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# The Impact of Prenatal Anxiety on Maternal - Fetal Attachment: A Quantitative Correlational Study

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**Abstract**

Pregnancy is a major part of a woman's life that includes significant psychological bonding and physiological changes among others. Although many people consider the bonding process that takes place through the development of a child as the most enjoyable aspect of pregnancy, many clinical psychological studies of the current times portray a more complex scenario. With the growth of a child, the psychological bonding a mother feels is a component of a process referred to as Maternal-Fetal Attachment (MFA) that is affected by a number of constraining factors, one of which is the mother's prenatal anxiety (PNA). In this quantitative correlational research, it was explored that the scope of the mentioned relationship during the most recent study. The data was gathered from the Antenatal clinics of the Maternal and Child Healthcare Center's using a convenience sampling technique for the study and randomly selected 100 expectant mothers, aged 21 to 30 years. The PASS and MAAS psychological scales were used to evaluate the data collected by the most recent study. Statistical analysis of the data collected by the most recent study showed the presence of a significant negative correlation which concludes that the higher the level of anxiety, the lower the level of emotional prenatal bonding. The study underlines the fact that the emotional wellbeing of expectant mothers is one of the many factors that should be prioritized through early mental health screening and therapeutic psychological counselling as part of the prenatal care process.

**Keywords:** Prenatal Anxiety, Maternal-Fetal Attachment, Pregnancy, Maternal Mental Health, Prenatal Bonding, Antenatal Anxiety

## 1. Introduction

Pregnancy represents one of the most important physiological, psychological, and sociocultural shifts in an individual's life. While traditionally viewed as an idealized and euphoric state of expectant motherhood, current psychological models have recognized pregnancy as an important period in an individual's development, marked by emotional vulnerability and significant psychological adaptation.

During this period, the expectant mother has to cope with an array of somatic, hormonal, and personal identity shifts. At the heart of this psychological transformation is the development of Maternal-Fetal Bonding, an extensively studied concept in psychological literature referred to as Maternal-Fetal Attachment (MFA). This concept was first proposed in the early 1980s by Cranley and refers to "the extent that she behaves in ways, thinks in ways, and feels in ways that demonstrate her connectedness and interactivity with her unborn child."

**Theoretical Framework**

**Attachment Theory**

The Theory of Attachment John Bowlby first introduced in 1969 establishes that humans have an innate need to maintain proximity with their attachment figures which becomes essential during times of stress to protect their survival. Contemporary attachment theorists have expanded the original framework which studied postnatal infant and caregiver relationships to include prenatal attachment development. The process of prenatal attachment develops through cognitive and emotional development until it reaches its ultimate form in postnatal attachment. A mother develops a secure bond with her unborn child through her attachment patterns and current psychological condition which shape her internal working models of attachment. A pregnant woman who experiences high levels of prenatal anxiety will spend most of her time thinking about threats and worrying according to the model. The ongoing state of psychological disturbance prevents her from seeing her unborn child as a distinct person who requires special care which normally leads to emotional bonding and attachment development (Göbel et al., 2018). Current versions of Bowl's attachment theory use neurobiological research findings to explain how the oxytocinergic system contributes to social bonding.

The first oxytocin receptors start to increase their production throughout the entire pregnancy period while the mother develops her nesting instincts together with her ability to connect emotionally with others. The situation develops when a pregnant woman experiences high anxiety levels which cause her body to produce extra cortisol hormones that decrease the positive effects of oxytocin. The biochemical transformation leads to an interruption of the caregiving system which operates as a natural behavioral pattern that drives people to seek closeness through behaviors like abdomen contact and fetal communication which prevents them from forming secure attachment relationships. The mother develops a protective mechanism of distance because she sees her pregnancy at risk which she uses to shield herself against future emotional pains. A mother lacks the ability to handle her anxiety which stops her from experiencing the prenatal preoccupation state that Winnicott described as vital for experiencing the internal life of the fetus. The fetus transforms into a source of anxiety for the mother which results in her identity as a mother becoming fractured because she cannot transition from her identity as a woman. The theoretical framework shows that the quality of prenatal attachment creates intergenerational effects because the child develops an internal working model which starts to form in utero. A mother who experiences persistent anxiety during this critical time period will show her future ability to respond to her baby because her anxiety will make her view her fetus with anxious feelings.

**Maternal Identity Theory**

Reva Rubin's (1975) foundational research on maternal role attainment offers a valuable framework for understanding the maternal experience. Rubin identified four connected responsibilities which pregnant women must complete to deliver their child safely and receive social recognition of their newborn while establishing a maternal bond with their unborn child. The concept of "binding-in" describes how mothers incorporate their developing fetus into their personal identity. Prenatal anxiety can disrupt this

developmental process. Mothers who experience increased anxiety about their pregnancy will show two opposite reactions because they want to protect their unborn baby. Highly anxious mothers use emotional distancing as a coping mechanism because they want to protect themselves from pregnancy dangers and possible total fetal loss.

The interruption of the binding-in process shows that prenatal anxiety operates as a mental barrier which prevents mothers from understanding the subtle signs that occur during their transition into motherhood. Rubin established a framework in which mothers must first practice imitation and role-playing activities to develop their maternal identity since they need to picture their future interactions with their children. The universal presence of anxiety results in major cognitive dissonance because the future mother must deal with her personal anxieties while people expect her to show nurturing and peaceful behavior. The dissonance effect blocks the incorporation stage because it causes the fetus to become seen as a disruptive force, which leads to an incomplete integration of the mother's identity. The elevated anxiety level prevents mothers from using their mental abilities to create bonding fantasies because they must use their mental energy to watch out for possible dangers. The fourth task of self-giving which Rubin established becomes more difficult to accomplish when mothers experience prenatal distress because their maternal instincts fight against their need to protect themselves. The social perception of her anxiety as unacceptable prompts her to withdraw from social interactions, which creates a cycle that obstructs her ability to become a mother through social recognition.

**Charles Spielberger's State-Trait Anxiety Theory**

The State-Trait Anxiety Theory, which Spielberger created in 1966, explains how expectant mothers react to different situations based on their inner personality traits. The theoretical framework defines Trait Anxiety (T-Anxiety) to show how people react to different situations through their long-term disposition which gives them permanent characteristics. State Anxiety (S-Anxiety) describes how people react emotionally to their present stress but their anxiety shows permanent symptoms of the stress that comes with pregnancy and labor. The theory describes how expectant mothers experience different levels of state anxiety but pregnant women with high trait anxiety face greater risk to develop long-lasting and intense psychological difficulties. Chronic state anxiety functions as a cognitive disruptor because it keeps the sympathetic nervous system active while making threat-monitoring processes work which requires emotional energy needed by parents to bond with their fetus through nurturing and reflective thought. High anxiety levels lead to lower Maternal-Fetal Attachment (MFA) because mothers who experience high anxiety need to protect themselves instead of caring for their unborn child. The theory shows how high-anxiety attentional bias causes mothers to focus on their weaknesses which reduces their ability to observe their fetus developmental milestones and movements.

**Social Cognitive Theory: Maternal Self-Efficacy**

Social Cognitive Theory with its Maternal Self-Efficacy (MSE) concept which Albert Bandura introduced in 1977 provides researchers with essential tools to investigate how anxiety emerges during the perinatal period. MSE describes a mother's self-assurance about her capacity to fulfill all obligations which she encounters during motherhood and infant nurturing. The presence of elevated anxiety levels throughout pregnancy period leads to complete disruption of their self-confidence to handle their duties which results in mental barriers that obstruct the mother to child emotional bonding development. A woman who feels unworthy of her motherhood role will create distance from her unborn child whom she sees as a source of anxiety that she must handle. The mother maintains distance from her child because she needs to protect herself from future evaluations which might show her parenting deficiencies.

Research shows that mothers who experience anxiety during pregnancy develop stronger connections with their unborn children when they feel confident about their abilities. The presence of maternal competence functions as a protective factor which maintains the bond between mother and child during times of increased anxiety. The situation requires mothers to maintain their pregnancy worries at manageable levels because low MSE creates severe maternity-fetus bonding disruptions. Maternal self-efficacy development stands as a crucial element which helps pregnant women achieve emotional stability while creating better mother-child connections and reducing anxiety-related negative effects which impact both themselves and their offspring.

**Examination of the Relationship Between Anxiety and Attachment**

The existing studies which investigate the connection between prenatal anxiety and maternal-fetal attachment show an intricate relationship which sometimes leads to opposing results. Research shows that maternal mental health problems lead to difficulties in developing bonds during the prenatal period. The systematic review conducted by Göbel et al. in 2018 established that maternal anxiety leads to a decrease in perceived emotional connection to the fetus while maintaining cognitive maternal role representations. The high anxiety levels in mothers lead to emotional detachment which causes them to stop interacting with their pregnancy by speaking to or touching their abdomen while experiencing emotional numbness throughout their pregnancy.

The relationship between these two things tends to become complicated because different anxiety types create distinct effects on each specific connection. Generalized state or trait anxiety tends to promote emotional withdrawal, whereas pregnancy-specific anxiety (PRA) may elicit heightened vigilance. The study conducted by Abazari et al. in 2017 revealed from their Iranian research that severe anxiety leads to poor healthy attachment while specific anxieties such as intense fears about fetal abnormalities or miscarriage create an intense preoccupation with the fetus that causes anxiety. When attachment behavior measurements show increased values the attachment bond at that time exists between two people who exhibit fear and need to control their partner instead of maintaining a secure and positively expected relationship.

**Purpose of the Study**

The research intends to provide empirical proof about the psychological factors which obstruct proper prenatal bonding. Standard obstetric care mainly focuses on treating pregnancy's physical symptoms while it seldom evaluates the emotional bond between mother and fetus. This research will measure how anxiety affects a mother's ability to connect with her unborn child through the use of multiple assessment tools which include PASS and MAAS. The research results will support the case for implementing mental health assessments in prenatal healthcare environments. Maternal-fetal attachment represents an essential psychological development that determines how mothers will bond with their infants after birth and how their children will develop throughout their lives. Current obstetric care focuses on handling pregnancy's physical aspects yet it fails to evaluate and support pregnant mothers' psychological health needs which include their emotional ties to their unborn child. Prenatal anxiety represents a widespread condition which can severely interfere with developing this vital relationship.

The research study aims to determine which particular elements of Pregnancy-Related Anxiety (PRA) most strongly impact attachment deficits. The study will determine specific psychological treatment needs by examining how general distress affects anxiety regarding childbirth and fetal health. The study demonstrates how prenatal bonding creates long-lasting effects which establish the foundation for

maternal care during the postnatal period. Understanding the way anxiety destructs this relationship is essential for stopping detrimental mother-infant interactions which occur after childbirth.

**Need for the Study**

The investigation needs to occur because prenatal anxiety functions as a vital predictor of both postpartum depression and negative developmental impacts on infants. The PASS instrument enables researchers to assess perinatal anxiety because existing clinical assessments use general anxiety measures which do not address pregnancy-related anxiety symptoms. The MAAS provides researchers with a method to distinguish between attachment intensity and attachment quality which shows how anxiety disrupts maternal-fetal bonding. The study examines data from 100 pregnant women to discover patterns that establish the need for early psychological intervention which will prevent maternal detachment and mother-infant relationship difficulties in the postpartum period.

The research requirement increases because standard 15-minute obstetric appointments often miss detecting pregnancy-related distress which remains hidden during these medical checkups. Clinicians assess blood pressure and fundal height as physical signs of health while they ignore the psychological aspects that impact maternal-fetal connections. The study shows that mental health treatment requires specific solutions instead of generic methods because a mother can seem normal in daily activities but actually struggles with severe pregnancy-related anxieties which stop her from forming bonds with her child. The healthcare system needs to establish evidence that links specific anxieties to attachment problems because it constitutes an essential chance for establishing preventive mental health services.

This research addresses an essential knowledge gap about how mothers experience cognitive and emotional changes when they become parents.If parents do not treat their high levels of anxiety during pregnancy, their emotional problems will create permanent psychological effects, which take away from their ability to nurture their newborn children. The research aims to demonstrate that prenatal attachment abilities constitute an observable developmental element which affects both self-control and brain development in infants. The second and third trimesters require risk identification and risk management to reduce long-term societal costs which result from child development problems and family relationship breakdowns.

## 2. Review of literature

Abasi et al. (2021) conducted a systematic review and meta-analysis titled Evaluating the effect of prenatal interventions on maternal–fetal attachment: A systematic review and meta-analysis. The study examined randomized and non-randomized clinical trials published from 2000 to 2019 that evaluated the effect of prenatal interventions on maternal-fetal attachment. The research team analyzed 17 articles as their total sample but used 5 articles for their meta-analysis. The researchers used data extracted via CONSORT checklists and assessed maternal-fetal attachment using scales such as Cranley's MFAS, Muller's PAI, and Condon's MAAS. The researchers used RevMan 5.3 software to conduct statistical analyses which calculated mean differences through a random effects model. The study found that fetal movement counting failed to boost attachment levels but comprehensive interventions which included movement counting and counseling and active attachment activities through touching the belly and talking to the fetus led to significant improvements in maternal-fetal attachment.

Anjarwati and Suryaningsih (2021) conducted a study titled The Relationship between Pregnancy related Anxiety and Maternal-fetal Attachment among Primigravida. The researchers conducted their research with 84 expectant mothers who were experiencing their first pregnancy and were in their final trimester

of pregnancy at a primary health center located in Yogyakarta Indonesia. The researchers used the Pregnancy Related Anxiety Questionnaire (PRAQ-R2) and the Prenatal Attachment Inventory (PAI). The researchers used Pearson correlation and general linear models (GLM) to analyze their data. The research identified a significant negative relationship between pregnancy-related anxiety and maternal-fetal attachment because increased anxiety levels resulted in decreased attachment ratings. The research established a significant positive relationship between pregnancy-related anxiety and maternal age because older primigravida mothers showed increased anxiety levels.

Ballesteros-Andrés et al. (2025) conducted a study titled Positive Mental Health, Anxiety and Prenatal Bonding: A Contextual Approach. The study examined the role of positive psychological constructs in pregnant women, with a total sample of 90 pregnant women. The researchers used the Hospital Anxiety and Depression Scale (HADS) and the Prenatal Assessment Scale for Pregnant Women (EVAP) to assess anxiety and prenatal bonding, alongside measures of positive mental health. Statistical analyses included Pearson correlation coefficients and a regression-based simple mediation model. The findings revealed that anxiety partially mediated the relationship between positive mental health and prenatal bonding. Furthermore, anxiety emerged as an adaptive response; showing a positive association that improved maternal sensitivity and communication with the unborn child when grounded in positive mental health.

Barut and Baransel (2024) conducted a study titled Maternal-fetal attachment among pregnant women at risk for mental health: a comparative study. The study examined women attending obstetrics and gynecology outpatient clinics in eastern Türkiye, with a total sample of 404 pregnant women. The researchers used the Maternal Antenatal Attachment Scale (MAAS) and the General Health Questionnaire (GHQ-28) to divide participants into groups at risk and not at risk for mental health. Statistical analyses included descriptive statistics, chi-square tests, and independent samples t-tests. The findings revealed that pregnant women at psychological risk scored significantly lower on overall maternal-fetal attachment and the "Attachment Quality" subscale compared to healthy, non-risky pregnant women, indicating that mental health problems negatively affect maternal attachment.

Camarneiro et al. (2024) conducted a path analysis study titled Explaining maternal antenatal attachment by psychological, clinical and sociodemographic factors. The study interviewed 357 pregnant women in Portugal during their second trimester of pregnancy. The researchers used a comprehensive protocol addressing psychopathological symptoms, depression, anxiety, stress, occupational stress, attitudes about pregnancy, and marital satisfaction to measure their impact on the dimensions of MFA (quality of attachment, intensity of preoccupation, and global attachment). The findings revealed that depression, anxiety, maternal attitudes, and marital satisfaction explained 37% of the variance in the quality of attachment. Additionally, maternal age, combined with the aforementioned psychological factors, accounted for 34% of the variance in global maternal antenatal attachment.

Da Rosa et al. (2021) conducted a study titled Maternal-fetal attachment and perceived parental bonds of pregnant women. The study examined women up to 24-weeks pregnant residing in the urban zone of Pelotas, Brazil, with a sample size of 839 participants. The researchers used the Brazilian versions of the Maternal-Fetal Attachment Scale (MFAS) and the Parental Bonding Instrument (PBI). Statistical analyses included univariate analysis, t-tests, ANOVA, Pearson correlation, and multiple linear regression. The findings revealed that perceived paternal overprotection during childhood and adolescence was associated with better maternal-fetal attachment. Additionally, lower levels of attachment were observed in pregnant women who were in their first trimester, did not live with a partner, and lacked social support from the baby's father.

Ghanbari-Homaie et al. (2021) conducted a study titled Correlation of Anxiety with Pregnancy Symptoms and Maternal-Fetal Attachment. The study examined pregnant women with normal pregnancies in Tabriz, Iran, with a total sample size of 220 participants. The researchers used the Pregnancy-related Anxiety Questionnaire-revised 2 (PRAQ-R2), the Maternal-Fetal Attachment Scale (MFAS), and the Pregnancy Symptoms Inventory (PSI). Statistical analyses included Pearson's correlation coefficient and an adjusted general linear model. The findings revealed that there was no significant correlation between anxiety during pregnancy and maternal-fetal attachment among both nulliparous and multiparous women. However, high anxiety levels were significantly correlated with an increased prevalence and severity of physical and psychological pregnancy symptoms.

Gioia et al. (2023) conducted a study titled the relationship between maternal-fetus attachment and perceived parental bonds in pregnant women: Considering a possible mediating role of psychological distress. The study examined pregnant Italian women, with a total sample of 1,177 participants. The researchers used the Parental Bonding Instrument (PBI), the Maternal-Fetal Attachment Scale (MFAS), the State-Trait Anxiety Inventory (STAI-Y), and the Beck-Depression Inventory (BDI-II). Statistical analyses included Pearson correlation coefficients, regression models, and mediation analysis. The findings revealed that perceived maternal and paternal care had significant direct positive effects on maternal-infant bonding, indicating intergenerational transmission of attachment. This effect was not mediated by levels of psychological distress. Furthermore, gestational age and the mother's age had a significant synergistic non-linear effect on the degree of maternal-fetal attachment.

Jithesh (2024) authored a review paper titled Maternal Behavioral Patterns and Their Impact on Fetal Development Trajectories. The paper synthesized current research regarding MFA during pregnancy and its subsequent postpartum effects on the mother-infant relationship. The findings revealed that prenatal attachment begins well before birth and that maternal emotional states, stress, and environmental conditions can profoundly shape the developmental trajectory, behavior, and physical health of the child. The author highlighted a significant gap in the literature regarding longitudinal studies and emphasized that promoting a supportive environment and maternal wellbeing during pregnancy is critical to mitigating adverse outcomes associated with poor maternal fetal attachment.

Ko and Lee (2025) published a scoping review titled Influencing Factors and Consequences of Maternal-Fetal Attachment among Pregnant Women in East Asia. The researchers comprehensively analyzed literature published between 2005 and 2025 across multiple databases, including PubMed, Scopus, and PsycINFO, following the PRISMA-ScR guidelines. The findings revealed that the factors influencing maternal-fetal attachment could be systematically divided into five distinct levels based on the ecological systems theory. Furthermore, the review confirmed that strong maternal-fetal attachment serves to yield positive outcomes for both the mothers and their children in East Asian populations.

Kucharska (2021) conducted a study titled Selected predictors of maternal-fetal attachment in pregnancies with congenital disorders, other complications, and in healthy pregnancies. The study examined Polish women in the second and third trimesters of pregnancy across three groups: pregnancies with congenital disorders, other pregnancy complications, and healthy pregnancies, with a total sample of 195 participants (65 in each group). The researchers used the Maternal-Fetal Attachment Scale (MFAS), the Questionnaire of Attachment Styles, the State-Trait Anxiety Inventory (STAI), the Rosenberg Self-Esteem Scale, the Pregnancy Experiences Scale, the Social Support Scale, and the Dependency on Intimate Partner Scale. Statistical analyses included one-way ANOVA and structural equation modeling (SEM). The findings revealed that there were no significant differences in the intensity of maternal-fetal attachment between

high-risk and physiological pregnancies. However, predictors varied; in healthy pregnancies, attachment increased with gestational age, and younger mothers with positive pregnancy experiences achieved higher attachment levels, while in complicated pregnancies, negative attitudes toward pregnancy reduced attachment.

Murat Mehmed Ali, Çelebi, and Tozkır (2025) conducted a study titled Traumatic childbirth perception as a mediator between antenatal anxiety and prenatal attachment: A cross-sectional study. The study examined pregnant women attending routine antenatal care, with a total sample of 233 pregnant women. The researchers used the Stirling Antenatal Anxiety Scale, Traumatic Childbirth Perception Scale, and Prenatal Attachment Inventory to assess antenatal anxiety, traumatic childbirth perception, and maternal-fetal attachment. Statistical analyses included Pearson Correlation Analysis and mediation analysis using Hayes' PROCESS Macro with bootstrapping. The findings revealed that antenatal anxiety was significantly and negatively associated with prenatal attachment. Furthermore, an indirect effect of antenatal anxiety on prenatal attachment through traumatic childbirth perception was observed, supporting a partial mediation model.

Němcová et al. (2025) conducted a study titled the relationship between maternal psychopathology and maternal-fetal attachment: a cross-sectional study from the Czech Republic. The study examined pregnant women from outpatient clinics, with a total sample of 2,233 participants. The researchers used the Perinatal Anxiety Screening Scale (PASS) to assess symptoms of prenatal anxiety, the Edinburgh Postnatal Depression Scale for depression, and the Prenatal Attachment Inventory-Revised (PAI-R) to measure maternal-fetal attachment. Statistical analyses included Spearman's rho correlations, Kruskall-Wallis tests, and linear regression. The findings revealed that there were no statistically significant differences in overall maternal-fetal attachment scores between pregnant women with and without increased symptoms of anxiety. Furthermore, when exploring the association of general psychological distress, the negative impact on attachment was primarily linked to depressive symptoms rather than the anxiety dimension itself.

Pellerone et al. (2023) conducted a study titled Precursors of Prenatal Attachment and Anxiety during Pregnancy in Women Who Procreate Naturally and Pregnant Women following Assisted Reproduction Technology. The study examined women who procreate naturally and those following assisted reproductive technology (ART), with a total sample of 95 pregnant women. The researchers used the Maternal-Fetal Attachment Scale (MFAS) and the State-Trait Anxiety Inventory (STAI) to assess maternal-fetal attachment and state and trait anxiety levels. Statistical analyses included Pearson's correlations and a parallel mediation model. The findings revealed that the ART group demonstrated significantly higher state anxiety and lower maternal-infant attachment. Furthermore, the study showed a significant negative correlation between total maternal-fetal attachment and both state and trait anxiety within the experimental group.

Ranjbar et al. (2021) conducted a study titled Maternal-fetal attachment and anxiety in pregnant women who conceived through assisted reproductive technology: A longitudinal study. The study examined pregnant women who conceived through assisted reproductive technology (ART) compared to those who conceived naturally, with a total sample of 187 participants (43 ART conception, 144 natural conception). The researchers used the Cranley Maternal-Fetal Attachment Scale (MFAS) and the Van Den Bergh Pregnancy-Related Anxiety Questionnaire (PRAQ-17). Statistical analyses included descriptive statistics, Chi-square tests, independent and paired t-tests, and Pearson correlation. The findings revealed that at the 12th week of gestation, attachment scores were lower in women who conceived via ART compared to

natural conception, but by the 36th week, this difference disappeared as attachment significantly increased in both groups. Additionally, pregnancy-related anxiety declined similarly in both groups, showing no statistically significant difference in anxiety levels between ART and natural conception mothers.

Tokuda et al. (2021) conducted a study titled Feelings about pregnancy and mother-infant bonding as predictors of persistent psychological distress in the perinatal period: The Japan Environment and Children's Study. The study examined mothers with psychological distress in their first trimester, with a total sample of 24,324 pregnant women registered in the Japan Environment and Children's Study (JECS). The researchers used the Kessler 6 (K6) to assess mental health, the mother-to-Infant Bonding Scale Japanese version (MIBS-J), and a questionnaire on feelings about pregnancy. Statistical analyses included logistic regression and structural equation modeling (SEM). The findings revealed that maternal negative feelings about pregnancy in the first trimester and poor mother-infant bonding after childbirth were significantly associated with persistent psychological distress at 12 months after childbirth. Furthermore, an indirect effect of feelings about pregnancy on persistent distress through mother-infant bonding was observed.

Yeşilçınar et al. (2023) conducted a study titled Pregnancy-Related Anxiety and Prenatal Attachment in Pregnant Women with Preeclampsia and/or Gestational Diabetes Mellitus: A Cross-sectional Study. The study examined pregnant women with high-risk conditions compared to healthy pregnancies, with a total sample of 150 pregnant women. The researchers used the Pregnancy-Related Anxiety Questionnaire-Revised-2 (PRAQ-R2) and the Prenatal Attachment Scale (PAS) to assess pregnancy-related anxiety and prenatal attachment. Statistical analyses included chi-square, Kruskal-Wallis, and Mann-Whitney U tests. The findings revealed no statistically significant difference between the groups in terms of prenatal attachment and anxiety scale scores. Furthermore, the presence of risky pregnancy conditions did not have a significant overall effect on prenatal attachment or anxiety levels in this specific sample.

Zhang et al. (2021) conducted a study titled the mediating role of prenatal depression in adult attachment and maternal-fetal attachment in primigravida in the third trimester. The study examined primigravida women between 28 and 40 weeks of gestation at Chaohu Hospital of Anhui Medical University, China, with a total sample of 260 participants. The researchers used the Edinburgh Postnatal Depression Scale (EPDS), the Experience of Close Relationship (ECR) scale to measure adult attachment, and the Maternal Antenatal Attachment Scale (MAAS). Statistical analyses included t-tests, Mann-Whitney U tests, chi-square tests, Spearman's correlation, and mediation analysis using Hayes's PROCESS macro. The findings revealed that pregnant women with insecure adult attachment styles exhibited a higher prevalence of prenatal depression and lower maternal-fetal attachment quality and overall scores compared to those with secure attachment. Furthermore, prenatal depression scores were found to mediate the relationship between adult attachment avoidance and the quality of maternal-fetal attachment.

## 3.Methodology

### 3.1 Problem statement

The research examines how prenatal anxiety impacts the emotional bond between a mother and her unborn child. The study aims to examine the relationship which exists between prenatal anxiety and maternal-fetal bonding.

### 3.2 Research Aim & Objectives

The study aimed to investigate the connection between maternal-fetal attachment and prenatal anxiety which pregnant women experience. The specific objectives were to assess maternal-fetal attachment, ass-

ess the level of prenatal anxiety, and determine the relationship between the two constructs.

### 3.3 Hypothesis

H0: There is no significant relationship between levels of prenatal anxiety and maternal fetal attachment among expectant mothers.

### 3.4 Research Design & Participants

The researchers used a quantitative correlational research design for their study. The researchers collected a sample of 100 pregnant women who visited antenatal outpatient clinics. The study required participants to be currently pregnant and between the ages of 21 and 30 and to live with a stable partner and to give their expressive consent. The study excluded single parents, individuals who could not finish the questionnaire, and people who did not possess reading skills in the assessment languages.

### 3.5 Measures

The research showed that prenatal anxiety serves as the independent variable while maternal antenatal attachment functions as the dependent variable. The researchers used two standardized self-report instruments to measure the constructs. The Maternal Antenatal Attachment Scale (MAAS; Condon, 1993) with its 19-item questionnaire evaluates maternal-fetal attachment through assessment of affectional bond strength and maternal fetal preoccupation level. The researchers used the Perinatal Anxiety Screening Scale (PASS; Somerville et al., 2014) which contains 31 items to evaluate the clinical anxiety symptoms that occur during the perinatal period.

### 3.6 Tool Description

**Maternal Antenatal Attachment Scale (MAAS) Condon (1993)**

The Maternal Antenatal Attachment Scale (MAAS), developed by Condon (1993), is a 19-item self-report instrument which measures and tracks the internal psychological process of prenatal bonding. The MAAS uses a Likert scale to assess the feelings and experiences of expectant mothers during the two-week period which preceded the assessment. The scale measures attachment through two main dimensions which include the “Quality of Attachment” subscale that contains 11 items to measure the emotional strength between mother and fetus through tender emotions and negative feelings and the “Intensity of Preoccupation” subscale which has 8 items to assess how frequently mothers think about their unborn child and dream about their unborn child and talk about their unborn child. The Maternal Antenatal Attachment Scale (MAAS) has undergone extensive psychometric validation and has demonstrated strong reliability across a variety of international populations which enables researchers to conduct cross-cultural studies without losing accuracy. The scale establishes two distinct dimensions that researchers can use to measure the “Quality” and “Intensity” of maternal-fetal bonding. Busonera et al. (2016) provided comprehensive validation of the instrument which demonstrated high internal consistency and established its suitability for clinical use to identify early signs of maternal-fetal attachment disruption.

Research conducted by Lingeswaran et al. (2012) has validated the Tamil translation of maternal-fetal attachment scales which were culturally adapted for use in South Asian communities. The Maternal Antenatal Attachment Scale (MAAS) demonstrates strong reliability through previous research which found Cronbach’s alpha coefficients between 0.69 and 0.82 while this study’s sample showed an internal consistency value of 0.82. The scale establishes its validity through its design as a complete assessment tool which evaluates maternal-fetal bonding using a two-factor assessment model. The assessment framework allows researchers to measure “Quality of Attachment” through emotional warmth and “Intensity of Preoccupation” through maternal thoughts about the fetus which enables them to study both the emotional and cognitive aspects of how mothers connect with their unborn child.

**Perinatal Anxiety Screening Scale (PASS) Somerville et al. (2014)**

The Perinatal Anxiety Screening Scale (PASS), developed by Somerville et al. (2014), is a 31-item self-administered questionnaire specifically designed to assess anxiety symptoms related to pregnancy, which are often not captured by general psychometric instruments. The scale evaluates the frequency of symptoms experienced over the preceding month using a 4-point Likert scale, ranging from 0 ("Not at all") to 3 ("Almost always"). The assessment divides perinatal distress into four distinct subscales, which reach clinically significant levels of severity. A total score of 26 or above has been established as the diagnostic cutoff to identify women at elevated risk for clinical anxiety disorders, thereby facilitating precise and timely psychological assessment during the antenatal period. The present study requires this instrument because it helps track anxiety levels during the entire antenatal period. The Perinatal Anxiety Screening Scale (PASS) demonstrates enhanced construct validity specifically within perinatal populations, having been purposefully developed to assess pregnancy-related stressors that are not adequately captured by general psychiatric assessment tools. The PASS system divides anxiety into four distinct subscale categories which help measure the specific psychological difficulties that mothers experience during the perinatal period.

The scale has undergone extensive validation internationally, including rigorous factor analysis studies that confirm its strong internal consistency and cross-cultural diagnostic reliability. The Perinatal Anxiety Screening Scale (PASS) demonstrates excellent reliability, with a reported Cronbach's alpha of approximately 0.96. The PASS achieved its highest validity when researchers developed and tested the instrument for use during antenatal periods which allowed better detection of pregnancy-related anxiety than standard anxiety assessment tools. The assessment tool identifies perinatal anxiety disorders with high sensitivity and specificity and it contains four subscales which include Acute Anxiety, General Worries/Specific Fears, Perfectionism/Control, and Social Anxiety to provide multiple ways of understanding the psychological state of expectant mothers.

### 3.7 Conceptual Definitions

**Maternal-Fetal Attachment**

Maternal-Fetal Attachment (MFA) is described by Condon (1993) as the emotional connection that forms between a woman and her unborn child during pregnancy. The mother establishes a psychological connection with her fetus through protective actions which she visualizes in her thoughts and mental images of the unborn.

**Prenatal Anxiety**

Somerville et al. (2014) define Prenatal Anxiety (PA) as a collection of symptoms which show excessive worry and panic and social anxiety symptoms and trauma-related stress that occur during the perinatal period. The anxiety disorder shows continuous symptoms which include nervousness and fear and tension that people experience during their pregnancy time.

### 3.8 Operational definition

**Maternal-Fetal Attachment**

Maternal-Fetal Attachment describes the emotional bond which a mother establishes with her unborn baby through her emotional connection which she feels toward her child and her mental fixation which she displays about her baby. The mother demonstrates her attachment to the child through her regular practice of loving thoughts which she experiences, her ability to picture the baby's characteristics with clarity, and her commitment to practicing protective health measures. She practices healthful eating habits while she

interacts with the unborn child through vocal communication because she wants to support the baby's healthy growth and development.

**Prenatal Anxiety**

Prenatal Anxiety defines itself through the presence of continuous pregnancy-related anxiety which includes excessive worrying and feeling tense. The anxiety causes a mother to experience severe psychological distress because she becomes consumed with worries about her health and the baby's progress and the upcoming childbirth process. The researchers of this study define prenatal anxiety as a cognitive barrier which uses up all mental capacity of mothers to identify potential dangers. The mother focuses on the baby instead of developing a nurturing relationship which prevents her from developing emotional bonds during this critical time.

**3.9 Procedure**

The study began its participant recruitment process after it received ethical approval when it started recruiting participants from clinics that serve expectant parents. The researchers conducted their study which included 100 pregnant women who received treatment at antenatal outpatient clinics after they selected participants who met their established inclusion criteria. The research team obtained informed consent from all participants before they began their data collection. Participants completed the MAAS and PASS questionnaires in private clinic settings which provided them with comfortable testing environments. The research team protected all participant responses through confidentiality measures which used unique identifiers to maintain participant anonymity during statistical analysis.

**3.10 Statistical Analysis**

The research studies the association between Prenatal Anxiety (independent variable) and Maternal Fetal Attachment (dependent variable) by using Pearson's Correlation Coefficient. The researchers will encode the gathered data which they will then input into the Statistical Package for the Social Sciences (SPSS).

## 4. Results and discussion

**Demographic Analysis**

| AGE GROUP | FREQUENCY (N) | PERCENTAGE (%) |
|---|---|---|
| 21 – 23 Years | 26 | 26.0% |
| 24 – 26 Years | 25 | 25.0% |
| 27 – 30 Years | 49 | 49.0% |
| **Total** | **100** | **100.0%** |

**TABLE 1 Distribution of samples based on Age Group (21–30 Years)**

The demographic distribution shows that the sample mainly included women who belonged to the highest part of the defined age range. The study results showed that 49% of the participants belonged to the age group of 27 to 30 years while the other 51% almost equally divided between the 21 to 23 age group and the 24 to 26 age group. The study results show that 27 to 30 year old participants make up the majority of the study group because this age group represents a growing trend toward delayed parenthood. Women in this age group have achieved career and personal life stability, which leads to their greater participation in clinical or research settings than younger people who are experiencing various life transitions. The sample

shows a peak pregnancy age range which centers at 49% because educational and marital patterns common to this demographic group determine the peak pregnancy age range. The younger group (21 to 26 years) shows equal representation which establishes a baseline, while the older group displays maternal experiences that occur during a vital life transition period and maturity.

| GESTATIONAL AGE | FREQUENCY (N) | PERCENTAGE (%) |
|---|---|---|
| **1st Trimester** | 35 | 35.0% |
| **2nd Trimester** | 28 | 28.0% |
| **3rd Trimester** | 37 | 37.0% |
| **Total** | **100** | **100.0%** |

**TABLE 2 Distribution of samples based on Gestational Age**

The research results show that participants from different pregnancy trimesters maintained an equal distribution across their study. The third trimester accounted for 37% of participants, closely followed by the first trimester at 35%, with the second trimester comprising 28% of the sample. The distribution shows its importance because the research found that prenatal anxiety negatively affected maternal-fetal attachment throughout pregnancy instead of being limited to one specific trimester. The study achieved its purpose through equal distribution of participants across pregnancy trimesters because this method helped researchers study maternal experiences without being affected by specific hormonal or psychological shifts that happen during particular pregnancy time periods. The third trimester of research participation showed a 37% increase which researchers think happened because mothers received more medical checks and became more aware of their health during the last stages of their pregnancy. The first trimester had 35% of participants who showed up for research while the second trimester had 28% of participants who showed up for research during this phase of their pregnancy when their condition remained that way. The distribution shows that people who experience anxiety will develop attachment problems because this link between anxiety and attachment operates as a fundamental psychological mechanism which extends through all stages of pregnancy.

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| RESIDENCE | FREQUENCY (N) | PERCENTAGE (%) |
|---|---|---|
| Urban | 39 | 39.0% |
| Rural | 38 | 38.0% |
| Semi-Urban | 23 | 23.0% |
| **Total** | **100** | **100.0%** |

**TABLE 3 Distribution of samples based on Residence**

The environmental diversity of the group studied in this research shows through this data. The study found that participants chose their homes almost equally between urban areas (39%) and rural areas (38%) while

23% of participants chose to live in semi-urban areas. The research discovered that anxiety and attachment maintain their negative connection across various living situations because this relationship functions as a basic psychological process that does not depend on surroundings. The study found that participants divided their time between urban (39%) and rural (38%) areas which demonstrates that psychological phenomena studied in this research apply to all aspects of different environments. The research shows that the psychological mechanism which causes anxiety to decrease when people form attachments operates without interruption through all residential areas because different stressors and support systems exist.

The research found that urban environments create obstacles through their rising housing expenses and sound pollution while rural areas face difficulties because they have insufficient medical facilities yet people experience pregnancy anxiety which remains intact despite these external challenges. The 23% of residents who live in semi-urban areas support the conclusion that this pattern exists across all levels of residential density which researchers studied in their sample.

**Descriptive Statistics**

The descriptive analysis provides an overview of the central tendencies and dispersion of the study variables, establishing a baseline for the psychological state of the participants.

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| **MATERNAL FETAL ATTACHMENT** | 100 | 45 | 85 | 65.50 | 12.40 |
| **PRENATAL ANXIETY** | 100 | 15 | 60 | 38.20 | 10.15 |
| **Valid N (listwise)** | 100 | | | | |

**TABLE 4 Descriptive Statistics showing the Mean and Standard Deviation of Maternal-Fetal Attachment and Prenatal Anxiety**

The data analysis from 100 participants (N=100) shows that Maternal Fetal Attachment scores reached an average of 65.50 while the scores ranged between 45 and 85. The study results demonstrate that expectant mothers from the sample group showed moderate to high emotional attachment to their unborn children. The attachment measurement showed a Standard Deviation of 12.40 which demonstrated that participants maintained similar attachment levels throughout the study. Participants demonstrated a mean score of 38.20 for Prenatal Anxiety which extended from 15 to 60. The Standard Deviation of 10.15 shows that participants displayed different anxiety levels but their scores mostly stayed within the moderate anxiety range. These basic statistical data points which demonstrate the link between maternal bonding with children and psychological health serve as important information for later analysis.

**Correlational Analysis**

| | | MATERNAL FETAL ATTACHMENT | PRENATAL ANXIETY |
|---|---|---|---|
| **MATERNAL-FETAL ATTACHMENT** | Pearson Correlation | 1 | -.624** |
| | Sig. (2-tailed) | | .000 |
| | N | 100 | 100 |

| | | | |
|---|---|---|---|
| | Pearson Correlation | -.624** | 1 |
| | Sig. (2-tailed) | .000 | |
| **PRENATAL ANXIETY** | N | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed)

**TABLE 5 Correlational Analysis showing the relationship between Maternal-Fetal Attachment and Prenatal Anxiety.**

The research results established a statistically significant moderate negative relationship between prenatal anxiety and maternal-fetal attachment. The Pearson coefficient showed this relationship with an r value of -0.624 and a p value below 0.001. The research demonstrates that higher prenatal anxiety levels cause mothers to experience diminished emotional bonds with their unborn children. The significance level of 0.000 shows that this relationship occurs at a rate beyond random chance, which establishes a solid empirical foundation for the inverse relationship between psychological distress and maternal bonding during pregnancy. When someone experiences heightened anxiety, their body activates a fight or flight response, which creates difficulties for mothers who want to establish emotional bonds with their unborn children. This correlation demonstrates how anxiety serves as a vital factor for explanation, but it shows that attachment scores require assessment from additional factors, which direct that social support and previous pregnancy experiences, allow researchers to achieve a complete picture of their study results.

**Correlation table for subscales**

| | | **QUALITY OF ATTACHMENT** | **MATERNAL FETAL ATTACHMENT** |
|---|---|---|---|
| | Pearson Correlation | 1 | +.382** |
| **QUALITY OF ATTACHMENT** | Sig. (2-tailed) | | .000 |
| | N | 100 | 100 |
| | Pearson Correlation | +.382** | 1 |
| **MATERNAL FETAL ATTACHMENT** | Sig. (2-tailed) | .000 | |
| | N | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6 demonstrates how maternal-fetal attachment links with attachment quality. The study found a moderate positive relationship between the Quality of Attachment subscale and total Maternal-Fetal Attachment which reached statistical significance through the results ($r = 0.382$, $p < 0.001$). The study shows that an increase in a mother's emotional warmth toward her fetus leads to stronger prenatal attachment development. The MAAS theoretical framework which includes the psychological aspect of the MAAS framework and the quality subscale, which measures the bond's emotional component through tender and positive feelings. An expectant mother experiences total attachment increase because her emotional security and positive pregnancy feelings drive her cognitive preoccupation and protective behavior toward her unborn child.

| | | INTENSITY OF PREOCCUPATION | MATERNAL FETAL ATTACHMENT |
|---|---|---|---|
| **INTENSITY OF PREOCCUPATION** | Pearson Correlation | 1 | +.591** |
| | Sig. (2-tailed) | | .000 |
| | N | 100 | 100 |
| **MATERNAL FETAL ATTACHMENT** | Pearson Correlation | +.591** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed)

Table 7 establishes a link between two variables which measure how much people think about something and the strength of maternal-fetal bonds. The study found that there is a significant positive relationship between preoccupation and maternal-fetal attachment which shows that when women think about their pregnancies more they will develop stronger emotional bonds with their unborn babies. The phenomenon occurs because people who become more preoccupied with their thoughts to a high degree will develop intense cognitive focus which leads to "psychological nesting" that causes mothers to think about their upcoming parenthood while they observe fetal movements and create mental images of their future child. The mother's deep mental commitment to her work creates a vital process that helps her develop a secure attachment because her ongoing knowledge about the fetus makes her more emotionally protective and responsive.

| | | PRENATAL ANXIETY | EXCESSIVE WORRY AND SPECIFIC ANXIETY |
|---|---|---|---|
| **PRENATAL ANXIETY** | Pearson Correlation | 1 | +.605** |
| | Sig. (2-tailed) | | .000 |
| | N | 100 | 100 |
| **EXCESSIVE WORRY AND SPECIFIC ANXIETY** | Pearson Correlation | +.605** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed).

Table 8 investigates how prenatal anxiety impacts both excessive worry and various anxiety types. The research shows a significant positive relationship between prenatal anxiety and excessive worry which indicates that when a woman experiences higher anxiety levels her specific pregnancy-related worries intensify. The mind uses prenatal anxiety as a cognitive trigger which leads to focused anxiety on particular worries that include the baby's health and labor and her parenting abilities. The woman develops repetitive

thought patterns which stem from her general anxiety because she needs to control her pregnancy-related uncertainties through detailed risk assessment.

| | | PRENATAL ANXIETY | PERFECTIONISM, CONTROL AND TRAUMA |
|---|---|---|---|
| PRENATAL ANXIETY | Pearson Correlation | 1 | +.578** |
| | Sig. (2-tailed) | | .000 |
| | N | 100 | 100 |
| PERFECTIONISM, CONTROL,AND TRAUMA | Pearson Correlation | +.578** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed).

Table 9 establishes a link between prenatal anxiety and three psychological factors which are perfectionism and control and trauma. The study found that prenatal anxiety has a strong positive relationship with three psychological factors which are perfectionism and control and trauma ($r = 0.578$, $p < 0.01$). The research shows that people who display more intense psychological characteristics or life experiences will experience greater pregnancy-related anxiety. People who have perfectionist tendencies and need to control every situation face difficulties when they encounter unpredictable events during pregnancy and childbirth because their actual experiences do not match their idealized expectations. A woman who experienced trauma in her past will develop increased sensitivity that causes her to observe pregnancy's major physical and emotional transformations through a hyper-vigilant viewpoint. The need for perfect safety creates an anxiety-filled method which people use to handle their intense fears of losing control and their ability to make decisions.

| | | PRENATAL ANXIETY | SOCIAL ANXIETY |
|---|---|---|---|
| PRENATAL ANXIETY | Pearson Correlation | 1 | +.612** |
| | Sig. (2-tailed) | | .000 |
| | N | 100 | 100 |
| SOCIAL ANXIETY | Pearson Correlation | +.612** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed).

Table 10 demonstrates how prenatal anxiety impacts social anxiety. The study found that women who experience higher levels of prenatal anxiety display increased social anxiety because their anxiety about pregnancy leads to more social discomfort. The physical and emotional changes of pregnancy create conditions that make women feel more vulnerable and self-conscious about their appearance. Women

develop social anxiety because they fear other people will judge them in social situations. Social anxiety increases which leads to protective withdrawal behavior because the woman already faces internal pregnancy stress and finds social situations to be too overwhelming which makes her experience more prenatal distress.

| | | PRENATAL ANXIETY | ACUTE ANXIETY AND ADJUSTMENT |
|---|---|---|---|
| PRENATAL ANXIETY | Pearson Correlation | 1 | +.597** |
| | Sig. (2-tailed) | | .000 |
| | N | 100 | 100 |
| ACUTE ANXIETY AND ADJUSTMENT | Pearson Correlation | +.597** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed).

Table 11 demonstrates how prenatal anxiety links to both acute anxiety and adjustment difficulties. The study shows a significant positive link between prenatal anxiety and the combination of acute anxiety with adjustment problems. The statistical result demonstrates that increased prenatal anxiety for women leads to decreased ability of women to handle pregnancy-related changes which results in more frequent acute distress episodes. New parents experience distress because they must develop a new identity while their body undergoes physiological changes which need a solid emotional base. Chronic prenatal anxiety will exhaust a mother's adjustment capacities which makes her more susceptible to panic attacks and overwhelming feelings that happen from minor stress. The mother experiences all natural pregnancy changes as critical emergencies because her brain stays in constant high alert mode.

## 5. Discussion

The research was conducted to investigate how prenatal anxiety impacts maternal-fetal attachment in pregnant women. The study results showed a statistical relationship between the two variables which showed a moderate negative correlation with a value of r equal to -0.624 and a p value below 0.001. The research shows that increasing prenatal anxiety levels lead to decreasing maternal emotional attachment towards their unborn child. The inverse relationship supports the defensive exclusion hypothesis which states that mothers who experience higher anxiety will unconsciously reduce their emotional ties to their fetus as they try to protect themselves from their mental distress. The system protects them from experiencing emotional distress and from facing the dangers which come with their pregnancy.The Null Hypothesis (H0) was rejected, as the p-values in all correlation analyses are .000, significantly lower than the 0.01 threshold for significance.

The study results gain support from the demographic information which researchers collected during the research. The adverse effects of anxiety on maternal attachment showed consistent results throughout all three trimesters because anxiety disrupted the bonding process which continued throughout the entire pregnancy period. The research demonstrates that anxiety negatively impacts maternal bonding through

different living situations because urban and rural and semi-urban environments test the same psychological principle which exists between mothers and their babies. The study demonstrates that researchers need to treat prenatal anxiety as an essential factor which develops healthy relationships between mothers and their unborn children.

The subscale analysis showed researchers how maternal mental engagement affects attachment through their research. The study found a significant positive relationship between "intensity of preoccupation" and maternal-fetal attachment at the level of ($r = 0.591$, $p < 0.01$). People who think about becoming parents while watching their baby move develop "psychological nesting" according to the research finding.

The mother establishes a secure bond with her unborn child through her constant thoughts about him. The study discovered that mothers who experience attachment insecurity with their infants show lower maternal-fetal bonding because mothers try to manage their personal fears.The study showed how particular anxieties affect maternal mental health. The study found a strong positive link between overall prenatal anxiety and excessive worry and specific anxiety which includes concerns about the baby's health and the labor process. The constant anxiety leads to uncontrollable intrusive thoughts which prevent the mother from experiencing positive aspects of pregnancy. This condition prevents mothers from achieving the prenatal preoccupation which is necessary for creating strong emotional bonds with their unborn child. The findings demonstrate an immediate demand to implement mental health assessments through Perinatal Anxiety Screening Scale (PASS) as standard practice for prenatal health assessment. Healthcare providers who identify emotional strengths and weaknesses during early assessment periods will provide improved maternal support which leads to better developmental results for the child.

## 6. Conclusion

In essence, heightened perinatal distress significantly hinders a mother's capacity to establish a nurturing connection with her fetus. Although the intensity of preoccupation subscale exhibited a positive correlation, reflecting an active mental engagement with the fetus, the quality of attachment subscale demonstrated that higher anxiety levels adversely affect the emotional connection.The study results provide definitive evidence that null hypothesis (H0) testing results in rejection because the testing demonstrates that no significant connection exists between prenatal anxiety levels and maternal-fetal attachment in expectant mothers. The statistical analysis showed a moderate negative relationship between the two variables which reached statistical significance at ($r = -0.624$, $p < 0.001$) because higher prenatal anxiety levels resulted in lower emotional ties between mothers and their unborn children. The research results demonstrate that maternal psychological health needs to be prioritized because it serves as a vital aspect for developing healthy attachment between mothers and their unborn children. The results demonstrate that "defensive exclusion" operates as a cognitive defense mechanism which results in increased anxiety that prevents mothers from nurturing their children while protecting themselves. The Perinatal Anxiety Screening Scale (PASS) requires implementation as a standard mental health assessment tool which should be conducted during obstetric visits to detect emotional weaknesses at an early stage and prevent long-term harm to the mother-infant relationship.

## 7. Limitations and Future Scope

The study's sample of 100 pregnant women may limit the applicability of the results to the wider population, as it does not encompass diverse cultural, social, or healthcare backgrounds due to its restricted

geographic focus. Self-reporting methods create opportunities for bias to enter research. The study uses a cross-sectional design which collects information at one moment, thus blocking researchers from establishing any causal links.

Future research should aim to include a larger and more varied sample, adopt a longitudinal research design to provide insights into how prenatal anxiety affects mother-infant bonding over time, and investigate the effectiveness of psychological interventions.

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## Reference

1. Abasi E., Keramat A., Borghei N.S., Goli S., Farjamfar M., "Evaluating the effect of prenatal interventions on maternal-foetal attachment: A systematic review and meta-analysis", Nursing Open, 2021, 8, 1-16.
2. Anjarwati A., Suryaningsih E.K., "The Relationship between Pregnancy-related Anxiety and Maternal-fetal Attachment among Primigravida", Open Access Macedonian Journal of Medical Sciences, 2021, 9 (G), 47-51.
3. Ballesteros-Andrés L.X., Luengo-González R., Rodríguez-Rojo I.C., García-Sastre M., CuestaLozano D., Gómez-González J.L., Martínez-Hortelano J.A., Peñacoba-Puente C., "Positive mental health, anxiety and prenatal bonding: A contextual approach", Healthcare, 2025, 13 (24), 3300.
4. Barut S., Sabancı Baransel E., "Maternal-fetal attachment among pregnant women at risk for mental health: A Comparative Study", Journal of Clinical Medicine of Kazakhstan, 2024, 21 (1), 67-73.
5. Bowlby J., "Attachment and loss: Vol. 1. Attachment", Basic Books, 1969.
1. 6 .Buss C., Davis E.P., Hobel C.J., Sandman C.A., "Maternal pregnancy-specific anxiety is associated with child executive function at 6–9 years age", Stress, 2011, 14 (6), 665-676.
6. Camarneiro A.P.F., Roberto M.S., Justo J.M.R.M., "Explaining maternal antenatal attachment by psychological, clinical and sociodemographic factors: a path analysis study", BMC Pregnancy Childbirth, 2024, 24, 638.
7. Da Rosa K.M., Scholl C.C., Ferreira L.A., Trettim J.P., da Cunha G.K., Rubin B.B., Martins R.L., Motta J.V.S., Fogaça T.B., Ghisleni G., Pinheiro K.A.T., Pinheiro R.T., Quevedo L.A., de Matos M.B., "Maternal-fetal attachment and perceived parental bonds of pregnant women", Early Human Development, 2021, 154, 105310.
8. Gaffney K.F., "Maternal-fetal attachment in relation to self-concept and anxiety", Maternal-Child Nursing Journal, 1986, 15 (2), 91-101.
2. Ghanbari-Homaie S., Hasani S., Mirghafourvand M., "Correlation of Anxiety with Pregnancy Symptoms and Maternal-Fetal Attachment", Shiraz E-Medical Journal, 2021, 23 (5), e119085.
9. Gioia M.C., Cerasa A., Muggeo V.M.R., Tonin P., Cajiao J., Aloi A., Martino I., Tenuta F., Costabile A., Craig F., "The relationship between maternal-fetus attachment and perceived parental bonds in pregnant women: Considering a possible mediating role of psychological distress", Frontiers in Psychology, 2023, 13, 1095030.

10. Göbel A., Stuhrmann L.Y., Harder S., Schulte-Markwort M., Mudra S., "The association between maternal-fetal bonding and prenatal anxiety: An explanatory analysis and systematic review", Journal of Affective Disorders, 2018, 239, 313-327.
11. Jithesh N., "Maternal Behavioral Patterns and Their Impact on Fetal Development Trajectories", Preprints.org, 2024.
12. Ko E., Lee Y., "Influencing Factors and Consequences of Maternal-Fetal Attachment among Pregnant Women in East Asia: A Scoping Review", Journal of Transcultural Nursing, 2025, 37 (1).
13. Kucharska M., "Selected predictors of maternal-fetal attachment in pregnancies with congenital disorders, other complications, and in healthy pregnancies", Health Psychology Report, 2021, 9 (3), 193206.
14. Murat Mehmed Ali M., Çelebi E.Z., Tozkır E., "Traumatic childbirth perception as a mediator between antenatal anxiety and prenatal attachment: A cross-sectional study", Health Care Academician Journal, 2025, 12 (3), 439-446.
15. Němcová H., Kuklová M., Hrdličková K., Horáková A., Sebela A., "The relationship between maternal psychopathology and maternal-fetal attachment: a cross-sectional study from the Czech Republic", BMC Psychology, 2025, 13, 248.
16. Pellerone M., Martinez-Torvisco J., Razza S.G., Commodari E., Micciché S., "Precursors of prenatal attachment and anxiety during pregnancy in women who procreate naturally and pregnant women following assisted reproduction technology", International Journal of Environmental Research and Public Health, 2023, 20 (20), 6945.
17. Ranjbar F., Warmelink J.C., Mousavi R., Gharacheh M., "Maternal-fetal attachment and anxiety in pregnant women who conceived through assisted reproductive technology: A longitudinal study", International Journal of Reproductive BioMedicine, 2022, 19 (12), 1075-1084.
18. Tokuda N., Kobayashi Y., Tanaka H., Sawai H., Shibahara H., Takeshima Y., Shima M., "Feelings about pregnancy and mother-infant bonding as predictors of persistent psychological distress in the perinatal period: The Japan Environment and Children's Study", Journal of Psychiatric Research, 2021, 140, 132-140.
19. Yarcheski A., Mahon N.E., Yarcheski T.J., Hanks M.M., Cannella B.L., "A meta-analytic study of predictors of maternal-fetal attachment", International Journal of Nursing Studies, 2009, 46 (5), 708-715.
20. Yeşilçınar İ., Kıncı M.F., Ünver H.C., Sivaslıoğlu A.A., "Pregnancy-related anxiety and prenatal attachment in pregnant women with preeclampsia and/or gestational diabetes mellitus: A cross-sectional study", Journal of Clinical Obstetrics & Gynecology, 2023, 33 (1), 27-35.
21. Zhang L., Wang L., Yuan Q., Huang C., Cui S., Zhang K., Zhou X., "The mediating role of prenatal depression in adult attachment and maternal-fetal attachment in primigravida in the third trimester", BMC Pregnancy and Childbirth, 2021, 21, 302.