

The relationship between childhood trauma in mothers and maternal-fetal attachment: A scoping review

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ABSTRACT

An unpleasant childhood experience for a mother can be a risk factor that negatively impacts both the mother herself and her offspring. This review highlights the complexity and significant impact of childhood trauma on the maternal-fetal attachment relationship, emphasizing the need for a holistic approach in supporting maternal well-being and the positive development of the baby being conceived. The objectives of this review were (1) to identify the factors that affect the maternal-fetal attachment relationship, (2) to find out the relationship between childhood trauma in mothers and maternal-fetal attachment, (3) to identify the supporting and inhibiting factors of childhood trauma that affect maternal-fetal attachment. The databases used in the search literature include Ebsco, Willey, PubMed, and ScienceDirect with articles from 2019 to 2023. The databases used in the search for literature include Ebsco, Willey, PubMed, and ScienceDirect with articles from 2019 to 2023. Critical appraisal uses JBI's checklist, which includes all articles in category A. Seven articles are included in the inclusion criteria. The four themes obtained were the influence of the emotional environment on maternal-fetal attachment, sociodemographic characteristics, the relationship between maternal-fetal attachment and postnatal development, and the measurement of the relationship between prenatal, depression, and anxiety in mothers. The conclusion of this review is that maternal attachment during pregnancy plays an important role in predicting a child's emotional health and development, which emphasizes the need for holistic mental health care and adequate social support to reduce the negative impact of childhood trauma.

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1. Introduction

Childhood trauma is an experience that is considered harmful for the children who experience it. These bad experiences are often serious and have the potential to have an impact on adolescence and adulthood later in life. An unpleasant childhood experience for a mother can be a risk factor that negatively impacts both the mother herself and her offspring. Childhood trauma is associated with a variety of risky, unhealthy, or problem behaviors before the age of eighteen. Childhood trauma exposure is often defined as physical, sexual, and/or emotional abuse, or physical and/or emotional neglect before the age of eighteen (Roche et al., 2019). It may encompass broader traumatic events and household dysfunction, such as severe accidents, witnessing parental substance abuse, or the loss of a parent. Research has shown that individuals who have experienced childhood trauma are more prone to engaging in problematic behaviors, including smoking, alcohol misuse, high-risk sexual activities, disordered eating, and self-harm. Moreover, the extent of exposure to childhood trauma has

been found to directly impact diminished functioning in adolescence and adulthood (Blackmore et al., 2016).

The risks associated with these childhood experiences could begin to manifest during pregnancy, which is known as the time when physical and psychological demands increase significantly (Goldstein & Briggs-gowan, 2022). Women who had experienced some form of childhood trauma were 37% more likely to have pregnancy complications than those who hadn't (BJM, 2022). Previous research stated that childhood trauma in women has a 4.95-fold impact on mental health symptoms in adulthood (Garon-Bissonnette et al., 2022). That means that a woman with childhood trauma is at risk of psychological instability that can affect interpersonal relationships including closeness to the fetus. In addition, childhood trauma is also associated with lower maternal-fetal attachment (Infurna et al., 2024). The attachment of the relationship between pregnant women and the fetus in the womb has a significant effect on the health of the mother's pregnancy and the optimization of the baby's development when it has been born (Garon-Bissonnette et al., 2022). Adults who have experienced trauma in childhood may face complex challenges in parenthood. Women who experience emotional neglect as a child tend to have difficulty forming healthy bonds (Stigger et al., 2020). Recent research on childhood trauma and pregnancy showed that women who experienced childhood trauma face greater difficulty in dealing with physical changes caused by pregnancy, which can reduce their well-being. The same study also found that women with a history of emotional neglect during childhood may develop a negative view of their child and have difficulty forming strong bonds with them (Christie et al., 2017). In addition, other studies have also shown that childhood trauma were associated with an increased risk of pregnancy complications, including gestational diabetes, hypertensive disorders of pregnancy, excessive gestational weight gain, and depression/anxiety during pregnancy (Mamun et al., 2013).

The objectives of this review were (1) to identify the factors that affect the maternal-fetal attachment relationship, (2) to find out the relationship between childhood trauma in mothers and maternal-fetal attachment, (3) to identify the supporting and inhibiting factors of childhood trauma that affect maternal-fetal attachment.

2. Method

The method used in this review is scoping review. Scoping review is a systematic method of thoroughly exploring the literature on a topic, which includes mapping key concepts, theories, and relevant evidence. The main purpose is to identify and summarize the level, scope, and type of research that has been conducted on a particular research question, as well as to provide a basis for further research recommendations. This method follows the guidelines developed by Arksey & O'Malley, 2005, as well as adheres to the scoping review extension checklist of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

2.1. Identifying Research Questions

The review questions are compiled based on the PEOS framework, which are as follows:

Table 1. Framework PEOS

Population	Exposure	Outcome	Study
Woman Mother	Maternal fetal attachment	Childhood growth and development	Qualitative Quantitative

Scoping literature review questions based on the PEOS framework in table 1 "What is the relationship between childhood trauma experienced by mothers and the level of maternal-fetal attachment?"

The literature selection was carried out using the Ebsco, Willey, PubMed, and ScienceDirect databases. Article search uses keywords and selection is carried out using Boolean, MeSH, and Truncation:

(((((mom) OR (women) OR (mother)) AND (maternal*)) OR (fetal)) OR (attachment)) AND (childhood)) AND (growth) OR (development)))

The inclusion criteria used in this study are articles that are original researchs with quantitative and qualitative research designs, , and with a range of publication years between 2019 and 2023. The exclusion criteria in the selection of literature used are opinion articles or reviews, articles that discuss violence in maternal services, the creation of PCMC survey tools, articles that discuss patient center care in general, and books. The selection of inclusion criteria is considered based on the data used in the scoping review to adjust the research objectives. Determination of inclusion criteria to limit the scope of appropriate data so that the data obtained is precise in accordance with the research objectives.

2.2. Units

Based on the results of literature selection from several databases using predetermined keywords, the researcher found 350 articles and then screened until there were 7 articles that were in accordance with the research topic. At this stage, the researcher uses the [Prisma Flow Chart](#) to describe the process of selecting the articles carried out.

Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity that you use in an equation.

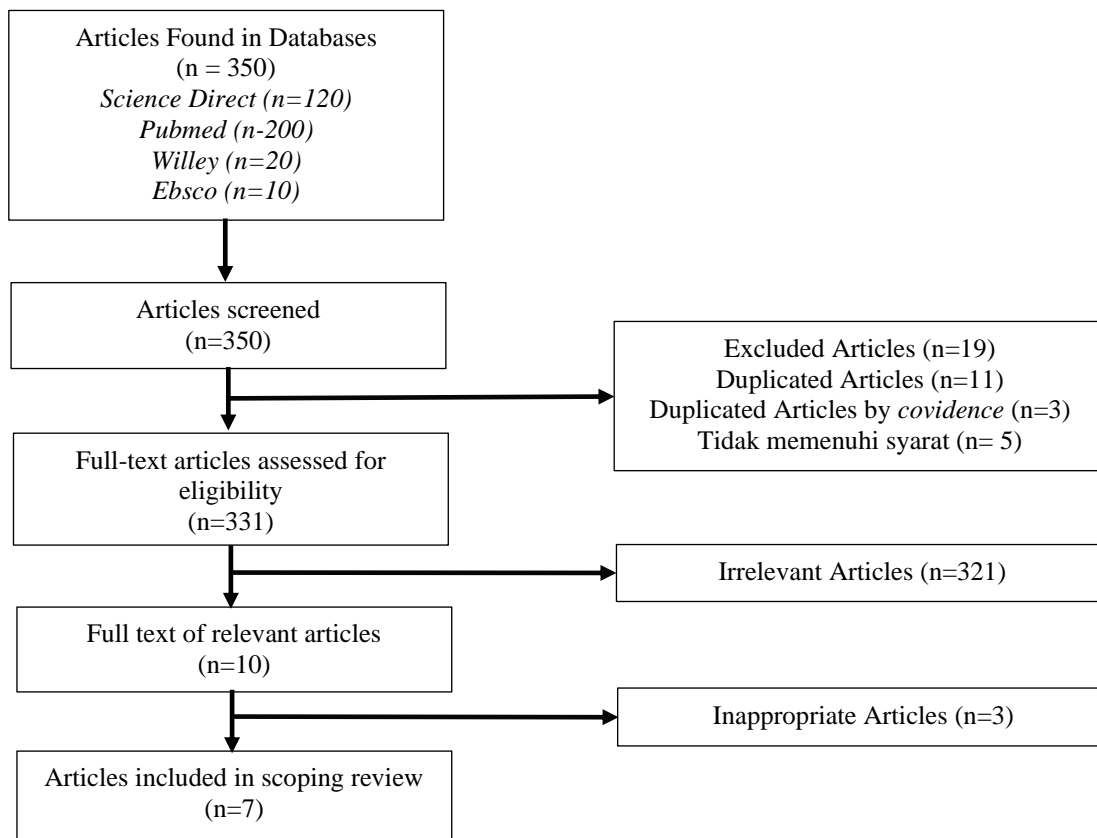


Fig. 1.Prisma Flowchart

2.3. Study Selection

The extracted data included data relevant to the topic of childhood trauma with maternal-fetal attachment, instruments used, research country of origin, research objectives, study design, participants, sampling samples, and research results (shown in [table 2](#)).

Table 2. Data Charting

No	Title / Country / Author / Year	Objective	Research design	Methods / Instruments	Respondents / participants	Data analysis	Results
A1	Is Maternal Exposure to Childhood Trauma Associated With Maternal Fetal Attachment? Brazil/(Stigger et al., 2020)	Evaluated the association between childhood trauma and maternal-fetal bonding in pregnant women in a population-based study	Quantitative Cross-sectional Longitudinal study of pregnant women who were interviewed twice at different times before 24 weeks of pregnancy and 60 days after the first interview.	Interview guide Mini International Neuropsychiatric Interview (MINI) - Plus Version was used to assess maternal depression. The perception of childhood trauma was assessed with the Childhood Trauma Questionnaire (CTQ) Maternal-Fetal Attachment Scale.	A total of 974 pregnant women were evaluated, of whom 327 received psychotherapy and were excluded from the study. The total research sample consisted of 647 women.	Student's t-test, ANOVA, and Spearman's correlation were used to compare means. Linear regression was used to control confounding factors. Variables that showed a p value ≤ 0.20 in the initial analysis were taken for adjusted analysis, except for depressive disorders because they may be mediators between CTQ domains and maternal-fetal bonding.	The findings of this study suggest that experiences of childhood trauma can have a detrimental impact during the prenatal period and have the potential to damage the mother-fetus attachment. The information gathered can help health professionals identify elements that can provide protection and support for pregnant women who have experienced childhood trauma, so that they can better cope with the change of parenthood.
A2	Relationship between prenatal and maternal attachment: a longitudinal study from Turkey/(Sahin et al., 2023)	The aim of this study was to determine the impact of the maternal-fetal bond formed during pregnancy on the maternal-infant bond during the postnatal period.	<i>Cross Sectional</i>	Data was collected using a Questionnaire Form, Prenatal Attachment Inventory (PAI) and Maternal Attachment Scale (MAS).	Involving 150 mothers who were willing to participate and could be contacted again within 1-4 months after delivery.	Descriptive statistics. Data normality with the Kolmogorov-Smirnov test. Independent samples t test for paired groups, One Way ANOVA test for more than two groups on normal distribution data. The Mann Whitney U test was used for groups where paired data were not normal, and the Kruskal-Wallis H test was used for more than two groups.	This research shows that the formation of a strong and healthy bond during the prenatal period has a positive impact on the development of the bond between mother and baby in the postnatal period. This finding has important implications, because both the baby and the mother will experience the positive effects of this condition.

A 3	Maternal adverse childhood experiences, attachment style, and mental health: Pathways of transmission to child behavior problems Australia/(Cooke et al., 2019)	To evaluate the chain of impacts of Adverse Childhood Experiences (ACE) on the risk of behavioral problems in five-year-old children, through the pathways of maternal attachment insecurity and mental health.	Cohort prospective longitudinal When gestation was less than 25 weeks, women completed a demographic survey as part of the initial assessment. At 36 months of age of their children, the women retrospectively reported their history of Adverse Childhood Experiences (ACE). When the children reached 60 months of age, the mothers filled out questionnaires that included their children's current attachment style, depressive symptoms, anxiety symptoms, and behavioral problems.	ACEs checklist Experiences in Close Relationships-Short Form (ECR-S) Center for Epidemiologic Studies Depression Scale (CES-D) Short-form of the Spielberger State Anxiety Scale from the State Trait Anxiety Inventory Form X (STAI) Parent Rating Scale of the Behavior Assessment System for Children, Second Edition (BASC-2)	Purposive sampling Of the 2909 total eligible to participate at the 3-year time point, data could be analyzed secondarily using a subsample of 1994 women who provided information about their ACE history when their child was 36 months old.	Statistical descriptions were analyzed using SPSS 24.0 software. Path analysis was carried out with Mplus 8.0 with the maximum likelihood robust estimation method. This model combines the variables of recent education, age, and income as covariates simultaneously. Model suitability was assessed using root mean square error of approximation (RMSEA < .05 indicates good fit) and Comparative Fit Index (CFI > 0.95 indicates good fit)	Mothers who experienced adversity as children have a higher risk of having children with emotional and behavioral problems in childhood. This risk may be transmitted through adult attachment styles and depressive symptoms. These findings emphasize the importance of addressing insecurity in the bond between mother and child, as well as distress as a potential focus for intervention in mothers who have a history of childhood adversity.
A4	The impact of childhood trauma on children's wellbeing and adult behavior /Ireland/(Downey & Crummy, 2022)	To investigate whether coping mechanisms are related to individuals who have experienced childhood trauma. explores whether depression and anxiety-related symptoms, sleep disturbances, and low self-esteem are the impact of childhood trauma experiences. investigate possible relationships between resilience capacity and social class background.	Qualitative by applying semi-structured interviews, aims to ensure the development of understanding and consideration between participants and the main researcher.	Semi-structured interview guide The questions are arranged in order of 1-10, and additional questions are added to enhance the flow of conversation during the interview	Samples were taken using the convenience sampling method and snowball sampling. This group consisted of seven women and two men. The sample included a number of professionals with qualifications in psychology, psychotherapy, social/support care, and counselling. Participants actively work in various areas of Ireland, including Dublin, Louth, Mayo and Sligo. As such, this sample creates variation in terms of the background and location of the professionals involved in this research in Ireland.	Thematic analysis	Individuals who experience childhood trauma tend to show low self-esteem, in addition to experiencing symptoms of depression and anxiety. Some people may refuse to acknowledge their history of trauma, while others may create an inaccurate self-image and engage in alcohol and drug abuse as a way to cope with the traumatic impact in their lives. Through early intervention, it is possible to reduce the symptoms of trauma along with the implementation of adequate and adapted treatment strategies.

A5	The impact of maternal adverse childhood experiences and prenatal depressive symptoms on foetal attachment: Preliminary evidence from expectant mothers across eight middle-income countries/UK/(Brown et al., 2021)	This study aims to explore the correlation between Adverse Childhood Experiences (ACE) in mothers and fetal attachment, by considering the possible mediating role of prenatal depressive symptoms. The research sample consisted of women who were in their third trimester of pregnancy, recruited from eight countries with diverse cultural backgrounds, covering various levels of society.	Birth study cohort	Questionnaire Patient Health Questionnaire (PHQ-9) Prenatal Attachment Inventory-Revised (PAI-R) Adverse Childhood Experiences – International Questionnaire (ACE- IQ)	Purposive sampling A total of 1,473 expectant mothers were contacted, and of these, 1,208 mothers gave consent to participate, achieving a participation rate of 82.0%. All data used in this research were obtained from initial measurements.	Mediation analysis on the observed composite variables was conducted using R statistical software with the 'lavaan' package (Rosseel, 2012) to test the direct effect (c') of the predictors (maternal Adverse Childhood Experiences-ACE; ACE-IQ) on the outcome (attachment fetus; PAI-R), as well as indirect effects (c) through mediators (current depressive symptoms; PHQ-9).	Depressive symptoms generally have a negative impact on fetal attachment in a cross-cultural sample of mothers. Although Adverse Childhood Experiences (ACE) do not directly affect overall fetal attachment, they can predispose the mother to mental health difficulties in the future.
A 6	Association of prenatal attachment and early childhood emotional, behavioral, and developmental characteristics: A longitudinal study /Turkey/(Cildir et al., 2020)	To evaluate the relationship between prenatal bonding and child progress, socioemotional behavioral problems, and skills in early childhood	<i>Cross-sectional</i>	Sociodemographic data form PAI questionnaire focuses on the emotional dimension of conscious representations BDI questionnaire BAI questionnaire BITSEA questionnaire ADSI questionnaire	Purposive sampling The study consisted of 83 mothers and their children aged between 21 and 31 months.	Descriptive statistics for categorical variables Evaluation of normal distribution: Kolmogorov-Smirnov test Pairwise comparisons: Mann-Whitney U and Kruskal-Wallis if the data is not normal Categorical variables: chi-square test or Fisher's chi-square test Multiple linear regression analysis was carried out: whether the independent variables can predict the "normal" and "at risk" groups based on the BITSEA cutoff value and ADSI T score Multiple regression analysis was used: independent variables and their interactions with PAI, BITSEA and ADSI scores	There is a correlation between prenatal attachment and a child's socioemotional abilities during childhood. Children who experience delays in overall development, including language, cognition, fine and gross motor skills, and social abilities, tend to have mothers with lower levels of prenatal attachment.

A 7	Mother-child bonding, environment, and motor development of babies at risk accompanied by a follow-up et , Brazil/ (Chaves et al., 2021)	To identify elements that emerge from the correlation between mother-child attachment, environment, and infant motor development.	Quantitative Cross-sectional	The information collected involved the use of a form that included socioeconomic data, mother/child routine during hospital stay, home environmental conditions, and three other instruments that have been validated in Brazil: Protocolo de Avaliação do Vínculo Mãe-Filho (Protocol for Evaluation of the Mother-Child Bond), Affordances in the Home Environment for Motor Development - Infant Scale, as well as Escala Motora Infantil de Alberta (Alberta Infant Motor Scale).	A total of 130 mothers or guardians with at-risk babies aged 3 to 12 months received assistance in an outpatient clinic follow-up program at a public hospital.	Correlation testing uses Pearson's chi-square test, Fisher's exact test, with a significance level equal to 5%.	Data shows a high prevalence of premature babies (74.5%), low income families (86.2%), and inadequate housing conditions (93.8%) are associated with optimal motor development. In the context of mother-child bonding, 60% of mothers show a strong attachment to their children. As many as 62.3% of children showed motor development that was in accordance with general development. Regarding interactions between variables, there was statistical significance ($p < 0.05$) observed in the relationship between mother-child attachment and appropriate motor development.
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Critical Appraisal and Data Mapping

Critical assessment of a scientific article is an evaluation process that aims to assess the quality of the research article. In this review, researchers used an evaluation tool developed by the Joana Briggs Institute (JBI) to evaluate both quantitative and qualitative research. The selection of JBI evaluation tools is based on the type of research that matches the tool. The researcher classifies the value of the articles based on the overall score obtained from the critical assessment in accordance with the guidelines provided by JBI. all articles included in category A.

3. Results and Discussion

3.1. Results

Based on the 350 articles identified, only 7 articles met the criteria. These articles were written in English and published between 2019 and 2023. These seven articles have several characteristics, such as year of publication, country of origin, and research methods used.

Table 3. Year Classification

No	Publication Year	Number of Articles
1	2019	1
2	2020	2
3	2021	3
4	2022	1
5	2023	1
Total		7

Based on the table, the articles reviewed are from 2019 to 2023. The details are: 1 article in 2019, 2 articles in 2020, 3 articles in 2021, 1 article in 2022, and 1 article in 2023.

Table 4. Country Classification

No	Country	Number of Articles
1	Brazil	2
2	Turkey	2
3	Australia	1
4	Ireland	1
5	UK	1
Total		7

Based on the table, the articles reviewed come from 5 countries. The details are: 2 articles come from Brazil, 2 articles come from Turkey, 1 article comes from Australia, 1 article comes from Ireland, and 1 article comes from *the United Kingdom*.

Table 5. Design Methods of Study

No	Design Methods	Number of Articles
1	Cross-sectional	4
2	Cohort	2
3	Recorded semi-structured interviews	1
Total		7

Based on the table, the articles reviewed consist of 3 types of research methods. The details are: 4 cross-sectional studies, 2 cohort studies, and 1 qualitative study with a semi-structured interview recording design.

Theme Analysis

Based on the seven articles that include in this review, four themes were obtained that showed the relationship between childhood trauma and maternal attachment to the fetus. The themes found were related to emotional environment, sociodemographic characteristics, maternal fetal attachment and postnatal development, and measurement of prenatal psychology effect.

Table 6. Determining Themes and Subthemes

Theme	Subtheme	Article
The influence of the emotional environment on <i>maternal fetal attachment</i>	1. Supporting and inhibiting factors 2. The impact of adverse childhood experiences on mothers	A1, A4 A1, A4
Sociodemographic characteristics	1. Cultural and Geographical 2. Socio-economic	A7, A5
The relationship between <i>maternal fetal attachment</i> and postnatal development	Impact of Depression and Anxiety on <i>maternal fetal attachment</i>	A6, A2
Measurement of prenatal associations, depression and anxiety in mothers	Prenatal relatedness measurements for mothers and infants and toddlers	A6, A2, A1, A7

3.2. Discussion

3.2.1. The Influence of the Emotional Environment on *Maternal Fetal Attachment*

Supporting and Inhibiting Factors

In article A1 the average level of emotional neglect reached 8.9 (± 4.7), while physical neglect, sexual abuse, and physical abuse had average values of 6.7 (± 2.8), 5, respectively. 9 (± 3.0), and 6.8 (± 3.1). The adjusted study found that pregnant women who experienced emotional neglect tended to have lower attachment to the fetus, showing a decrease of 0.4 points ($\beta = -0.4$, 95% CI [-0.6, -0.2]). Similarly, pregnant women who experienced emotional abuse also experienced a 0.2 point decrease in attachment ($\beta = -0.2$, 95% CI [-0.5, 0.0]). The results of this study highlight that the experience of childhood trauma can have a negative impact during pregnancy, disrupting the emotional connection between mother and fetus. In article A4 it is also stated that social class does not have a significant influence in reducing the impact of various types of traumatic experiences experienced by individuals from various backgrounds. However, financial conditions are an important factor in determining accessibility to support services. Intervention, treatment planning, and social support are considered crucial in increasing mental resilience, reducing problem behavior, and improving an individual's psychological condition.

The analysis of articles A1 and A4 suggest that experiences of childhood trauma, such as emotional neglect and emotional abuse, can negatively affect maternal attachment to the fetus during pregnancy. Research shows that pregnant women who go through this experience tend to have less attachment to their fetus. Additionally, article A4 highlights that although social class does not play a significant role in mediating the impact of trauma on individuals from different backgrounds, financial conditions influence accessibility to necessary support services. Intervention, treatment planning, and social support are considered important for increasing mental resilience, reducing problem behavior, and improving the psychological condition of individuals who have experienced childhood trauma. Thus, efforts to acknowledge and treat childhood trauma experiences are important in order to improve an individual's emotional and mental well-being, especially during crucial periods such as pregnancy and postpartum.

This is in line with research (Fields et al., 2023) that pregnancy is often a period that causes a lot of stress for mothers who have just experienced pregnancy. Adverse childhood experiences have been known to increase stress levels during pregnancy and are also linked to aspects of personality in the Big Five model, especially neuroticism. The Big Five model has also been linked to the way individuals perceive stress, and evidence suggests that personality may act as a mechanism explaining how adverse childhood experiences (ACEs) occur. can affect psychosocial functioning during pregnancy.

The emotional environment in mothers includes mothers who have a history of emotional neglect, physical neglect, sexual abuse and physical abuse. Previous experiences of neglect experienced by the mother have an impact on the low attachment of the mother and fetus during the pregnancy period. Previous research explains that traumatic experiences resulting from emotional and physical neglect are associated with poor mental health in victims (Kumari, 2020). It was even reported that an unsafe emotional environment occurred in childhood at 36%, physical abuse at 18%, sexual abuse at 18%, and physical neglect at 16% (Stoltenborgh et al., 2015). This unsafe emotional environment has a negative impact on the development of mental health in adulthood.

Pregnant women who have an unsafe emotional environment during childhood can also feel the impact on aspects of mental health in particular. Previous research explains that a traumatic history in childhood causes feelings of hopelessness, low self-esteem, poor receipt of social support, reduced life satisfaction, easy experience of stress, and risk of experiencing mental disorders (Pandey et al., 2023). Pregnant women experience behavioral disorders, one of which is manifested in the form of parenting behavior during pregnancy and the postpartum period. This occurs due to prolonged stress as a result of traumatic experiences during childhood (Ven et al., 2020). One form of parenting behavior during the mother's pregnancy period is the formation of a bond between the mother and the fetus in the womb.

The process of forming a bond between mother and fetus involves neurobiology in the mother's brain. Mothers who experienced a history of trauma in childhood have disorders in neurobiological aspects. The results of the study stated that mothers who experienced childhood trauma had hypothalamic-pituitary-adrenal hyperactivity and the autonomic nervous system which influenced their daily behavior. In line with this review, it explains that past trauma that occurred to the mother, especially during childhood, can influence the mother's attachment to the fetus.

The low attachment of the mother to the fetus during pregnancy is caused by the mother experiencing stress and other psychological problems. Unresolved stress during childhood causes mothers to feel excessive pressure during pregnancy. Previous research explains that during normal pregnancy the mother can feel pressure (Fields et al., 2023). Therefore, pregnancy is felt to be more difficult for mothers who have unresolved past stress so that maternal attachment decreases.

Pregnant women who experience stress and depression are at risk of having low attachment to the fetus. Previous research explains that manifestations of stress and depression which are manifested in negative feelings of self and low receipt of social support make mothers feel disinterested in their pregnancy. Mothers who feel uninterested in their pregnancy act unresponsive to the condition of their pregnancy and fetus so they do not have a sense of responsibility and form an attachment to the fetus during pregnancy (Rubertsson et al., 2015).

Other research explains that pregnant women who experience anxiety can reduce the attachment of mother and fetus (Farokh, 2017). The need for positive self-evaluation in pregnant women is not fulfilled due to childhood trauma which also causes low attachment between mother and fetus. Previous research explains that good self-compassion in mothers can increase the bond between mother and fetus in her womb (Mohamadirizi & Kordi, 2016). Thus, childhood trauma experienced by pregnant women is a predisposing factor for low attachment between mother and fetus through stress mechanisms and psychological problems resulting from this trauma which have an impact on parenting behavior during the pregnancy period.

The Impact of Mothers' Adverse Childhood Experiences

In the article A4 stated that individuals who survive childhood trauma often experience problems with dependence on alcohol and drugs, often refusing to acknowledge the negative impact of the difficult experiences they have experienced, especially if the cause comes from their parents. They tend to build an inauthentic self-image to cope with the problem rather than isolate themselves. Traumatic experiences early in life can cause deep low self-esteem, and often trigger depression and anxiety due to feelings of helplessness. Sleep disorders were not identified as a direct result of childhood trauma in this study. Research results highlight that childhood trauma can have detrimental consequences for a person's emotional and physical health, sleep quality, and stress reactivity. It can be concluded that childhood trauma has a significant impact on emotional and physical health, including dependency problems, low self-esteem, depression, and anxiety, although sleep disorders were not identified as a direct outcome in this study (Beilharz et al., 2019).

The long-term impacts of childhood trauma can be felt into adulthood. Pregnant women with a history of childhood trauma experience psychological instability and inability to control behavior as mentioned in the results of this review, including alcohol and drug abuse, denial of disturbed psychological conditions, poor self-image, and social isolation. Traumatic experiences early in life can cause deep low self-esteem, and often trigger depression and anxiety due to feelings of helplessness. In line with previous research, it was stated that the experience of childhood trauma experienced by mothers had an impact on psychological aspects such as low self-esteem, anxiety, stress, depression, risk of suicide, and mental disorders (Pandey et al., 2023).

The impact felt by mothers on these psychological aspects varies. Sleep disorders as in the results of this review are mentioned as one of the manifestations of mothers experiencing psychological problems due to childhood trauma. In line with previous research, it is stated that childhood trauma has an impact on the mother's mental and physical health, which is manifested in low sleep quality and stress. Sleep disorders that cause low sleep quality are a small part of the stress experienced by mothers (Beilharz et al., 2019). Thus, the experience of childhood trauma provides an unpleasant psychological experience for pregnant women.

3.2.2. Sociodemographic Characteristics

Cultural And Geographical

In article A5 states that mediation uses a large sample and adjusts for relevant covariates, it is found that prenatal depression acts as a full mediator. However, at the individual and country levels, there appears to be both positive and negative effects of ACE (*Adverse Childhood Experiences*) on attachment to the fetus after considering depressive symptoms as a mediator. This suggests that cultural and geographic factors have the potential to influence how mothers respond and develop empathy after experiencing an ACE.

Research (McKenna et al., 2023) shows that maternal childhood trauma, particularly sexual abuse, can predict offspring symptoms. However, this association was significantly attenuated in offspring experiencing accelerated epigenetic aging. These findings provide new insight into the role of epigenetics in linking stress and intergenerational psychopathology, highlighting the complexity of factors influencing the transmission of the psychological impact of childhood trauma. Analysis of article A5 suggests that prenatal depression mediates the relationship between Adverse Childhood Experiences (ACE) and maternal attachment to the fetus, with effects that can vary both positively and negatively at the individual and country levels. These findings emphasize the important role of cultural and geographic factors in shaping maternal responses to childhood trauma experiences, as well as illustrate the complexity in the intergenerational transmission of psychological impacts through epigenetic mechanisms.

Cultural and geographic factors influence maternal and fetal attachment during pregnancy. In line with the results of this review, cultural and geographic factors have the potential to influence how mothers respond and develop empathy after experiencing childhood trauma. Previous research explains that maternal and fetal attachment during pregnancy is influenced by factors such as age, maternal education, economic status, number of children, type of pregnancy, pregnancy planning, previous pregnancies, and gestational age.

The older the mother's age, the better the bond with the fetus during pregnancy (Hopkins et al., 2018). Higher education is also in line with better maternal and fetal attachment (Rusanen et al., 2018). Multiparous pregnant women have lower attachment to the fetus compared to primiparas (Rubertsson et al., 2015). A planned pregnancy will affect the attachment of mother and fetus during pregnancy (Camarneiro et al., 2017). First-time pregnant women have a higher attachment to the fetus compared to mothers who have had previous children. A high average economic status can also increase the attachment of mother and fetus during pregnancy. Thus, apart from childhood trauma, the mother's attachment to the fetus during pregnancy can also be influenced by characteristic and demographic factors.

Socio-Economic

Most of the families in study A7 had low incomes (86.2 %) and inadequate levels of home facilities (93.8%) to support optimal motor development. As many as 60% of mothers show a strong emotional bond with their children. Meanwhile, 62.3 % of these children showed motor development that was in line with general development. The analysis shows that there is a statistically significant relationship ($p < 0.05$) between the strength of the bond between mother and child and general motor development. Research (Martucci et al., 2021) results show that children who have mothers with depression have a higher risk of experiencing emotional dysregulation and social-emotional problems. Some studies also indicate possible delays in cognitive, motor, and language development, as well as behavioral problems in preschool children. In conclusion, these findings demonstrate the importance of incorporating maternal mental health care into primary care and providing adequate support to married couples to treat maternal depression and prevent its negative impact on child development.

3.2.3. The Relationship Between *Maternal Fetal Attachment* and Postnatal Child Development

The results of study A6 showed that prenatal attachment scores were significantly related to BITSEA Competency subscale scores and ADSI total scores in childhood, with correlation coefficients (r) of 0.246 ($P = 0.025$) and 0.316 ($P = 0.004$) respectively. Prenatal attachment was also found to be a predictor of behavioral and emotional competence as well as early childhood development, with regression coefficients (b) of 0.081 ($t = 2.273$, $P = 0.014$) and 0.281 ($t = 3.225$, $P = 0.002$) respectively. In addition, prenatal attachment was also shown to be a stronger predictor of child development than the level of depression experienced by the mother in early childhood, with a regression coefficient (b) of -0.319 ($t = 2.140$, $P = 0.035$). Research findings suggest that strengthening prenatal attachment may have significant benefits for better development in early childhood. The development of healthy bonds, which begins during the prenatal period and continues after birth, plays an important role in supporting positive care of the baby and contributes to the formation of a healthy individual in the future. Study A2 involved 150 volunteer mothers who were followed for 1 to 4 months after giving birth. Data is collected through Questionnaire Sheets, *Prenatal Attachment Inventory* (PAI), and *Maternal Attachment Scale* (MAS). Data analysis revealed a weak but statistically significant positive relationship between participants' mean scores on the PAI (41.20 ± 11.35) and MAS (26.05 ± 5.13) scales ($r = 0.304$, $p = 0.000$). These findings suggest that the bond formed between the pregnant mother and the developing fetus correlates with the bond observed between mother and baby in the postpartum period.

Stress experienced by the mother, whether in acute or chronic form, both physiological and emotional, can create conditions in the womb that interfere with fetal development, which in turn can cause an unadaptive response to stress from the external environment after birth. Stress during pregnancy affects various psychological systems such as attachment, affect, and stress regulation, as well as physiological systems including the endocrine and cardiovascular systems, as well as neuroanatomical structures (Lange et al., 2013).

The bond between mother and fetus in the womb contributes to the health of the mother and fetus during pregnancy and after birth. In line with the results of this review, it is stated that fetal brain development, child emotional development, the bond between mother and child after giving birth, child health, child behavior, and child growth and development are influenced by the attachment of mother and fetus while in the womb. The attachment of mother and fetus during pregnancy increases the interactive process of mother and fetus. Previous research explains that mothers who have a high attachment to the fetus during pregnancy will also have a higher perception and interactive capacity with the child, which can influence the child's behavior after birth (Alvarenga et al., 2015). In addition, low maternal and fetal attachment during pregnancy can risk the emergence of neglectful behavior towards the baby. Previous research explains that maternal and fetal attachment increases acceptance of the baby at birth, motivation to breastfeed, adequate baby care, and a pleasant psychosocial situation. Good acceptance of the fetus or baby after birth can optimize the baby's growth and development and minimize problems that arise for the mother and baby during the birth to postpartum period.

The bond between mother and fetus during pregnancy has a major impact on the health of the mother and baby after birth and influences the relationship between mother and baby in later life (Punamäki et al., 2017). Previous research also explains that the bond between mother and fetus during pregnancy has a positive impact, including maturation of brain development, ability to socialize, and optimal development during infancy. Apart from that, mothers who give birth to their children who have previously built an attachment between mother and child can also help the adaptation process to changes during pregnancy, childbirth and postnatal periods (Golbasi et al., 2015).

3.2.4. Measuring the Relationship between Prenatal Care, Depression and Anxiety in Mothers, Babies and Toddlers

In study A2, the Prenatal Attachment Inventory (PAI) and Maternal Attachment Scale questionnaires were used (MAS) to measure the prenatal relationship that will be carried out by the mother. In study A6, children aged between 21 and 31 months were evaluated using the Brief Infant and Toddler Social Emotional Assessment (BITSEA) and the Ankara Developmental Screening Inventory (ADSI). This evaluation was carried out simultaneously with administering the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) to mothers. In study A1, the measurement scales given to mothers were the Childhood Trauma Questionnaire and the Maternal-

Fetal Attachment Scale. In the A7 study, instruments that have been validated in Brazil are used, namely the Mother-Child Bonding Evaluation Protocol, Affordances in the Home Environment for Motor Development – Infant Scale, and the Alberta Infant Motor Scale. The PAI (Prenatal Attachment Inventory) has a three group model and one common factor with an excellent fit to the data. The three subscales also have construct validity.

4. Conclusion

The maternal fetal attachment is determined by several factors. The mother's childhood trauma influences the mother's attachment to the fetus. The mother's childhood trauma causes the mother to have disturbed psychological integrity which is manifested in the form of anxiety and depression. The impact of disturbed maternal fetal attachment could affect the growth and development of the child until the next age. These findings demonstrate the importance of cultural and geographic factors in shaping maternal responses to childhood trauma, as well as the complexity of intergenerational transmission of psychological impacts via epigenetics. Holistic maternal mental health care and partner support are essential to reduce the risk of child developmental problems, especially in families at high socio-economic risk. Prenatal attachment plays a crucial role in predicting a child's behavior, emotional competence, and development, highlighting the need to support positive attachment early in life to support a child's healthy future development.

References

- Alvarenga, Teixeira, & Peixoto. (2015). Apego Materno-Fetal e a Percepção Materna acerca da Capacidade Interativa do Bebê no Primeiro Mês. *Psico*, 46(3), 340.
- Beilharz, Paterson, Fatt, Wilson, Burton, Cvejic, & Vollmer-Conna. (2019). The impact of childhood trauma on psychosocial functioning and physical health in a non-clinical community sample of young adults. *Australian & New Zealand Journal of Psychiatry*, 54(2), 185–194. <https://doi.org/10.1177/0004867419881206>
- BJM. (2022). *Childhood trauma may heighten risk of pregnancy complications | BMJ*. <https://www.bmj.com/company/newsroom/childhood-trauma-may-heighten-subsequent-risk-of-pregnancy-complications/>
- Blackmore, Putnam, Pressman, Rubinow, Putnam, Matthieu, & O'Connor. (2016). The Effects of Trauma History and Prenatal Affective Symptoms on Obstetric Outcomes. *Journal of Traumatic Stress*, 29(3), 245–252. <https://doi.org/10.1002/jts.22095>
- Brown, Eisner, Walker, Tomlinson, Fearon, Dunne, & Murray. (2021). The impact of maternal adverse childhood experiences and prenatal depressive symptoms on foetal attachment: Preliminary evidence from expectant mothers across eight middle-income countries. *Journal of Affective Disorders*, 296(9), 612–619. <https://doi.org/10.1016/j.jad.2021.08.066>
- Camarneiro, Justo, & Miranda, D. (2017). Prenatal attachment and sociodemographic and clinical factors in Portuguese couples. *Journal of Reproductive and Infant Psychology*, 35(3), 212–222.
- Chaves, Campos, & Nobre. (2021). Mother-child bonding, environment, and motor development of babies at risk accompanied by a follow-up. *Revista Brasileira de Saude Materno Infantil*, 21(4), 1015–1023. <https://doi.org/10.1590/1806-93042021000400004>
- Christie, Talmon, Schäfer, Haan, D., Vang, Haag, & Brown. (2017). The transition to parenthood following a history of childhood maltreatment: A review of the literature on prospective and new parents' experiences. *European Journal of Psychotraumatology*, 8(7). <https://doi.org/10.1080/20008198.2018.1492834>
- Cildir, A., Ozbek, Topuzoglu, Orcin, & Janbakhishov. (2020). Association of prenatal attachment and early childhood emotional, behavioral, and developmental characteristics: A longitudinal study. *Infant Mental Health Journal*, 41(4), 517–529. <https://doi.org/10.1002/imhj.21822>
- Cooke, Racine, Plamondon, Tough, & Madigan. (2019). Maternal adverse childhood experiences,

- attachment style, and mental health: Pathways of transmission to child behavior problems. *Child Abuse and Neglect*, 93(4), 27–37. <https://doi.org/10.1016/j.chiabu.2019.04.011>
- Downey, & Crummy. (2022). The impact of childhood trauma on children's wellbeing and adult behavior. *European Journal of Trauma and Dissociation*, 6(1), 100237. <https://doi.org/10.1016/j.ejtd.2021.100237>
- Farokh. (2017). Anxiety and Its Relationship With Maternal Fetal Attachment In Pregnant Women In Southeast of Iran. *I-Manager's Journal on Nursing*, 7(3), 16.
- Fields, Ciciolla, Addante, Erato, Quigley, Mullins-Sweatt, & Shreffler. (2023). Maternal Adverse Childhood Experiences and Perceived Stress During Pregnancy: The Role of Personality. *Journal of Child & Adolescent Trauma*, 16(3), 649–657.
- Garon-Bissonnette, Bolduc, Lemieux, & Berthelot. (2022). Cumulative childhood trauma and complex psychiatric symptoms in pregnant women and expecting men. *BMC Pregnancy and Childbirth*, 22(1), 10.
- Golbasi, Ucar, & Tugut. (2015). Validity and reliability of the Turkish version of the Maternal Antenatal Attachment Scale. *Japan Journal of Nursing Science*, 12(2), 154–161. <https://doi.org/10.1111/jjns.12052>
- Goldstein, & Briggs-gowan. (2022). The effects of Intimate Partner Violence and a history of Childhood Abuse on Mental Health and Stress during Pregnancy. *Midwifery and Reproduction*, 36(3), 337–346. <https://doi.org/10.1007/s10896-020-00149-1>
- Hopkins, Miller, Butler, Gibson, Hedrick, & Boyle. (2018). The relation between social support, anxiety and distress symptoms and maternal fetal attachment. *Journal of Reproductive and Infant Psychology*, 36(4), 381–392. <https://doi.org/10.1080/02646838.2018.1466385>
- Infurna, Fazio, Bevacqua, Costanzo, Falgares, Maiorana, & Antonucci. (2024). Understanding the relationship between childhood emotional abuse and neglect and psychological distress in pregnant women: The role of prenatal attachment. *BMC Psychology*, 12(1), 520. <https://doi.org/10.1186/s40359-024-02024-w>
- Kumari. (2020). Emotional abuse and neglect: Time to focus on prevention and mental health consequences. 97–599. *The British Journal of Psychiatry*, 217(5), 5. <https://doi.org/10.1192/bjp.2020.154>
- Lange, Ven, van de, & Schrieken. (2013). Interapy: Treatment of post-traumatic stress via the internet. *Cognitive Behaviour Therapy*, 32(3), 110–124. <https://doi.org/10.1080/16506070302317>
- Mamun, Biswas, Scott, Sly, McIntyre, Thorpe, & Callaway. (2013). Adverse childhood experiences, the risk of pregnancy complications and adverse pregnancy outcomes: A systematic review and meta-analysis. *BMJ Open*, 2(3), 1–13. <https://doi.org/10.1136/bmjopen-2022-063826>
- Martucci, Aceti, Giacchetti, & Sogos. (2021). The mother-baby bond: A systematic review about perinatal depression and child developmental disorders. *Rivista Di Psichiatria*, 56(5), 223–236. <https://doi.org/10.1708/3681.36670>
- McKenna, Knight, Smith, Corwin, Carter, Palmer, & Brennan. (2023). Infant epigenetic aging moderates the link between Black maternal childhood trauma and offspring symptoms of psychopathology. *Development and Psychopathology*, 16(3), 1–13. <https://doi.org/10.1017/S0954579423001232>
- Mohamadirizi, & Kordi. (2016). The relationship between multi-dimensional self-compassion and fetal-maternal attachment in prenatal period in referred women to Mashhad Health Center. *Journal of Education and Health Promotion*, 5(1), 21.

- Pandey, Raushan, Gautam, & Neogi. (2023). Alarming Trends of Cesarean Section—Time to Rethink: Evidence From a Large-Scale Cross-sectional Sample Survey in India. *Journal of Medical Internet Research*, 25(2), e41892. <https://doi.org/10.2196/41892>
- Punamäki, Isosävi, Qouta, Kuittinen, & Diab. (2017). War trauma and maternal–fetal attachment predicting maternal mental health, infant development, and dyadic interaction in Palestinian families. *Attachment & Human Development*, 19(5), 463–486. <https://doi.org/10.1080/14616734.2017.1330833>
- Roche, Kroska, Miller, Kroska, & O'Hara. (2019). Childhood trauma and problem behavior: Examining the mediating roles of experiential avoidance and mindfulness processes. *Journal of American College Health*, 67(1), 17–26.
- Rubertsson, Pallant, Sydsjö, Haines, & Hildingsson. (2015). Maternal depressive symptoms have a negative impact on prenatal attachment – findings from a Swedish community sample. *Journal of Reproductive and Infant Psychology*, 33(2), 153–164. <https://doi.org/10.1080/02646838.2014.992009>
- Rusanen, Lahikainen, Pölkki, Saarenpää-Heikkilä, & Paavonen. (2018). The significance of supportive and undermining elements in the maternal representations of an unborn baby. *Journal of Reproductive and Infant Psychology*, 36(3), 261–275. <https://doi.org/10.1080/02646838.2018.1462476>
- Sahin, Merve, & Erbill. (2023). Relationship between maternal antenatal attachment and traumatic childbirth.pdf. *Intl J Gynecology Obste.*
- Stigger, Martins, Matos, Trettim, Cunha, Scholl, & Quevedo. (2020). Is maternal exposure to childhood trauma associated with maternal-fetal attachment? *Interpersona*, 14(2), 200–210.
- Stoltenborgh, Bakermans-Kranenburg, Alink, & IJzendoorn, V. (2015). The Prevalence of Child Maltreatment across the Globe: Review of a Series of Meta-Analyses. *Child Abuse Review*, 24(1), 37–50. <https://doi.org/10.1002/car.2353>
- Ven, van de, Heuvel, van den, Bhogal, Lewis, & Thomason. (2020). Impact of maternal childhood trauma on child behavioral problems: The role of child frontal alpha asymmetry. *Developmental Psychobiology*, 62(2), 154–169. <https://doi.org/10.1002/dev.21900>