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Factors influencing maternal-fetal attachment in adolescent pregnant women: scoping review

Faktor-faktor yang Memengaruhi Maternal-Fetal Attachment pada Ibu Hamil Remaja: Scoping Review

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ABSTRACT

Background: *During pregnancy, one important aspect that needs to be considered is the formation of maternal-fetal attachment (MFA), which is the emotional bond that forms between a mother and her fetus during pregnancy. Maternal-fetal attachment begins to develop before the baby is born, even while it is still in the womb.*
Objective: *This study analyses scientific evidence related to factors that influence maternal-fetal attachment in adolescent pregnant women.*
Methods: *This review used the PRISMA-ScR diagram. Literature searches were conducted using three databases and one search engine, namely PubMed, ScienceDirect, Wiley Online Library, and Google Scholar. This review began in February 2025. Articles were assessed using the Critical Appraisal Skills Programme (CASP) checklist for cohort, cross-sectional, and qualitative studies, with inclusion criteria being original research articles, articles published between 2020-2025, in English, open access and available in full text, with a research focus on MFA in adolescent pregnancy, while exclusion criteria were paid articles and articles with only abstracts. From the 211 articles selected, 7 relevant articles were obtained, 6 quantitative articles and 1 qualitative article.*
Results: *the factors that influence maternal-fetal attachment in adolescent pregnant women are health practices during pregnancy, the mother's psychological condition, emotional and social support, sociodemographic and marital factors, pregnancy characteristics, and family and cultural background.*
Conclusion: *Maternal-fetal attachment in adolescent pregnancy is influenced by psychological, social, and contextual factors. Strengthening psychosocial support and promoting healthy behaviors are essential to improve attachment and maternal well-being.*

Keywords*: adolescent pregnancy, influencing factors, maternal-fetal attachment*

ABSTRAK

Latar belakang: Pada masa kehamilan, salah satu aspek penting yang perlu diperhatikan adalah pembentukan maternal-fetal attachment (MFA), yaitu ikatan emosional yang terbentuk antara ibu dan janinnya selama masa kehamilan. Maternal-fetal attachment mulai berkembang sebelum bayi lahir, bahkan dimulai semenjak dalam kandungan.
Tujuan: Penelitian ini untuk menganalisis bukti ilmiah terkait faktor-faktor yang mempengaruhi maternal-fetal attachment pada ibu hamil remaja.
Metode: Tinjauan ini menggunakan diagram PRISMA-ScR. Pencarian literatur menggunakan 3 database dan 1 search engine yaitu, PubMed, ScienceDirect, Wiley Online Library, dan Google Scholar, tinjauan ini dimulai pada februari 2025. Penilaian artikel menggunakan Critical Appraisal Skills Programme (CASP) cohort, cross-sectional, dan kualitatif , dengan kriteria inklusi yaitu artikel penelitian asli, artikel yang diterbitkan 2020-2025, berbahasa inggris, akses terbuka dan tersedia dalam teks lengkap, fokus penelitian membahas MFA pada kehamilan remaja, sedangkan kriteria

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eksklusi yaitu artikel berbayar dan artikel yang hanya abstrak. Dari 211 artikel yang diseleksi didapatkan 7 artikel yang relevan, 6 artikel kuantitatif dan 1 artikel kualitatif. **Hasil:** Faktor-faktor yang memengaruhi maternal-fetal attachment pada ibu hamil remaja yaitu praktik kesehatan selama kehamilan, kondisi psikologis ibu, dukungan emosional dan sosial, faktor sosio demografis dan perkawinan, karakteristik kehamilan, dan latar belakang keluarga dan budaya.
Kesimpulan: Keterikatan ibu-janin pada kehamilan remaja dipengaruhi oleh faktor psikologis, sosial, dan kontekstual. Memperkuat dukungan psikososial dan mempromosikan perilaku sehat sangat penting untuk meningkatkan keterikatan dan kesejahteraan ibu.

Kata kunci: faktor-faktor yang mempengaruhi, ikatan ibu-janin, kehamilan pada remaja

INTRODUCTION

An ideal pregnancy is planned, wanted, and well-nourished [1]. Adolescent pregnancy is a health issue of global concern, especially in developing countries such as Indonesia, and usually occurs unplanned in adolescent girls under the age of 19. Based on data from the *Badan Pusat Statistik (BPS)* in 2023, the trend of teenage pregnancy in Indonesia shows that the teenage pregnancy rate reached 48 per 1,000 women aged 15-19 years [2]. This figure shows that reproductive health challenges among adolescents in Indonesia remain high and have an impact on increasing the risk of pregnancy complications, such as anaemia, pre-eclampsia, premature birth, and low birth weight [3].

In addition to physical risks, adolescent pregnancy also causes psychosocial stress such as social stigma, anxiety, emotional instability, and low social support, which can hinder psychological adaptation during pregnancy and disrupt the process of forming an early emotional bond between the mother and fetus [3]. One important psychological aspect that needs to be considered is the formation of maternal-fetal attachment (MFA), which is the emotional bond that forms between a mother and her fetus during pregnancy [4]. In addition, maternal-fetal attachment includes emotional, cognitive, and behavioral bonds that form early in pregnancy and develop as the mother becomes more aware of her fetus's presence [5].

Maternal-fetal attachment is very important during pregnancy, helping mothers develop feelings of love, affection, and commitment to their unborn babies. This attachment can be seen in mothers' behavior, such as talking to their fetuses, thinking about them, and showing concern for their well-being [6]. Strong maternal-fetal attachment can encourage positive behaviors in mothers, such as compliance with antenatal checkups, maintaining nutritional intake, and avoiding risky behaviors such as smoking or alcohol consumption [7]. This bond plays an important role in preparing mothers for parenthood and influences the long-term relationship between mother and child after birth [8].

Strong maternal-fetal attachment is associated with better fetal health, including optimal birth weight, lower fetal stress levels, and better birth outcomes [9]. The formation of this bond is often more difficult for teenage mothers. Emotional immaturity, unstable relationships, unplanned pregnancies, and lack of access to reproductive health information are major obstacles to building a healthy bond between mother and fetus [10]. In addition, cultural pressures and economic constraints can exacerbate the situation, so that teenage mothers tend to have lower attachment levels than adult mothers [11].

Although research on maternal-fetal attachment is important, it is still very limited in Indonesia and has not received much attention from pregnant women in hospitals and community health centers [12], especially among pregnant adolescents. Many studies

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have been conducted on maternal-fetal attachment, but they focus on adult populations and have not explored the psychosocial and cultural contexts specific to pregnant adolescents in Indonesia. This limitation indicates a knowledge gap that needs to be filled through more comprehensive scientific studies. Therefore, this scoping review aims to identify the factors that influence maternal-fetal attachment in adolescent pregnant women. The results of this study are expected to provide new insights for the development of good antenatal services for adolescents, with an emphasis on psychological well-being and strengthening the emotional bond between mother and fetus.

METHODS

Study design

This scoping review was conducted using the framework developed by Arksey and O'Malley (2005 hich includes identifying the research question, searching for relevant studies, selecting eligible articles, charting the data, and collating and reporting the results [14]. The review process followed the PRISMA-ScR guidelines. The main question in this scoping review is what factors influence Maternal-Fetal Attachment in adolescent pregnant women.

Data Source and Search Strategy

The literature search was conducted using three databases and one search engine, namely PubMed, ScienceDirect, Wiley Online Library, and Google Scholar. This scoping review began in February 2025. Keywords relevant to the research topic were entered using Boolean operators (“AND”, “OR”) as follows: (“adolescent pregnancy” OR “teenage pregnancy” OR “young mothers”) AND (“influencing factors” OR “determinants”) AND (“maternal-fetal attachment” OR “prenatal attachment”).

Study Selection Process

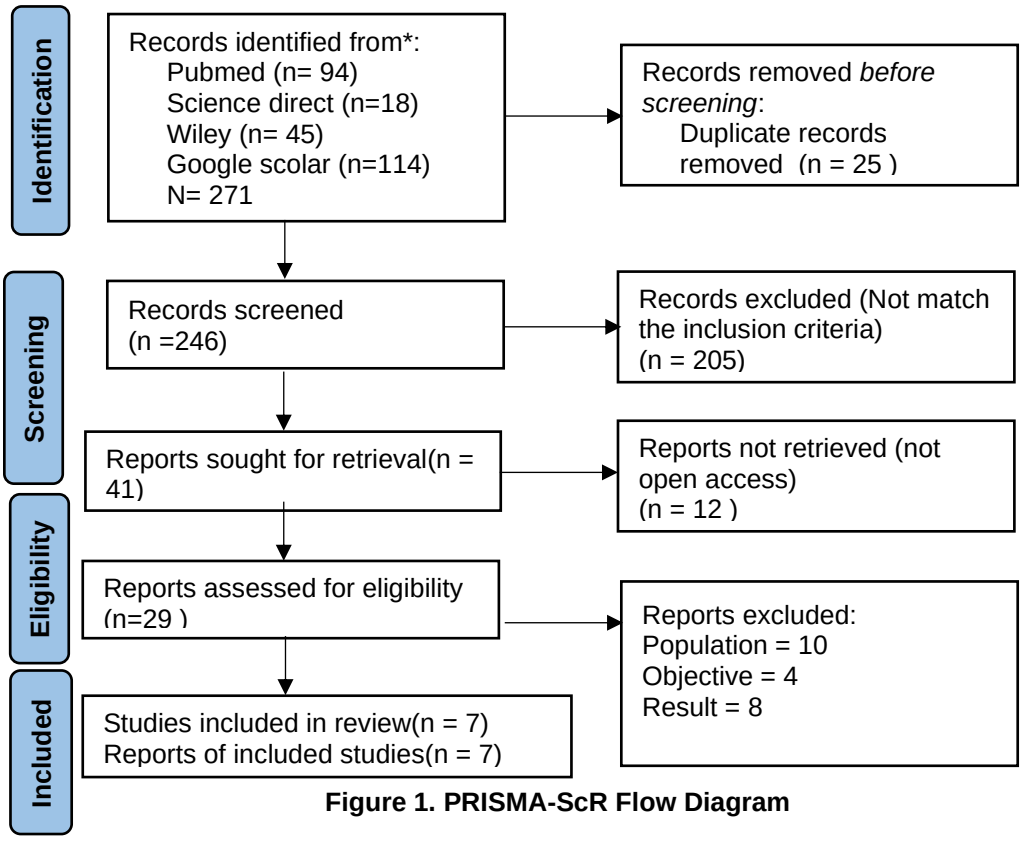

Figure 1. PRISMA-ScR Flow Diagram

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All identified records were imported into Covidence to facilitate duplicate removal, screening, and data management. The selection process involved removing duplicates, screening titles and abstracts, and assessing full-text articles. As shown in Figure 1, out of 271 identified records, seven studies met the inclusion criteria. Two reviewers independently carried out the study selection process, and disagreements were resolved through discussion or consultation with a third reviewer when necessary.

Quality Assessment

Quality appraisal was performed using the Critical Appraisal Skills Programme (CASP) checklists appropriate for each study design, including cohort, cross-sectional, and qualitative studies. The appraisal was conducted independently by two reviewers, with excellent interrater reliability demonstrated by a Cohen's kappa coefficient of 0.82.

Data Extraction

Data from the included studies were then extracted and organized into structured tables summarizing the country, year, objectives, study design, sample characteristics, instruments used, and main findings.

Framework PEO

The inclusion and exclusion criteria were determined based on the PEO framework (Population, Exposure, and Outcomes), namely: (1) Population: adolescent pregnant women, (2) Exposure: influencing factors, and (3) Outcomes: maternal-fetal attachment. The inclusion criteria were: (1) original research, (2) articles published between 2020 and 2025, (3) English language, (4) open access and available in full text, and (5) research focusing on maternal-fetal attachment in adolescent pregnancy. The exclusion criteria were: (1) paid articles, and (2) articles that were only abstracts.

Data synthesis

Data synthesis was carried out through an inductive thematic analysis approach. This process involved data familiarization, identification of initial codes, grouping of codes into subthemes, and development of overarching themes. Coding was performed manually using Microsoft Excel by two independent reviewers, and discrepancies were resolved through consensus to minimize bias. Because this scoping review relied solely on secondary data from previously published studies, ethical approval was not required and was considered not applicable.

RESULTS

Table 1. Charting data

No	Title, Country, Author, Year	Objective	Study Design	Sample, Research Instrument	Research result
A1	Relationship of health practices with depression and maternal-fetal attachment in adolescent pregnant women: A prospective study. Iran 2021 [15]	To determine the relationship between health practices and depression and maternal-fetal attachment in adolescent pregnant women.	Prospective study	Sample: 316 adolescent pregnant women Research Instruments: socio-demographic and obstetric questionnaires designed by the research team, Health Practice Questionnaire-II (HPQ-II), Edinburgh Postnatal Depression Scale (EPDS), and Cranley Maternal-	• The results showed that there was a significant association between health practices and depression during pregnancy, with higher health practice scores associated with lower depression scores (β = 0.10, P = 0.001). • Higher health practice scores correlated with increased maternal-fetal attachment (β = 0.30, P < 0.001).

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				Fetal Attachment Scale (MFAS).	• The study also found that 29.4% of participants had a depression score above the threshold of 12 on the Edinburgh Postnatal Depression Scale (EPDS).
A2	Prenatal Attachment and Related Factors in Adolescent Pregnant Women. Turkey 2023 [16]	To determine the level of prenatal attachment and associated factors in adolescent pregnant women	Cross-sectional descriptive	Sample: 34 adolescent pregnant women Research Instruments: Personal information form using the Prenatal Attachment Inventory (PAI), Marriage Life Scale (MLS), and Health Practices in Pregnancy Scale (HPPS).	• The results showed that there was a strong positive correlation between (PAI) and (MLS) scores (r = 0.873; p = 0.025), indicating that as prenatal attachment increased, marital satisfaction also increased. • Prenatal attachment increased as health practices in pregnancy decreased, showing a weak negative correlation between PAI scores and (HPQ) scores (r= -0.423; p=0.005).
A3	Comparison of mental health and fetal attachment in adolescent and Non-adolescent pregnancies. Iran 2020 [17]	To compare the mental health and maternal fetal attachment of adolescent and non-adolescent mothers.	Descriptive-comparative	Sample: 145 adolescent mothers (group 1) and 140 non-adolescent mothers (group 2), for a total of 285 women. Research Instruments: demographic and obstetric questionnaires, General Health Questionnaire (GHQ), and Cranley Maternal-Fetal Attachment Scale (MFAS).	There are no significant differences in mental health between adolescent and adult pregnant women, but adolescent pregnant women have lower levels of mother-fetus bonding. This low level of bonding is influenced by young age, emotional immaturity, unplanned pregnancy, lack of social support, and socioeconomic and cultural factors.
A4	Prenatal attachment. Anxiety and depression in pregnant adolescents and the emotional availability of their parents. Tukey 2020 [18]	To investigate prenatal attachment, levels of anxiety and depression in pregnant adolescents, as well as their parents' emotional availability.	Comparative study	Sample: 55 pregnant and 61 non-pregnant adolescents. Research Instruments: Prenatal Attachment Inventory (PAI), Hospital Anxiety and Depression Scale (HADS), Lum Emotional Availability of Parents (LEAP), and Sociodemographic Data Form prepared by the authors.	The education of pregnant adolescents ended earlier than that of the control group. The mother's age of marriage and age of having her first child were lower in the case group (p<0.05). Depression levels and parental emotional availability were similar in both groups. However, the HADS anxiety score was 7.4±3.8 in the case group and 9.1±4.1 in the non-pregnant adolescent group and was statistically

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					significant. Prenatal Attachment: There was a significant association between prenatal attachment and parental anxiety/depression and emotional availability scores in the pregnant group.
A5	Maternal-antenatal attachment in young pregnant women: Social support, mentors, and fear of childbirth. US 2025 [19]	To examine correlates of maternal-fetal attachment in a diverse sample of young pregnant mothers.	A prospective cohort	Sample: The sample included 142 participants Research Instrument: The primary instrument used was the 18-item Maternal Antenatal Attachment Scale (MAAS), along with other measures such as the PROMIS depression screener, social support scales, perceived stress scales, and sleep quality indices.	The research found that certain factors were significantly associated with maternal-fetal attachment (MFA). Specifically, higher MFA scores were linked to greater social support in the third trimester, having a natural mentor, and not reporting pregnancy as "wrong time" or "unplanned". Additionally, younger partner age and more experiences of discrimination were associated with lower MFA scores in bivariate analyses, but the final regression model highlighted social support, mentorship, and pregnancy intendedness as the key predictors.
A6	A longitudinal investigation of young mothers' prenatal attachment, depressive symptoms, and early parenting behaviour. US 2021 [20]	This study explores whether young, low-income mothers' prenatal attachment to their infants is related to attachment and parenting behaviour postnatally.	Longitudinal study	Sample: 240 pregnant women Research Instrument: Maternal Antenatal Attachment Scale (MAAS) to assess prenatal attachment, the CES-D scale for depressive symptoms, and observational video recordings of mother-infant interactions.	There was stability in attachment and depressive symptoms from pregnancy to postpartum. In multivariate path models, prenatal attachment was directly associated with two types of parenting behaviour: positive engagement and encouragement of learning, even when accounting for depressive symptoms and postnatal attachment. There was an indirect effect of prenatal attachment on sensitivity through postnatal attachment.
A7	Prenatal Attachment Among Thai	To explore the composition of prenatal	Qualitative Study	Sample: thirteen adolescents pregnant	The research results indicate that Thai pregnant adolescents develop

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	Pregnant Adolescents: A Qualitative Study. Thailand 2020 [21]	attachment among Thai pregnant adolescents.		Research instrument: in-depth interviews and a focus group interview, utilizing open-ended and semi-structured questions to explore thoughts, feelings, and behaviors related to prenatal attachment. The interviews lasted approximately 30-45 minutes, and the focus group about 90 minutes.	prenatal attachment through three main components: cognitive, affective, and behavioral. The study also found that factors such as acceptance of pregnancy, family and partner support, and cultural or religious practices significantly influence the development of prenatal attachment. Most adolescents expressed a strong emotional bond and a desire to care for their babies, despite facing financial constraints. The findings highlight the importance of social support and cultural context in fostering prenatal attachment among pregnant adolescents.

There were seven articles selected, which were then critically evaluated using the Critical Appraisal Skills Program (CASP). Articles A1, A4, A5, and A6 used cohorts [22]. Articles A2 and A3 used cross-sectional studies [23]. Article A7 used qualitative data [24]. Critical appraisal in research is a process used to assess the quality and relevance of an article and determine whether the research results are valid. There were two good quality articles (A1, A2, A5, A6) and two fairly good quality articles (A3, A4, A7).

Table 2. Quality Appraisal Results Using the CASP Checklist

Article Code	Study Design	Score	Quality Category
A1	Cohort Study	12/12	Good
A2	Cross-sectional	8/11	Fair
A3	Cross-sectional	7/11	Fair
A4	Cross-sectional	7/11	Fair
A5	Cohort Study	11/12	Good
A6	Cohort Study	11/12	Good
A7	Qualitative Study	7/10	fair

The included studies displayed substantial heterogeneity in MFA measurement instruments (MFAS, PAI, MAAS), additional psychological scales (EPDS, GHQ, HADS), study designs (cohort, cross-sectional, qualitative), sample sizes, and cultural contexts. These instruments differ in operational definitions, number of items, and scoring systems, making effect estimates non-comparable. Variations in study design and sample size varied considerably (13–316 participants), further affecting internal validity and statistical weighting. Cultural differences also shape how MFA is expressed, contributing to interpretive heterogeneity. Because these factors violate key assumptions of meta-analysis, particularly methodological and measurement homogeneity, meta-analysis was not feasible, and narrative and thematic synthesis were used instead. The

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findings obtained from reviewing seven articles on mother-fetus bonding in pregnant adolescents are as follows.

Table 3. Mapping

Theme	Subtheme	Artikel source
1. Health Practices During Pregnancy	• Balanced nutrition, rest, exercise, and avoidance of harmful substances • Adherence to prenatal care • Better health practices lead to higher mother-fetus bonding	A1,A2
2. Mother's Psychological Condition	• High levels of depression reduce bonding • High levels of anxiety also have a negative impact	A1,A4,A6
3. Emotional and Social Support	• Emotional support from a partner enhances bonding • Harmonious marital relationships enhance attachment • Parental emotional availability also plays a role	A1,A2,A4,A5
4. Socio-demographic and Marital Factors	• Low maternal and parental education levels correlate with low attachment • Age at marriage and the mother's age at conception • Type of marriage (arranged marriage or marriage due to social pressure)	A1,A2,A4,A5
5. Pregnancy Characteristics	• Planned pregnancies enhance attachment • First pregnancies (primigravida) have higher attachment • Knowing the sex of the fetus and feeling fetal movements increases attachment	A2,A3,A6
6. Family cultural background	• Early marriage patterns in families decrease attachment levels and increase the risk of teenage pregnancy. • Cultural values and norms that pressure teenagers to marry and have children immediately	AA4,A7

DISCUSSION

The review analyzes seven articles that examine factors affecting maternal–fetal attachment (MFA) in adolescent pregnant women. Based on data synthesis, six interrelated main themes were obtained, namely: health practices during pregnancy, the mother's psychological condition, emotional and social support, sociodemographic and marital factors, pregnancy characteristics, and family and cultural background.

Health Practices During Pregnancy

A mother's attachment to her fetus is directly related to her health behaviors during pregnancy. Studies by [16] in Turkey and [15] in Iran show that pregnant adolescents who regularly attend antenatal care (ANC) visits, maintain a nutritious diet, and avoid risky habits such as smoking and excessive caffeine consumption have higher levels of maternal-fetal attachment (MFA). These practices strengthen mothers' awareness of the fetus's presence and encourage adaptive maternal behavior from the prenatal period onwards. Biologically, adequate nutrition and reduced stress hormones may enhance fetal movement perception, while psychosocially, ANC visits reinforce maternal identity and increase emotional engagement with the fetus.

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Mother's Psychological Condition

Depression and anxiety are major psychological factors that influence MFA. Symptoms of depression in pregnant adolescents can lead to neglect of fetal care and emotional distancing from the pregnancy, resulting in decreased attachment [15],[18]. Research by [18] found a negative correlation between depression levels and prenatal attachment, where higher depression scores were associated with lower bonding. Psychologically, depression reduces motivation, emotional sensitivity, and cognitive capacity to form attachment, while biologically it is linked to cortisol dysregulation, which may disrupt bonding mechanisms. Previous studies also emphasize that depressive symptoms during pregnancy can reduce a mother's responsiveness to fetal cues, thereby hindering maternal-fetal attachment [25].

Emotional and Social Support

Social support plays an important role in shaping MFA in adolescent pregnant women. Adolescents who receive adequate support from family, partners, and their social environment tend to have stronger emotional attachment to their fetus [26]. Recent research also indicates that parental attachment, particularly a mother's attachment to her fetus, known as maternal-fetal attachment (MFA), influences optimal infant development after birth [25]. Support from partners, families, and social environments has been shown to play an important role in increasing maternal attachment to the fetus. Research by [15] notes that emotional support from husbands and satisfaction within marital relationships are significantly related to MFA levels. Similarly, [16] found that marital satisfaction has a strong positive relationship with MFA. Support systems strengthen coping mechanisms, reduce psychological distress, and facilitate maternal role acceptance, which together promote stronger bonding mechanisms.

Socio-demographic and Marital Factors

Factors such as age at marriage, the educational level of the mother and her parents, and the nature of the marriage (arranged or culturally pressured) also affect MFA. Adolescents with lower levels of education, or those who come from families with limited educational backgrounds, tend to have weaker fetal attachment [15]. Additionally, marriages that are not based on the adolescent's own decision, such as arranged marriages or bride exchanges due to economic hardship, can contribute to psychological unpreparedness and reduced willingness to bond with the fetus [18]. Research indicates that a mother's age significantly influences maternal-fetal attachment [27]. Adolescent pregnant women generally have lower levels of attachment compared to older mothers, possibly due to limited experience and insufficient emotional support. Low-quality mother–fetus bonding may reduce motivation to provide necessary care for the baby after birth, which can affect infant well-being [6].

Younger mothers often exhibit lower bonding levels due to feelings of unpreparedness and mixed emotions related to physical and psychological changes during pregnancy, leading to a lack of readiness for motherhood [28]. However, positive partner relationships, strong social support, and adequate guidance can enhance bonding regardless of age. Gestational age also plays an important role, with attachment generally increasing as pregnancy progresses. Socio-demographic variables such as maternal age, partner's age, and education demonstrate mixed associations with MFA [19]. Having a younger partner has been linked to weaker MFA, suggesting that relational maturity may influence the attachment process. Previous research also shows that adolescents with lower education or those in marriages shaped by cultural pressure tend to report lower MFA, highlighting that both structural disadvantages and interpersonal relationship dynamics shape maternal-fetal bonding. Differences across studies may

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result from variation in sample characteristics, relational maturity, and cultural expectations surrounding marriage and pregnancy.

Pregnancy Characteristics

Several specific characteristics of pregnancy also influence maternal–fetal attachment, including first pregnancy, planned pregnancy, and knowledge of the fetus's sex. A study by Sonkaya (2023) showed that first pregnancies and planned pregnancies were positively correlated with higher MFA scores[16]. Conversely, unpreparedness for a first pregnancy or an unwanted pregnancy tends to hinder the bonding process. Similarly, [17] noted that most pregnant adolescents who did not want to be pregnant demonstrated lower levels of attachment. Pregnancy intendedness strongly influences MFA; research by [19] reported that pregnancies perceived as occurring at the "right time" were associated with higher MFA compared to those considered "wrong time." Planned pregnancies generally enhance acceptance and emotional bonding, whereas unintended or mistimed pregnancies are linked to weaker attachment. Additionally, first-time pregnancies often generate. These findings illustrate that psychological acceptance and cognitive preparedness play central roles in attachment formation.

Family and cultural background

Cultural norms that support early marriage and parenting patterns within families that encourage girls to marry at a young age contribute to high rates of teenage pregnancy. Cultural values that emphasize the roles of mother and wife without adequate mental preparation also become major obstacles to the formation of maternal–fetal attachment [18],[21] highlighted that early marriage patterns, family norms, and cultural expectations contribute to adolescent pregnancies and can impede MFA. Adolescents raised in environments where early childbearing is normalized may struggle with psychological readiness for motherhood, which reduces attachment levels. Cultural pressure to fulfill maternal roles prematurely can also hinder the natural development of emotional connection to the fetus.

Across studies, sociocultural contexts—such as norms on early marriage, family authority, and gender roles—shape variations in maternal–fetal attachment (MFA) among adolescents by influencing emotional readiness and maternal identity. However, evidence is limited by methodological differences (varied instruments, small samples, cross-sectional designs, and self-reports), reducing comparability and strength of conclusions.

Overall, MFA in adolescents results from the interaction of psychological, social, behavioral, and cultural factors, with key influences including depression, social support, pregnancy intention, and cultural pressures. Future research should use longitudinal designs, larger diverse samples, and validated adolescent-specific tools, while developing culturally sensitive psychosocial and family-based interventions, as findings are not broadly generalizable.

CONCLUSION

This scoping review identified six main factors that influence maternal-fetal attachment (MFA) in adolescent pregnant women, namely health practices during pregnancy, psychological conditions, emotional and social support, sociodemographic factors, pregnancy characteristics, and family and cultural background. Social support and psychological well-being are the most dominant factors that shape the strength of the mother-fetus bond. Practically, these results indicate the need to strengthen adolescent-friendly antenatal services integrated with psychological counseling and family support. Reproductive education programs should involve partners and families to foster self-acceptance, reduce social stigma, and improve self-care behaviors during

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pregnancy. In the future, research needs to use a longitudinal design with standardized MFA measurement instruments in order to trace the causal relationships between factors and assess the effectiveness of psychosocial and culturally-based interventions. A multidisciplinary approach, involving health workers, psychologists, and family counselors, is needed to develop more contextual preventive and promotive strategies for pregnant adolescents in Indonesia.

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