



Factors that Cause Pregnancy Stress and its Impact on Fetal Health: A Literature Review

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ABSTRACT

Stress experienced by pregnant women can have a negative impact on pregnant women and the fetus. According to the results of research, pregnant women who have high stress levels can increase the risk of premature birth, even miscarriage. When pregnant women feel stressed, their body will produce stress hormones that can affect the fetus and block blood vessels and reduce oxygen supply to the fetus. This causes abnormal activity or movement in the fetus. The purpose of this study is to determine what factors affect pregnancy stress and its impact on the fetus. This Literature Review study analyzed 10 journals from the database (Google Scholar, Crossref Metadata Search, Taylor & Francis Online and Publish and Perish) from 2021-2024. The results of this literature review study show that stress in pregnant women can be triggered by various factors such as, age and education of the mother, employment status, family support, pregnancy during the covid 19 pandemic, and financial problems. Some psychological factors such as anxiety and depression can also affect stress levels in pregnant women. High levels of stress in pregnant women can have a negative impact on the health of pregnant women and their fetuses, such as stunted fetal brain growth, LBW, premature birth and the risk of miscarriage.

Keywords: *Stress, Pregnancy, and Fetal Health*

INTRODUCTION

According to Purwanti (2011) the psychological condition of mothers undergoing the pregnancy process can cause stress. Pregnancy stress is the experience of stress that comes from pregnancy itself (Ibrahim & Lobel, 2020). Pregnancy stress includes concerns regarding the physical symptoms of pregnancy, bodily changes, changes in interpersonal relationships, fetal or maternal health, impending labor, or caring for a future baby (Alderdice et al., 2012; Ibrahim & Lobel, 2020). Stress during pregnancy is a mood disorder that is the same as what happens in general, where in the event of stress there will be chemical changes in the brain, stress can also be caused by hormonal changes that have an impact on the mother's mood so that the mother feels upset, angry and sad. In addition, the constant worry about the womb will make the mother feel depressed. The stress experienced by pregnant women can be in the form of doubts about not being able to deliver normally, fear of not being able to withstand the pain of labor, the health of the baby after birth, the smoothness of labor, the condition of the pregnant woman after childbirth, labor that is not as desired, not immediately meeting the baby after childbirth, and reduced attention from others (Aryani et al., 2016).

In general, pregnant women will be more vulnerable to stress. Changes in the increase in pregnancy hormones and the condition of pregnancy itself often cause discomfort during pregnancy which is the biggest trigger for the threat of stress. Stressful conditions themselves will stimulate the release of adrenaline hormones in excess, which causes a person to easily vent emotions and vent anger on others. When pregnancy becomes worrisome and stress increases, many problems can occur, including fatigue, sleeplessness, anxiety, headache disorders and backaches. Exposure to stress can lead to serious health problems such as immune function, hypertension and heart disease.

According to a study, the chance of stress in pregnant women in Spain is 30% lower than in Indonesia, where 64.4% of pregnant women reported experiencing severe stress. Physical stress or psychosocial stress can also contribute to pregnancy stress. (Vivi Silawati et al., 2019). Suryanti's research revealed that out of 102 pregnant women, 65 (63.6%) of them admitted to feeling stressed (Hasni & Evie, 2022). According to a study by Moyer et al, of 2,700 pregnant women in 47 countries in 2020, it was reported that more than half of pregnant women experienced increased stress conditions due to running out of food ingredients, losing their jobs, or decreasing household income. More than a third of pregnant women reported higher levels of stress as a result of domestic disputes and being exposed to Covid-19 infections. (Moyer et al., 2020).

Said (2013) explained in his research that in psychological conditions that affect pregnancy, pregnant women will usually experience stress that can affect the health of the mother and fetus. In addition, women who are expecting their first child find it more difficult to cope with pregnancy stress due to their lack of experience in this regard due to first undergoing pregnancy (Lobel & Dunkel Schetter, 2016). Pregnancy stress has been associated with higher

fetal movements (DiPietro et al., 2002), Pregnancy should be the happiest time for a mother, but sometimes as an expectant mother (especially the first time facing pregnancy) there is a sense of excessive worry in connection with getting closer to the birth process. Mood disorders or stress sometimes appear in one in four pregnant women, but often the pregnant women are not aware of the mother's mood disorders or stress because they think this incident is something that is often experienced by pregnant women. Even though if not handled properly it can affect the baby she is carrying (Priyoto, 2016: 45).

The impact of stress can be in the form of heart palpitations, increased blood pressure, increased stomach acid, heavy breathing and tightness, emotional changes can even cause early contractions during pregnancy, hyperemesis gravidarum, abortion, and eclampsia which are very threatening to the lives of pregnant women and fetuses and can even cause death. The factors that cause stress are influenced by various things, namely internal and external stressors. The impact of stress experienced can increase the risk of congenital abnormalities, cesarean section, premature birth, low birth weight babies (LBW) and long-term disorders related to children's emotional behavioral disorders. For this reason, efforts are needed to overcome stress by doing light exercise during pregnancy so that the mother and fetus are healthier and fewer problems arise in pregnancy.

METHODS

This research uses the literature review research method. Literature review is a description of the theory, results and other research documents obtained from the search for references to serve as the basis for research activities in developing critical thinking from the formulation of the problem and the subject matter under study. In this study, data sources came from national and international articles by searching using databases (Google Scholar, Crossref Metadata Search, Taylor & Francis Online and Publish and Perish) within the period 2021-2024. The keywords used were "stress" and "pregnancy" and "fetal health". Next, article selection was carried out using the predetermined criteria so that 20 articles were obtained. Then, article elimination was carried out by selecting articles with appropriate content and 10 articles were obtained for analysis. Meanwhile, the other 10 articles were eliminated because the discussion was incomplete and inappropriate.

RESULTS AND DISCUSSION

A. Research Results

Based on the results of the literature search through the publication of scientific articles, the following are some previous articles presented as a source of data for research studies:

Table 1. Literature Review Results

No.	Researcher/ Year	Title	Methods	Results
1.	Meital Navon et al/ 2023	Psychological Well-being during Pregnancy: The Contribution of Stress Factors and Maternal-Fetal Bonding	Quantitative	The higher the COVID'19-related anxiety, the higher the pregnancy stress, which in turn was associated with lower psychological well-being. However, this effect was weaker among women who reported greater maternal-fetal bonding.
2.	Mario Sánchez-Rubio et al/ 2024	Maternal stress during pregnancy alters circulating small extracellular vesicles and enhances their targeting to the placenta and fetus	Experiment	Mild chronic maternal stress during pregnancy induces anhedonic-like behavior in pregnant women and causes intrauterine growth restriction (IUGR), particularly in the male fetus and placenta. Prenatal stress is associated with various adverse prenatal outcomes, including stunted fetal growth.
3.	Fadhila Kusumasari et al/ 2024	Relationship of Pregnancy Stress with the Occurrence of Hypertension in Pregnancy: A Systematic Review	Systematic Review	There is an association between stress and hypertension in pregnancy. Psychosocial and medical interventions for complementary therapies early in monitoring throughout the course of pregnancy.
4.	Jumrah Sudirman, Hairuddin K/ Rahayu Eryanti K/ 2022	Risk Factors for Stressful Events in Primigravida Pregnant Women during the Covid-19 Pandemic	Quantitative	There was no relationship between pregnancy status and stress (P value = 0.099>0.05), while there was a relationship between family income and stress (p value = 0.006 <0.05) and there was a strong and negative correlation (r = 0.630).

5.	Velga Yazia, Ulfa Suryani/ 2023	Factors associated with stress levels in pregnant women In Facing Labor	Quantitative	There is a relationship between husband support and stress level, there is a relationship between traumatic experience and stress level, there is a relationship between personal readiness level and stress level and there is a relationship between activity level and stress level.
6.	Enur Nurhayati Muchsin/ 2021	Stress Level Of Pregnant Women During The Pandemic Covid-19 In The Village Of Kalianyar Ngronggot District Nganjuk Regency	Quantitative Descriptive	Pregnancy stress is influenced by several factors, age, education, occupation, pregnancy history, gestational age, information about Covid-19. Antenatal care (ANC) can control stress during pregnancy. Support from family and always apply health protocols and think positively during pregnancy.
7.	Selfiana et al/ 2023	Effects of Stress on Pregnant Women	Qualitative Descriptive	One of the adverse consequences caused by stress in pregnant women is miscarriage and premature birth.
8.	Arinda dan Herdayati/ 2021	Mental Health Issues in Pregnant Women During the COVID-19 Pandemic	Literature Review	Pregnant women often feel higher levels of anxiety This disease can increase the risk to the fetus by causing low birth weight, premature birth, or poor fetal development.
9.	Zahria Arisanti/ 2021	Psychological Impact of Pregnant Women during the Covid-19 Pandemic	Literature Review	The Covid-19 pandemic has an impact on psychological disorders in pregnant women because they have a fear of going to health services for fear of being exposed to the virus. Emotional changes that occur can have an impact on the psychological health of the mother and fetal health.
10.	Hasda dan Fajar Kurniawan/ 2024	Maternal Stress During Pregnancy Is a Risk for Premature Labor	Quantitative	Stress has an 11.22-fold risk for the incidence of preterm labor at South Konawe Regional Hospital. It is concluded that stress in pregnant women is a risk factor for preterm labor.

B. Discussion

Analysis of Factors Causing Pregnancy Stress

Stress in pregnant women is related to the safety and health of the baby that will be born (Qodriyah L, 2015). Pregnant women who experience stress can cause blood pressure to rise or hypertension. The Corona Virus Disease 2019 (Covid-19) pandemic that has hit 215 countries in the world makes everyone stressed and anxious because the virus can infect from human to human, it does not rule out the possibility of also having an impact on pregnant women. A pregnant woman will be faced with various challenges and psychological changes that can result in high levels of stress. Pregnancy with high stress levels can certainly have a negative impact on the mother and fetus.

The harmful effects of stress during pregnancy are as follows; low birth weight, and preterm labor, delayed infant neuromotor development, delayed excitosis effectiveness, prolonged labor or failure to progress labor, vasoconstricted uterus, increased labor pain, increased maternal heart rate and blood vessels, high incidence of miscarriage, obstetric complications, increased stress hormones and depression. Stress can have far-reaching effects during pregnancy and in basic pregnancy. As almost no woman experiences pregnancy without stress, it is therefore important that women during pregnancy receive physical, emotional and social support to combat adverse consequences.

Prenatal stress is almost common in all pregnant women. This stress can be caused by external and internal factors of pregnant women. Stress is an uncomfortable condition (dysphoric) as an imbalance of pregnant women to feel capable or reject various changes in the process of adapting to pregnancy (Nurdin, 2014). The cause of stress in pregnant women before delivery is around 95% of health workers do not pay much attention to the psychological condition of pregnant women, but pay more attention to the physical condition of the mother and the baby to be born (Suryani, 2014). In addition, the social, economic, and geographical environment can affect the mother's stress level depending on the mother's ability to deal with these stressors. Some factors that cause stress in pregnant women and its impact on fetal health that the author found from several article reviews include:

1. Age

Age greatly affects attention in the labor process. The younger the mother, the less attention and experience the pregnant woman has because of the mother's unpreparedness in accepting a pregnancy (Velga Y. and Ulfa. 2023). This condition of unpreparedness can cause stress and anxiety due to physical and mental changes when facing pregnancy.

2. Education

Education is one of the factors of moderate stress levels in pregnant women. From the results of the study (Enur Nurhayati et al. 2021), it shows that most of the respondents have a high school education of 15 respondents (75%). Education and income levels support a person to care about their health. Mothers with higher education will be more thorough in searching, collecting, and assessing health information so that it can increase the insight of pregnant women (Anis, 2012). Pregnant women with higher education will be more selective in filtering information obtained from online media, friends, and family. Pregnant women with low education can cause stress in pregnant women.

3. Financial Problems

Low family income or below the UMP (Provincial Minimum Wage) causes mothers and families to have concerns about not being able to finance the birth of a baby and fulfill the baby's material needs. This causes mothers' family finances below the UMP to experience the most moderate and severe stress. Adequate family income is needed by mothers during pregnancy. This is because when pregnant women really need special or additional costs such as spending on maternity check-up fees and nutritious food (Jumrah S et al. 2022).

4. Family/Husband Support

Family dysfunction factors will increase the stress level of pregnant women with hypertension. Research by Xing shows high stress levels correlate with family function scores. Male partners are expected to provide maternal emphasis on a sense of togetherness during pregnancy (Kashanian et al., 2021). Perfect family function not only helps relieve maternal anxiety but also maintains family harmony thereby improving maternal physical and mental well-being (Xing et al., 2021). The lower the support of the husband or family during pregnancy causes increased stress in pregnant women due to lack of support and togetherness for the psychological condition of pregnant women (Velga Y. and Ulfa. 2023).

5. Pregnant during Covid 19 Pandemic

During the covid-19 pandemic, there were various impacts including affecting the psychological conditions of the community including pregnant women, causing stress as a psychosocial change. Psychological problems faced by pregnant women during the COVID-19 pandemic include increased anxiety, PTSD (Post-Traumatic Stress Disorder) or post-traumatic stress disorder is a mental health condition triggered by a traumatic event, either by experiencing it or witnessing it. In mothers exposed to COVID-19, depression, fear of their current pregnancy condition, triggers negative thinking and is at risk of postpartum depression (Arum M et al. 2022).

6. Employment Status

Heavy workloads cause mothers to become exhausted and cause stress conditions to increase (Woolhouse H et al. 2014). Women who work while taking care of the household face double tasks that are more complex and not easy so that they have a heavier activity load, this will affect their pregnancy. The heavy household workload coupled with the workload obtained by pregnant women can cause stress and affect their psychology. As for pregnant women who still get night work time which causes lack of sleep, it will also have an impact on their psychological well-being (Saleha, Delfina and Maiyulis, 2019). Pregnant women who work during pregnancy will experience more stress than pregnant women who do not work (Enur Nurhayati, 2021) Working during pregnancy will cause stress due to disruption of daily activities, besides that the threat of being expelled from work due to physical weakness and decreased performance exacerbates the stress that pregnant women have. This factor is what causes pregnant women to easily experience severe stress.

Effects of Pregnancy Stress on Fetal Health

Women who experience stress tend to have a decreased appetite resulting in a lack of fetal nutritional intake, stress will also inhibit blood flow to the uterus and cause the myometrium to become more susceptible to infection. In mothers who have chronic circulatory disorders during pregnancy will reduce uterine blood flow and the development of the uterus, placenta and fetus. Sustained stress during pregnancy can result in hypertension, preeclampsia, premature babies, low birth weight (LBW), impaired uterine contractions, and abnormal fetal brain development (Pao-Ju et al., 2017).

1. Retarded Fetal Growth and Low Birth Weight (LBW)

Stress in pregnancy has the potential to impact morbidity during pregnancy. Complications arising from prenatal stress such as preterm labor because the placenta increases the production of corticotropin-releasing hormone (CRH) and progesterone under stress. In addition, in early pregnancy stress and decreased progesterone can cause abortion, progesterone which is calming and slows gastric motility as a trigger for hyperemesis gravidarum to low birth weight babies (LBW). These effects prove that the mental state of the mother can affect the health of the mother during pregnancy and the growth and development of the baby in the next period of life (Woods et al., 2010).

2. Abnormal Fetal Brain Development

The impact of an increase in stress levels, anxiety and feelings of depression in pregnancy can change physiological parameters, namely an increase in the regulatory activity of the hypothalamic pituitary adrenal (HPA) axis. HPA is one of the main stress systems in the human body that regulates the release of glucocorticoid, namely cortisol. The medullary adrenal sympathetic system (SAM), the second important regulator of human stress reactivity,

releases the catecholamines norepinephrine (NE) and epinephrine (E). Maternal and fetal cortisol levels are highly correlated, and cortisol is known to cause growth retardation and may also affect fetal brain development.

3. Risk of Miscarriage

Pregnant women who experience high levels of stress and often cry can result in the risk of miscarriage, especially when the pregnancy is still young (Selfiana et al., 2023). When pregnant women are stressed, this can result in weakness in the fetal condition. This weakness increases the risk of miscarriage in the fetus. After a miscarriage, a mother will experience emotional and physical changes. According to research conducted by Selfiana et al. (2023), stated that mothers who experience these changes can face physical and psychological problems. Physical problems that may arise include bleeding, fatigue, heartburn, and fever. Meanwhile, psychological problems that may arise include feelings of sadness, lack of enthusiasm, feeling lost, feeling guilty, lack of confidence, difficulty sleeping, stress and decreased appetite.

4. Premature Baby Birth

Several studies have shown that chronic stress or high levels of stress in pregnant women can contribute to various pregnancy complications, including premature birth, respiratory infections, and the risk of infant mortality (Kurniawan, Hamudi, et al. 2022). Stress can trigger the release of stress hormones such as cortisol, which in turn can affect the balance of other hormones involved and active in the labor process. In addition, stress can also interfere with the overall health of the expectant mother, affecting sleep patterns, nutrition and physical activity, all of which can contribute to an increased risk of preterm labor.

CONCLUSION

The results of the literature review on all articles found several factors that can cause stress in pregnant women and have a serious impact on the health of the unborn child. There are several factors that can cause stress in pregnant women, namely maternal age and education, financial problems, poor family support, pregnancy during the COVID-19 pandemic, and employment status. These factors can cause pregnant women stress so that it can have a negative impact on fetal health, including stunted fetal brain growth, LBW, higher risk of miscarriage, and premature birth. The results of this study can be used to support literature review for future researchers to deepen this problem, for example by adding an analysis of the solution to the problem of stress in pregnant women in order to reduce the impact on fetal health and by adding previous journals to be more accurate and the information obtained is more complete.

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