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# The Anxiety During Pregnancy and Its Relation to Maternal-Fetal Relations: A Systematic Review

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**ABSTRACT**

**Background:** The pregnant women may experience anxiety as an independent mental health issue or as a significant feature of antenatal depression. Postpartum depression can persist and negatively impact the bonding attachment period, the baby's growth process, and the motherhood transition. This study performed aimed to assess the relation of anxiety during pregnancy and maternal-fetal relations.
**Methods:** The current study was a systematic review conducted to assess the related articles from databases of Sage, Springer, Pubmed, and Taylor & Francis. The articles of the cross-sectional studies that focused on anxiety and maternal-fetal relations conducted from 2021 to 2025 were included, while other study designs performed before 2021 were excluded. The articles were assessed by PRISMA flow analysis after being screened by PICOs analysis.
**Result:** Only two articles provided results that showed no significant relation between anxiety during pregnancy and maternal-fetal relations, while the remaining 9 studies proved the relation. Anxiety during pregnancy and maternal-fetal relations have a tendency towards an inverse relationship.
**Conclusion:** Most of the studies proved that higher anxiety during pregnancy period is related to lower maternal-fetal relations. It is concluded that several factors need to be assessed based on the characteristics of mothers or the causes of anxiety due to the inconsistent results.

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## INTRODUCTION

The excessive and uncontrollable worry, called anxiety, appears during pregnancy due to several changes in motherhood life. Anxiety may appear during pregnancy and affect the daily activities of pregnant women (National Library of Medicine, 2024). If it becomes intense and lasts a long time, it is called an anxiety disorder (The American College of Obstetricians and Gynecologists, 2025). Even though the period of pregnancy is related to a happy phase, the increase of uncertainty led to anxiety and induced a poor outcome for the mother and baby if it remained uncontrolled (National University Health System, 2025). This condition has a detrimental effect on mother and fetal health if there is no earlier identification.

Anxiety during pregnancy affected about 10% of mothers worldwide. Moreover, it was noted to be higher in developing countries, reaching 15,6% (World Health Organization, 2025). Pregnant mothers in low-middle-income countries may experience a higher risk of pregnancy-related anxiety. The data from 700 journal articles, which were compiled in a systematic review and meta-analysis, stated that self-reported

anxiety during pregnancy reached 29,2% and was clinically diagnosed in 8,1% (Nielsen-Scott et al., 2022). The latest study in 2025 reveal that the depression noted higher in the second trimesters accompanied with anxiety based on study across 48 countries worldwide (Aziz et al., 2025). The mental problem among pregnant women in Indonesia also noted as a non-optimal problem to detect in primary health care. The researcher from the Centre for Public Health and Nutrition of Indonesia's National Research and Innovation Agency stated that one-fifth of pregnant mothers developed depression until after delivery (BRIN, 2026).

Anxiety in pregnant mothers may arise from concern about pregnancy complication, fear of a detrimental outcome on the infant, or feelings of financial burden (Kajdy et al., 2023). Previous research had identified that the most relevant factors contributing to pregnancy anxiety in the first semester are previous episodes of depression, previous anxiety, and marital problems which was carried out among pregnant women with intended and unintended pregnancies. The factors changed as the pregnancy advanced through trimesters (Jimènez-Barragan et al., 2024). Anxiety as one of the psychological issues that occur during pregnancy may affect the feto-maternal relation. Specifically during pregnancy, the previous research found that primigravida experienced higher anxiety, but the positive relationship between anxiety and prenatal attachment was weak (Edis & Bal, 2023). The anxiety appears after the early trimester of pregnancy and may be maintained in the postpartum episode. Anxiety risk factors vary by trimester throughout pregnancy (Jimènez-Barragan et al., 2024). Regarding the maternal-fetal relations, the first contributing factor is emotion. A good maternal-fetal relations can be achieved if the mother has positive emotions, including being tender and loving, rather than feelings of irritation feeling or emotional distance

The harmful impact of pregnancy-related anxiety and lower maternal-fetal relations/attachments highlights the need od implementing intervention. Trait anxiety levels in pregnant mothers, specifically in primigravida, showed a notable decrease after the counseling (M. Aziz & Kokiwar, 2025). A study carried out in Indonesia that focused on pregnant women showed that an educational program helps reduce anxiety levels and improves the relationship between the mother and her unborn baby (Purwati et al., 2025).

The relation between anxiety and maternal-fetal relations has not been clearly understood due to different findings from those articles. The systematic review was conducted to compile related studies and identify the most supportive result regarding the relation between anxiety during pregnancy and maternal-fetal relations.

# METHOD

### Study Design

This is a systematic review organized by journal database identity, which includes Sage, Springer, Pubmed, and Taylor & Francis. Based on PRISMA for systematic review and meta-analysis, the articles from each database being analyzed using the step from identification, screening until included articles that met the study aim.

### Criteria Appropriateness

The articles were conducted in 2021 or later, with an emphasis on anxiety, pregnancy, and mother-fetal relations or prenatal relations. English research studies on anxiety in pregnancy were either primigravida or multigravida, whereas the kinds of reviews were omitted. There were 1413 articles after the first step of the searching process, and 10 remained after being assessed using inclusion and exclusion criteria and checked for duplication, title, and content.

The PICOs screening procedure establishes inclusion and exclusion criteria based on academic databases such as Sage, Springer, Pubmed, and Taylor & Francis. The inclusion and exclusion criteria are explained in Table 1.

**Table 1. Inclusion and exclusion criteria based on PICOs**

| Criteria | Inclusion criteria | Exclusion criteria |
|---|---|---|
| Population | Primigravida or multigravida | Nonbiological mother |
| Intervention | No intervention | Anxiety reduction |
| Comparator | Postpartum mothers | Non-pregnant mothers |
| Outcome | Anxiety, maternal-fetal attachment, maternal-fetal relations | PTSD or others |
| Study design | Cross-sectional study | Qualitative study, literature review, systematic review, study protocols, guidelines |
| Publication year | 2021 or later | Before 2021 |
| Language | English | Indonesia or other languages |

**Search Strategy**

The article identification process began by entering keywords in Sage, Springer, Pubmed, and Taylor & Francis of "anxiety", "fetal attachment", "pregnancy", and "maternal-fetal relations". The Boolean searching approach was used to find the keywords of (anxiety OR anxiety disorders) AND (pregnancy OR maternal-fetal relations) AND (cross-sectional studies).

**Study Selection and Synthesis**

Two authors independently screened articles based on criteria. Disagreements were resolved through discussion or third reviewer. All the included articles then assessed deeply by all authors. The article selection process was tested based on its methodological quality based on the aspects of the accuracy of study design, data extraction, risk of bias, and synthesis of results. Articles with a cross-sectional study or survey were assessed for risk of bias using the CASP Cross-Sectional Studies Checklist. The flow of identification of literature studies is presented in chart 1.

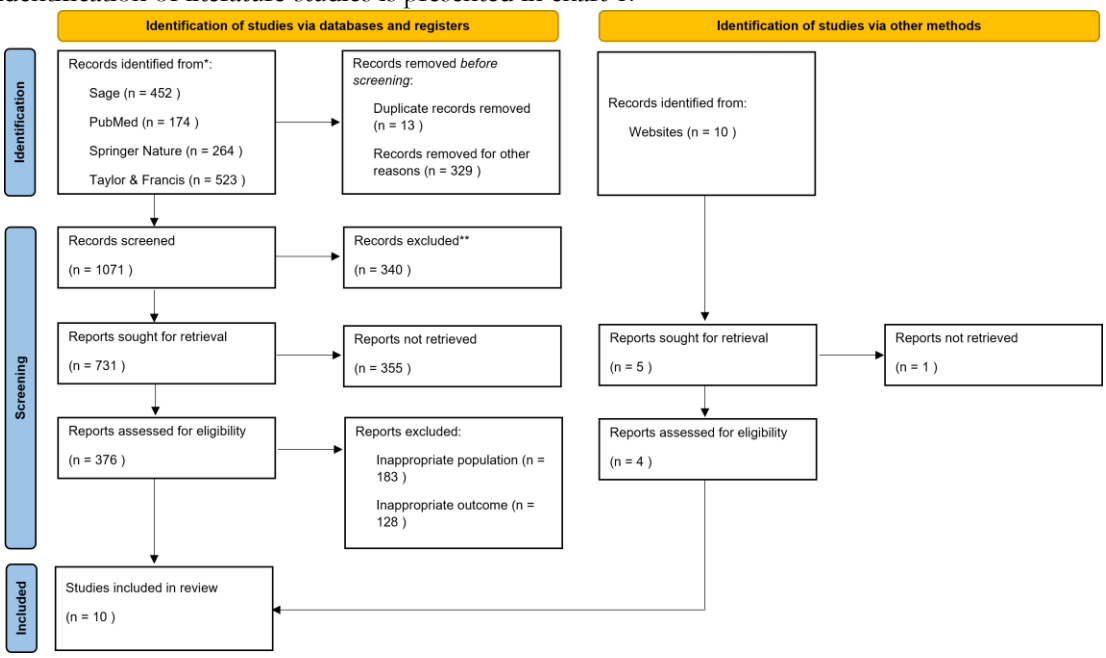


**Chart 1. Prisma flow diagram of article analysis**

A thorough search of the database identified 1413 titles and abstracts to select. After an in-depth evaluation, a total of 10 studies were selected for inclusion because they met the criteria that had been set and were considered relevant to this review.

# RESULTS AND DISCUSSION

## Results

The detailed characteristics of the included studies were compiled based on DSVIA form (Design, Sample, Variable, Instrument, and Analysis) framework and summarized in Table 2.

**Table 2. Summary of the included articles**

| Author, year, country | Title | Method (Design, sample, variable, instrument) | Results |
|---|---|---|---|
| (Barut & Baransel, 2024)<br><br>Turkiye | Maternal-fetal attachment among pregnant women at risk for mental health: a comparative study | Design: cross-sectional study<br>Sample: 404 women as obstetric and gynecology outpatient clinics<br>Variable: psychological risk and maternal antenatal attachment<br>Instrument: the Maternal Antenatal Attachment Scale (MAAS), and the General Health Questionnaire (GHQ-28) | The maternal-fetal attachment level found higher among pregnant with low psychological risk |
| (Maghalian et al., 2024)<br><br>Iran | Comparison of maternal-fetal attachment, anxiety, depression, and prevalence of intimate partner violence in Iranian women with intended and unintended pregnancy: a cross-sectional study | Design: cross sectional study<br>Sample: 486 pregnant women<br>Variable: maternal-fetal attachment, anxiety, depression<br>Instrument: Socio-demographic characteristics questionnaire, Maternal Fetal Attachment questionnaire, Edinburgh Postnatal Depression Scale, World Health Organization Domestic Violence Questionnaire, Pregnancy Anxiety questionnaire | Women with unintended pregnancies had significant lower maternal fetal attachment and higher level of anxiety and depression |
| (Němcová et al., 2025)<br><br>Czech Republic | The relationship between maternal psychopathology and maternal-fetal attachment: a cross-sectional study from the Czech Republic | Design: cross sectional study<br>Sample: 2.233 pregnant women<br>Variable: prenatal depression, perinatal anxiety, psychosocial stress, maternal-fetal attachment<br>Instrument: Edinburgh Postnatal Depression Scale, Perinatal Anxiety Screening Scale, Prenatal Psychosocial Scale, Prenatal Attachment Inventory | No other significant association between antenatal depression, anxiety, and the maternal-fetal attachment |
| **(**Navon–Eyal & Taubman - Ben-Ari, 2025)<br><br>Israel | Psychological Well-being during Pregnancy: The Contribution of Stress Factors and Maternal-Fetal Bonding | Design: cross sectional study<br>Sample: 1.378 pregnant women<br>Variable: covid-19 related anxiety, psychological well-being, pregnancy stress, maternal-fetal bonding<br>Instrument: mental health inventory-short form, prenatal distress questionnaire, maternal antenatal attachment scale | The higher covid-19 related anxiety align with stress during pregnancy and also reported low maternal-fetal attachment |
| (Rubin et al., 2023)<br><br>Brazil | Which social, gestational and mental health aspects are associated to maternal-fetal attachment? | Design: cross sectional study<br>Sample: 840 pregnant women<br>Variable: maternal-fetal attachment, depressive and anxiety symptoms,<br>Instrument: maternal-fetal attachment scale, : Edinburgh Postnatal Depression Scale, Beck Anxiety Inventory | - Depression found as the strongest variabel associated with maternal-fetal attachment<br>- Anxiety has no significant relation with maternal-fetal attachment after adjusted with other variable |
| (Gioia et al., 2023)<br><br>Italia | The relationship between maternal-fetus attachment and perceived parental bonds in pregnant women: | Design: cross sectional study<br>Sample: 1177 pregnant women<br>Variable: bonding status, maternal-fetal attachment, anxiety, depression<br>Instrument: Parental Bonding Instrument, the Maternal-Fetal Attachment Scale, State- | Anxiety found as the mediator of relation between perceived parental bond and maternal-fetal attachment |

| **Author, year, country** | **Title** | **Method (Design, sample, variable, instrument)** | **Results** |
|---|---|---|---|
| | Considering a possible mediating role of psychological distress | Trait Anxiety Inventory (STAI-Y), and Beck-Depression Inventory (BDI-II | |
| (Schaal et al., 2023)<br><br>German and Swiss | Associations of stress, anxiety, and partner satisfaction with maternal-fetal attachment in women pregnant during the COVID-19 pandemic: an online study | Design: cross sectional study<br>Sample: 431 pregnant women<br>Variable: pandemic-related stress, pregnancy specific stress, anxiety, relationship satisfaction, maternal-fetal attachment<br>Instrument: Maternal Antenatal Attachment Scale , Revised Pandemic Emotional Impact Scale, Pregnancy-specific Stress Questionnaire, State-Trait Anxiety Inventory, Relationship Assessment Scale | Negative correlation between anxiety and maternal-fetal attachment |
| (Anjarwati & Suryaningsih, 2021)<br><br>Indonesia | The relationship between pregnancy-related anxiety and maternal-fetal attachment among primigravida | Design: cross sectional study<br>Sample: 84 primigravida<br>Variable: pregnancy-related anxiety and maternal-fetal attachment<br>Instrument: pregnancy-related questionnaires anxiety (PRAQ), and prenatal attachment inventory (PAI) | A significant negative relationship between pregnancy-related anxiety and maternal-fetal attachment in which they have a correlation reversely. |
| (Ghanbari-Homaie et al., 2022)<br><br>Iran | Correlation of Anxiety with Pregnancy Symptoms and Maternal-Fetal Attachment | Design: cross sectional study<br>Sample: 220 pregnant women<br>Variable: maternal-fetal attachment, pregnancy symptoms<br>Instrument: Pregnancy-related Anxiety Questionnaire-revised 2 (PRAQ-R2), MFA Scale (MFAS), and Pregnancy Symptoms Inventory | No correlation between anxiety during pregnancy and MFA among nulliparous and multiparous pregnant women |
| (Smith et al., 2026)<br><br>Iran | Pregnancy-related anxiety and maternal-foetal bond: Examining the influence of parental, relational and child characteristics | Design: cross sectional study<br>Sample: 470 pregnant women<br>Variable: maternal-foetal bond, anxiety, spouse support, foetal sex happiness<br>Instrument: prenatal attachment inventory, maternal antenatal attachment scale, pregnancy-related anxiety scale, multidimentional scale of perceived social support, questionnaire | - Symptoms of pregnancy-related anxiety (PrA) were not significantly associated with the frequency of maternal-fetal bonding behaviours<br>- There is a significant negative relationship between pregnancy-related anxiety and the magnitude of the MFB. This means that the higher the anxiety level, the lower the quality and intensity of the mother-fetus bond |

Table 2 analyzed 10 articles from several countries. The fact that anxiety in pregnant mothers is not only the problem in developing countries (Indonesia, Iran, Turkey, and Brazil), but also existed in developed countries (Israel, German, Swiss, Czech Republic, and Italia). The various instruments were used to assessed anxiety such as Pregnancy Anxiety Questionnaire, Perinatal Anxiety Screening Scale, Beck Anxiety Inventory, State-Trait Anxiety Inventory, Pregnancy-Related Questionnaires Anxiety (PRAQ) and the revised version. Maternal-fetal relations mostly measured by using Maternal Antenatal Attachment Scale. Overall, the analysis shows that anxiety and maternal-fetal attachment have a negative relationship.

**Discussion**

Based on the results of the included articles, it reveals that from 10 studies, only 2 studies reported that there was no significant relation between anxiety during pregnancy and maternal-fetal attachments (Ghanbari-Homaie et al., 2022; Němcová et al., 2025), while the other 8 studies stated otherwise. The difference in this result might be due to various factors.

Pregnant women experienced anxiety due to several important background, including family's earnings, a past history of preterm birth, and having an unwanted pregnancy (Mahini et al., 2023). The experience of different pregnancy symptoms also found to be positively related to anxiety among pregnant mothers (Kiyak, 2024). Previous study showed that many women who were giving birth for the first time felt worried during their pregnancies. The kind of anxiety, such as general anxiety, or the specific focus of anxiety may interfere how the mothers connect to with their baby during pregnancies (Schaal et al., 2023).

Maternal-fetal attachments/ relations are defined as the important element for influencing a child's future physical, emotional, and intellectual development. It is recognized as the emotional bond and thoughts a woman has towards the fetus. If the mother develops positive fetal relations, it is consequence of interactive and better infant development (Appleton & Hughes, 2021). Another positive protective factor that also played an important role in maternal-fetal attachments/ relations was family support. This factor mediate the relationship between anxiety and maternal-fetal attachments/ relations (Yoon & Sung, 2021).

Focus on the research that are reported that a relation between anxiety and maternal-fetal attachments/ relations, the anxiety may persist due to the crisis situation that is uncontrollable (Navon–Eyal & Taubman - Ben-Ari, 2025; Schaal et al., 2023). Base on pregnant women's characteristics, a high risk of psychological issues and unintended pregnancy induced lower maternal-fetal attachments/ relations. These factors potentially affect the readiness to have a new family member for a lifetime if compared to the intended pregnancy (Barut & Baransel, 2024; Maghalian et al., 2024; Rubin et al., 2023). Regarding previous similar results of study, anxiety tendency is more pronounced among pregnant mothers as unemployed women, specifically in unintended pregnancy. It is reflected that mental health support is needed for this kind of situation among pregnant women (Wang et al., 2025). In another study, anxiety was detected as a risk factor of prenatal depression, while it was positively correlated to feto-maternal attachment/ relations quality (Zhang et al., 2021).

Those studies indicate that the need to assess other factors that may interfere with the result of the correlation between anxiety, specifically in pregnancy with maternal-fetal attachments/ relations. The factors might played role as risk factors, protective factors, or confounders that may affect the significance of the result, even though the anxiety found relates to prenatal attachments/ relations.

The results of this systematic review imply as baseline data that people beneficially understand about the negative relation of anxiety in pregnant mothers' and maternal-fetal relations and show the indication of intervention needs. The limitation of this study has not yet been able to categorize studies specifically in the low-middle-income countries. From the findings of the relation of anxiety in pregnant mothers and maternal-fetal relations, it was showed that the strategy of reducing anxiety can be applied to achieve better maternal-fetal relations, thereby enhancing the enjoyment of the pregnancy process.

# CONCLUSION

The results of this systematic review show that there is a relation between anxiety during pregnancy and maternal-fetal attachment/ relations with the unborn baby. The different results occured because of several factors that affected the statistical analysis, therefore the results do not indicate significant relationship between those variables.

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**AUTHOR CONTRIBUTION STATEMENT**

The first author (F) contributed to the screening and analysis of articles, while the second author (MH) in developing ideas and assisting the first author in the analysis. The third author (EKS) determined which articles could be analyzed and helped in the discussion writing process.

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