pregnancy week 12+0 and for some cases of a missed miscarriage or incomplete miscarriage, a two-step treatment is another option, i.e. mifepristone in combination with misoprostol. Mifepristone is a progesterone receptor antagonist that inhibits the effect but not the production of progesterone from the placenta. Mifepristone is administered orally, followed by vaginal misoprostol 36-48 hours later every third hour until contractions start. In a recent study, pre-treatment with 220 mg mifepristone administered orally, followed by 800 μg misoprostol vaginally resulted in a more successful treatment for women with first-trimester non-viable pregnancy than treatment with misoprostol alone. (57). Diarrhea, headache, nausea, vomiting, fever and/or chills, skin rash and bleeding are common side-effects of misoprostol and mifepristone (58, 59). If a woman is Rh(D)-negative, she will
receive 1500 IU Rh(D) immune globulin within 72 hours after a complete miscarriage less than 12 weeks gestation (60). The duration of bleeding is accepted to be longer after medical treatment than after surgery and women should be informed to contact a care provider in cases of heavy bleeding (19).

Surgical treatment

Indications for surgical treatment include heavy vaginal bleeding with abdominal pain where adequate pain relief is not achieved, continuous bleeding lasting for > 7 days, and remaining products of conception in the uterine cavity, including the cervical canal, unsuccessful medical treatment, infections, and circulation problems (53). There are different surgical methods for the treatment of miscarriages, vacuum evacuation, and dilatation and curettage (D&C). Additionally, women are usually given misoprostol before treatment to dilate and soften the cervix. In vacuum evacuation, a vacuum can be created electrically, or in manual vacuum aspiration (MVA) a handheld plastic aspirator is used to evacuate the uterine contents through the cervix (61). During D&C the care provider dilates the cervix, if needed, and proceeds to evacuate the products of conception from the uterus with a curette. D&C is used in cases of incomplete and missed miscarriage. Preoperative antibiotic treatment may sometimes be needed before evacuation if the woman shows symptoms of infection. Pain relief such as a paracervical block (PCB) or general anesthesia is used according to local recommendations (62). Complications such as infections (53) injury to the cervix, perforation of the uterus, adhesions, and damage to the uterine endometrium during scraping, as in Asherman's syndrome, are rare (62, 63).
Antenatal care in Sweden and the USA

Antenatal care in Sweden

Most women in Sweden visit antenatal care units during their pregnancies and the women's partners are welcome to attend each visit, free of charge (64). Antenatal care units offer maternity support, parenting education, health information, family planning, prevention of unwanted pregnancies and sexually transmitted infections and gynecological cell sampling and the Swedish Pregnancy Register is used for improvement in the quality of care and for research (65). The midwives handle normal pregnancies and midwives work independently and handle all routine visits according to the base programme, but in cases of complications, they work in collaboration with obstetricians and the Swedish national guidelines recommend a minimum of eight visits during pregnancy. The first antenatal visit occurs around pregnancy week eight and is in the form of health information, the focus being to record women's social situations and to give information about lifestyle factors such as the risks associated with alcohol, tobacco, and drugs. Guidelines concerning nutrition during pregnancy are provided. Information is also given about the benefit of regular exercise and different types of prenatal diagnosis. Midwives also ask the women about their mental health and can also discuss existential questions (66). The second antenatal visit generally occurs at week 11-12; medical and obstetric history is taken and the care provider asks the women about their mental health and psychosocial situation, and various tests are performed. If a woman has a disease that must be followed, and/or if she is on medication the care provider can take their medical history and a doctor's appointment can be booked (65).

In 16 out of 20 counties in Sweden, women over 35 years of age have the opportunity to undergo a combined ultrasonography and biochemical test (CUB test) after pregnancy week nine. This includes a blood sample from the woman and, in addition, another blood sample is taken between pregnancy weeks 11 to 14 together with vaginal ultrasonography, in order to detect possible chromosomal abnormalities of the fetus (65, 67).

All pregnant women in Sweden are offered routine ultrasonography at 18 to 20 weeks of pregnancy, which is performed to determine gestational age, number of fetuses, placental position, and fetal abnormalities. All prenatal diagnostic screenings, are voluntary and before the screening the care-provider inform the women about the content of the examination and the possibilities of abnormal findings (65, 68). The third antenatal visit generally occurs during pregnancy week 21, after completion of a routine ultrasonography examination. After these visits, there are regular visits until week 30, after which visits become more frequent, although some but some women need more visits than in the base programme (65). Most pregnant women are satisfied with the antenatal health care offered in Sweden and they emphasize the importance of
meeting the same midwives during the pregnancy (69, 70). In a study of Swedish women's expectations of antenatal care in Sweden a third of the women wanted more or fewer visits than in the base programme, and the results showed that special attention and care should be paid to women with a previous stillbirth, miscarriage or a negative birth experience (70).

Antenatal care in the USA

In the United States, midwives and obstetricians work at the antenatal units to promote the health and well-being during pregnancy. Experts in antenatal care recommend that low-risk pregnant women should be seen at six-eight weeks, 14-18 weeks, 24-28 weeks, and at 32, 36 and 38 weeks of pregnancy and then weekly until birth, and they recommend several visits to care providers for those women with moderate- or high-risk pregnancies. Care providers also hold parental education sessions during pregnancy, individually or in groups, and the first antenatal visit is in the form of health information, the focus being to record women's social situations and give information about lifestyle factors. Guidelines concerning nutrition during pregnancy are provided, with health information, and care providers also ask the women about their mental health and psychosocial situation. Antenatal care in the US provides protection for women by way of various tests during pregnancy, routine ultrasonography, and serum screening for genetic markers. Women's care should be individualized during pregnancy (71, 72).
Caring and emotions

Caring and well-being
Care and compassion for couples after miscarriage plays a crucial role in their long-term psychological recovery. When nurses focus on health and well-being, care must take into account knowledge and what it means to be a whole person who is developing, self-reflecting and seeking to connect with others (73-75). Well-being could be defined as a state of good or satisfactory conditions of existence (76). In a randomized longitudinal study had caring and associated time a positive effect on women's experiences of psychological well-being in the first year after miscarriage (74).

Feelings after a miscarriage
Feelings after a miscarriage can be expressed as grief, anxiety and depressive symptoms. Anxiety is an emotional feeling that has been found to be pronounced after miscarriage (77, 78). Other feelings are shocked reactions. Cullberg & Bonnave defines a traumatic crisis, as a loss of a close relative and friend, and the experiences are of such degree that the person experiences his physical existence, social identity and security is seriously threatened. A crisis can be divided into four phases shock-phase, reaction-phase, processing-phase and reorientation-phase (79, 80). There may also be feelings of guilt, including self-blame for the miscarriage, as women may wonder if the miscarriage might be or was their fault, due to something they did during pregnancy. Some feel anger, loss, and loneliness and some women talk about their losses and the fact that they felt that they had lost their dream of motherhood and a planned future with the infant and they search for a meaning for the miscarriage (4, 10, 81, 82). Risk factors of these reactions have been reported to be previously poor social support and no living children (83). Women who have had a miscarriage are likely to experience sadness or low mood and worry during a subsequent pregnancy. Some women can distance themselves from their pregnancies and focus on their pregnancy symptoms, searching for confirming information, asking for ultrasonography examination and for professional and social support (6, 7). Like women, men have reported shock reactions after a miscarriage diagnosis and later they have reported feelings such as loss and frustration, and some men have felt guilty.
for blaming their partner for the miscarriage (8, 84). Those who already have children before experiencing a miscarriage are better able to reassure themselves that they could successfully become pregnant and give birth. Couples who do not have children before experiencing a miscarriage have thoughts about their health, behavior and their fertility (85).

Experiences of miscarriage

Experiences of miscarriage capture the meaning/significance of miscarriage, which in turn can have an impact on coping (86). According to stress and coping theory, coping is a function of how the event as a miscarriage is viewed by the individual, and their resources to deal with the event (87). "Isolation/guilt" refers to how alone or guilty an individual feels after a miscarriage, "Loss of baby" refers to how strongly the miscarriage as identified as the loss of a baby or a person, and "Devastating event", refers to the degree of hopelessness the miscarriage perceived (86).

Mental health

Anxiety and depressive symptoms are common feelings after miscarriage (2). Reactions to miscarriage have been assessed by means of various indices of anxiety, depressive symptoms, and depression (4, 13, 77, 88). Major depressive disorder (MDD) is a mental disorder characterized by at least two weeks of low mood, accompanied by low self-esteem and by a loss of interest or pleasure in normal activities (80, 89). Depressive symptoms can be measured with self-rating scales (90, 91).

Grief

The symptoms of grief following a miscarriage are similar to those experienced after other types of loss. Grief implies emotional reactions, shock and denial, pain and guilt, anger and bargaining, depression, reconstruction and working through, acceptance and hope (92). Normal grief includes moderate disorder in cognitive, emotional, physical or interpersonal functioning after a miscarriage and it is the most common form of grief. After one year, the majority have returned to normal function (3). A few express complicated griefs (chronic grief), which exhibits symptoms such as MDD, anxiety or post-traumatic stress disorder (PTSD) (3, 5).
Theoretical framework

The theoretical framework of this thesis was based on the Swanson's Middle Range Caring Theory (SCT), which was derived through three phenomenological studies with individuals who had personally or professionally dealt with loss and stress related to childbearing (76, 93, 94).

Caring is defined as:

*A nurturing way of relating to a valued other towards whom one feels a personal sense of commitment and responsibility.* (p.162) (93).

Caring is exhibited through five caring categories that encompass the overall definition of caring in nursing practice (76, 93). The Impact of Miscarriage Scale (IMS) is based on the MMM (94, 95) and the SCT (76, 93, 94).

SCT was inductively derived and validated in three perinatal studies. Caring was described by 20 women who had recently miscarried, and by 19 healthcare providers in a new-born intensive care unit, and by eight young mothers who had been part of a longitude public health nursing intervention study. The findings were compared and contrasted with Cobb's definition of social support (96), within Watson's theory, ten carative represent the core of caring. Carative factors support and enhance the patients caring experience (97), and Benner's description of the nurse from novice to expert (98). SCT provides a comprehensive approach to understanding the factors that influence psychological experiences after a miscarriage and it concerns five caring categories. The first category, "Maintaining belief" is the basis of the care the care category describe that care provider can meet the patient with a positive attitude and create a hope for the future. The second category is "Knowing"; it means identifying wishes and longings and understanding the personal meaning of miscarriage. The third category is "Being with", which means that care providers can be an emotional presence for others. It includes listening attentively, giving reflective answers and being physically present, allowing them to show emotion without burdening them. The fourth category is "Doing for", which means to do for the other what they would do for themselves if it were at all possible. It includes caring such as comforting and protecting their needs while preserving their dignity. The fifth category is "Enabling", which means facilitating handling of their experience of miscarriage. The second, third and fourth categories are therapeutic in nature and the intended outcome is the patient's well-being (76, 93, 94).
Rationale

There is limited knowledge of how care providers experience women's reactions after a diagnosis of missed miscarriage in pregnancy weeks 18-20. There is a lack of knowledge in women's and men's experiences of miscarriage. Little is known about comparisons between women and men, and longitudinal experiences, grief, and depressive symptoms after a miscarriage. In addition, little is known about the degree to which women's experiences, grief, and depressive symptoms are influenced by the type of miscarriage and treatment of miscarriage and if it influences their psychological well-being.

Interviews with nurses and midwives can provide greater understanding and knowledge of how health care can be improved according to how the care providers experience how the woman perceives her care after a routine ultrasonographic diagnosis of a missed miscarriage. Questionnaire which measure emotions in women and men after miscarriage is RIMS which measure experiences (4, 74, 86) and the Perinatal Grief Scale (PGS) which measure perinatal losses (99, 100) and the Montgomery-Åsberg Depression Rating Scale (MADRS-S) which is a self-rating scale about depressive symptoms (90). These questionnaires could bring more understanding of how a miscarriage experience affects women's and men's emotions and well-being after miscarriage.
Aims

Overall Aim
The overall aim of this work was:

To describe and measure experiences among women and men after a miscarriage.

Specific Aims
The specific aims were:

I  To describe midwives' and nurses' experiences when women are diagnosed with a missed miscarriage during a routine ultrasonography scan in pregnancy weeks 18-20.

II  To test the consistency of RIMS for Swedish conditions.

III To compare Swedish and American couples experiences of miscarriage by use of RIMS.

IV To study emotions, grief and depressive symptoms in Swedish women and men at one week and at four months after the miscarriage.

V To determine if experience, depressive symptoms or grief are influenced by the cause of miscarriage and type or duration of treatment.
Methods

Design of the included studies

In this thesis one study was qualitative and three studies were quantitative. A qualitative approach with interviews was used in Study I, and quantitative approaches with questionnaires were used in Studies II-IV (Table 1).

Table 1. Overview of the included studies.

<table>
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<tr>
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<th>Design</th>
<th>Study participants</th>
<th>Data collections</th>
<th>Data analysis</th>
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<td>Care providers (n=13)</td>
<td>Semi-structured interviews</td>
<td>Content analysis</td>
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<tr>
<td></td>
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<td></td>
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<td>American women (n=70)</td>
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<td></td>
<td></td>
<td></td>
<td>RIMS</td>
<td>Cronbach's alpha</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>MADRS-S</td>
<td>Spearman's rank-correlation</td>
</tr>
<tr>
<td>III</td>
<td>Quantitative</td>
<td>Swedish women (n=103)</td>
<td>Questionnaire</td>
<td>χ²-test</td>
</tr>
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<td>Longitudinal</td>
<td>Swedish men (n=78)</td>
<td>Socio-demographic data</td>
<td>Mann-Whitney U-test</td>
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<td>Cohort</td>
<td>Control group (n=93)</td>
<td>Health questions</td>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Couples (n=64)</td>
<td>RIMS</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>MADRS-S</td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td>PGS</td>
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</tr>
<tr>
<td>IV</td>
<td>Quantitative</td>
<td>Swedish women (n=102)</td>
<td>Questionnaire</td>
<td>Fisher's exact test</td>
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<td></td>
<td>Randomized</td>
<td>Baseline</td>
<td>Socio-demographic data</td>
<td>χ²-test</td>
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<tr>
<td></td>
<td>Longitudinal</td>
<td>Spontaneous miscarriage (n=35)</td>
<td>Health questions</td>
<td>Student's t-test</td>
</tr>
<tr>
<td></td>
<td>Cohort</td>
<td>Missed miscarriage (n=67)</td>
<td>Fertility questions</td>
<td>Mann-Whitney U-test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Four months</td>
<td>RIMS</td>
<td>Wilcoxon's signed-rank test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spontaneous miscarriage (n=27)</td>
<td>MADRS-S</td>
<td>Spearman's rank-correlation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Missed miscarriage (n=54)</td>
<td>PGS</td>
<td>Multiple regression</td>
</tr>
</tbody>
</table>
Qualitative study

Design of the qualitative study

The qualitative study was carried out by using a qualitative content analysis with an inductive approach with semi-structured interviews with midwives and nurses at antenatal clinics, ultrasounds clinics and gynecological clinics (101-103).

Study participants

The qualitative study was performed at University Hospitals in Stockholm and Uppsala from January 2007 to August 2007. The study participants included nurses and midwives who had at least two years of professional experience and had cared for women with a missed miscarriage diagnosis. At the time of the interview, they worked at antenatal clinics, ultrasonography clinics and gynecological clinics (Table 1).

The study participants were interviewed about how women reacted after an ultrasonographic diagnosis of missed miscarriage in pregnancy weeks 18-20. Before the interviews started, information was sent to the selected departments. After permission to commence the study, the first author (CJ) contacted the head midwives, who asked midwives or nurses if they wanted to participate in the study in order to obtain broad insight into midwives' and nurses' experiences in different parts of the health-care sector.

Data collection

After permission from the participants had been obtained, a tape recorder was used in a face-to-face setting. The average length of the interviews was 45 minutes. A semi-structured interview guide with two basic topics for each department antenatal clinics, ultrasonography clinics, and gynecological clinics was produced by the authors (Table 2). These basic topics were followed by related topics to obtain more information based on the aim of the study. If the interviewee stopped talking in the middle of a sentence CJ repeated the last word, so that the interview could continue. In cases of silence, CJ waited until the interviewee went on talking to provide time for reflection. Tape recordings and handwritten notes were obtained by CJ during the interviews as a basis for data analysis. A summary was made at the end of each interview and CJ asked the study participants if they wanted to correct or add anything, a procedure applied according to Brinkmann and Kvale (102).
Table 2. Semi-structured interview guide.

<table>
<thead>
<tr>
<th>Items</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ultrasonography clinics</strong></td>
<td>Tell me about your experience when you were present when a woman was informed about a missed miscarriage after a routine ultrasonographic examination during week 18-20 of her pregnancy. Can you describe your experience of a woman or a couple you have met in this situation?</td>
</tr>
<tr>
<td><strong>Gynecological clinics</strong></td>
<td>Tell me how you care about the woman after a routine ultrasonography diagnosis of missed miscarriage during weeks 18-20 of her pregnancy. Can you describe your experience of a woman or a couple you have met in this situation?</td>
</tr>
<tr>
<td><strong>Antenatal clinics</strong></td>
<td>Tell me about your experience when finding out that a woman has been diagnosed with a missed miscarriage after a routine ultrasonography examination during week 18-20 of her pregnancy. Can you describe your experience of a woman or a couple you have met in this situation?</td>
</tr>
</tbody>
</table>

| Follow-up items |  |

Data analysis

Content analysis with an inductive approach was used this is expressed in terms of codes, subcategories, categories, and one theme. Preconceptions of the researchers were considered before we started the study. Both of us were midwives and have worked with and cared for these patients. Preconceptions reflected the knowledge and experience the researchers already had about the topic before initiation of the study that could affect the interviews, the data analysis, and results (101).

The transcribed material was read several times by both authors. Thereafter, meaning-bearing units were identified which corresponded to the aim of the study. Meaning-bearing units were defined as words and sentences that had a similar meaning and were related to each other through a common context. After this, condensation was performed, which means that the units were shortened while still retaining both the central content and the context. These condensing units were abstracted to descriptive codes. The identified codes were aggregated to subcategories and thereafter to categories, defined as collections of codes that share a commonality. Thereafter, one main theme was identified which referred to the underlying meaning of several categories. The analytical steps involved latent analysis this is an interpretation of the under-
lying meaning of the theme, at a deeper level of abstraction. After 11 interviews, it was estimated that saturation had been reached. However, two additional interviews were performed check that saturation had been attained or sustained (102-104).

Table 3. Example of the analyzing process of Study I.

<table>
<thead>
<tr>
<th>Meaning units</th>
<th>I am so worried I don't feel pregnant anymore. I have had a bleeding once. I am afraid that something has gone wrong with the pregnancy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensed meaning units</td>
<td>A woman's physical premonition</td>
</tr>
<tr>
<td>Code</td>
<td>Premonition</td>
</tr>
<tr>
<td>Subcategory</td>
<td>The care providers' experiences women's reactions</td>
</tr>
<tr>
<td>Category</td>
<td>The care providers' experience of reactions</td>
</tr>
<tr>
<td>Theme</td>
<td>The care providers reported that the women had had a premonition that something was wrong with their pregnancy</td>
</tr>
</tbody>
</table>

Quantitative studies

Design of the quantitative studies

There were three quantitative studies in this work; the Swedish data (Studies II-IV) came from this quantitative study and the American data came from a multicenter study (4). In Study II, validation of RIMS has carried out for Swedish conditions and women's and men's experiences of miscarriage in Sweden and the USA were compared. Study III was a longitudinal cohort study of Swedish women's and men's experiences, depression and grief after miscarriage after one week and again after four months. Study IV was a randomized longitudinal cohort study focusing on the type of miscarriage and treatment in a cohort of Swedish women coming to the clinic for treatment of miscarriage. The study was based on a questionnaire (Appendix 1); patient characteristics were also retrieved from their medical records.
Data collection

The study participant answered the questionnaire one week and four months after the women's finalized miscarriage treatment and reminders to participate in the study were sent two-three times. The questionnaires had four parts (Appendix 1). The first part contained general questions on socio-demographic data, such as health and fertility. For assessment of mental health (the second part) the Swedish and American participants completed self-rating scales for depressive symptoms. The Swedish participants completed the MADRS-S (90, 105) and the American participants completed the Center for Epidemiologic Studies-Depression (CES-D) scale (91). The third part was IMS, which gives a measure of women's and men's experiences after miscarriage (86). The fourth part was the Perinatal Grief Scale (PGS), which gives a measure of women's and men's reactions after the perinatal loss (99, 100). The control women completed the first general questionnaire and MADRS-S (90, 105).

Study participants (Studies II-IV)

The Swedish study participants (Studies II-IV) came from the same quantitative study, women with a miscarriage and their partners were recruited at Uppsala University Hospital between January 2013 and December 2014. The Swedish study subjects (Study II) came from the validation and comparison study and the women with a miscarriage between pregnancy weeks 6+0 to 21+6 and male partners and they should be able to read and speak Swedish or English. They were asked by CJ for voluntary participation when they came to the gynecological clinic for a return visit after one week. They answered the questionnaire at home after they finalized the treatment of miscarriage and four months later. Women presenting after pregnancy week 22, or with ectopic pregnancy, molar pregnancy or recurrent pregnancy loss were excluded from the study (Table 1).

The American study participants Study II, came from the couples' miscarriage healing project (CMHP) and the study was a randomized controlled trial of the effect of the intervention on depression and grief. The subjects were 341 a miscarriage at ≤ 20 weeks of gestation, and their male partners. They were studied 12 weeks post-miscarriage and should be able to read and speak English. Couples were excluded if only one member answered the baseline questionnaire and unmarried women aged < 18 were not eligible. The couples were recruited from different clinics in the Pacific Northwest of the United States. The American study period was from January 2003 to June 2006 (4). Of the 341 couples involved, 70 American women were matched in age, previous miscarriage and previous children to the Swedish women (Table 1).
The Swedish study participants in Study III, Swedish women and men answered the questionnaires one week after the women finalized miscarriage treatment. Four months later matched couples answered the second questionnaire. In Study III, control women were selected from the Swedish population register and invited by letter. These women were included in the study to compare the results of depressive scores among women with miscarriage and women of the same age the study participants completed a self-rating scale the Montgomery-Åsberg Depression Rating Scale (MADRS-S) for depressive symptoms. Inclusion criteria for control women were healthy women from the general population between 20 and 45 years of age who had not experienced miscarriage or had given birth to at least one child after a miscarriage. Exclusion criteria were ongoing grief defined as unprocessed grief, and experience of miscarriage without having given birth after later (Table 1).

The Swedish study participants in (Study IV) were the same women as in Study III, and they were divided into two group's women with spontaneous miscarriage and women with missed miscarriage (Table 1). Missed miscarriage was defined as the presence of a fetus without heart activity after six weeks of pregnancy, a blighted ovum was defined as a gestational sac forms which grows but the embryo does not develop (20). Women answered the questionnaires one week after the finalized miscarriage treatment which was defined as a complete miscarriage no remains of the pregnancy left in the uterus and no bleeding and after four months (20).

Meaning of Miscarriage Model

Experiences of miscarriage were originally assessed by the women's experiences of losing and gaining in connection with the meaning of miscarriage model (94, 95) and within the context of stress and coping theory (87). The Meaning of Miscarriage Model (MMM) is a useful framework for anticipating the variety of responses women have to associate with miscarriage. The model was developed from a phenomenological study of 20 women who had suffered a miscarriage within four months when interviewed. Through this work, the MMM was developed, which identified six common experiences according to miscarriage. "Coming to know", the process described as realization of the miscarriage, "Losing and gaining", described as women identifying what was lost and gained through miscarriage, "Sharing the loss", described as receiving emotional support for what it is like to miscarry, "Going public", described as entering the world again as a no-longer expectant couple, "Getting through", described as a personal process to work through miscarriage, and "Trying again", facing the ongoing fears of future miscarriage and planning for a new pregnancy (94, 95).
Impact of Miscarriage Scale

IMS contains 24 items scored from one to four, with a maximum score of 94 and it contains four factors "Loss of baby", "Isolation/guilt", "Devastating event" and "Personal significance". IMS was developed in three phases to capture the significance and meaning of miscarriage in women. The three phases were - interviews with 20 women following a recent miscarriage, resulting in 105 statements; instrument refinement - the 105 statements were sent to 446 women in the USA who had experienced a miscarriage within 10 years, the data then being reduced to 30 items, and subscale identification - factoring of responses from 188 women (74). Women's experiences form MMM were translated into IMS by focusing on what was lost and gained in the miscarriage (94, 95).

IMS was adapted for women (n=185) in a randomized longitudinal Salomon four-group experimental study during the first year after miscarriage the impact of miscarriage on each woman's life was examined using the IMS (74) and for men CMHP, a randomized controlled trial concerning 341 couples' depression and grief after a miscarriage and the effects of different forms of intervention, i.e. follow-up by a nurse, and self-caring, versus a control group. An intervention was based on SCT and MMM. The study participants filled out the IMS at one, six, 16, and 52 weeks after enrollment (4). In the revision from IMS to RIMS, one subscale, "Personal significance", described as the meaning of the miscarriage to a person, and eight of the initial 24 questions were removed (86).

Revised Impact of Miscarriage Scale

RIMS is used to assess the significance/meaning of a miscarriage in women and men and it can be used to identify those who may experience face greater loss and difficulty coping with a miscarriage. The scale does not cover other feelings after miscarriage such as depressive symptoms, grief, and anxiety. It contains 16 items scored from 1 to 4, with a maximum score of 64 and it contains three factors "Isolation/guilt", "Loss of baby" and "Devastating event". All items are reverse-coded so that higher scores represent greater significance or meaning. The responses were "Definitely true for me", "Quite true for me", "Barely true for me" and "Definitely Not true for me" (Table 3). RIMS comprises three subscales: "Isolation and guilt", with a maximum score of 24, "Loss of baby", with a maximum score of 20, and "Devastating event", with a maximum score of 20 (Table 3).

RIMS has been shown to discriminate between those who may be more impacted by miscarriage, i.e., cases of infertility, later gestational age at loss, previous miscarriage history and childlessness (14). RIMS demonstrated good reliability and test-retest reliability over the course of a year. All three sub-scales were positively correlated with pure grief measured with miscarriage
grief inventory (106) and CES-D (91). These correlations demonstrate convergent validity, as the impact of miscarriage increases so does grief and depression. The Cronbach's alpha coefficients were ≥ 0.78 (86, 91).

Translation of the Revised Impact of Miscarriage Scale
To obtain the most accurate translation of the English questionnaire, forward and back translation was used for translating RIMS into Swedish. Translations were undertaken by two professional English-Swedish translators. The IMS questionnaire was translated from English to Swedish by one translator and then re-translated back to English by a second translator and thereafter sent to the person who originally designed the questionnaire (4, 74).

Table 4. The Revised Impact Miscarriage Scale, subscale and items.

**Directions:** The following statements are about miscarriage. Please read each statement and decide how true each statement is for you. If it is exactly the way you feel, then circle the 1 underneath "Definitely true for me". If it is close to the way you feel, then circle 2, "Quite true for me". If it is slightly like the way you feel, then circle 3 "Barely true for me". If it is not at all similar, then circle 4 "Definitely Not true for me". Put only one circle around the figure that corresponds best to how you feel.

<table>
<thead>
<tr>
<th>RIMS subscales</th>
<th>RIMS items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isolation/guilt</strong></td>
<td>1. I felt much alone in my (our) loss.</td>
</tr>
<tr>
<td></td>
<td>2. My (our) miscarriage destroyed my zest for life.</td>
</tr>
<tr>
<td></td>
<td>3. I feel my (partner's) body has betrayed me (us).</td>
</tr>
<tr>
<td></td>
<td>4. I feel guilty about my (our) miscarriage.</td>
</tr>
<tr>
<td></td>
<td>5. Through my (our) miscarriage, I have experienced a loss of pride in myself.</td>
</tr>
<tr>
<td></td>
<td>6. I feel very isolated by my (our) miscarriage.</td>
</tr>
<tr>
<td><strong>Loss of baby</strong></td>
<td>7. Through miscarriage, I feel I lost a part of myself.</td>
</tr>
<tr>
<td></td>
<td>8. I feel there will always be a place in my heart for the miscarried baby.</td>
</tr>
<tr>
<td></td>
<td>9. Through miscarriage, I feel that I have lost a person.</td>
</tr>
<tr>
<td></td>
<td>10. I get irritated when my (our) miscarried baby is called a fetus.</td>
</tr>
<tr>
<td></td>
<td>11. I dwell on the fact that my miscarried baby will exist only in my memory.</td>
</tr>
<tr>
<td><strong>Devastating event</strong></td>
<td>12. My (our) miscarriage was a horrendous, devastating event.</td>
</tr>
<tr>
<td></td>
<td>13. Miscarriage equals one big loss of control.</td>
</tr>
<tr>
<td></td>
<td>14. Miscarriage is like going from one extreme of happiness to the other, total unhappiness.</td>
</tr>
<tr>
<td></td>
<td>15. Miscarriage is a nightmare.</td>
</tr>
<tr>
<td></td>
<td>16. My (our) miscarriage represent a major setback for me.</td>
</tr>
</tbody>
</table>
Montgomery-Åsberg Depression Rating Scale

MADRS-S is a self-rating scale which is used to assess depressive symptoms in the previous three days. The purpose of this scale is to give a detailed picture of the current state of mind and it is often used in clinical practice. MADRS-S was originally developed from the Comprehensive Psychopathological Rating Scale (CPRS) and has been used in several countries for both women and men (90). The scale is validated for Swedish conditions (105).

The MADRS-S instrument has nine questions, the score for each question being 0 to 6. The scores range from 0-54 with a cut-off level of 13 and the higher the score, the higher the level of depressive symptoms. The scores and their meanings are as follows: 0-12 points, untroubled, 13-19 points, mild depression, 20-34 points, moderate depression, and > 34 points severe depression. The questionnaire covers eight different features, namely, apparent sadness, reported sadness, reduced sleep, reduced appetite, lassitude, inability to feel, pessimistic thoughts and suicidal thoughts (90, 105).

Center for Epidemiologic Studies-Depression Scale

CES-D is a self-rating scale which is used to assess depressive symptoms within the past week. The purpose of this scale (like MADRS-S) is to give a detailed picture of the current state of mind and it is also often used in clinical practice (91). The CES-D scale has 20 questions, the scores for each question being 0-4. The scores range from 0-80 with a cut-off level of 15 and the higher the score, the higher the level of depressive symptoms. The scores and their meanings are as follows: 15-21 points, mild to moderate depression, over 21, possibility of depression. The questionnaire covers nine different features: sadness, loss of interest, reduced appetite, reduced sleep, poor concentration, guilt, tiredness, lassitude and suicidal thoughts (91).

Perinatal Grief Scale

PGS is a scale which is used to assess grief after perinatal losses including miscarriage, stillbirth, neonatal death, and ectopic pregnancy. The scores for each question are 0-5 and are analyzed by reverse coding except for items 11 and 33, so a higher score represents greater significance or meaning. Those study subjects who answer mark on the scale how they feel at the present time (99). The original scale has 84 items and the short version was reduced to 33 items (100). The PGS short version was translated into Swedish in a Swedish study (107) and validated for Swedish conditions (17). The responses and scores are, 1) "Strongly agree", 2) "Agree", 3) "Neither disagree nor agree", 4) "Disagree", 5) "Strongly disagree". Both the original and short versions have three components of grief. The subscale "Active grief" (items 1-11) includes questions about sadness, missing the baby and crying for the baby. It is
a normal grief reaction and the score is highest immediately after the loss and the subscale has a cut off level of 34. The subscale "Difficult coping" (items 12-22) includes questions on difficulties in dealing with normal activities and with other people. It gives a measure of mental health and depressive symptoms and is a link between active grief and difficulty coping and the subscale has a cut off level of 30. The subscale "Despair", (items 23-33) concerns feelings of worthlessness and hopelessness and it gives a measure of delayed grief and the long-lasting effect of the loss and the subscale has a cut off level of 27. The values of each subscale are 11-55. The sum of the three subscales are 33-165 (99, 100).

Statistical analysis

Statistical analysis was performed by using Excel and Graph Pad and IBM SPSS Statistics version 20.0 software (SPSS Inc., Chicago, Illinois, USA) and Sigma Plot (Systat, Software Inc., San Jose, CA, USA).

A power calculation was performed before starting the study, based on data from a previous study of experiences of miscarriage. Concerning RIMS factors, with an alpha value of 0.05 and a the desired power of 0.8, a sample size of 45 women and 45 men would be sufficient (74). In the second study, Fisher's exact test was applied to test for significant differences in categorical variables. To test the internal consistency of RIMS for Swedish conditions Cronbach's alpha was used in women and men's RIMS scores and principal component analysis (PCA) was applied in RIMS factors scores and a direct oblimin rotation was performed if correlated. The Mann Whitney U-test was used to test for significance in scores between women and men in RIMS, MADRS-S, and PGS, and Spearman's rank correlation was applied to test the relationship between the Swedish and American men and women's responses regards to RIMS.

In the third study, \( \chi^2 \)-test was applied to test for significant differences in categorical variables. Mann Whitney U-test was applied to test for significance in age and body mass index (BMI). While, Mann-Whitney-U test was applied to test for significance of differences between women's and men's RIMS, MADRS-S and PGS scores after one week. Wilcoxon's signed-rank test was applied to test for significance in RIMS, PGS, and MADRS-S scores for the dependent couples up to four months.

In the fourth study, Fisher's exact test was applied to test the significance in categorical data. Student's t-test was applied to test the significance for age and Mann-Whitney U-test for BMI, number of previous children, miscarriage and miscarriage week. Mann-Whitney U-test was applied to test for significance of differences between women with spontaneous miscarriage and
women with missed miscarriage in RIMS, MADRS-S, and PGS scores after one week. Wilcoxon's signed-rank test and was applied to test for significance in RIMS, PGS and MADRS-S scores for the dependent women up to four months. Mann-Whitney $U$-test, $\chi^2$-test, and Multiple regression analysis were applied to test the significance between the two diagnosis groups, women with spontaneous miscarriage and women with missed miscarriage and between the two groups, women treated with misoprostol versus misoprostol/mifepristone and vacuum aspiration. Spearman's rank correlation was used to test the relationship between treatment time and MADRS-S, PGS and RIMS scores. A $p$-value of $\leq 0.05$ was taken to represent statistical significance (108) (Table 1). Medical records were used to gather data on treatments and diagnoses, e.g. number of diagnoses and treatments and the number of visits to care providers.
Ethical considerations

The studies followed the principles of the Declaration of Helsinki from the World Medical Association (WMA) to ensure the rights and welfare of the study participants (109). According to this declaration, a study participant health and integrity should be the main consideration when medical research involves humans.

The regional ethics committee in Stockholm approved the qualitative study (2006/1559-31/5). The regional ethics committee in Uppsala approved the quantitative studies (2012/306). The published American study, from which data was obtained, had approval from the Scientific Review boards at the University of Washington (5P30 NR 004001) (4).

All study participants were recruited voluntarily and informed that they were entitled to interrupt their participation at any time without explaining why.

In the qualitative study, the study participant received information at the clinics and we gave them oral and written information about the study and asked for their consent. Once they have given their consent to participate a code was assigned to each participant interview in order to keep confidentiality.

In the quantitative studies, the study participant received information at the clinics and we gave them oral and written information about the study and gave them the consent. The study participants took the questionnaires and consent form home and returned them if they wanted to participate. This gave them time to consider participation in the study, and if they did not want to participate, we did not ask them why or try to find out anything about their background. Once they have given their consent to participate a code was assigned to each participant in order to keep confidentiality. Only the members in the research group had access to the transcribed recorded interviews and the questionnaires. They were told that the recorded interviews and the questionnaires would be treated confidentially and that all material was to be locked up at the university and destroyed after ten years.
Results

Qualitative study
Theme, categories and subcategories
One main theme was found, two categories and four subcategories emerged during data analysis (Table 4).

Table 5. Overview of the results, main theme, categories, and subcategories.

<table>
<thead>
<tr>
<th>Main Theme</th>
<th>1. Premonition and Follow up.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories</td>
<td>1. Care provider's experiences of reactions.</td>
</tr>
<tr>
<td></td>
<td>2. Support from care-providers.</td>
</tr>
<tr>
<td>Subcategories</td>
<td>1. Care provider's experiences of women’s reactions.</td>
</tr>
<tr>
<td></td>
<td>2. Care provider's experiences of men’s reactions.</td>
</tr>
<tr>
<td></td>
<td>3. Communication between health care providers and women.</td>
</tr>
<tr>
<td></td>
<td>4. Support from midwives and nurses.</td>
</tr>
</tbody>
</table>

Premonition and follow-up
The main theme was that the care providers experienced that the women had had a premonition that something was wrong with their pregnancy they found that many women with missed miscarriage had reduced pregnancy symptoms and absence of fetal activity, or they experienced minor bleeding. The care providers at the antenatal clinic and ultrasound clinics carried out one individual and appreciate follow-up among their own patients after they had received information from the data system concerning the women’s consent regarding their medical records.

Care provider's experiences of women's reactions
The care providers said that the women with a missed miscarriage diagnosis were normally happy when they came to the antenatal clinic for the first visit in early pregnancy, although they could have had worries about whether or not their pregnancies were normal. During ultrasonography, the women were excited but often a little nervous. The care providers at the ultrasounds clinics
reported that the examined women needed information about the ultrasonography findings honestly and immediately.

One midwife said:

*I used to say, I can’t see any heart activity.*

It was difficult for the women when ultrasonography revealed that no fetus was present. Care providers found that they had trouble accepting the news/information because they were already in a state of shock and distressed when they received the diagnosis, and they had questions and wanted all the relevant facts. One midwife said that the women retreated within themselves and cried and that they also entered a state of denial and did not comprehend what had happened.

The care providers reported that women had already had a premonition that something was wrong with their pregnancy before the ultrasonographic examination. The women who had noted fetal movements felt the loss of fetal activity.

One midwife reported that one woman said:

*I am so worried, I have had a little bleeding and I don’t feel pregnant anymore.*

She answered her after the diagnosis:

*Your feelings were right about the missed miscarriage symptoms.*

The care providers said that the women asked for treatment of miscarriage on the same day of miscarriage diagnosis. Care provider reported that one woman said:

*One week is too long to wait.*

Care provider's experiences of men's reactions

The care providers indicated that men felt sad and disappointed and experienced the same types of emotion as the women when processing the miscarriage diagnosis. The men were also supportive of their partners during the miscarriage diagnosis. If the women were very sad, their partners tried to remain calm and composed. He was usually present during the treatment at the gynecology clinic. The nurses supported the men during the women’s treatment.

One nurse said:

*When the fetus is still inside the woman the man has difficulty understanding what has happened. It can be hard for the man to look at the fetus, but when*
he does look he understands and can show his emotions. The woman has understood from the start, but he understands when he sees it. He can cry a lot and for a long time.

Men were also encouraged to discuss their emotions and thoughts. Midwife felt it was important to invite him to join in the conversation by talking to them both as a couple.

One midwife said:

*It is good that you are both present during the consultation as well as the return visit to the midwife. Then you both know what’s been said, and this increases positive participation.*

**Communication between care providers and women**

The care providers informed the women that they try to arrange a time for treatment of the miscarriage as soon as possible. The care providers said that they contacted the gynecology clinics after the women have received the diagnosis at the ultrasound clinic or antenatal clinics. The ultrasound care providers had a memorandum or note stating that they should contact the antenatal clinic's midwife after the women's consent which was done automatically via the computer.

**Support from midwives and nurses**

The midwives provided support and showed empathy when the diagnosis was made and the nurses provide the same when the treatment was carried out.

There was a private room in the ultrasound clinics where the care providers and the couples could go and talk privately and undisturbed after the examination and the care providers gave oral and written information about the diagnosis.

At the gynecology clinic, the couple was preferably given a single room where they could talk privately and undisturbed. The nurses said that they established contact with the couple and showed empathy and they gave the woman pain relief during the treatment of miscarriage.

One nurse said:

*The goal is to give the woman the best possible pain relief.*

Before the couple left the hospital, the care providers gave them their business cards so that they could make contact if they had further questions.
The midwives from the antenatal clinics and ultrasounds clinics called the women even though this was not a routine procedure at the time of the study. One midwife said:

*It is through expressing their feelings and being taken seriously that the women can heal.*

In most cases, a telephone call was sufficient some had already spoken with care providers or with their family and that was sufficient for them. However, some couples wanted a return visit. During return visits, they asked questions about the miscarriage. The care providers said that they also offered a counselor's contact if needed. Men were also encouraged to discuss their emotions and thoughts. The care providers felt it was important to invite him to join in the conversation by talking to them both as a couple.

One midwife said:

*It is good that you are both present during the consultation as well as the return visit with the midwife. Then you both know what's been said, and this increases positive participation.*
Quantitative studies

Study participants

The Swedish study participants in II, III and IV were from the same cohort. The study participants included in study II (Appendix II) were matched with the Swedish and American couples from Sweden and USA. There were no differences between the American and Swedish couples in regards to the history of infertility and depressive symptoms.

The study participants in study III (Appendix III) were from the same cohort as study II. In study III a control group of Swedish women participated. There were no significant differences in the number of children and infertility diagnosis for the miscarriage group compared with the controls.

The study participants in study IV (Appendix IV) were divided into two groups' women with spontaneous miscarriage and women with a missed miscarriage. There were no differences in age, BMI, week of miscarriage, the number of a previous miscarriage and previous children prior miscarriage, and in planned pregnancy between the two groups. The majority of the study participants were born in Sweden a few were born in other European countries and outside Europe.

The consistency of RIMS for Swedish conditions

To check the consistency of RIMS for Swedish conditions, Cronbach's alpha coefficient was used (Study II). Internal consistency of Cronbach's alpha shows a mean value of 0.820 in RIMS factor. There was an alpha-value above 0.7 for all factors except for "Loss of baby" for the American women.

Cronbach's alpha value would be higher if question two was removed from the factor "Isolation and guilt", for the American men. Cronbach's alpha value would be higher if question 10 was removed from the factor "Loss of baby" for the American women and men. Cronbach's alpha value would be higher if question 11 was removed from the factor "Loss of baby" for the Swedish women. Cronbach's alpha value would be higher if question 13 was removed from the factor "Devastating event" for the Swedish women and men and for the American women. (Table 6).

By use of PCA, a scree plot revealed a one-factor solution, which shows a unidimensional structure. The three-factor used in this study originates from the revision of IMS in the previous American study (85). Therefore, we conclude that RIMS questionnaire is reliable for Swedish conditions.
Table 6. Results from RIMS factors "Isolation/guilt", "Loss of baby" and "Devastating event". Cronbach's alpha analysis from four groups, Swedish women, American women, Swedish men, and American men is shown. Mean and standard deviation (SD) show Cronbach's alpha value if items are deleted.

<table>
<thead>
<tr>
<th>Swedish women</th>
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<th>American women</th>
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<tr>
<td>RIMS factors</td>
<td>Cronbach's Alpha</td>
<td>Items deleted</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>Isolation/guilt</td>
<td>0.881</td>
<td>0.863</td>
<td>11.9 ± 5.0</td>
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<tr>
<td>Loss of baby</td>
<td>0.745</td>
<td>0.873 Q11</td>
<td>9.7 ± 3.8</td>
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<td>Devastating event</td>
<td>0.862</td>
<td>0.867 Q13</td>
<td>13.3 ± 4.4</td>
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<table>
<thead>
<tr>
<th>Swedish men</th>
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<th>American men</th>
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<tbody>
<tr>
<td>RIMS factors</td>
<td>Cronbach's Alpha</td>
<td>Items deleted</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>Isolation/guilt</td>
<td>0.871</td>
<td>0.868</td>
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<td>Loss of baby</td>
<td>0.903</td>
<td>0.900</td>
<td>8.6 ± 4.3</td>
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<tr>
<td>Devastating event</td>
<td>0.901</td>
<td>0.909 Q13</td>
<td>11.7 ± 4.6</td>
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Week of miscarriage
The median week of the miscarriage was 10.2 for the Swedish women and 10.0 for the American women and there was no correlation between the week of miscarriage and RIMS factors.

Comparison of Swedish and American couples experiences
For comparison of experiences after a miscarriage in women and men from Sweden and the USA, we used RIMS (Study II). One week after the miscarriage the Swedish and American women's experiences were more pronounced than men in all three factors "Isolation/Guilt" and "Devastating event", and "Loss of baby". There were no significant differences in the two factors between the Swedish and American couples in, "Isolation/Guilt" and "Devastating event", but there was a significant difference in factor "Loss of baby", as the American couples, men and women combined, scored significantly higher than the Swedish couples, and the Swedish women and men scored lower and similar. There were two questions in the factor "Loss of baby" where the Swedish couples scored significantly lower than the American couples. The first question was "I feel there will always be a place in my heart for the miscarried
baby" and the second question was, "Through miscarriage, I feel that I have lost a person". There was a positive correlation between the couples (Figure 1). In conclusion, women's experiences were more pronounced than the men and two of three of the RIMS factors were similar in the two countries but there was a gender difference.

**Figure 1.** The box plot shows the Revised Impact Miscarriage scale scores, comparing Swedish and American couples. The groups are the following: Sw W (Swedish women), Sw M (Swedish men), Am W (American women) and Am M (American men). A = "Isolation/guilt", B = "Loss of baby", C = "Devastating event", The Mann-Whitney U-test was applied with median and range. * = p<0.05, *** = p<0.001.

**Comparison of Swedish women and men's emotions**

For comparison of emotions after a miscarriage in Swedish women and men one week and four months after the miscarriage, we used RIMS, PGS and MADRS-S (Study III). The emotions of miscarriage, measured by use of RIMS after one week, was more pronounced in women than in men, the men scored significantly lower than the women in RIMS factors "Isolation/guilt" "Loss of baby" and "Devastating event". This was also seen in the matched couples for "Isolation/guilt" and "Devastating event" but not for "Loss of baby" which did not reach statistical significance after four months and most of the couples in the study had planned their pregnancy.

Measurement of grief by use of PGS after one week showed a significant difference between women and men for all three factors "Active grief", "Difficult coping" and "Despair" this was also seen in the matched couples after four months. Among women, "Active grief" and "Difficult coping" were reduced after four months, while feelings of "Despair" remained the same. Among the men, all three PGS factors "Active grief", "Difficult coping" and "Despair" were reduced after four months. The relative reduction in grief from one week to four months did not differ between women and men in the three PGS factors. There was a significant relative reduction in the score from one week to four months, both for women and men.

The self-reported depressive symptoms were more pronounced in women than in men after one week and did not differ between women after miscarriage and control women after one week and after four months.
In MADRS-S the women scored higher than the men both after one week and after four months and the relative reduction was similar for both the women and the men and this was also seen in the matched couples. Therefore, we conclude that women were more emotionally affected by depressive symptoms than the men after one week. The same was seen after four months in the couples for grief and depressive symptoms, but not for their experiences after miscarriage there the women and men were more similar especially in "Loss of baby".

Comparisons of women with and without an obstetric history prior to the miscarriage

For comparison of emotions one week after a miscarriage in women with a previous miscarriage, women without children and in women with infertility diagnosis prior to the miscarriage we used RIMS, MADRS-S and PGS (study III). There were significantly higher scores in women with previous miscarriage in RIMS factors "Isolation/guilt", "Loss of baby" and "Devastating event" and in PGS factors "Active grief", and "Despair" compared to women without previous miscarriage. There were significantly higher scores in women without previous children in RIMS factor "Isolation/guilt" and in PGS factor "Active grief" compared to women with previous children.

There was a significantly higher score in women with an infertility diagnosis in RIMS factors "Isolation/guilt" and "Loss of baby" and in PGS factors "Active grief", "Difficult coping" and "Despair" compared to women without an infertility diagnosis prior miscarriage. Therefore, the conclusion is that previous miscarriage, lack of previous children and an infertility diagnosis prior to the miscarriage can lead to negative emotions especially in grief reactions.

Comparison of women with miscarriage and a control group of women

For comparison of depressive symptoms in women with previous miscarriage compared to a control group of women one week and four months after the miscarriage, we used MADRS-S (study III). There was a significant difference in depressive symptoms in women with previous miscarriage compared to the control group after one week, but this difference did not persist and there was no difference after four months. The results show that women whit miscarriage had coped and recovered from their depressive symptoms after four months, corresponding to the control group.
Comparison of women with spontaneous miscarriage and women with missed miscarriage

To compare emotions in women with spontaneous miscarriage and women with missed miscarriage after one week and four months after the miscarriage, we used RIMS, MADRS-S, and PGS (Study IV).

Women with spontaneous miscarriage and women with missed miscarriage scored similar one week after treatment in RIMS factors "Isolation/grief", "Loss of baby" and "Devastating event". Furthermore, the RIMS factor "Loss of baby", was reduced in women with a missed miscarriage, while it remained the same in women with spontaneous miscarriage after four months. Furthermore, the RIMS factor "Devastating event" was also reduced and remains the same for both groups after four months.

Women with spontaneous miscarriage and women with missed miscarriage scored similar one week after treatment in depressive symptoms as measured by the use of MADRS-S. After four months the depressive symptoms scores were significantly reduced in both groups.

Furthermore, the PGS factors "Active grief", "Difficult coping" and "Despair" was similar in both groups one week after the miscarriage. "Active grief" and "Difficult coping", but not "Despair" was significantly reduced four months for women with missed miscarriage but not for women with spontaneous miscarriage. Hence, miscarriage diagnosis has a limited influence on women's psychological well-being, especially for women with a diagnosis of missed miscarriage.

Comparison of women treated with misoprostol and women treated with misoprostol/vacuum aspiration

To compare treatment in women only treated with misoprostol compare to those women treated first with misoprostol followed by vacuum aspiration and mifepristone we used RIMS, MADRS-S, and PGS (Study IV). Women with missed miscarriage were more often given additional treatment after misoprostol usually vacuum aspiration and mifepristone and they had significantly more visits to the hospital, while women who received misoprostol alone had higher scores regarding depressive symptoms. Longer duration of treatment and more frequent additional treatment usually vacuum aspiration or mifepristone was seen in women with a missed miscarriage.

Thus, women treated with misoprostol followed by vacuum aspiration experienced better psychological well-being as regards depressive symptoms compared to women treated with misoprostol alone. There was a positive correlation in "Difficult Coping" and duration of treatment within women with spontaneous miscarriage and women missed miscarriage. In conclusion, coping
scores correlated with the duration of treatment time. Diagnosis of miscarriage has limited influence on woman's experience of miscarriage; more important is the duration of treatment particularly for women with a missed miscarriage.
Discussion

The care providers in the qualitative study found that most women with a diagnosis of missed miscarriage in pregnancy weeks 18-20 had had a premonition that something was wrong with the pregnancy. The care providers found that women with missed miscarriage had reduced pregnancy symptoms and absence of fetal activity, or they experienced minor bleeding. In previous studies reported the women that they needed confirmation from care providers of the first symptoms of miscarriage (75, 110, 111).

It has previously been shown that women have been in health care center, as they were worried about miscarriage symptoms, but were often advised to wait before seeking medical care (17). Therefore, in order to improve the possibility of early diagnosis of a missed miscarriage a questionnaire based on the qualitative work of Adolfsson et al. was developed, which is used today in gynecological clinics and antenatal clinics in Sweden (112). With the help of these questionnaires, care providers can identify women with suspicion of a missed miscarriage and offer them an ultrasonographic examination. A miscarriage can affect their psychological well-being and it is important that care providers have knowledge of nursing care and pay attention to the women emotions (and those of their partners) after miscarriage (4, 15). Therefore, care providers can give women confirmation that their feelings about the missed miscarriage symptoms were right so they can seek care and a diagnosis can be done early in the pregnancy.

The midwives gave the women written and oral information and their business cards, so they could be contacted if they needed to talk or have questions about the miscarriage. Midwives at the ultrasounds clinics and the antenatal clinics reported that they made a phone call to women who had given their consent and this form of follow-up by the care providers was much appreciated. They called the women even though there were no routines for follow-up in the clinics. In most cases, a telephone call was sufficient some had already spoken to care providers or with their family or friends, however, some couples wanted a return visit. During return visits, they asked questions about the miscarriage both women and men were encouraged to discuss their emotions and thoughts. Care providers felt it was important to invite the men to join in the conversation and talking to them both as a couple. The care providers said that they also offered a counselor's contact if needed. This is in line with previous studies which have shown that follow-up in the form of information and a
telephone call from care providers after an ultrasonography diagnosis of missed miscarriage reduces grief and anxiety symptoms over time (15, 73, 110).

Other appropriate forms of support, according to studies, are the opportunity to meet others with miscarriage experiences in group therapy (113) and support from family and friends are valuable (114). Internet discussion forums have been used by women to seek support and reading about other women's experiences and/or sharing their experiences online (115, 116). The similarities between studies from different countries show that individual patient-centered follow-up after a missed miscarriage, with relevant information, should be prioritized by care providers (77, 110, 111) for improve well-being (117). These results are in line with results from this present study, which show that individual patient-centered follow-up from care providers, family, friends and to talk with other women and couples with miscarriage experience and share their feelings with others can improve their psychological well-being.

The care providers in the qualitative study informed the women promptly and honestly when a diagnosis of missed miscarriage was made by during routine ultrasonography examination in weeks 18-20. Thereafter, the women or the couple were brought to another room at the ward, where they were given written and oral information about the diagnosis. Care providers found that some women had trouble accepting the news/information because they were already in a state of shock and distressed when they received the diagnosis, and they had questions and wanted all the relevant facts. One care provider said that the women retreated within themselves and cried and that they also entered a state of denial and did not comprehend what had happened. According to the results of previous studies is it not enough to provide information after ultrasonography examination, because it could be difficult to accept and understand the information about the diagnosis, although it is important to give ongoing information (75, 110, 111).

The care providers in our study found that the men were normally present during the ultrasonography scan and supported their partners during the miscarriage diagnosis. They said that the men could feel sad and disappointed and experience the same types of emotions as the women during the scan he tried to remain calm and collected and support his partner. In a previous study, men experienced negative psychological feelings at the time of ultrasonographic diagnosis, but they coped by remaining optimistic, hiding their feelings and focusing on supporting their partners (11, 118). Several studies have shown that men may feel overlooked and marginalized in comparison with their female partners (12, 119) but women appreciate the support from their partners through the experiences of miscarriage (75, 120, 121). In a study of 204 women who had experienced an ultrasonographic diagnosis of a missed mis-
carriage, the results showed that women who were provided with an opportunity to discuss their feelings and ask questions about the diagnosis had significantly lower levels of anxiety after four months than women with no counseling (110). According to recommendations in earlier studies, it is important to provide patient-centered support in the physically and emotionally difficult situation during a diagnosis of miscarriage (16, 122-125). These results and previous results show that receive a diagnosis of missed miscarriage can be a difficult experience for women and men and it can be difficult to assimilate and understand the miscarriage so oral and written information may need to be repeated later.

When women came to the gynecology ward in this study the care providers asked questions about their miscarriage symptoms, pregnancy and their medical history in order to set a diagnosis of miscarriage. For women where bleeding actually was a miscarriage the care providers in our qualitative study found that the waiting period to an evacuation was perceived as being difficult for the women, who preferred to undergo evacuation of the pregnancy as soon as possible, preferably on the day of diagnosis. However, the waiting period for an evacuation could range from the same day to one week after the diagnosis for practical reasons and availability of beds at the clinics. In a recent qualitative study concerning 14 couples, about treatment and care after a miscarriage diagnosis, couples asked for effective medical care in order to reduce the length of hospital stay (126). This is in line with what has been found in previous studies, showing that the waiting period from the first miscarriage symptoms to diagnosis and treatment is perceived as being difficult (10, 120, 127, 128) as some women have felt powerless and uncertain about the outcome of the pregnancy (124, 129). In the light of the present results and previous ones, care providers can try to reduce the waiting period for the women, offer a time for treatment after a women's request and ask for the clinic to arrange it.
Swanson's Middle Range Caring Theory

Our qualitative study is linked to SCT and is the theoretical framework of this thesis. The first category, "Maintaining belief" is the basis of care. Care providers can meet women with a positive attitude and create a hope for the future and try help them achieve a psychological well-being. The care providers in the present study gave ongoing information, stayed with the couple and met their reactions or were just present, in line with the categories "Knowing"; and "Being with". Care providers try to arrange a time for treatment for the women as soon as possible and they ensured counselor contact if needed, in addition to giving their own support, this form of care is linked to the fourth category, "Doing for". Care providers reported that both women and men appreciated a follow-up to talk about their experiences and care providers can help them work through the miscarriage to reach individual levels of psychological well-being, according to the fifth category "Enabling" (76, 93, 94). In conclusion, SCT can be useful in miscarriage care for both care providers in their work and for the couples involved in order to improve their psychological well-being.

We found reliability for up to four months in RIMS factors in our validation study. The Swedish women scored higher in two of the three RIMS factors compared with men, and American women scored higher in all RIMS factors compared with men. Earlier studies have shown that women's experiences measured by RIMS are significantly more pronounced for women than for men (4, 86, 130) but there was a positive correlation between Swedish women and men and American women and men. This is in line with previous results from studies including the gender-related comparison of miscarriage experiences (13, 86). This results and previous results show that the RIMS is reliable for Swedish conditions and can be used for Swedish and American women and men.

In terms of experiences after a miscarriage, the Swedish and American women experienced more "Isolation/guilt" and "Devastating event" than the men which has also been shown in earlier studies (4, 86, 130). The feeling of "Isolation/guilt" could last for as long as one year after the miscarriage; some women blame themselves and try to find causes of the miscarriage (4, 10). "Devastating event" means that the miscarriage is a hopelessly devastating event that cannot be controlled (4, 86). Many women carefully plan their pregnancies and to have a miscarriage could be experienced as a loss of control in life (131). In conclusion, women felt more "Isolation/guilt" and experienced "Devastating event" more than the men and it may be due to the fact that the miscarriage cannot be controlled and not always explained.
The Swedish women and men showed similar results as regards the factor "Loss of baby" after one week and this experience was not significantly reduced among women and men after four months. The American couples showed significantly higher results in the factor "Loss of baby" than the Swedish couples. The experiences were more pronounced in women than in men and this is in line with the results of previous studies (4, 86, 130). In a previous study involving 72 American women who had experienced miscarriages, 75% felt that they had lost more than just a pregnancy, they had lost a child (132). Results from a second analysis from CMHP (measured by RIMS) showed that men and younger couples were more likely to identify "Loss of Baby" in connection with gestational age (14). It is clear from the findings of a Swedish qualitative study that women not only feel the loss of an early pregnancy, but also their motherhood and their ability to be able to reproduce themselves (10, 133). These similarities in our study and earlier studies show that both women and men can experience "Loss of baby" and results from this study show that the Swedish women and men showed similar results.

There was a difference between women and men in two of the three PGS factors, "Active grief" and "Difficult coping" after one week. Among women, "Active grief" and "Difficult coping" were reduced after four months, while feelings of "Despair" remained the same. Among the men, all three PGS factors were reduced after four months. A reduction in grief with time has also been noticed in previous studies (133, 134), and it has been shown that grief after miscarriage is associated with their relationship (135). Some investigators have reported a greater impact of grief among both women and men after they have been at an ultrasonographic scan and observed the fetus on the ultrasound screen further along in the pregnancy (8, 125, 136). Men also feel grief after a miscarriage and the length of pregnancy and a miscarriage diagnosis via a routine ultrasonography scan have been found to be factors related to elevated levels of grief and stress in men (119). From these results and previous ones, it seems that both women and men can experience grief after an ultrasonographic diagnosis of miscarriage and the grief reaction is more pronounced in women than in men, although it becomes reduced with time.

Depressive symptoms were more pronounced in women with miscarriage than in men and the same was noted for the matched couples after four months, but there was a significant reduction of depressive symptoms among both women and men. Those women who had experienced miscarriage were more than twice as likely to suffer either a new or recurrent major depressive episode within the following six months, compared with a control group (137). In several studies, the psychological impact of miscarriage and the occurrence of depressive symptoms among men was less enduring when compared with those in women. Men also appear to resolve their mental health more quickly than women (13, 77). In a prospective one-year longitudinal observational
study general health and depressive symptoms of 83 women and men were measured immediately and at three, six and 12 months after a miscarriage. The results showed that feelings concerning miscarriage among the men were less enduring than in women up to one year after miscarriage (13). In conclusion, our results and previous ones show that depressive symptoms were more pronounced in women than in men but there was a significant reduction among both women and men after four months.

Depressive symptoms were more pronounced in women with miscarriage than in a control group of women after one week but this difference did not persist after four months. In a recent prospective study, the level of moderate to high depressive scores according to MADRS-S was around 15%, being decreased after three months among women with miscarriage (81). In a prospective one-year longitudinal study on 280 miscarrying women and 150 non-pregnant women, depressive symptoms were more pronounced in women with miscarriage, but the levels of distress became reduced over time until they were comparable with those in the controls (138). Younger couples among whom either member had been previously treated for anxiety, depression were more likely to feel "Isolation/guilt" over their miscarriage than those with no treatment history (measured by RIMS from a second analysis from CMHP) (14). In conclusion, our results and previous ones show that depressive symptoms were more pronounced in women with miscarriage than in the control group of women but there was a significant reduction of depressive symptoms after four months.

There were also significantly higher scores among women with previous miscarriage in "Isolation/guilt", "Loss of baby", "Devastated event", "Active grief" and "Despair" compared with women without an earlier miscarriage. Our results are in line with those of an earlier study which showed that women with previous miscarriage prior to miscarriage have significantly higher scores in grief, anxiety and depressive symptoms than women without a history of miscarriage (139). In one study, after a late miscarriage, some women had a high level of self-criticism and some developed complicated grief (140). Of these women, many had had an earlier depressive disorder, and some had complicated grief lasting for years after miscarriage (141, 142). According to another study on women with previous miscarriage, women can feel worried about a new miscarriage in a new pregnancy (7, 143). Some of these women need to meet a counselor for psychological counselling about their experiences, and some women ask for frequent ultrasonographic examinations to check that the pregnancy is developing normally (6, 144). They can be more vulnerable try to gain control during over the pregnancy (145) and they can seek care (146). Earlier results and ours show that women who suffer a miscarriage after a previous one experience poorer psychological well-being. It may be the case that emotion from their earlier miscarriage experiences can
come up again in a new pregnancy and they can be more vulnerable and ask for more controls during the new pregnancy.

There was also a difference in the present study when we compared women with and without children prior to miscarriage. There was a significant difference in women without children in "Isolation/guilt" and in "Active grief" compared to women with children prior to miscarriage. This is in line with the results of a previous study which showed that the most common reactions that women experienced after the miscarriage was grief and isolation, and risk factors of these reactions include having no living children (14, 83, 133). It is clear from the findings of a Swedish qualitative study that after miscarriage women felt that they have not only lost an early pregnancy but also their motherhood and their ability to be able to reproduce themselves (10). This results and previous show that women without children prior to miscarriage need caring because they experience feelings of grief and isolation.

In the present study there was a low number of women with infertility diagnosis and treatment before miscarriage, and such women experience "Isolation/guilt", "Loss of baby" and "Active grief", "Difficult coping" and "Despair" which has been described in earlier studies (147, 148). This is in line with a previous study with a secondary analysis of data from the CHMP which showed that older couples with infertility were more devastated and felt more "Isolation/guilt" related to miscarriage (measured by RIMS) (14). Previous studies show that some women with an infertility diagnosis may question their fertility and their role as a woman and mother, and a miscarriage could lead to feelings of helplessness and powerlessness and lack of hope for a new successful pregnancy (125, 145, 149). Earlier studies and our results show that if they suffer a miscarriage after infertility treatment it could affect their psychological well-being negatively. It may be the case that couples who have tried to achieve pregnancy for more than one year and have gone through treatments to become pregnant could experience poorer psychological well-being because of their fertility history.

The majority of women with spontaneous miscarriage and women with missed miscarriage had planned their pregnancies. A previous Swedish study revealed that more than 75% of pregnancies in Sweden are planned and there is strong coherence within the couples concerning their pregnancies and relationships (150). Our results and these previous ones show that a planned pregnancy before a miscarriage can lead to coherence within the couples concerning pregnancy and miscarriage.

There were no differences in experiences, depressive symptoms or grief between women with a missed miscarriage and women with spontaneous miscarriage one week, but after four months "Loss of Baby" was higher for
women with spontaneous miscarriage compared to women with missed miscarriage. Furthermore, the RIMS factor "Devastating event" was also reduced but it remains the same after four months. "Grief" and "Difficult coping", but not "Despair" was significantly reduced four months for women with a missed miscarriage but not for women with spontaneous miscarriage. In a study of 121 women and facing threatened miscarriage, anxiety and depressive symptoms was greater among women with threatened miscarriage compared to women with uncomplicated pregnancies (88).

In one study, among 143 women who had an ultrasonographic diagnosis of missed miscarriage in pregnancy weeks 10-14, a fetal chromosomal abnormality were the most commonly identified cause, and this group of women with missed miscarriage reported significantly less self-blame than women in whom no cause was identified (78) although the cause in 50% of cases cannot be explained (34). In conclusion, miscarriage diagnosis has a limited influence on women's psychological well-being, especially for women with a diagnosis of missed miscarriage after four months. The limited better psychological well-being of women with missed miscarriage after four months may be due to the fact that these women were told that the most common cause of miscarriage is a chromosomal abnormality.

In the present study, women answered the questionnaire after they had finished the treatment of miscarriage, and those women with missed miscarriage who had received additional treatment after misoprostol had significantly more visits to the hospital. Those women who received misoprostol alone had higher scores in depressive symptoms compared with women treated first with misoprostol, with further treatment thereafter. In a recent qualitative study concerning treatment and care after a miscarriage diagnosis women asked for effective medical care in order to reduce the length of hospital stay (126). This is in line with previous results that show that some women are not prepared for the duration of the miscarriage treatment process, and after active treatments, women have been found to have significantly better psychological well-being (57).

Women with a diagnosis of missed miscarriage had a longer duration of treatment compared with women with spontaneous miscarriage and they needed to use medical and surgical treatment more often for the treatment to be successful. A previous study has shown that mifepristone and misoprostol treatment is more efficient than misoprostol alone (58). In a recent study, women with missed miscarriage received a standard dose of misoprostol administered vaginally, which has a low-level effect in women with a closed cervix, and such women required a second dose of misoprostol, which prolonged the treatment period (57). However, vacuum aspiration is a faster treatment method, although it carries a small risk of cervical tears and uterine perforation (62). In a recent controlled trial carried out in Finland among women with early
miscarriage, surgically treated women were more satisfied with the treatment than medically treated women because the treatment took a shorter time (151). However, many women prefer expectant or medical treatment as an alternative to surgery (152). A suggestion in one study is that women should be offered an informed choice about treatment options after a miscarriage in relation to their psychological well-being (55). In this study coping scores correlated with duration of treatment for women with spontaneous miscarriage and for women with a missed miscarriage, and since surgical treatment with vacuum aspiration is a faster option, with fewer visits to the hospital for treatment, this increased the ability of women to cope after a miscarriage. Therefore, faster treatment can be beneficial after a miscarriage, as it can lead to better psychological well-being, especially among women with a diagnosis of missed miscarriage.

Methodological considerations

This thesis can be seen as a process - in the first study the qualitative study was carried out by using a qualitative content analysis with an inductive approach with semi-structured interviews to meet the aim of the study and to obtain a deeper understanding of the topic miscarriage. We used content analysis and latent analysis which is an interpretation of the text's underlying meaning (103). In this qualitative study, validity means that the results truthfully reflect the phenomena and aim of the studied "To describe midwives' and nurses' experiences when women are diagnosed with a missed miscarriage during a routine ultrasound scan in pregnancy weeks 18-20", and reliability requires that the same results would be obtained if the study were replicated in a new research (104). In the second, third and fourth studies we used a quantitative approach with three validated scales for Swedish conditions about experiences, grief and depressive symptoms to investigate women's and men's emotions after miscarriage (86, 90, 99, 105, 107, 130).

Trustworthiness

Concerning quality in all phases of the analysis in the qualitative study, an aspect to take into consideration is trustworthiness, which has four features: credibility, dependability, conformability, and transferability.

Credibility concerns confidence in the approach and interpretation of the data. To ensure credibility, semi-structured interviews with an inductive approach were considered to be the best data-collection method. The research group designed an interview guide to ensure that all topics were covered for each participant. We continued to interview until no new information came up. However, to bring in many different views the care providers met women
with miscarriage in different departments - gynecological clinics, antenatal clinics and ultrasound clinics, in order to ensure credibility.

Dependability concerns the stability of the data over time. It was assured through a detailed description of data collection, analysis and results, leading to stability of the data. The analytical process started after the first interview and after 11 interviews we decided that saturation had been reached, although we carried out two more interviews to ensure saturation.

To strengthen Conformability, which refers to objectivity and neutrality and the fact that the data represents what the study participants have stated, we considered the researcher's awareness of their pre-understanding before starting the interviews, considering that we were midwives and have cared for women with a missed miscarriage. The analysis was performed by both authors and each interview was thoroughly read several times and discussed by the two authors.

Transferability was strengthened by providing detailed descriptions of the content and the context of the interviews, the inclusion and exclusion criteria of the study participants, data collection, analysis, and the findings. This description provides a basis for other researchers to see the relevance of the study (101, 153).

Validity and reliability

In the second, third and fourth studies general questions about socio-demographic factors, health and fertility were asked and three validated instruments (RIMS, PGS and MADRS-S) were used (105, 107, 130). In statistics, non-parametric tests were used in connection with all three scales owing to the fact that answers in the questionnaires were ordinal and not exact in relation to the number of response alternatives (108). Validity refers to the extent to which the instruments measure what they are intended to measure and reliability concerns the overall consistency of a measure. Statistical conclusion validity is related to statistical power (154). A power calculation was performed before starting the study, based on data from a previous study of experiences of miscarriage. Concerning RIMS factors, with an alpha value of 0.05 and a the desired power of 0.8, a sample size of 45 would be sufficient (74). The power calculation was carried out to avoid bias and negative confounding, which could arise from systematic errors in data collection and/or in an analysis for all statistical analyses, there is always a risk of type 1 and type 2 errors, since the p-value was set to 0.05 (108).

In (Study II), data collection stopped at 70 women and 70 men in each group, when the data in the intermediate analysis showed significance according to power calculation. The study in the USA was performed in 2003-2006 (4) and the study in Sweden in 2013-2014, and although the collection of RIMS questionnaire data differed in time and location the RIMS questionnaire has shown
test-retest reliability, which refers to the fact that the scores are consistent from one study to the next. The studies were performed by different research groups, so the results show inter-group reliability. The high consistency in Cronbach's coefficient alpha between the countries strengthens the external validity, i.e. the generalizability of RIMS. Cronbach's alpha value could be higher if some questions were removed. Construct validity concerns whether or not the questionnaire really is measuring what it is supposed to measure, and whether it measures it in an adequate way. In Study II the RIMS questionnaire was translated from English to Swedish by one translator and then re-translated back to English by a second translator and thereafter sent to the person who originally designed the questionnaire (154).

In the prospective longitudinal study (Study III), internal validity was strengthened in the prospective longitudinal study in that we followed the same cohort up to four months and we had a control group of women (154).

In (Study IV), after finalized data collection and before data analysis we randomized the women into two groups, women with spontaneous miscarriage and women with a missed miscarriage. The distribution of the two diagnoses among the women was not equal. Women with complete spontaneous miscarriage might have called the clinic and been advised to stay at home, or they may not have paid a follow-up visit to the clinic and therefore were not asked to be included in the study. Internal validity, which refers to whether a treatment truly caused the observed effect, was strengthened in the prospective longitudinal study in that we followed the same cohort up to four months. This might constitute a risk of type 1 or type 2 errors, and a higher number of study participants would probably have improved the data (108).

For an ethical reason, in the (quantitative study) we chose not to ask the women to be included in the study at their first visit to the care providers because in most cases they were in a state of shock reaction. For this reason, we chose to ask the women to be included after the treatment was completed. In the studies, (qualitative and quantitative) the questions can be perceived as being sensitive and could have affected the study participants emotionally. However, on the other hand, the study participants could share their experiences of miscarriage, which makes it possible for patients, care providers, researchers, and the public to benefit from the results. If the study participants needed contact with a counselor, the research midwife conveyed that contact to them.

Those couples coming to the clinic on days when the midwife was not present were not asked to be included in the study, and women who called but did not come to the clinic were not asked to be included in the study. We did not carry out a dropout analysis concerning those who did not want to participate in the
study, for ethical reasons and ethical decision, and we can only speculate about that dropout rate. Drop-outs among the women and men may be because they don't want to answer the miscarriage questions because the miscarriage was a difficult experience. Drop-outs among some men may be because the women came alone to the clinic and took the questionnaires home to the men, who failed to complete them. These cases were taken to be normal drop-outs because the men were not physically present. There was a low dropout rate after four months - 84% for women and 88% for men. This may be due to the fact that the study participants met CJ after a week and they then received follow-up from CJ after four months. When they sent back the questionnaires, some study participants wrote and thanked us for their participation in the study. The drop-out rate among the control women was 48%. This rate may be due to the fact that some women had moved, and some women might not have wished to answer the questions. Most women, in (Study IV), 77% of women with spontaneous miscarriage 80% women with missed miscarriage answered the second questionnaire.

Strengths and limitations

A strength in the first study was that care providers were from three different areas of healthcare, i.e. ultrasonography clinics, antenatal clinics, and gynecology clinics, and this provided an opportunity to capture experiences from different healthcare areas, with semi-structured interviews.

A strength in the second (quantitative) study was that the groups were matched for factors known to be important as regards the experience of miscarriage. The majority of the Swedish and American study participants were highly educated and had planned their pregnancies. The Swedish participants included in the study were from one county in Sweden, while the American couples were included in a multicentre study, which is a limitation of our current study.

A strength in the third (quantitative) study was the longitudinal design up to four months and the inclusion of control women for comparison of depressive symptoms. On the other hand, a limitation of the study was the low response rate, with no information on those declining to participate. We did not contact those who did not respond, for ethical reasons.

A strength of the fourth (quantitative) study is that the cultural origin of the women is the same as would be expected in the general population, and the results are valid for Swedish conditions. This is in line with results where we showed that experiences of miscarriage are the same regardless of cultural differences (130). Another strength of the study is that the three questionnaires have been used in previous studies. MADRS-S was developed for Swedish conditions and the other two scales (PGS and RIMS) have been validated for
Swedish conditions (105, 107, 130). One more strength was that most women answered the second questionnaire after four months. A limitation of the study was the low response rate (51.5%). However, a sample size calculation was performed before initiation of the study, based on data from a previous study (74).
Conclusions

- Care providers found that women needed confirmation of their premonition of the symptoms of a missed miscarriage, so a diagnosis can be made as early as possible in the pregnancy.
- Care providers found that women and their partner who have suffered a missed miscarriage needed extended support on an individual basis in addition to a follow-up by the midwives.
- The high consistency between the countries suggests that the RIMS questionnaire is reliable for both women and men to be used in both countries.
- Two of the RIMS factors, "Isolation/Guilt" and "Devastating event" were similar between the two countries.
- Grief and depressive symptoms is reduced over time while emotions such as "Isolation/guilt", "Loss of Baby" and "Devastating event", persist longer than four months.
- Previous miscarriage, lack of previous children and an infertility diagnosis prior to miscarriage can lead to negative emotions after miscarriage, this was especially pronounced for grief reactions.
- The diagnosis of miscarriage had a limited influence on the experience of miscarriage.
- Shorter duration with misoprostol and subsequent vacuum aspiration resulted in fewer depressive symptoms.

Coherent conclusions

- The care providers found that women and men are psychologically affected by their miscarriage experiences and women's and men's emotions after miscarriage persist.
- The care providers found that women want treatment on the same day as a missed miscarriage diagnosis and there was a correlation between treatment time and "Difficulties of Coping". Women who receive rapid and successful medical and surgical treatment of their miscarriage have reduced depressive symptoms and they achieve greater psychological well-being.
Clinical implications

The findings may be applicable in clinical situations when care-providers consult couple's faced with a diagnosis of miscarriage.

The following clinical implications are suggested:

- To see the couple's and include the men in miscarriage care.
- Care providers can make sure that treatment of miscarriage is as efficient as possible and of short duration, especially for women with a diagnosis of missed miscarriage.
Suggestions for future research

The present findings suggest the need for further research:

- Further studies using RIMS are needed to establish the experiences of miscarriage among people with different education levels and from different countries.
- Further studies using RIMS among both couple's are needed to establish if a planned pregnancy compared with an unplanned pregnancy might affect their experiences after a miscarriage.
- Further studies using RIMS are needed in order to set cut-off values of RIMS subscales.
- Further studies using RIMS are needed among couples who have a new pregnancy after a miscarriage, compared to couples without a history of miscarriage.
- Further studies on women and men are needed to establish if no previous children, previous miscarriage, and an infertility diagnosis prior to miscarriage might affect their psychological well-being.
- Further studies are needed on psychological well-being among women treated with misoprostol and mifepristone compared to women with other treatments.

Det övergripande syftet med denna avhandling var att beskriva och mäta kvinnor och mäns erfarenheter av missfall.

Studie I, är en kvalitativ studie med en innehållsanalys med en induktiv insats och semistrukturerade intervjuer. Studierna II-IV, är kvantitative studier och utfördes med tre validerade skalar "The Revised Impact of Miscarriage Scale" (RIMS) som mäter upplevelser av missfall, "Montgomery-Åsberg Depression Rating Scale" (MADRS-S) en självskattningsskala för depressiva symptom, "The Perinatal Grief Scale" (PGS) som mäter perinatala förluster och dessutom besvarade en del socio-demografiska, hälso-, fertilitets frågor.

Studie I, är en kvalitativ studie med semistrukturerade intervjuer med 13 svenska barnmorskor och sjuksköterskor om deras erfarenheter av kvinnors reaktioner efter rutinultraljuds diagnosen av ett uteblivet missfall under graviditetsvecka 18-20.

Studie II, är en valideringen av RIMS för svenska förhållanden och en jämförelse av svenska och amerikanska kvinnor och mäns upplevelser av missfall. Studiedeltagarna var (n=70) svenska par och (n=70) amerikanska par.

Studie III, är en longitudinell kohortstudie av svenska kvinnor och mäns upplevelser, sorg och depressiva symptom en vecka och fyra månader efter missfall. Studiedeltagarna var (n=103) svenska kvinnor och (n=78 män) och en
kontroll grupp av (n=93) svenska kvinnor som deltog för en jämförelse av depressiva symptom en vecka och fyra månader efter missfallet.

Studie IV, är en randomiserad prospektiv longitudinell kohortstudie om kvinnors upplevelser, depressiva symptom och sorg i samband med typ av missfall och behandling. Studiedeltagarna var (n=102) svenska kvinnor med tidiga missfallsdiagnoserna, spontana missfall (n=35) och uteblivna missfall (n=67).

Resultaten visar att barnmorskor noterar att kvinnorna har haft en föraning om det uteblivna missfallet och att paren uppskattar en individuell uppföljning från barnmorskorna. RIMS är validerad för svenska förhållanden och kan användas för svenska kvinnor och män.

Den höga graden av överensstämmande i två av RIMS faktorer visar att frågeformuläret kan användas i en svensk kontext. De svenska och amerikanska kvinnorna och männen uppvisade liknande resultat beträffande två faktorer, "Isolering/skuld" och "Förödande händelse" men kvinnornas upplevelser är mer uttalade än männens.

Sorg och depressiva symptom reduceras över tid, medan upplevelserna kvarstår. Barnlöshet, tidigare missfall eller infertilitetstreatment före missfallet förvärvar de emotionella känslorna speciellt i sorgereaktionen.


Sammanfattningsvis kan vårdgivare bekräfta kvinnors symptom på ett uteblivet missfall och genomföra en individuell patient centrerad uppföljning. Den höga graden av överensstämmande mellan Sverige och USA i RIMS faktorer visar att RIMS kan användas både i svenska och amerikanska förhållanden och två av tre faktorer "Isolering/skuld" och "Förödande händelse" är liknande för både Svenska och Amerikanska kvinnor och män. Sorg och depressiva symptom minskade med tiden medan upplevelserna kvarstår. Tidigare missfall, barnlöshet och en infertilitetstagnostik före missfallet kan leda till negativa känslomässiga tillstånd speciellt i sorgereaktionen. En missfallsdiagnos har ett begränsat inflytande på upplevelserna av missfall. En kortare behandlingstid
och en behandling med misoprostol och efterföljande vakuumaspiration leder till färre depressiva symtom speciellt för kvinnor med uteblivna missfall.
Acknowledgments

This thesis would not have been possible without contributions from wonderful people. I would like to give thanks to all of you, who have in different ways supported me in finishing my PhD thesis.

First, I want to express my gratitude to the care providers, and women and men who participated in this research project. Thank you for answering our interview questions, for taking the time to respond to questionnaires and for your willingness to share your experiences of miscarriage.

Thanks to my supervisors:

Anneli Stavreus-Evers, my main supervisor. I want to thank you for your advice and that you have shared your broad clinical and scientific knowledge with me during my education.

Agneta Skoog-Svanberg, my co-supervisor. Thank you for your broad clinical and scientific knowledge and for your encouragement to me during my education.

Elisabeth Darj, my co-supervisor. Thank you for your wonderful effort in our project. I want to thank you for your humanity and for your broad clinical and scientific knowledge.

Thanks to my co-authors:

Kristen M. Swanson, thank you for your cooperation during my education and that you have shared your research about miscarriage with us.

Carolyn Huffman-Ponder, thank you for your cooperation during my education and that you have shared your research about miscarriage with us.

Annsofie Adolfsson, thank you for your cooperation and for the work with our two articles.

Helena Volgsten, thank you for your cooperation during my education and for the work with our articles.
Thanks for all help from the administrative staffs at the Department of Women's and Children's Health in Uppsala University, and the International Maternity and Children's Health (IMCH), Uppsala University.

*Matts Olovsson*, thank you for interesting seminars and that I have had the opportunity to belong to a research group.

Thanks to *Kjell Alving*, from Women's and Children's Health at Uppsala University.

Thanks to *Lena Hellström-Westas* for your support.

Thanks to *Margareta Larsson*, for encouragement and interesting seminars.

Thanks to the members of the PhD groups for all the interesting seminars where we have shared our projects with each other.

Thanks to all the staff at the gynecological ward at Akademiska Hospital and I want especially like to thank midwives *Karolina Hilding and Birgitta Lindahl* for help with the clinical quantitative study.

Thanks to *Nick Bolton* for your valuable comments.

My family, my husband *Allan* and my three children *Cecilia, Jaqueline, and Erik*; thanks all of you for your valuable support.

Many thanks for financial support from *Vinnova*.

Thank for scholarships from *Tora Wåhlins Foundation*,

Sophiahemmet University, Stockholm, Sweden, my nursing school.

Many thanks for scholarships from the *Family Planning Foundation in Uppsala, Sweden*. 
References


This questionnaire relates to whom you are and how you feel. The purpose of this study is to measure women and men’s experiences after miscarriage. It is our hope that the answers will provide enhanced knowledge which may lead to the development of care following miscarriage. The questionnaire takes about 10 minutes to fill in.

Please answer all of the questions.

Date when you are answering the questionnaire________________________________________

Date of birth________________________________________

1. In which country were you/your parents/your partner/your partner’s parents born?

I was born in _________________________________________

My parents were born in _________________________________________

My partner was born in _________________________________________

My partner’s parents were born in _________________________________________

2. Marital status

☐ Married
☐ Registered partnership
☐ Cohabite
☐ Live-apart partner

3. What is the highest education that you have completed?

(Do not count individual courses)

☐ Elementary school/compulsory school or corresponding
☐ 2-year upper secondary school, lower secondary school or corresponding
☐ At least 3-year upper secondary school or corresponding
☐ University college/University
☐ Other _________________________________________

4. What is your main occupation right now?

☐ Working
☐ On leave of absence from work
☐ Seeking work
☐ Registered on sick leave
☐ Studying

5. What are your profession/your post?

(Avoid general professional descriptions such as teacher, joiner or white collar worker. Write instead a more detailed description, for instance secondary school teacher, carpenter and clerk.)

Profession/post _________________________________________

Appendix 1

Code number ____________
Health and lifestyle

1. Height ________ cm
2. Weight ________ kg

3. How often do you exercise?
   - Never
   - Less than once per month
   - 1-3 times per month
   - 1-3 times per week
   - More than 3 times per week

4. In what state of health do you consider you are today?
   - Excellent
   - Very good
   - Good
   - Not too bad
   - Poor

5. Are you a smoker?
   - No, I have never smoked
   - No, I do not smoke now; I stopped more than one year ago
   - No, I do not smoke now; I stopped within the last year
   - Yes, I smoke sometimes (less than one cigarette per day)
   - Yes, I smoke regularly (between 1 to 9 cigarettes per day)
   - Yes, I smoke regularly (more than 10 cigarettes per day)

6. Do you take medicine regularly?
   - No
   - Yes

If "Yes", what kind of medicine(s) __________________________
7. Has a doctor ever told you that you have?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>High blood pressure</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Rheumatism</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Emphysema</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Arthritis (or other joint disease)</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Heart disease</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Gall bladder problem</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Cancer</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Gluten/lactose intolerance/food allergy</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Stomach/intestinal disease</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Overweight</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Underweight</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Diabetes</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Thyroid disease</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Mental illness/previous depression</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other sickness</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

8. How often do you drink alcohol?

- ☐ Never
- ☐ Once per month or less often
- ☐ 4 times per week or more
- ☐ 2-3 times per week
- ☐ 2-4 times per month

9. How many "glasses" do you drink on typical day when you drink alcohol?

- ☐ 1 – 2
- ☐ 3 – 4
- ☐ 5 – 6
- ☐ 7 – 9
- ☐ 10 or more

10. Have you changed any of these habits within the last year?

<table>
<thead>
<tr>
<th>Habit</th>
<th>Increased</th>
<th>Decreased</th>
<th>No change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise habits</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Consumption of dietary supplements</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fruit or vegetable consumption</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fish consumption</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

11. Do you use vitamins, minerals or other dietary supplements?

- ☐ No
- ☐ Yes
- ☐ Sometimes

- ☐
12. If you answered "Yes" or "Sometimes", which of the following do you use?

- Berocca effervescent tablets
- Beviplex forte
- Calcitugg
- Ginsana
- Vitamin C effervescent tablets
- Ido-E
- Vitamin C tablets
- Kalcipos
- Dulcivit Comp
- Minorplex
- Echinagard
- My choice woman
- Enomdan
- Mivitotal
- Omega-3
- Vitamineral family
- Esberitox
- Vitamineral woman
- MultiTwelve
- Vitamax woman
- Gerimax
- Other
- Vitamin C tablets
- Folsyra (Folic acid)__________ g

13. If you use a dietary supplement, do you usually remember to take this every day?

- No
- Yes

14. If you use a dietary supplement, did you remember to take it yesterday?

- No
- Yes

15. When did you start taking a dietary supplement?

_________________________________________

16. Have you received information about taking folate supplements during your pregnancy?

- No
- Yes

17. If ‘Yes’, who informed you?

- Midwife at the prenatal clinic
- Other medical care staff
- Relatives
- Friends
- Internet
- TV/Newspapers
- Other

18. Do you take folic acid?

- No
- Yes

If ‘Yes’, when did you start taking it?

_________________________________________
Questions concerning fertility

1. How long is your menstrual cycle normally? _______ days
2. How many days do you usually have menstrual bleeding? _______ days
3. Is your menstrual cycle regular?
   No ☐   Yes ☐
4. If not, how does it vary? _________________________________________
5. How old were you when you had your first menstruation? _______ years
6. How many biological children do you have? ____________________________
7. Have you tried to get pregnant during more than one year? ______________
8. Have you had miscarriages previously?
   No ☐   Yes ☐
9. If "Yes", how many times _________
10. At what stage of the pregnancy did the miscarriage(s) occur?
    First miscarriage:     Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Second miscarriage:   Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Third miscarriage:    Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Fourth miscarriage:   Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Fifth miscarriage:    Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Sixth miscarriage:    Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Seventh miscarriage:  Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Eighth miscarriage:   Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Ninth miscarriage:    Before week 12 ☐  Before week 18 ☐  After week 18 ☐
    Tenth miscarriage:    Before week 12 ☐  Before week 18 ☐  After week 18 ☐
**Questions about miscarriage**

**Directions:** The following statements are about miscarriage. Please read each statement and decide how true each statement is for you. If it is exactly the way you feel, then circle the 1 underneath "Definitely true for me" if it is close to the way you feel, then circle 2 underneath "Quite true for me". If it is slightly like the way you feel then circle 3 underneath "Barely true for me". If it is not at all similar, then circle 4 underneath "Definitely NOT true for me". Put only one ring around the figure that corresponds best to how you feel.

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<tr>
<th></th>
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<th>Quite true for me</th>
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</tr>
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<tbody>
<tr>
<td>1. My miscarriage was a horrendous, devastating event.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I felt very much alone in my loss.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. After my miscarriage I was feeling down for several days, but then I got over it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tr>
<tr>
<td>4. Miscarriage equals one big loss of control.</td>
<td>1</td>
<td>2</td>
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<tr>
<td>5. My miscarriage destroyed my zest for life.</td>
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<tr>
<td>6. I have gotten through with dealing with my miscarriage.</td>
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<td>7. I feel my body has betrayed me.</td>
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<tr>
<td>8. Miscarriage is like going from one extreme of happiness to the other, total unhappiness.</td>
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<td>11. When I think of my miscarriage, I still feel emotional pain.</td>
<td>1</td>
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<tr>
<td>12. My miscarriage represents a major setback for me.</td>
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<td>13. Miscarriage equals a loss of a part of my partner and me.</td>
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<tr>
<td>18. Through my miscarriage I have experienced a loss of pride in myself.</td>
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<tr>
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<td>Statement</td>
<td>1</td>
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<td>---------------------------------------------------------------------------</td>
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Questions about mental health

Instruction: The questions contain a number of various statements about your current mood. The following nine questions ask about how you have been feeling in the last three days. Please cross only one box for each statement on the defined scale steps (0.2.4.6) or between them (1.3.5).

1. Apparent Sadness

Representing despondency, gloom and despair, (more than just ordinary transient low spirits) reflected in speech, facial expression, and posture. Rate on depth and inability to brighten up

- 0 No sadness.
- 1
- 2 Looks dispirited but does brighten up without difficulty.
- 3
- 4 Appears sad and unhappy most of the time.
- 5
- 6 Looks miserable all the time. Extremely despondent.

2. Reported Sadness

Representing reports of depressed mood, regardless of whether it is reflected in appearance or not. Includes low spirits, despondency or the feeling of being beyond help and without hope. Rate according to intensity, duration and the extent to which the mood is reported to be influenced by events.

- 0 Occasional sadness in keeping with the circumstances.
- 1
- 2 Sad or low but brightens up without difficulty.
- 3
- 4 Pervasive feelings of sadness or gloominess. The mood is still influenced by external circumstances.
- 5
- 6 Continuous or unvarying sadness, misery or despondency.

3. Reduced Sleep

Representing the experience of reduced duration or depth of sleep compared to the subject's own normal pattern when well.

- 0 Sleeps as usual.
- 1
- 2 Slight difficulty dropping off to sleep or slightly reduced, light or fitful sleep.
- 3
- 4 Sleep reduced or broken by at least two hours.
- 5
- 6 Less than two or three hours sleep.
4. Reduced Appetite

Representing the feeling of a loss of appetite compared with when well. Rate by loss of desire for food or the need to force oneself to eat.

- 0 Normal or increased appetite.
- 1
- 2 Slightly reduced appetite.
- 3
- 4 No appetite. Food is tasteless.
- 5
- 6 Needs persuasion to eat at all.

5. Concentration Difficulties

Representing difficulties in collecting one's thoughts mounting to incapacitating lack of concentration. Rate according to intensity, frequency, and degree of incapacity produced.

- 0 No difficulties in concentrating.
- 1
- 2 Occasional difficulties in collecting one's thoughts.
- 3
- 4 Difficulties in concentrating and sustaining thought which reduces ability to read or hold a conversation.
- 5
- 6 Unable to read or converse without great difficulty.

6. Lassitude

Representing a difficulty getting started or slowness initiating and performing everyday activities

- 0 Hardly any difficulties in getting started. No sluggishness.
- 1
- 2 Difficulties in starting activities.
- 3
- 4 Difficulties in starting simple routine activities, which are carried out with effort.
- 5
- 6 Complete lassitude. Unable to do anything without help.

7. Inability to Feel

Representing the subjective experience of reduced interest in the surroundings, or activities that normally give pleasure. The ability to react with adequate emotion to circumstances or people is reduced.

- 0 Normal interest in the surroundings and in other people.
- 1
- 2 Reduced ability to enjoy usual interests.
- 3
- 4 Loss of interest in the surroundings. Loss of feelings for friends and acquaintances.
- 5
- 6 The experience of being emotionally paralyzed, inability to feel anger, grief or pleasure and a complete or even painful failure to feel for close relatives and friends.
8. **Pessimistic Thoughts**

Representing thoughts of guilt, inferiority, self-reproach, sinfulness, remorse and ruin.

- 0. No pessimistic thoughts.
- 1. Fluctuating ideas of failure, self-reproach or self-depreciation.
- 2. Persistent self-accusations, or definite but still rational ideas of guilt or sin. Increasingly pessimistic about the future.
- 3. Delusions of ruin, remorse and unredeemable sin. Self-accusations which are absurd and unshakable.

9. **Suicidal Thoughts**

Representing the feeling that life is not worth living, that a natural death would be welcome, suicidal thoughts, and preparations for suicide. Suicidal attempts should not in themselves influence the rating.

- 0. Enjoys life or takes it as it comes.
- 2. Probably better off dead. Suicidal thoughts are common, and suicide is considered as a possible solution, but without specific plans or intention.
- 3. Explicit plans for suicide when there is an opportunity. Active preparations for suicide.
## Questions about grief

**Instruction:** Present thoughts and feelings about your loss. Each of the items is a statement of thoughts and feelings that some people have concerning a loss such as yours. There are no rights or wrong responses to these statements. For each item, put only one ring around each figure which best indicated the extent to which you agree or disagree with it at the present time. If you are not certain, use the “neither” category. Please try to use this category only when you truly have no opinion.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Disagree or Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I feel depressed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>I find it hard to get along with people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>I feel empty inside.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>4.</td>
<td>I can’t keep up with my normal activities.</td>
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<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>I feel a need to talk about the baby.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>I am grieving for the baby.</td>
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<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>I am frightened.</td>
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<tr>
<td>8.</td>
<td>I have considered suicide since the loss.</td>
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<tr>
<td>9.</td>
<td>I take medicine for my nerves.</td>
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<td>2</td>
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<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>I very much miss the baby.</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>11.</td>
<td>I feel I have adjusted well to the loss.</td>
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<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>It is painful to recall memories of the loss.</td>
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<td>13.</td>
<td>I get upset when I think about the baby.</td>
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<td>14.</td>
<td>I cry when I think about him/her.</td>
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<td>16.</td>
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<td>17.</td>
<td>I feel unprotected in a dangerous world since he/she died.</td>
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<td>18.</td>
<td>I try to laugh, but nothing seems funny anymore.</td>
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<td>19.</td>
<td>Time passes so slowly since the baby died.</td>
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<tr>
<td>20.</td>
<td>The best part of me died with the baby.</td>
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<td>21.</td>
<td>I have let people down since the baby died.</td>
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<td>22.</td>
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<td>I blame myself for the baby’s death.</td>
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<td>24.</td>
<td>I get cross at my friends and relatives more than I should.</td>
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<td>25.</td>
<td>Sometimes I feel like I need a professional counsellor to help me get my life back together again.</td>
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<td>I feel as though I’m just existing and not really living since he/she died.</td>
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<td>27.</td>
<td>I feel so lonely since he/she died.</td>
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<td>28.</td>
<td>I feel somewhat apart and remote, even among friends.</td>
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<td>29.</td>
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<td>30.</td>
<td>I find it difficult to make decisions since the baby died.</td>
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<td>31.</td>
<td>I worry about what my future will be like.</td>
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<td>32.</td>
<td>Being a bereaved parent means being a “Second-Class Citizen”.</td>
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Appendix 2

The figure shows the number of participants and reasons for dropouts of Swedish women and men.
Appendix 3

The figure shows the number of participants and reasons for dropouts of Swedish women and men.
Initially, 198 women were asked to answer the questionnaires and 102 women (51.5%) were included in the study divided into 2 groups, spontaneous miscarriage (n=35) and missed miscarriage (n=67) (Figure 1). Four months after the miscarriage, 77% (27 of 35) of the women in the spontaneous miscarriage group and 80% (54 of 67) of the women in the missed miscarriage group answered the questionnaire again. There was no difference in age, body mass index, week of miscarriage, or previous number of children or planned pregnancy.

The figure shows the number of participants and reasons for dropouts of Swedish women with missed miscarriage and spontaneous miscarriage.
A doctoral dissertation from the Faculty of Medicine, Uppsala University, is usually a summary of a number of papers. A few copies of the complete dissertation are kept at major Swedish research libraries, while the summary alone is distributed internationally through the series Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine. (Prior to January, 2005, the series was published under the title “Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine”.)