
Effects of Stress and Anxiety on Pregnant Women's Cardiovascular Health: A Narrative Review

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Review

Effects of Stress and Anxiety on Pregnant Women's Cardiovascular Health: A Narrative Review

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Abstract: Pregnancy is a complex biological process which is associated with significant metabolic and hemodynamic changes of the maternal body which allow a normal fetal growth. The inability to adapt to these changes can affect the cardiovascular health. During pregnancy, women may experience mood swings, anxiety and emotional ambivalence. These symptoms can lead to stress and have a negative impact on the mental well-being of expectant mothers. It is crucial to know the aspects that can influence the development of cardiovascular problems among pregnant women in order to manage these cases properly. The current narrative review explores and summarizes the evidence regarding the impact of stress and anxiety on cardiovascular health in pregnant women. Understanding the physiological adaptations that the body undergoes throughout pregnancy is crucial for educating and supporting individuals as well as healthcare professionals. This enables them to recognize any risk factors or pathological conditions that may exacerbate pregnant women's health. In order to reduce maternal morbidity and mortality from cardiovascular disease, a

psychological and cardiovascular risk factor screening that is done either before or during pregnancy may be able to identify situations that call for particular medical and/or psychological therapies.

Keywords: pregnancy; fetus; stress; anxiety; cardiovascular diseases; heart disease risk factors; psychological; mental health

1. Introduction

Many people view pregnancy as a happy moment in a woman's life, filled with happiness, excitement, and other pleasant feelings. However, the future mother's body experiences hormonal and cardiovascular changes throughout pregnancy, which can make it a vulnerable emotional period and pose problems for her general health. Pregnancy has significant physiological impacts on expectant mothers, including changes in hormones, hemodynamic, and emotions that all impact the cardiovascular system. Hormonal changes in women of reproductive age may be related to specific cardiovascular manifestations, with women of childbearing age having a higher prevalence of cardiovascular disease (CVD) [1], which recommends a correct evaluation of the pregnant woman starting from the first visit and monitoring of cardiovascular parameters throughout the period of the pregnancy. An additional reason for careful monitoring is the fact that CVD is the leading cause of death for women worldwide [2]. Still, only 44% of American women identify heart health as their top health concern, according to a survey, despite numerous national programmes to increase public awareness of the issue [3,4].

The increase in maternal age at which a woman becomes pregnant for the first time increases the prevalence of cardiovascular risk factors, especially obesity, diabetes and hypertension, which could lead to an increase in the number of CVD cases in pregnancy. The manifestations of CVD may occur in pregnancy for the first time, probably due to the hormonal and adaptive changes of the body during the pregnancy period, or they may be pre-existing during pregnancy [5]. Since it is known that pregnancy increases a woman's risk of developing CVD, the correct assessment and monitoring of the pregnant woman during pregnancy is very important to reduce the risk of complications both during pregnancy and postpartum, although sometimes it is difficult even for experienced doctors to distinguish between signs of CVD and normal pregnancy. Owing to these current inadequacies in healthcare, misdiagnosis by healthcare providers causes treatment delays. Most often, maternal death is related to hypertensive disease and its complications, cardiomyopathy, and other fatalities due to maternal CVD [6–8].

Emotional disorders and cardiovascular events have a common epidemiology and pathophysiology, which indicates fundamental pathways that link these diseases. There is evidence in the literature regarding psychological determinants' influence on somatic diseases [9]. Research demonstrates that people experiencing depression, anxiety, stress, and even posttraumatic stress disorders can experience specific physiological effects on the body, such as increased cardiac reactivity (e.g., increased heart rate and blood pressure), reduced blood flow to the heart and increased cortisol levels [10,11]. Studies show that there is a link between mental health and cardiovascular risk factors through biological pathways but also indirectly through risky behaviours for health [12,13].

Preventing CVD in pregnant women and applying prompt measures to cases diagnosed with CVD could lead to a decrease in the number of complications and maternal deaths from this cause [1]. For the early detection of pregnant women with the potential to develop CVD, it is imperative to know and identify the psychological factors that could constitute a cardiovascular risk. The purpose of this narrative review is to provide an overview of the literature on the impact of stress and anxiety on the cardiovascular health of expectant mothers and to highlight the multidisciplinary team's involvement in treating this condition.

2. Cardiovascular Physiological Adaptive Changes during Pregnancy

The cardiovascular system undergoes significant adaptive physiological changes during pregnancy, intended to help the mother's body cope with the increased metabolic demands and to ensure adequate maternal-fetal circulation that ensures good development and growth of the fetus [14].

Knowing and understanding these changes is crucial to providing quality medical care to patients and distinguishing between possible pathological cardiovascular changes.

Cardiac output increases while maternal systemic vascular resistance decreases; the renin-angiotensin-aldosterone system is significantly activated, and the heart and the entire vascular system remodel. Adapting to the new status helps the mother's body ensure normal fetal development and growth. Non-adaptation leads to increased fetal morbidity and mortality.

The increase in the level of estrogen and progesterone during pregnancy determines, from 5 weeks of gestation, systemic vasodilatation changes that occur before the completion of the placentation process and complete development of the uteroplacental circulation. Studies show that relaxin, a peptide hormone produced by the corpus luteum in pregnancy, could influence small arterial resistance vessels, having an endothelium-dependent effect vasodilator [15,16]. The nitric oxide production stimulated by the increased secretion of estradiol and prostaglandins are local mediators that create an active vasodilatation with a decrease in systemic vascular resistance, increase the cardiac output and decrease the systemic arterial pressure [17,18]. These changes result in a decrease in systemic vascular resistance from the first trimester of pregnancy, which then decreases slightly until the middle of the second trimester, up to 35–40% of baseline values [15], then remaining in the plateau or increasing slightly until the end of the pregnancy. Global arterial compliance increases by 30%, and the vasomotor sympathetic activity increases with the significant activation of the renin-angiotensin-aldosterone axis [19]. Normally, after birth, after removal of the placenta, the maternal hemodynamic systemic vascular resistance increases, returning to normal in approximately two weeks [20]. These aspects are crucial to understanding the cardiovascular pathology of pregnancy.

In a pregnant woman whose pregnancy develops normally, in parallel with the reduction in vascular resistance, there is also a 30% increase in global arterial compliance, and through substantial activation of the renin-angiotensin-aldosterone axis, vasomotor sympathetic activity increases [21].

Cardiovascular output (CO) must rise to maintain blood pressure since the placental circulation in pregnancy lacks autoregulation. In the first and second trimesters of pregnancy, cardiac output increases progressively up to 30% compared to the previous pregnancy period, reaching 24 weeks up to an increase of 45%, with a slight decrease near the term [22]. The increase in cardiac output is due to the increase in stroke volume in the first trimester and then to the rise in heart rate, stroke volume decreasing in the last trimester of pregnancy due to caval compression [23]. Cardiac output changes during pregnancy are presented differently in various studies, which could be explained by the fact that the adaptive changes interfere with the mother's anthropometric variables and the body's position [21,24].

Research conducted on typical expectant mothers has revealed that the CO is lower in standing and supine postures and higher in knee-chest and left lateral positions. The compression of the larger uterus on the inferior vena cava and descending aorta in the supine position, more common after 24 weeks of gestation, is responsible for the fall in the supine position. This has the consequence of decreasing venous return and CO and limits blood flow to the placenta, leading to maternal arterial hypotension and acidemia that compromise the fetus. Sympathetic tone and heart rate increase to compensate for aortocaval compression. The azygos venous system creates a significant connection between the two inferior vena cava through the multiple anastomoses with them and with the vertebral venous plexuses. However, these compensatory mechanisms may be inadequate to maintain supine blood pressure in many pregnant women and may lead to supine hypotensive syndrome (or aortocaval compression syndrome) [25]. In these cases, the patient presents transient tachycardia and late bradycardia, pallor, diaphoresis, sweating, nausea, hypotension, and dizziness

in the supine position, which improves if the patient turns to the side position. This phenomenon can lead to the loss of consciousness or even sudden death of the pregnant woman in its severe form [26].

During the early stages of pregnancy, the heart rate increases progressively, with 15–25% reaching a maximum level in the third trimester, and the stroke volume increases by 20–30% to increase CO [27].

During pregnancy, around the gestational age of 6-8 weeks, the blood volume increases, reaching the maximum value, representing an increase of 20%, around the gestational age of 28-30 weeks [28]. The renin-angiotensin system is activated due to the increase in pulse pressure and the reduction in mean arterial pressure, which results in sodium and water retention. As a result, the plasma volume increases by 40-50%, and the end-diastolic volume of the left ventricle, while the end-systolic volume remains unchanged. These changes lead to increased ejection fraction [29].

Because maternal systemic and renal arterial dilatation, leading to salt and water loss, creates an “underfilled” cardiovascular system, activation of the renin-angiotensin system maintains blood pressure and aids in salt and water retention during pregnancy [30,31]. In addition, relaxin increases vasopressin secretion and stimulates water consumption during pregnancy, leading to greater water retention. Despite the variable increase in sodium, plasma osmolality is reduced, and hyponatremic hypervolemia occurs during pregnancy [32]. A potent aldosterone antagonist, progesterone acts on the mineralocorticoid receptor to prevent sodium retention and provide protection against hypokalemia [33]. The importance of aldosterone is highlighted in cases that develop preeclampsia when plasma volume is reduced and aldosterone concentrations are low.

During pregnancy, remodelling phenomena of the heart and the entire cardiovascular system are described, intended to support the pregnant woman’s body in adapting to the state of pregnancy. Thus, the studies note an increase in the thickness and mass of the left ventricle by 28% and 52% [20], respectively, and a 40% increase in the mass of the right ventricle compared to the pre-pregnancy values [34]. Vascular distensibility increases following the vasodilatation of the systemic vasculature [19], and the aortic augmentation index, which is considered a marker of aortic stiffness, decreases significantly from the beginning of pregnancy, reaching a nadir in the second trimester because then, in the last trimester of the load increases gradually [35,36].

Physiological adaptations in normal pregnancy can induce symptoms and signs that could be confused with those of heart disease, which sometimes raises difficulties in establishing a diagnosis of CVD, especially in cases where no risks for CVD have been identified. These symptoms include severe or progressive dyspnea, paroxysmal nocturnal dyspnea, progressive orthopnea, nausea and heartburn, epigastric or chest pain (gastro-oesophageal reflux), precordial pain on effort or after emotions, syncope, hemoptysis, peripheral oedema distended neck veins, lateral displacement of the cardiac apex, and the presence of a third heart sound and ejection systolic murmur [37–41].

To differentiate between adaptive physiological changes and pathological conditions related to cardiovascular health, every woman should have an antepartum and postpartum CVD screening to identify women who may be at risk and to educate and raise awareness among patients and healthcare professionals. This tool could contribute to reducing CVD morbidity and mortality among pregnant women [6].

3. Psychological Changes, Stress and Anxiety Factors during Pregnancy

Pregnancy is a multifaceted bio-psycho-social phenomenon involving somatic, psychological, and socio-cultural changes. marked by notable adjustments in mood, functioning, and maternal characteristics. Expectant mothers, especially those experiencing their first pregnancy, are faced with a novel circumstance and a critical stage in the development of maternal traits. Throughout pregnancy, the body and the soul bear the burden, alternating between mental strain and relaxation periods [42]. These aspects are crucial to understanding the implications of the stress and the anxiety generated by the pregnancy on the cardiovascular health.

The period of pregnancy can be considered a psychological burden, when the woman is experiencing a strong psychological phenomenon associated with important functional changes. The pregnant woman can experience frequent mood changes, accusing fatigue, exhaustion, sleepiness,

anxiety, depressive reactions and sometimes ending up being overwhelmed by states of agitation, euphoria [43].

Pregnancy can be considered a period of development of the feminine potential, the woman accepting to live in the present and think for the future, the changes of values and perspectives and the understanding of the role of mother [44]. Other pregnant women describe a feeling of discomfort related to the physical, professional and social life limitations, which trigger intense negative feelings that usually result in difficulties in accepting the role of mother [45].

Near the due date, pregnant women can trigger fears related to the moment of birth and how the relationship will handle after the birth [46]. They feel constrained by her body's adaptive abilities, her way of life, and the expectations of her new social standing. Therefore, pregnancy is frequently linked to high levels of stress, which can negatively impact both the mental health of the expectant mother and the newborn's ability to function mentally after birth [42]. Stress during pregnancy can negatively impact fetal development and potentially jeopardise a child's health. Stress is most likely caused by epigenetic mechanisms and a changed release of 11 β HSD type 2 (HSD2), which is normally involved in protecting the developing foetus from the harmful effects of excessive maternal glucocorticoids [47].

Common mental disorders and heart disease are complicated illnesses with many risk factors, especially for women, according to a review focused on women's experiences from adolescent until old age [48]. Throughout their lives, women are more likely to experience common mental disorders because of a variety of variables, including social pressures, sex hormones, childbirth, and cultural and racial differences. They also have a worse prognosis following an event and are more vulnerable to stress-related cardiac problems.

Improving the detection and management of anxiety and depression before and after an acute cardiac event is crucial, as evidenced by the greater incidence of these conditions among women and their correlation with worse outcomes and therapy for CVD [49]. Moreover, a woman experiences various changes after becoming a mother. The mother's body experiences unique changes throughout pregnancy, requiring all of its systems to adapt to support the fetus's growth. Pregnancy-related modifications serve vital functions, such as regulating the mother's metabolism to support the growth and development of the fetus and to prepare the body for labour, delivery, and nursing. Psychological adaptations are necessary throughout pregnancy because it is a dynamic, cyclical, and long-lasting occurrence. Stress exposure during the first trimester might affect the development of the organs and have long-term consequences like cardiac deformity and cognitive impairment. Due to the embryonic organs' primary enlargement and refinement during the second and third trimesters, stress exposure during this time may result in low birth weight and skeletal deformities, among other complications [50].

Heart disease-afflicted women in their reproductive years report feeling stressed, finding it difficult to take charge and make decisions, feeling like they don't have enough autonomy, and realizing how important social support is [51,52]. Both physical and psychological changes influence pregnant women's subjective experiences. During pregnancy, women may experience mood swings, anxiety, and affective ambivalence [53–57]. These symptoms can lead to stress and negatively impact the mental well-being of expectant mothers. Pregnant women's concerns over their health, the health of their unborn child, and childbirth are linked to anxiety [53] and there is a higher chance of unfavourable outcomes for the newborn [55,58].

In a study of Vianna and her team, 35.6% of participants in a screening program for 90 pregnant women in 2017 reported having mild to severe anxiety [59]. Anxiety during pregnancy can raise the risk of developing gestational disorders, such as hypertension, especially in women who experience mild to severe anxiety as also results from other studies [59,60]. To offer emotional support throughout pregnancy, prenatal care should incorporate the mother's mental health follow-up services, given the significant morbidity and mortality linked to preeclampsia [61] It is well established that stress and anxiety are positively correlated, per the researches [62–64]. Furthermore, some research highlights how crucial it is to provide a full range of prenatal care services starting in the first trimester of pregnancy [65].

Specifically, younger women seem to be more vulnerable to a decline in mental health and there is a higher prevalence of mental health problems connected with certain cardiac disorders, especially those that affect this population [66].

4. Stress and Cardiovascular Diseases

Selye was the first who identified stress as the body's non-specific (neuroendocrine) reaction to any unpleasant stimulus in medical literature [67]. Later, this idea was clarified by separating the terms "stressor" and "stress response," and stress was defined as the body's reaction to environmental pressures that are more than it can naturally regulate [68].

Currently, specialized literature presents evidence regarding a clear and consistent association between acute and chronic psychological stress and cardiovascular risk factors, such as hypertension and insulin resistance, respectively, ischemia, arrhythmia, and heart failure [69,70].

The intensity of cardiovascular reactions to stressors is calibrated by brain areas associated with visceral control [9]. Excessive cardiovascular reactions can exert stress on the walls of blood vessels, ultimately leading to the acceleration of the atherosclerosis process [71]. Acute stress has various actions on the sympathetic nervous system, which results in the production of arrhythmias, endothelial dysfunction, respectively the activation of platelets [72]. Acute stress may further increase the incidence of acute CVD through direct effects on blood pressure and heart rate, as well as circulating inflammatory markers and cardiac cell death. These effects may act in concert to induce adverse cardiac events in patients with established atherosclerosis [73]. Stress is an important risk factor for acute and chronic cardiovascular disorders.

Chronic psychosocial stress can be caused by a variety of factors, including changes in one's lifestyle (such as marital issues and work-related stress), environmental issues (such as air pollution or noise pollution), socioeconomic factors (such as money, education, and criminal activity), and chronic mental illnesses (such as depression or anxiety) [74,75].

The risk of CVD associated with chronic psychosocial stress is equal to the risk associated with traditional CVD risk factors [76].

The relationship is ambivalent since psychological components may be prevalent in some CVD and predict poorer outcomes, or psychological disorders may be present before CVD develops. A recent cohort study indicated that higher psychosocial stress was substantially linked with mortality as well as CVD, coronary heart disease, and stroke events [75].

The mechanisms that link mental stress to CVD are illustrated by Ahmad and his team [77]. The interaction mechanisms by which mental stress on the brain-immune-arterial axis raises the risk of cardiovascular events are described in their research. Chronic or acute mental stress triggers the amygdala/prefrontal stress-related neural network response, which affects the vasculature and activates the autonomic nervous system, hypothalamic-pituitary-adrenal axis, and bone marrow [77].

Stress is associated with a wide range of cardiac conditions, such as coronary artery disease and myocardial infarction, cerebrovascular disease, sudden cardiac death and ventricular arrhythmias, atrial fibrillation, heart failure, hypertension, and peripheral vascular disease. The influential INTERHEART study involved around 25,000 individuals from over 50 nations. After controlling for confounding variables, it was shown that people with chronic daily stress were more than twice as likely to have a myocardial infarction as people without chronic stress [76]. Booth et al.'s meta-analysis revealed an independent correlation between perceived psychosocial stress and a higher probability of stroke [78]. Additionally, it has been discovered that post-traumatic stress disorder and depression raise the risk of stroke [79,80].

Natural disasters and stressful life events have been linked to sudden cardiac death, with acute psychological stress being a prominent precipitant [81,82].

An independent risk of atrial fibrillation was found in a prospective multi-cohort research to be correlated with chronic psychological stress in the form of extended work hours [81].

In a prospective research, Endrighi et al. shown that in patients with heart failure, chronic psychological stress was a significant predictor of cardiovascular morbidity and all-cause mortality [83]. Chronic psychological stress has been linked to the development of hypertension as a possible

independent risk factor, according to an increasing body of research. For instance, a number of studies have linked high levels of workplace stress to hypertension [84,85].

It has also been demonstrated that post-traumatic stress disorder and other chronic stress disorders are linked to a higher risk of hypertension [86]. A recent study by Thomas et al. found that patients with new-onset peripheral artery disease reported higher levels of perceived stress [87]. Increased chronic psychological stress is independently linked to worse walking capacity and quality of life in individuals with established peripheral artery disease [88].

Even if there is a clear correlation between stress and CVD, it is also important to recognize the role of harmful behavioral changes that frequently accompany chronic stress, such as smoking, limited physical activity, and poor eating habits [89]. A significant amount of the increased cardiovascular risk linked to stress is caused by unhealthy habits [90].

5. Anxiety and Cardiovascular Diseases

Anxiety is characterized by fleeting fear, uncertainty, and worry about the future, although how frequently and how intensely it affects a person varies [91]. Anxiety is an acute emotional reaction brought on by the unconscious detection of a conflict and is portrayed as a fear of future threat [92]. Numerous physiological and psychological symptoms, including anxiety, tachycardia, difficulty relaxing, and terror, are what define it [93].

Numerous studies have examined the connection between anxiety disorders, worsening symptoms of anxiety, and coronary heart disease events. After adjusting for other background factors and health behaviours, a meta-analysis of 20 studies with a follow-up period of more than 11 years revealed that anxiety was correlated with higher rates of coronary heart disease and cardiovascular death [94]. In other studies, phobia anxiety, has been linked to an increased risk of coronary heart disease and sudden cardiac death, but only in women [72].

It is essential to emphasize that patients may experience both anxiety and depression simultaneously. Many studies have attempted to investigate these two psychosocial factors' distinct and combined effects on coronary heart disease outcomes. After controlling for depression, one study found that anxiety was linked to a 77% increased risk of mortality and a nearly 3-fold increased risk of coronary heart disease in 5,073 healthy Dutch women [95].

Some studies have demonstrated that anxiety is an independent risk factor for CVD events after adjusting for depression and other traditional risk factors [96]. There is currently inconclusive evidence of an independent connection between anxiety and incident CVD [97]. A recent Chinese cohort study discovered a strong correlation between panic attacks and acute ischaemic heart disease, as well as the incidence and mortality of hemorrhagic and ischemic stroke. On the other hand, persistent anxiety was positively correlated with an incident of ischaemic heart disease, ischemic heart disease and major coronary events. However, it was not significantly associated with stroke. In the follow-up period of ≤ 6 years, there was an increased risk of incident ischaemic heart disease and hemorrhagic stroke for those with a diagnosis of generalized anxiety disorder [98].

6. Impact of Stress and Anxiety on Cardiovascular Health in Pregnant Women

Pregnancy-related cardiac disease is associated with high rates of morbidity and hospitalisation. Heart disease during pregnancy is linked to an increased risk of eclampsia, cesarean delivery, and postpartum haemorrhage; about one in four pregnant women with cardiac disease are admitted to the hospital throughout their pregnancy [1].

The studies highlight the fact that, during pregnancy and in the period immediately following birth, a broad spectrum of heart diseases were diagnosed, both from the category of congenital ones, such as tetralogy of Fallot, univentricular heart, atrial or ventricular septal defect and aortic valve stenosis, transposition of the great arteries pulmonary atresia or stenosis, septal defect, double outlet right ventricle, truncus arteriosus, coarctation of the aorta [99–101], as well as acquired before the woman becomes pregnant or during pregnancy, such as rheumatic heart disease [102–104].

A qualitative study conducted in 2018 interviewed 14 women to explore the experience of psychological adaptation after being diagnosed with peripartum cardiomyopathy [105]. The results

show that this category of women has difficulties finding a psychological balance in their lives and needs professional support to integrate this event into their lives. Moreover, the authors suggest that this pathology is difficult to diagnose.

More than 400,000 pregnant women's data were reviewed by the researchers across 41 research through a systematic review and meta-analysis. They discovered that there was an independent correlation between prenatal anxiety and depression and an increased risk of hypertensive problems throughout pregnancy. The findings also showed that there is a risk factor for the development of hypertensive disorders during pregnancy if prenatal depression or anxiety begins before 20 weeks of gestation [106].

To accomplish the goal of comprehending women's experiences with cardiac disease during pregnancy and the first year postpartum [107], begin a qualitative study design utilizing in-depth semi-structured interviews and explore the experiences of 25 Australian women with cardiac disease during pregnancy or during the first postpartum year. The study found that women diagnosed with cardiac disease during pregnancy or the first postpartum year described experiencing significant mental health impacts. These included feelings of terror, devastation, a sense of doom, and a loss of trust in the health system. Many women reported intense or prolonged pain, decreased functional capacity, and acute medical situations, but they emphasized that the mental health effects had the most significant impact on them. Recovery was difficult and multifactorial, involving physical and emotional healing. The discussion noted the lack of recognition and support for women's mental health needs in this situation. The findings point to a need for more integrated mental health care and resources to assist women's experiences of cardiac disease in the perinatal period.

Moreover, a higher incidence of congenital heart disease in the fetus is linked to mothers' psychological stress during pregnancy. However, it seems that there isn't the same chance of the child having congenital heart disease if the mother experiences anxiety or depression during pregnancy [108]. Anxiety is associated with preeclampsia, as demonstrated by a case-control study conducted on 300 women (150 with preeclampsia and 150 without), with severe anxiety reported by 5.3% of preeclamptic patients and 0.7% of non-preeclamptic cases [109]. Other studies demonstrate a similar relationship [110,111].

Overactive sympathetic nervous system is caused by certain psychological factors, which stimulate the autonomic nervous system and increase the risk of preeclampsia [112]. A recent study that used data from more than 242,000 births found that mothers with anxiety disorders were at higher risk of preterm birth, hypertensive disorders during pregnancy, and cesarean delivery after controlling for confounders [113].

Screening of the pregnant women with psychological changes is very important to reduce the complications of the pregnancy related to this cause [114].

7. Limitations

It's critical to note this article's limitations. Only English-language keywords and published or translated articles into English were included in the search parameters. The narrative review style of organization means that while they have a greater scope than systematic reviews, they need more rigor and synthesis of a systematic review. Furthermore, before firm conclusions about the role that stress and anxiety play in raising the risk of CVD in expectant mothers, a comprehensive meta-analysis is required.

Beyond these features, the current review presents several recent studies that clarify and demonstrate the link between stress and anxiety and the risk of cardiovascular illnesses in the population of women of reproductive age.

8. Conclusions

The cardiovascular health of a pregnant woman is greatly impacted by stress and anxiety. An interdisciplinary approach is necessary when treating an expectant mother who has been found to be experiencing stress and/or anxiety in addition to pathological cardiovascular conditions. Understanding and differentiating between the physiological changes that the body undergoes

during pregnancy due to hormonal fluctuations and the cardiovascular pathology that is impacted by the patient's stress and worry is crucial for appropriate care.

Recognition of the body's adaptive physiological changes during pregnancy is very helpful in providing education and support for patients and health care providers. It allows them to identify potential risk factors and/or pathological changes that could worsen the health status of pregnant women. A screening for psychological and cardiovascular risk factors performed before or during the pregnancy could help identify cases that require specific medical and/or psychological interventions, which can contribute to decreasing maternal morbidity and mortality related to CVD.

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