

# Clinical and psychological aspects of reproductive losses

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An analysis of the current literature shows that today there is an increased number of complications in women during pregnancy, which pose a real threat not only to the health and life of the future mother, but also to the unborn child, which in turn can act as an additional stressor. The women who have experienced constant fear, anxiety, and stress during pregnancy give birth to children who become sensitive to external stimuli, including frequent crying and poor sleep, and are at increased risk of developing neuropsychiatric disorders as they grow up.

For women of reproductive age around the world, anxiety is a serious problem often leading to other mental health issues. If the level of anxiety is constantly rising indefinitely, this can lead to negative outcomes, including pregnancy interruption. In addition, an increased level of anxiety also affects the somatic state of a pregnant woman, which can lead to the development of psychosomatic illness. Miscarriage, especially recurrent miscarriage, is also a risk marker for obstetric complications, including preterm birth, fetal growth retardation, placental abruption and stillbirth in future pregnancies, as well as a factor of long-term health problems.

Miscarriage affects psychological well-being of some women, increasing their stress levels after the negative experience. Women who have suffered a miscarriage may be at risk of maternal stress during the next pregnancy, which in turn is associated with adverse pregnancy outcomes. The presence of one reproductive loss in a woman's history leads to impaired reproductive function and affects the course of pregnancy and childbirth. These risks increase, namely 16%, 25%, 45% and 54% after one to four previous consecutive spontaneous abortions, respectively.

It is also worth considering the fact that each next pregnancy after a previous loss is perceived by the woman as more stressful due to the fear of repeating the loss. Therefore, examination, counselling and management of pregnant women with reproductive losses should be comprehensive and include not only highly professional medical care, but also appropriate psychological support.

**Keywords:** pregnancy, complications, miscarriage, reproductive losses, psychological state, stress, anxiety, psychological support.

## Клініко-психологічні аспекти репродуктивних втрат

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Аналіз даних сучасної літератури свідчить, що в умовах сьогодення спостерігається збільшення кількості ускладнень у жінок під час вагітності, які створюють реальну загрозу не тільки для здоров'я та життя майбутньої матері, але й майбутньої дитини, що, у свою чергу, може бути додатковим стресогенним чинником. Жінки, які постійно протягом вагітності відчували страх, тривожність, стрес, народжують дітей, які стають чутливими до дії зовнішніх подразників, зокрема вони часто плачуть і погано сплять, у них збільшується ризик розвитку нервово-психічних розладів у процесі дорослішання.

Для жінок репродуктивного віку в усьому світі тривожність є серйозною проблемою, часто призводячи до інших проблем психічного здоров'я. Якщо рівень тривожності постійно невизначено підвищується, то це може призвести до негативних наслідків, у тому числі й до переривання вагітності. Крім того, підвищений рівень тривожності впливає і на соматичний стан вагітної, що може стати причиною розвитку психосоматичного захворювання. Викидень, і особливо повторний, також є маркером ризику виникнення акушерських ускладнень, включаючи передчасні пологи, затримку росту плода, відшарування плаценти та мертвородження під час майбутніх вагітностей, а також провісником довгострокових проблем зі здоров'ям.

Викидень впливає на психологічне благополуччя деяких жінок, підвищуючи рівень стресу після одного досвіду. Жінки, які перенесли викидень, можуть піддаватися ризику материнського стресу під час наступної вагітності, що, у свою чергу, пов'язане з несприятливими її наслідками. Наявність в анамнезі жінки однієї репродуктивної втрати призводить до порушення репродуктивної функції, впливає на перебіг вагітності та пологів. Такі ризики зростають, а саме – на 16%, 25%, 45% і 54% після одного–чотирьох попередніх послідовних спонтанних абортів відповідно.

Слід враховувати і той факт, що кожна наступна вагітність після попередньої втрати сприймається жінкою як більш стресова через факт страху її повторення. Тому обстеження, консультування та ведення вагітних з репродуктивними втратами мають бути комплексними і передбачати не тільки високопрофесійну медичну допомогу, але й відповідний психологічний супровід.

**Ключові слова:** вагітність, ускладнення, викидень, репродуктивні втрати, психологічний стан, стрес, тривожність, психологічний супровід.

Today, the world is witnessing a rapid spread of mental illnesses that are inextricably linked to somatic ailments, the causes of which lie in the interaction of physical and mental factors. This problem is becoming increas-

ingly relevant in the realities of our time in Ukraine [1]. It is well known that during pregnancy changes are observed not only in the biological/physiological aspect, but also in its psychological and social aspects, which can

occur from the very beginning to the end of pregnancy, including the postpartum period [2].

Today, there is an increased number of cases of various complications in women during pregnancy which pose a real threat not only to the health and life of the expectant mother, but also to the unborn child, which can act as an additional stress factor. In the situation of additional stress factors (loss of relatives, change of residence, moving to another country, staying in temporary occupation, etc.), the risk of developing personal problems, which in turn can serve as a basis for maternal disorders, increases, when, on the verge of motherhood, women are unprepared to take responsibility for the life of their own child to perform maternal functions and duties properly [3].

Anxiety is a serious problem for women of reproductive age around the world, often leading to other mental health issues [4]. For example, a meta-analytical pooling of estimates showed that the prevalence of anxiety symptoms was 18.2%. For example, the prevalence of maternal anxiety in the antenatal and postnatal periods was assessed among 221,974 women from 34 countries. The results indicate that anxiety in the perinatal period is very common and deserves clinical attention similar to that given to perinatal depression. Prevalence rates were significantly higher in low- and middle-income countries, possibly reflecting cultural influences [5].

If the level of anxiety is constantly rising indefinitely, it can lead to negative consequences, including termination of pregnancy. In addition, an increased level of anxiety also affects the somatic state of a pregnant woman, which can lead to the development of a psychosomatic disease [6]. Anxiety, depression and stress during pregnancy are risk factors for adverse outcomes for mothers and children. Anxiety during pregnancy is associated with a shorter pregnancy duration and has adverse effects on fetal neurodevelopment [7]. It should be noted that depression and anxiety are very common in the perinatal period and are associated with many adverse pregnancy and childbirth outcomes [8].

The effect of stress on the fetus is due to the fact that it is in direct contact with the mother's blood through the placenta, and thus hormones, including stress ones, can pass through the placenta to the fetus. Excessive cortisol levels can affect fetal brain development, especially the development of the hippocampus, which is responsible for stress regulation and memory. This can lead to negative neuropsychological consequences in the child, including problems with memory, learning, behaviour and emotion regulation [9].

Research suggests that glucocorticoids are closely related to fetal growth, and there is strong evidence of a link between maternal cortisol levels and nervous system development. Maternal anxiety or depression can increase the transplacental passage of glucocorticoids [10]. Steroid hormones, such as progesterone and glucocorticoids, increase during pregnancy and are responsible for the adaptation of the mother's immune system to pregnancy [11]. Glucocorticoids and progesterone are in close balance during pregnancy. The balance between these hormones ensures adequate levels to maintain uterine receptivity and calm, as well as a tolerogenic immune

profile that mainly contributes to placental vascularisation and healthy fetal growth.

On the contrary, an imbalance of progesterone and/or glucocorticoids may not support pregnancy and underlie an altered intrauterine immune profile prone to inflammation, leading to placental insufficiency and fetal growth. This imbalance may play a major role in women suffering from infertility or pregnancy complications such as early pregnancy loss, preterm birth and fetal growth retardation [12]. Thus, the maternal hormonal environment can provide both ideal and harmful conditions for several aspects of intrauterine development, and in particular fetal brain development, which is a matter of serious concern to researchers and clinicians.

There is a significant cross-talk between different hormonal axes that is still poorly understood. However, their influence on the prenatal development of the central nervous system persists throughout life and may cause neurodevelopmental disorders, including cognitive, behavioural and affective disorders later in life [13]. The fetal brain is extremely plastic and vulnerable to environmental influences, which can have a long-term impact on the health and development of offspring [14].

Prenatal stress can lead to a wide range of adverse effects in offspring, including nervous system disorders, emotional dysregulation, cognitive deficits, mood disorders and an increased risk of psychopathological conditions [15]. For example, research over the past decades has provided evidence that stressful experiences during pregnancy have long-term consequences for the future mental well-being of both the mother and her child. Stressful experiences in utero or early life may increase the risk of neurological and psychiatric disorders, likely through changes in epigenetic regulation [16].

The impact of maternal stress on neurodevelopment, cognitive development, negative emotionality, difficult temperament and mental disorders has been shown in epidemiological and «case-control» research studies [17]. Approximately 3.3% of women experience post-traumatic stress disorder (PTSD) during pregnancy and 4% of women experience postpartum PTSD. The results suggest that perinatal PTSD is associated with some negative outcomes for children. Therefore, early screening for PTSD in the perinatal period and subsequent referral for effective treatment, if necessary, may be advisable [18].

Estimates of individual disorder prevalence range from 1.1% for post-traumatic stress disorder to 4.8% for specific phobia, with the prevalence of at least 1 or more anxiety disorders estimated at 20.7%. There was considerable heterogeneity between studies, suggesting that the 'true' prevalence varies considerably. There is evidence of a small (3.1%) tendency for pregnant women to be more susceptible to anxiety disorders than postpartum women [19]. Therefore, healthcare providers should assess for PTSD during routine mental health check-ups during and after pregnancy, especially if there is a history of trauma, mood or anxiety disorders [20].

Symptoms of maternal PTSD related to childbirth negatively affect the behaviour of the mother and infant during dyadic interactions, which can exacerbate neurophysiological and behavioural difficulties between moth-

er and infant - leading to dysregulation of mother-infant interaction [21]. Anxiety, depression and PTSD increase the risk of adverse birth outcomes (preterm birth, low birth weight and lower Apgar score). Several years after childbirth, children's emotional, neurological and motor development is closely linked to maternal well-being, mental health and socioeconomic conditions during the perinatal period, which highlights the need for health-care support for women [22].

Psychogenic disorders during wartime occupy a special place due to the fact that they can occur simultaneously in a large number of people. Armed conflict, forced displacement of people and related hardships, such as unemployment, poverty and social exclusion, significantly increase vulnerability to psychosocial stress and the prevalence of mental and behavioural disorders (including depression, anxiety, post-stress disorders, etc.) [23].

Women who experience military aggression during pregnancy may face particularly high levels of stress, which has a significant impact on their health and the health of their children [9]. In the context of the war, against the background of a decrease in the total number of births, the number of preterm births (for various reasons) and births of low birth weight children has significantly increased, but their connection with the impact of wartime factors (stress, vitamin and mineral deficiencies, poor medical monitoring of the pregnant woman's condition and the course of gestation, etc.) has not yet been proven [24].

Women who constantly experienced fear, anxiety, stress during pregnancy give birth to children who become sensitive to external stimuli, in particular, they often cry and sleep poorly, and they have an increased risk of developing neuropsychiatric disorders in the process of growing up [25]. For example, disorders of psycho-emotional state of pregnant women today lead to birth of 'children of war' – insecure, low self-esteem, deeply ill babies with mental disorders [24]. Our country currently has one of the worst fertility rates among European countries [26]. According to the Institute of Demography and Quality of Life Problems of the National Academy of Sciences of Ukraine, since February 2022, the fertility rate has decreased to 1.0, compared to 1.2 in 2020, due to deteriorating reproductive health [27].

The problem of population reproduction in modern Ukraine is caused by both low birth rates and still high level of reproductive losses (primarily prenatal losses up to 22 weeks of gestation), which reflect the decline in the country's reproductive potential. A large number of unsuccessful pregnancies and unborn children (spontaneous abortions and stillbirths) and infants lost in the first year of life not only characterise the decline in the viability of offspring and the loss of life potential of the current generation, but also cause a high level of irreparable losses of reproductive potential of future generations of the population [28].

Reproductive health of the nation is seen as the basis for formation of demographic potential and is a prerequisite for population renewal through new generations, the quantitative and qualitative composition of which meets social needs [29]. Poor reproductive health of women is

confirmed by the negative trend in objective criteria of newborn health - an increase in the frequency of low birth weight babies, with the number of low birth weight babies exceeding the number of premature babies [30]. In general, reproductive losses mean the loss of products of conception at all stages of fetal development - as a result of forced (unauthorised) and medical legal termination of pregnancy at 12–22 weeks, stillbirth, and death of children in the first year of life [28].

The presence of one reproductive loss in a woman's history leads to impaired reproductive function, affects the course of pregnancy and childbirth [31]. A previous pregnancy loss also increases the risk of repeat pregnancy loss, with the risk increasing with each subsequent loss [32]. Studies show that the risk of pregnancy loss is 16%, 25%, 45% and 54% after one to four previous consecutive spontaneous abortions, respectively [33, 34]. Recurrent miscarriage is a traumatic life event that affects a woman's physical and psychological health and also social well-being [34, 35].

It is important to take into consideration the fact that each subsequent pregnancy after previous loss is perceived by the woman as more stressful due to the fear of repeating the loss [36]. Pregnancy loss of any type is considered a significant psychological stressor with a detrimental impact on the mother's well-being. Bereaved women often show signs of guilt, anger, sadness and, in some cases, depression. They often perceive a stillbirth or miscarriage as the loss of a family member and therefore mourn [37, 38].

Perinatal loss can cause psychological stress during the next pregnancy. And so women use a complex self-defence mechanism to cope with this suffering by reassuring themselves [39]. The metaphor «Rainbow in a storm» succinctly summarises the experiences of women during pregnancy after perinatal loss. They experience a new pregnancy in a state of emotional dilemma, alternating between feelings of joy, excitement and fear, anxiety and uncertainty. Although these emotional changes also occur in pregnancies without previous loss, these emotions seem to be heightened as previous fears are reignited and new ones are created by the loss. Consequently, women experience pregnancy cautiously, especially until the viability of pregnancy is confirmed [40].

Recurrent pregnancy loss is a disturbing pregnancy disorder that affects approximately 2.5% of women trying to get pregnant [41]. Late fetal death is also a significant risk factor for PTSD. Early detection of patients at risk of developing symptoms of this disorder is important for adapting treatment, reducing the risk of re-activation of trauma and long-term persistence of post-traumatic stress disorder symptoms [42].

Given the consequences of miscarriage, the relevance of studying this problem is also due to the fact that the incidence of miscarriage worldwide is approximately 23,000,000 cases per year, with an estimated 1 in 10 women experiencing fetal loss at least once in their lifetime. The risk of miscarriage can be as high as 15%, and stillbirths are reported in approximately 2,000,000 women annually [37, 38].

Pregnancy loss is usually associated with physical consequences, such as bleeding in early pregnancy, which

varies in severity from bloody discharge to bleeding. However, it can also be associated with deep psychological distress that both partners may experience, which can include feelings of denial, shock, anxiety, depression, post-traumatic stress disorder and suicide. Miscarriage, and especially recurrent miscarriage, is also a risk marker for obstetric complications, including preterm birth, fetal growth retardation, placental abruption and stillbirth in future pregnancies, as well as a precursor to long-term health problems such as cardiovascular, venous diseases and thromboembolism [38, 43].

Pregnancy termination in all its forms (miscarriage, abortion and intrauterine death) is one of the most common adverse pregnancy outcomes, but the psychological impact of such a loss is often underestimated. Individual reactions to this outcome may vary between women, but most experience anxiety, stress and symptoms of depression [44]. Any fetal loss can be associated not only with psychological consequences such as anxiety and depression, but also with feelings of guilt and anxiety about future fertility [45].

Women who have had recurrent miscarriages experienced significantly higher levels of stress, anxiety and depressive symptoms than their male counterparts. The key predictors of depression symptoms among women of childbearing age were anxiety, stress, history of recurrent miscarriage, etc. [46].

Miscarriage affects the psychological well-being of some women, increasing stress levels after the experience. There is a potential risk that women who have experienced a miscarriage may be at risk of maternal stress in a subsequent pregnancy, which in turn, is associated with adverse outcomes [47]. Recent studies have shown a significant association between a history of miscarriage and higher levels of stress in pregnant women during the first trimester of the next pregnancy [48].

Both miscarriage and abortion are risk factors for mental illness and their impact on a woman's life can be easily underestimated. Even the birth of an unplanned child is often traumatic, but abortion seems to be even more traumatic or similar in terms of psychological consequences; this should be taken into account when counselling women who are afraid of an unwanted pregnancy [49].

The psychological consequences of abortion include depression, anxiety about not being able to get pregnant again, and abnormal eating behaviour, as well as low self-esteem, nightmares and guilt. Unfortunately, the psychological consequences of abortion are often largely neglected [50].

The psychosomatic concept of miscarriage is supported by evidence of increased asthenic emotions that reduce personality activity: pessimism, timidity, submissiveness, vulnerability, fixation on the shadow sides of life, in women with a threat of miscarriage. A pronounced neurotic syndrome in a pregnant woman, based on increased emotional lability and susceptibility, a sense of fear, determines an increase in the frequency of pregnancy and childbirth complications [51, 52].

Today, there is growing recognition of the link between various pregnancy complications and the development of chronic diseases in later life. Pregnancy has come

to be viewed as a physiological stress test, as the strain it places on a woman's body can reveal an underlying predisposition to disease that would otherwise remain hidden for many years [53]. The association between spontaneous abortion and cardiovascular disease may reflect common mechanisms that contribute to spontaneous miscarriage and the development of cardiovascular disease and, ultimately, premature death. Spontaneous abortion may be an early marker of future health risks for women, including premature death. For example, a growing body of literature shows that certain reproductive events and the risk of chronic diseases are linked throughout a woman's life [54].

Stressful situations and depression experienced by women during pregnancy can be one of the driving factors leading to the loss of a child. Specific individual psychological characteristics of women, such as emotional imbalance, irritability, high levels of psycho-emotional stress, anxiety, aggressiveness, inadequate self-esteem, unresolved intrapersonal conflicts, low level of communication competence, etc., also play a significant role in the occurrence of miscarriage [25].

Pregnant women with a threat of miscarriage have higher levels of stress, anxiety and intolerance of uncertainty, and their psychological well-being was significantly worse compared to pregnant women without a threat of miscarriage [55]. The experience of miscarriage becomes particularly acute when a woman does not feel supported by her loved ones, especially her partner. This often leads to feelings of guilt, shame, and uncertainty, which can be an additional traumatic factor and affect various areas of a woman's life [25]. The current level of organisation and provision of effective assistance to pregnant women under martial law requires a comprehensive approach that includes not only high-quality professional medical care, but also appropriate psychological support [3].

One of the areas for this contingent of women may be training in ways to overcome stress, as well as creating a favourable emotional background during pregnancy and subsequent childbirth. Difficult cases require involvement of highly qualified psychotherapists in pregnancy management [56]. Working with perinatal psychologists is a promising way to ensure an uncomplicated pregnancy and positive perinatal outcomes. At the same time, the use of additional psychosomatic effects of basic therapy should not be underestimated [24]. Given the possible long-term consequences for infant and child development, early intervention and prevention programmes are vital. Therefore, early interventions that focus on dyadic reciprocity can improve children's regulatory skills [57, 58].

Thus, today's conditions contribute to an increase in the incidence of complications in women during pregnancy and childbirth. The anxiety and stress that accompany pregnancy, associated with a shorter duration, have adverse long-term consequences for the neurodevelopment of the fetus, as well as the future somatic and mental well-being of both the mother and her child. Examination, counselling and management of pregnant women with reproductive losses should be comprehensive and include not only highly professional medical care, but also appropriate psychological support.

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Стаття надійшла до редакції 16.01.2025. – Дата першого рішення 20.01.2025. – Стаття подана до друку 17.02.2025