



Husband's Support, Anxiety and Maternal-Fetal Attachment in Pregnant Women: A Scoping Review

Yuni Purwati ^{1*},², Noor Pramono ³, Mohammad Hakimi ⁴, Anggorowati⁵

¹ Doctoral Study Program of Medical and Health Science, Faculty of Medicine, Universitas Diponegoro Semarang

² Nursing Study Program, Faculty of Health Sciences, Universitas Aisyiyah Yogyakarta

³ Department Obstetry and Gynecology, Faculty of Medicine, Universitas Diponegoro Semarang

⁴ Department of Obstetric and Gynecology, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada Yogyakarta

⁵ Department of Nursing, Faculty of Medicine, Universitas Diponegoro Semarang

ARTICLE INFO

Article history:

Received 21 January 2023

Accepted 1 April 2023

Published 10 June 2023

Keyword:

MFA

husband's support

Anxiety

Birth outcome

**) corresponding author*

Ns. Yuni Purwati, M.Kep

Doctoral Study Program of Medical and Health Science, Faculty of Medicine, Universitas Diponegoro Semarang

Email: yunipurwati@unisayogya.ac.id

DOI: 10.30604/jika.v8i2.1828

Copyright 2023 @author(s)

ABSTRACT

MFA is an emotional bond that develops between mother and fetus. Maternal-fetal attachment is based on cognitive representations such as thoughts, feelings, and behaviors representing a pregnant mother's affection for her fetus. Husband's support and anxiety are factors that influence the quality of MFA and birth outcomes. Objective: to analyze husband's support, anxiety level and MFA level. Method: Scoping review using the PRISMA Scr framework. Using the PICO Framework, the search strategy was searched using keywords in the Scopus, Ebsco, Pubmed, ScienceDirect and Proquest databases. Critical Assessment is done with JBI. Results: 14 articles were obtained that were screened using the PRISMA Scr framework, 50% came from developing countries and 50% from developed countries. Articles with cross-sectional research methods, cohort and longitudinal studies each 28.6% and case control studies 14.2%. JBI results from 14 articles resulted in a score of > 50% so it was accepted. Conclusion: MFA is influenced by husband's support and anxiety which impacts birth outcomes and infant development. Efforts are needed to increase MFA through MFA training for pregnant women and constructive anxiety management

This open access article is under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



INTRODUCTION

Pregnancy is an event that happens in women as a result of fertilization that grows and develops into a fetus in the mother's womb. As the gestational age increases, the physical and emotional condition of the mother changes. The main developmental task in pregnancy is to prepare the mother psychologically for physical changes and to increase the emotional connection with the fetus (Čésnaitė et al., 2019). The emotional involvement of mother and fetus is called Maternal-Fetal Attachment/MFA. MFA is an emotional bond that develops between mother and fetus. The mother-

fetus attachment is based on cognitive representations such as thoughts, feelings, and behaviors that represent the pregnant mother's affection for her fetus. Caring behaviors shown include parenting (eating well, not consuming harmful substances, such as alcohol, cigarettes), calming (stroking the stomach), and physical preparation (preparing the baby's birth kit) as well as learning more about fetal development and care (Suryaningsih et al., 2020; Hassan & Hassan, 2017). The results of the study stated that 69% of pregnant women with good MFA showed better fetal well-being and healthy babies as indicated by an increase in body mass index at birth (Baltacı & Başer, 2018).

Adaptation to the mother's role is a potentially anxiety-inducing process, which can have a detrimental effect on MFA. Anxiety is a common problem that occurs in the context of pregnancy, around 16% of pregnant women experience anxiety in the first trimester of pregnancy (Wallace & Araji, 2020). Other research states that the prevalence of anxiety during pregnancy in the world shows between 11%-21% (Fawcett, et.al., 2019). Pregnancy anxiety is associated with parenting stress, unsafe MFA and poor birth outcomes. Anxiety during pregnancy can have serious consequences for the physical health of the baby and the mother including underutilization of prenatal care, increased use of substances (alcohol, smoking), premature birth, low birth weight and small for gestational age babies. The anxiety of pregnant women can have a detrimental effect on the development of MFA. Anxiety experienced by pregnant women can affect the mother's reaction to her pregnancy so that the mother becomes ambivalent about pregnancy, feels less involved with the fetus and expresses dislike about body image due to body changes that occur during pregnancy (Mohamadirizi & Kordi, 2016; Alhusen, J. L, et.al., 2014; Katrine Røhder et al., 2020).

Previous research on the quality of MFA between pregnant women who experienced anxiety and who did not experience anxiety showed that psychosocial problems during pregnancy were negatively related to the development of the relationship between mother and fetus. Mothers who experience anxiety during pregnancy are associated with lower quality of MFA (Abazari, Pouraboli, 2017). In a study of 73 third trimester primigravida pregnant women, there were 40% of mothers experiencing anxiety, 44.8% of them with low MFA scores, p-value = 0.019 and correlation coefficient -0.250. These results prove that pregnant women who experience anxiety produce lower MFA scores, measured by the prenatal attachment inventory (PAI), an instrument that describes feelings, thoughts and situations experienced in relation to their fetus (Baroah et al., 2020).

MFA quality is the basis for the mother-infant relationship after birth. Mothers who exhibit more intense MFA behavior show more involvement in mother-infant interactions around 12 weeks postpartum. Mothers with MFA disorders show a decreased ability to understand and interpret baby's signals and respond inappropriately to the baby's needs. Babies born with a good history of MFA, good mother-infant bond after birth, produce healthy babies, more optimal cognitive, mental and social development of babies (Bazari, P, 2017, Røhder et al., 2020).

Prenatal anxiety and MFA are associated with the social support role of the family and specifically that of the husband. The support provided by the husband is a vital resource for dealing with anxiety. Husbands play an important role in maintaining positive emotions in pregnant women. Husband's emotional support affects the inner peace and pleasure of pregnant women, making it easier to adjust

to changes during pregnancy, reducing tension or anxiety and increasing MFA. Effective spousal support can improve health and relationships during the transitional period of pregnancy, resulting in a comfortable psychological relationship that affects the quality of the mother-fetus relationship (Ramsdell et al., 2020) (Doss & Rhoades, 2017) (Calkins & Brock, 2022). Study of 285 pregnant women, 252 (88.4%) who received good family support had a strong maternal-fetal attachment relationship than mothers with poor family support 33 (11.5%) with P=0.001 (Hassan & Hassan, 2017).

Husband's support and anxiety are important factors in MFA which research findings have found. However, an analysis of husband's support, anxiety and MFA level has not yet been found. The purpose of this study was to analyze husband's support, anxiety level and MFA level in the prenatal period, carried out by scoping review method.

METHODS

This study is a scoping review to identify available evidence according to the topic of discussion, looking for an overview of the research implementation to identify key characteristics or factors related to the concept (Munn, Z., et.al, 2018). The stages of conducting a scoping review include focusing the review on research questions, using the PICO (Population, Intervention, Comparison and Outcome) framework, identifying relevant studies, describing the process of identifying literature with PRISMA flowcharts, data extraction and mapping or scoping (Arksey & O'Malley, 2005). Preparation of scoping review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018; Devi et al., 2022). Scoping review protocol registration on OSF home on doi: 10.17605/OSF.IO/UJRZP.

Step 1. Identify the research question

This scoping review aims to analyze husband's support, anxiety and the level of MFA during the prenatal period. The review question is "What are the results of the analysis of husband's support in prenatal anxiety and MFA?"

Step 2. Identify relevant studies

The use of PICO is used in identifying key concepts in the focus of the review, developing appropriate search terms to describe the problem, and determining inclusion and exclusion criteria. The article used for scoping this review is a quantitative research (Torous et al., 2021). The PICO framework is shown in table 1.

Table 1. PICO Framework

Population	intervention	comparison	Outcomes
Pregnant Women Pregnancy	Support Partners, Family Support, Social Support	anxiety, Social Anxiety	Maternal-Fetal Attachment, Prenatal Attachments

The article search strategy uses the Scopus, Ebsco, Pubmed, ScienceDirect and Proquest databases. In searching for articles, use the boolean operators "AND" and "OR".

Boolean Operator is a logical system that can be used as a word connector to combine, select, or exclude keywords when searching for information data using Search Engines.

The AND operator is used to narrow search results, because this operator will show search results with all of the keywords used. The OR operator expands search results, as it will show any or all of the keywords used (Design et al., 2019). The keywords used in the search for articles are “Pregnant Women AND Social Support OR Family Support OR Husband Support AND Anxiety OR Social Anxiety AND Maternal Fetal Attachment OR Prenatal Attachment”

Step 3. Study selection and data processing management

The selection of articles is determined based on the criteria (table 2):

Table 2. Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
1. original article	1. This article is a book review
2. Published in English	2. Opinion article
3. Published in 2016-2022	3. Is research thesis, dissertation.
4. Is the result of a quantitative study	

The findings of the articles were selected according to duplication, suitability criteria using the Mendeley format were then described in PRISMA-ScR (Tricco et al., 2018) shown in figure 1:

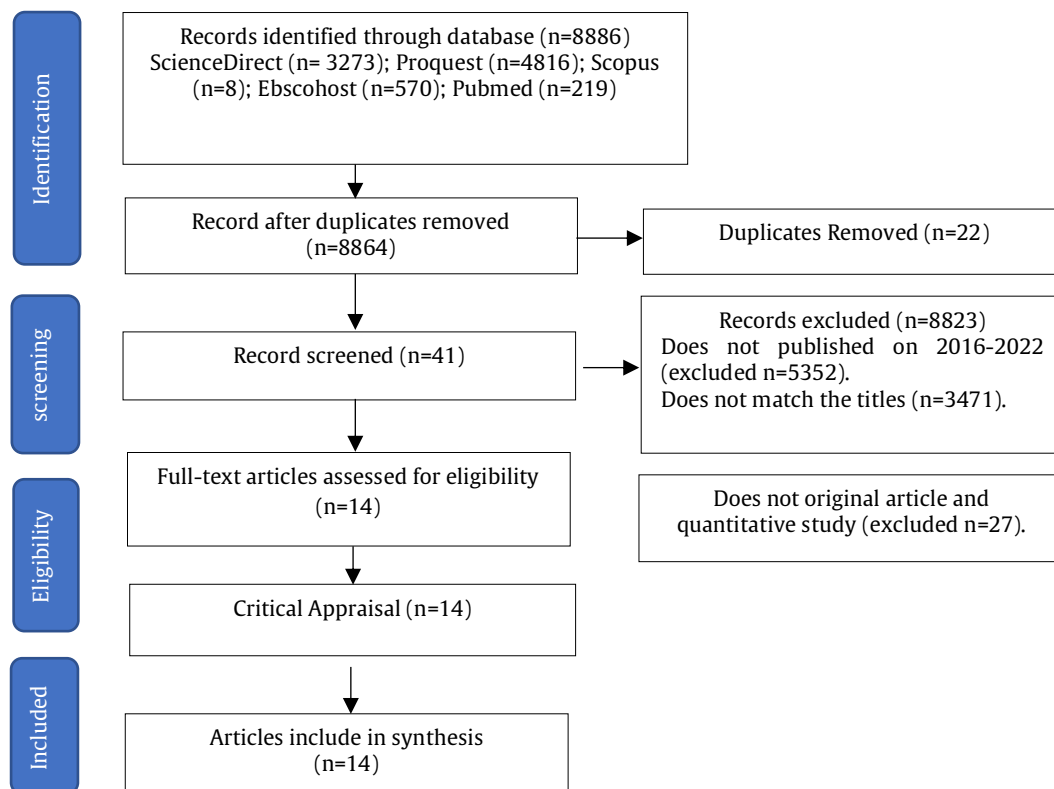


Figure 1. PRISMA Diagram

Step 4. Charting Data

Articles that meet the requirements for synthesis are mapped in a table which includes: (a) author and year of

publication, (b) country and journal name (c) research objective, (d) subjects/respondents (e). research design and methods, (f). research result. Charting data is shown in table 3:

Table 3. Charting Data

No	First Author, Year of Publication	Country, name journal	Study Purpose	Participants	Research Design & Methods	Outcomes
A1	Hopkins et al., (2018).	usa, Journal of reproductive and infant psychology vol. 36, no. 4, 381-392	Examine social support relationships, anxiety traits, psychological symptoms and MFA	94 pregnant women	Quantitative, case-control study, hierarchical regression analysis, Instruments: DASS-21, STAY-T, PSSQ, MAAS.	- Anxiety : $\beta = -0.23$, $p < 0.05$; social support: $\beta = -0.32$, $p < 0.01$; MFA: $\beta = -0.48$ $p < 0.01$ - Mothers with high levels of anxiety, low social support, tend to have low levels of MFA
A2	Yoon & Sung, (2021)	Korea, Korean J	Identifying the mediating effects	123 at-risk pregnant	Quantitative cross sectional study, data	- Average results: Anxiety score: 43.85, depression score: 10.13

		Women Health Nurs 2021;27(2): 104-112	of family support on anxiety and depression with MFA	women treated at the Maternal Fetal Intensive Care Unit (MFICU)	were taken using instrument MFAS, Cobb's family support, Trait Anxiety Inventory, EDPS	and 53.6% need psychiatric evaluation; family support: 43.3 and MFA 73.37. - Lower levels of anxiety and depression and high family support are associated with increased MFA. The mediating effect of family support, particularly spousal support was identified on anxiety, depression and MFA.
A3	Ertmann et al., (2021)	Denmark, BMC Psychologist 92021)9:2	Identify the importance of psychosocial factors on MFA	1328 first and third trimester pregnant women	Quantitative, prospective cohort study, instrument: MAAS	- MAAS 77.4 (SD=7.3), quality 45.7 (SD=3.4) and intensity 27.6 (SD=4.5). Low MAA in 513 pregnant women. - Social support, physical and mental health is low since early pregnancy, at risk of poor MFA.
A4	da Rosa et al., (2021)	Brazil, Early Human Development 154 (2021) 105310	Evaluating the MFA relationship and perceptions of parental bonding	839 pregnant women	Quantitative, cohort study, data collection using the Parental Bonding Instrument and the Maternal Fetal Attachment Scale (MFAS)	- Husband's protection increased MFA (B 2.00 95% CI 0.30; 3.7). - Primigravida, lack of spousal support, low MFA (p=0.04). - Husband's role is important for pregnant women, influencing feelings, affection, attention, on the fetus.
A5	Pasricha, Kochhar, Shah, & Bhatia, (2021)	India, Brief Research Report, vol.2 (2021)	relationship between pregnant women's sense of coherence, perceived social support, and maternal-fetal attachment to mental health outcomes.	122 nulliparous pregnant women	Quantitative, cross sectional study, data collection using the Edinburgh Depression Scale, Perceived Social Support, MFAS.	- MFA, coherence, social support were negatively correlated with antenatal depression and positively correlated with antenatal well-being (r=0.29, p=0.001). - Social support, sense of coherence, MFA contribute to the mental health and well-being of the fetus.
A6	Ozcan, Ustundag, Yilmaz, Aydinoglu, Ersoy, & Eyi, (2019)	turkey, The Eurasian Journal of Medicine, 2019; 51(3): 232-6	Exploring (personality style, mental problem solving techniques) and MFA	80 third trimester pregnant women	Quantitative, longitudinal study, data collection using instruments: PAI, BDI, CSAI, MAS scales	- A BDI score > 17 indicates moderate depressive symptoms with MFA. - Level of education, social support, as coping mechanisms are positively correlated with MFA.
A7	Beauquier-Maccotta et al., (2022)	France, Journal of Gynecology Obstetrics and Human Reproduction, 51 (2022) 102353	Evaluate emotional stress and MFA after TOP (termination of pregnancy)	25 pregnant women with a history of termination of pregnancy	Quantitative, prospective case-control study, data collection on subsequent pregnant women after termination of pregnancy, using instruments: PAI, PCLS, EPDS, SA & TA,	- Increased anxiety (66.7%), depression (30.4%), 25% stress symptoms. Trimester I MFA is lower, correlated with the intensity of grief. - The dynamics of pregnancy after TOP, the need for family psychological support, special attention that increases MFA.
A8	Smorti et al., (2020)	Italy, Midwifery 88 (2020) 102762	Assessing differences in levels of anxiety, fear of childbirth, centrality of pregnancy, and MFA in deliveries with and without Epidural Anesthesia (EDA).	87 third trimester pregnant women aged 24-44 years, 58 without EDA and 29 with EDA	quantitative, longitudinal study, data collection using instruments: Pregnancy Related Anxiety Questionnaire-R (PRAQ-R), W-DEQ, CES, PAI.	-Levels of anxiety, fear of giving birth, lower centralization of pregnancy and higher MFA in births without EDA compared to EDA. -High MFA provides a good birthing experience.
A9	Branjerdporn et al., (2021)	australia, Journal of Child and Family Studies:	Proving the relationship between MFA and psychological status (stress, anxiety)	N=108 Pregnant women	Quantitative, cross-sectional study Analysis: Independent sample t-test and chi square MAAS	- Psychological status correlated with MFA (alpha < 0.01), but was not associated with a history of infant loss. Good prenatal mental health status facilitates high MFA.

		30:528–541			Questionnaire & Mental Health Inventory	
A10	Ranjbar et al., (2021)	Iran, International Journal of Reproductive BioMedicine Volume 19, Issue no. 12	Comparing MFA and Pregnancy-Related Anxiety (PRA) levels in assisted reproductive technology (ART) pregnant women and natural pregnant women	N=43 pregnant women on ART, N=144 natural pregnant women	Quantitative, longitudinal study. Data collection using instruments: The Cranley MFA Scale and the Van Den Bergh PRA Questionnaire Data analysis with Independent sample t-test and chi square	-MFA was higher at week 36 than at week 12 ($p < 0.001$). The increase in MFA scores was higher in the ART group compared to natural ($p < 0.001$). Anxiety scores decreased in both groups ($p = 0.84$). -Pregnant women on ART and experiencing anxiety levels decreased as gestational age increased and MFA increased, but it was higher in pregnant women on ART.
A11	Zhang et al., (2021)	China, BMC Pregnancy and Childbirth, (2021) 21:307	Exploring comparisons of pregnancy rejection, prenatal depression scores and MFA rates.	n=250 primigravida s	Quantitative, case control, data collection using Instruments (EPDS), (ECR) scale, (MAAS) and a general data scale	- The EPDS score was higher in the group with a history of poor adult bonding (8.64 ± 4.47 vs 6.99 ± 4.24 , $p = 0.003$). The proportion of low MFA was higher in the group with a history of bad bonding (62.18% vs 48.94% , $p = 0.032$). - Pregnant women on ART and experiencing anxiety levels decreased as gestational age increased and MFA increased, but it was higher in pregnant women on ART.
A12	Schmidt et al., (2016)	German, Cogn Ther Res (2016) 40:565–576.	Knowing the relationship between mind load, worry as a trigger for anxiety related to MFA	n =215 Pregnant women	Quantitative, Longitudinal Studies, Instruments: DASS; PSWQ-PW; Ruminative Response Scale (RRS); MAAS. F-SozU-K-14. Data analysis using Pearson correlation.	- MASS-1, 45.5 ± 3.76 ; MASS-2 46.85 ± 3.41 . - DASS-1, 3.32 ± 3.25 . DASS-2, 2.86 ± 3.50 . - $P = 0.02$, - Decreased anxiety associated with increased MFA. - Burden of thoughts & worries affect late pregnancy anxiety. Decreased anxiety led to increased MFA late in pregnancy.
A13	Shamasbi et al., (2020)	Iran, Shiraz E-Med J. In Press(In Press):e119085.	Evaluate anxiety, pregnancy complaints and MFA	220 pregnant women	Quantitative, cross-sectional study, Instrument: PRAQ-R2, MFAS and PSI	- anxiety and symptoms of pregnancy ($P = 0.705$). - Improved treatment of complaints of pregnancy can reduce anxiety.
A14	Silahli et al., (2021)	Turkey, Comprehensive Psychoneuro endocrinology 8 (2021) 100085	Identify the relationship between MFA and milk ejection	50 pregnant women, average gestational age: 29.6 weeks and 38.4 weeks	Quantitative, prospective case-control study. Data collection using instruments: STAI, PAI, BMS	- Anxiety correlates with milk production, MFA is not proven to correlate with milk production. - Milk production is affected by anxiety during pregnancy and family support

Step 5. Assessment of Article Quality with Critical Appraisal

The tool for carrying out a careful and systematic assessment of the results of scientific research is Critical Appraisal to assess the quality of articles (Pollock et al., 2021). Critical Appraisal in the scoping of this review uses The Joanna Briggs Institute Critical Appraisal tools (JBI) for cross-sectional, cohort and case control studies (Moola, Z, et al., 2017). Assessment criteria are given a value of "yes", "no", "unclear" and "none". Every criteria with a "yes" score are given one point while the others are given a zero point. Each study score is then calculated and summed. The literature used has at least a minimum score of 50%. If it is less than 50% then it means that it is rejected and if it is more than

50% then the literature is accepted (Moola et al., 2016; Moola, Munn, et al., 2017; Moola, Z, et al., 2017). The results of critical appraisal on 14 articles, obtained a score of > 50%, so that all articles were synthesized in this scoping review.

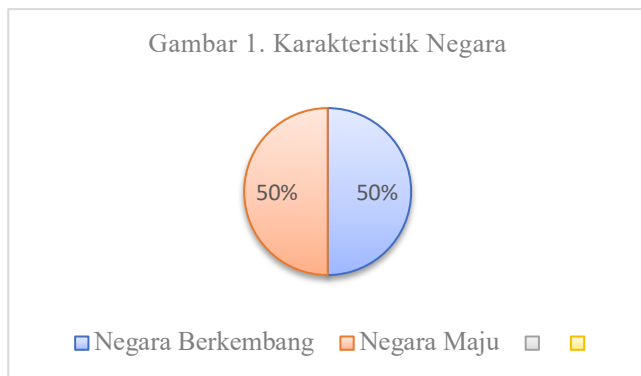
RESULTS AND DISCUSSION

RESULTS

Through the steps of filtering data using the Mendeley format, charting data has been obtained and JBI has been carried out. The articles found are described as follows:

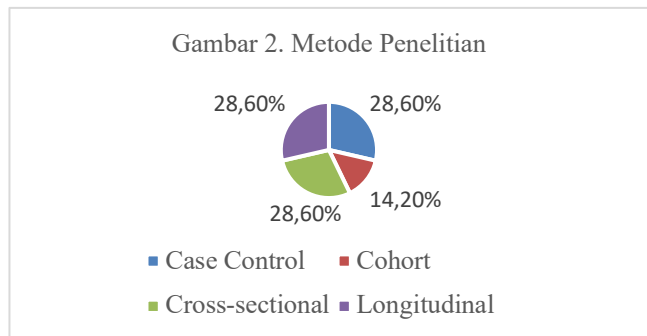
1.1. Characteristics of Articles by Country

Based on the 14 articles found, 7 (50%) articles were obtained from research in developing countries, namely 2 Iran, 2 Turkey, and 1 article each from China, Brazil and India. It was found that another 7 (50%) articles came from developed countries, namely 1 article each from the following countries: Australia, Germany, USA, Korea, Denmark, France and Italy. Husband's support is needed by all pregnant women in developing and developed countries and will affect anxiety and MFA levels. The distribution of country characteristics is described in a pie chart in Figure 1.



1.2. Characteristics of Articles Based on Research Methods

The research method found in 14 articles, that is, on average using the case-control method in 4 (28.6%) articles, namely articles A1, A7, A11, A14. Cross sectional 4 (28.6%) articles, namely A2, A5, A9, A13. Longitudinal 4 (28.6%) articles, namely A6, A8, A10, A12 and cohort 2 (14.2%) articles, namely A3, A4. Experimental study results were not found in this study. The distribution of the characteristics of the research method is described in the pie chart in Figure 2.



1.3. Theme Mapping

In the 14 articles found, the themes obtained are as follows (table 4):

Table 4. Theme Mapping

No	Themes	Sub Themes	Articles
1	Support	Social support Family support Husband support	A1, A3, A5, A6, A7. A2, A4, A5, A7. A2, A3, A4, A5, A6, A7, A11.
2	Psychological changes	Anxiety symptoms Coping mechanism	A1,A7. A8, A9, A11. A8, A10 A11.
3	Maternal Fetal Attachments	Factor affecting Interaction Quality Interaction Intensity	A2, A8, A9, A10, A11, A14. A1, A6, A7, A8, A9, A10, A11, A12.
4	Impact	Birth result Baby's growth Childbirth experience	A1, A4, A5, A8, A9, A10. A1, A2, A4, A11, A13. A3, A10, A12, A14. A8

DISCUSSION

1.4. Theme 1. Support

In this review, there are articles that discuss prenatal support. Found 5 articles discussing social support, 4 articles about family support and 7 articles about husband's support.

a. Social support

Pregnant women need other people to talk to and help with the pregnancy situation they are experiencing. Social support is physical and psychological comfort provided by friends, neighbours, health workers and family. Social support can be in the form of emotional support, awards, instrumental, information, and group support (Pasricha, K., et al., 2021). The support obtained by pregnant women will affect safety, calm so as to reduce the risk of psychological adverse effects, namely anxiety, stress and depression. The positive impact of social support given to pregnant women is adjustment to the pregnancy situation with various physical and psychological changes (Maccotta, 2022). The support

that pregnant women get will make them calm and comfortable during pregnancy, which has the effect of increasing the mother's concern for her fetus. Pregnant women pay attention to the growth and development of the fetus, care for the fetus and carry out antenatal care regularly and actively participate in prenatal classes that are beneficial in maintaining pregnancy, fetal health and giving birth to healthy babies (Pasricha, K., et al., 2021). The results of the 5 research articles show evidence that is in line with the importance of family support for pregnant women, from the first trimester to the third trimester, both in normal, high-risk pregnancies and pregnancies due to Assisted Reproductive Technology (ART) (Ranjbar et al., 2021; Hopkins et al., 2018). The social support that pregnant women get affects lower anxiety and stress levels and has an impact on high maternal fetal attachment and healthy baby birth outcomes. Even though social support can be obtained from friends, relatives, health workers, family, the support that most dominantly affects the safety and comfort of pregnant women is more important than the partner/husband (Ertmann et al., 2021).

b. Family support

Family support is social support, but comes from relatives who have blood ties such as parents, in-laws, siblings or the nuclear family which includes husband and children. The support given is proof of love, concern, and willingness to listen to complaints. Family support acts as a mediator to reduce the decline in MFA due to anxiety and depression. The bond that pregnant women feel with their parents as a source of support is an emotional experience from their parents from infancy, children to adolescents so that they feel close and comfortable being close to parents/family (Yoon & Sung, 2021).

Family support has a big contribution in determining the health status of pregnant women. Families expecting a pregnancy show great support and concern for pregnant women. Pregnant women are more confident, happy, ready to go through pregnancy, childbirth and postpartum. Family support affects the level of maternal anxiety during pregnancy and has an impact on MFA (Bäckström et al., 2017; Yoon & Sung, 2021). Family support increases feelings of security, reduces anxiety and increases mother's concern for the fetus. In parallel research Wang et. al. (2021) mentioned, family support is needed by pregnant women in dealing with pregnancy until the birth of the baby, reducing stressors for pregnant women and having an impact on the response of pregnant women in assessing the situation they are experiencing. Pregnant women feel safe and comfortable because there are families who are ready to help so that they change their response to the source of anxiety by confiding in the family about the situation they are experiencing.

c. Husband's Support

Husband's support is verbal and non-verbal communication, advice, help tangible or behavior given by the husband to pregnant women. Husband's support is a form of attention and affection given physically and psychic as the closest individual physically and psychologically to pregnant women.

Husband has a big share in status mother's health (Fielding-Miller et al., 2022). Good husband support can motivate mothers to have their pregnancies checked. Husband can help with choreswife, meet the wife's needs during pregnancy, deliver check-ups, accompany the wife to do exercise activities during pregnancy so that the growth and development of the fetus is better (Doss, 2010; Bäckström et al., 2017). The results of the study are in line with the fact that pregnant women with good husband support show higher MFA, shorter delivery times and normal birth babies (Ross et al., 2018).

1.5. Theme 2: Psychological Change

Based on the analysis of 14 articles, the theme of prenatal psychological change was found, with 2 sub-themes covering: anxiety symptoms in 5 articles and coping mechanisms in 3 articles.

a. Anxiety symptoms

Anxiety is a psychological condition of a person who is full with fear and worry about something that is not certain to happen. Symptoms of anxiety include restlessness, nervousness, unexplained worry and avoidance behavior. Relevant research results state that pregnant women with

high anxiety produce low MFA (Beauquier-Maccotta et al., 2022). According to Branjerdporn et al., (2021) and Smorti, et al., (2020) who conducted research on pregnant women that physical changes cause body image disturbance and fear of giving birth causes an increase in anxiety which affects the decrease in the ability of pregnant women to adapt to pregnancy. Anxiety in pregnant women can interfere with positive affective experiences and cognition in the fetus so that the MFA is low.

b. Coping mechanism

Coping mechanisms are ways to adapt to the anxiety and stress experienced by individuals (Ozcan, et al., 2019). Pregnant women who experience mild anxiety are easier to overcome by crying, telling stories with their husbands, meeting with the community of pregnant women in prenatal classes. In conditions of severe anxiety, it requires greater coping and involves health workers. If anxiety cannot be resolved, there is a risk of pathological problems due to the inability to deal with threats (Hyer et al., 2022). Pregnant women with high anxiety and worry about giving birth have negative expectations of childbirth, so they choose analgesics as an effort to relieve pain. The results of the study prove that the choice of coping mechanism with the choice of anesthesia has a lower MFA than pregnant women who choose not to use anesthesia during childbirth (Smorti et al., 2020). In pregnant women with Assisted Reproductive Technology (ART) coping who are chosen to be more careful in treating pregnancies, every change in the fetus is considered so that it increases MFA better than natural pregnant women (Ranjbar et al., 2021). For anxiety that occurs during pregnancy, coping mechanisms can generally be obtained from other people, namely family members, especially husbands and health workers. Health workers can screen anxiety, attachment behavior and socialize attachment behavior so that pregnant women can better adapt to pregnancy so that MFA increases (Zhang et al., 2021; Ranjbar et al., 2021).

1.6. Theme 3. Maternal-Fetal Attachment

The results of the analysis of 14 articles found the theme of maternal fetal attachment (MFA) which consisted of 3 sub-themes namely: factors influencing MFA, found in 6 articles, interaction quality in 8 articles and intensity of interaction in 6 articles.

a. Factor affecting

The results of the analysis found 6 articles discussing the factors that influence MFA. In this study, the factors that affect MFA are relatively the same, but the level of MFA is influenced by the diagnosis of normal or high-risk pregnancy (Ranjbar et al., 2021). It was found in other studies, factors that influence MFA include anxiety levels, perceived support during pregnancy, age level, educational level, socioeconomic status, attitude towards pregnancy and personality characteristics of pregnant women (Yoon & Sung, 2021; da Rosa et al., 2021; Silahli et al., 2021). The results of other studies state that anxiety and attachment to partners affect MFA. These findings confirm that the husband's support factor is an important factor affecting the safety and comfort of pregnant women. Husband is the closest source of support emotionally capable of providing peace, security and comfort to pregnant women which affects the fetus, stimulates optimal growth and development (Zhang et al.,

2021; Smorti et al., 2020). The experience of attachment that was obtained during the pre-pregnancy period stimulated the activation of the internal working model and was manifested in emotional and behavioral responses to the pregnancy encountered, so that the support of the closest people was very important to support positive behavior MFA (Zhang et al., 2021).

b. Interaction quality

Based on charting data, the majority of articles discussed the quality of interaction between mother and fetus, there were 8 of 14 articles. MFA is a behavior that represents the affiliation and interaction of mother and fetus. A good quality MFA is important with regard to preparation for motherhood, care of the fetus and interest in the baby. The quality of interaction determines the quality of care and the physical, cognitive, affective, social, mental development of the baby (Ozcan, U., et.al., 2019). Pregnant women with poor MFA quality will interfere with the health of the fetus (Beauquier-Maccotta et al., 2022). Pregnant women with high anxiety reduce the quality of interactions and mediate interactions after birth are still of less quality. Evidence suggests prenatal anxiety is related to low quality MFA. The quality of MFA can lay the foundation for a more quality attachment relationship after the baby is born (Schmidt et al., 2016).

c. Interaction Intensity

The intensity of mother-fetus interaction is the number or frequency of pregnant women showing concern for the fetus through the act of communicating/telling stories with the fetus, stroking the fetus when the fetus moves or listening to music/murrotal together. The results of the study are in line, stating that pregnant women who interact more positively with their fetuses show higher MFA and lower risk of delivery. Mothers also give birth with tolerable pain or less pain so less use of epidural anesthesia (da Rosa et al., 2021; Smorti et al., 2020). Pregnant women who are active in sensory interaction with their fetus, spend more time in thoughts and behaviors related to the fetus, activities that are expressed as pleasant for the mother and her fetus (Branjerdporn et al., 2021). Reinforced in research that the intensity and frequency of MFA will increase with increasing gestational age in line with the development of the fetus. The expectant mother imagines and describes the appearance and personality of the fetus in her mind. Besides that, routine pregnancy checks so that you can listen to the fetal heart rate via Doppler, see and feel fetal movements via ultrasound stimulate more increased MFA intensity (Ranjbar et al., 2021).

1.7. Theme 4. Impact

The theme of impact resulted in 3 sub-themes including: birth outcomes, in 4 articles, baby growth and development in 4 articles and birth experience in 1 article.

a. Birth Results

Anxiety during pregnancy can affect MFA and have an impact on poor pregnancy care, lack of nutrition needed for fetal growth and development, lack of concern for health guidelines during pregnancy, unhealthy behavior. This can affect the health of the mother and poor fetal growth and development as well as unhealthy neonatal outcomes

(Shamasbi et al., 2020). Low MFA, associated with high anxiety and poor support can lead to negative health consequences for mother and baby, can be at risk of producing unhealthy babies, preterm labor, low birth weight, low birth APGAR scores, prolonged labor and developmental delays child. The results of other studies also state that the level of MFA can predict the development of children's emotional behavior abilities from an early age (Zhang et al., 2021; Yoon & Sung, 2021; da Rosa et al., 2021).

b. Baby's growth

There are 4 articles that reveal the quality of MFA with the growth and development of the baby after birth. The quality of MFA is a major factor in the cognitive, emotional and mental development of infants, children and adolescents (Ranjbar et al., 2021). The results of the study found that consistently low MFA scores were preceded by perinatal anxiety and depression that persisted after delivery. This is a risk factor for the growth and development of children that is detrimental to long-term child mental and behavioral disorders (Ertmann et al., 2021). Study of Punamäki et al., (2017), a negative MFA is associated with poorer infant language and sensorimotor development and poorer continuation of mother-infant interactions in the postpartum period. A low MFA indicates a decrease in the ability to understand and interpret the baby's signals after birth accurately so that the response given by the mother becomes less precise. Lack of concern is a trigger for cognitive, emotional, mental and social problems in infants (Schmidt et al., 2016; Silahli et al., 2021). This explains that maternal anxiety and depression during pregnancy affect MFA and have an impact on attachment after birth and poor infant growth and development.

c. Childbirth experience

Maternal fetal attachment is a mother-fetus bond of affection that influences the mother's focus on the delivery aspect. Strong affection and attention to the fetus, has an impact on the complex interaction between physical and hormonal signals from mother to fetus that affect aspects of labor. The attachment of maternal-fetal affection affects ambivalent expectations of labour, but will lead to the focus of labour, pain being perceived as a non-threatening transformative event and supported by a strong desire to hold the baby immediately. In other words, strong prenatal attachment has an impact on a positive birth experience. Pregnant women give birth normally, naturally and healthy babies, reduce the risk of childbirth with actions, both induction, caesarean section and the use of anesthesia in the delivery process (Smorti et al., 2020; Whitburn et al., 2017; Rookesh et al., 2021).

LIMITATION OF THE STUDY

The findings of the articles in this scoping review were carried out by a critical appraisal using The Joanna Briggs Institute Critical Appraisal tools (JBI). There were 4 articles with longitudinal studies for which JBI instruments were not available for critical appraisal, so that articles with longitudinal studies were carried out critical appraisal using JBI Tools cross sectional studies.

CONCLUSIONS AND SUGGESTIONS

Maternal fetal attachment (MFA) is a bond of mother-fetus affection. The high or low quality of attachment is influenced by husband's support and anxiety. Husband's support is the main part of social support for pregnant women, because the husband is the individual who is emotionally closest to pregnant women. Anxiety for pregnant women can occur due to social status, readiness in pregnancy, husband's acceptance, worries about childbirth and health during pregnancy. Husbands who provide good support are beneficial for the comfort of pregnant women so that MFA increases. A high MFA has an impact on fetal development, readiness for childbirth, birth outcomes and growth and development of infants up to adolescents. It is necessary to optimize husband's support for pregnant women and increase the comfort of pregnant women to increase MFA,

Acknowledgment

The author would like to thank the Nursing Study Program, Faculty of Health Sciences, Aisyiyah University, Yogyakarta and the Doctoral Program in Medicine and Health, Faculty of Medicine, Diponegoro University, Semarang.

ETHICAL CONSIDERATIONS

This review is not conducted with an ethical review.

Funding Statement.

No funding was received for conducting this study.

Conflict of Interest Statements

In writing this scoping review, the authors do not have a conflict of interest, and the authors will be responsible for writing a scoping review.

REFERENCES

- Alhusen, J. L., Gross, D., Hayat, M. J., Woods, A. B., & Sharps, P. W. (2014). *The influence of maternal-fetal attachment and health practices on neonatal outcomes in low-income, urban women.* 35(2), 112-120. <https://doi.org/https://doi.org/10.1002/nur.21464>
- Arksey, H., & O' Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology: Theory and Practice*, 8(1), 19-32. <https://doi.org/10.1080/1364557032000119616>
- Bäckström, C., Thorstensson, S., Mårtensson, L. B., Grimming, R., Nyblin, Y., & Golsäter, M. (2017). 'To be able to support her, I must feel calm and safe': Pregnant women's partners perceptions of professional support during pregnancy. *BMC Pregnancy and Childbirth*, 17(1), 1-11. <https://doi.org/10.1186/s12884-017-1411-8>
- Baltacı, N., & Başer, M. (2018). Maternal-Fetal Attachment During Pregnancy and Nursing. *Health Sciences Research in the Globalizing World, October 2018*, 123-131. <https://www.researchgate.net/publication/329885554>
- Baroah, R., Jannah, M., Windari, E. N., & Wardani, D. S. (2020). Hubungan Antara Tingkat Kecemasan Pada Ibu Hamil dalam Menghadapi Persalinan dengan Skor Prenatal Attachment. *Journal of Issues in Midwifery*, 4(1), 12-19. <https://doi.org/10.21776/ub.joim.2020.004.01.2>
- Beauquier-Maccotta, B., Shulz, J., De Wailly, D., Meriot, M. E., Soubieux, M. J., Lisa, O., Grosmaître, C., Salomon, L. J., Golse, B., Ville, Y., & Missonnier, S. (2022). Prenatal attachment, anxiety and grief during subsequent pregnancy after medical termination of pregnancy. Attachment to which child? *Journal of Gynecology Obstetrics and Human Reproduction*, 51(4). <https://doi.org/10.1016/j.jogoh.2022.102353>
- Branjerdporn, G., Meredith, P., Wilson, T., & Strong, J. (2021). Maternal - Fetal Attachment : Associations with Maternal Sensory Processing , Adult Attachment , Distress and Perinatal Loss. *Journal of Child and Family Studies*, 528-541. <https://doi.org/10.1007/s10826-020-01876-1>
- Calkins, F. C., & Brock, R. L. (2022). Attachment anxiety and avoidance predict postnatal partner support through impaired affective communication. *Journal of Marriage and Family*, 84(2), 515-532. <https://doi.org/10.1111/jomf.12806>
- Čėsnaite, G., Domža, G., Ramašauskaitė, D., & Voločovič, J. (2019). Factors affecting the maternal-foetal relationship. *Acta Medica Lituanica*, 26(2), 118-124.
- da Rosa, K. M., Scholl, C. C., Ferreira, L. A., Trettim, J. P., da Cunha, G. K., Rubin, B. B., Martins, R. da L., Motta, J. V. D. S., Fogaça, T. B., Ghisleni, G., Pinheiro, K. A. T., Pinheiro, R. T., Quevedo, L. de A., & de Matos, M. B. (2021). Maternal-fetal attachment and perceived parental bonds of pregnant women. *Early Human Development*, 154, 105310. <https://doi.org/10.1016/j.earlhumdev.2021.105310>
- Design, L., Class, F., Operators, B., & Not, N. O. T. U. (2019). *Boolean Logical Operations*. 29-31.
- Devi, D. A., Hanifah, L., Prihatiningsih, A. D., & Astuti, A. W. (2022). *Jurnal Aisyah : Jurnal Ilmu Kesehatan Role of the Midwife in The Use of Ultrasonography (USG) Equipment in Antenatal Care (ANC) Service : A Scoping Review.* 7(4), 1081-1090. <https://doi.org/10.30604/jika.v7i4.1283>
- Doss, B. D. (2010). The Effect of the Transition to Parenthood on Relationship Quality: An Eight-Year Prospective Study. *Journal of Personality*, 96(3), 601-619. <https://doi.org/10.1037/a0013969>
- Doss, B. D., & Rhoades, G. K. (2017). The transition to parenthood: impact on couples' romantic relationships. *Current Opinion in Psychology*, 13, 25-28. <https://doi.org/10.1016/j.copsy.2016.04.003>
- Emily J. Fawcett, Ph.D.1, Nichole Fairbrother, Ph.D.2, Megan L. Cox, B.Sc.3, Ian R. White, Ph.D.4, Jonathan M. Fawcett, P. D. . (2019). The Prevalence of Anxiety Disorders during Pregnancy and the Postpartum Period: A Multivariate Bayesian Meta-Analysis Emily. *J Clin Psychiatry*, 80(4), 1-23. <https://doi.org/doi:10.4088/JCP.18r12527>
- Ertmann, R. K., Bang, C. W., Kriegbaum, M., Væver, M. S., Kragstrup, J., Siersma, V., Wilson, P., Lutterodt, M. C., & Smith-Nielsen, J. (2021). What factors are most important for the development of the maternal-fetal relationship? A prospective study among pregnant women in Danish. *BMC Psychology*, 9(1), 2. <https://doi.org/10.1186/s40359-020-00499-x>
- Faroch Abazari, Batool Pouraboli, P. T. (2017). Anxiety and Its Relationship With Maternal Fetal Attachment in Research Papers Anxiety and Its Relationship with Maternal-Fetal Attachment in Pregnant Women in Southeast of Iran. *J-*

- Manager's Journal on Nursing*, 7(3).
<https://doi.org/10.26634/jnur.7.3.13788>
- Fielding-Miller, R., Barker, K., & Wagman, J. (2022). Relative Risk of Intimate Partner Violence According to Access to Instrumental Social Support Among Pregnant Women in Eswatini Whose Partners Do and Do Not Drink Alcohol. *Journal of Interpersonal Violence*, 37(13–14), NP12671–NP12684. <https://doi.org/10.1177/0886260521993925>
- Hassan, N. M. M., & Hassan, F. M. A. E. (2017). Predictors of Maternal Fetal Attachment among Pregnant Women. *IOSR Journal of Nursing and Health Science*, 6(1), 95–106. <https://doi.org/10.9790/1959-06010695106>
- Hopkins, J., Miller, J. L., Butler, K., Gibson, L., Hedrick, L., & Boyle, D. A. (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>
- Hyer, S., Hu, W., Hu, M., Davis, J. W., Xie, R., & Giurgescu, C. (2022). Relationship With the Father of the Baby and Pregnancy-Related Anxiety Among Pregnant Black Women. *MCN The American Journal of Maternal/Child Nursing*, 47(4), 213–219. <https://doi.org/10.1097/NMC.0000000000000830>
- Mohamadirizi, S., & Kordi, M. (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. <https://doi.org/10.4103/2277-9531.184550>
- Moola, S., Munn, Z., Tufanaru, C., Aromataris, E., Sears, K., & Sfetcu, R. Currie M, Qureshi R, Mattis P, Lisy K, M. P.-F. (2016). Checklist for Case Control Studies. *Joanna Briggs Institute Critical Appraisal Tools*, 1–6.
- Moola, S., Munn, Z., Tufanaru, C., Aromataris, E., Sears, K., Sfetcu, R., Currie, M., Qureshi, R., Mattis, P., Lisy, K., & Mu, P.-F. (2017). Checklist for Cohort Studies. *Joanna Briggs Institute Reviewer's Manual*, 1–7. https://joannabriggs.org/ebp/critical_appraisal_tools
- Moola, Z. M. (2017). Checklist for analytical cross sectional studies. In *Joanna Briggs Institute Reviewer's Manual* (pp. 1–7).
- Ozcan, H., Ustundag, M. F., Yilmaz, M., Aydinoglu, U., Ersoy, A. O., & Eyi, E. G. Y. (2019). The Relationships between Prenatal Attachment, Basic Personality Traits, Styles of Coping with Stress, Depression, and Anxiety, and Marital Adjustment Among Women in the Third Trimester of Pregnancy. *The Eurasian Journal of Medicine*, 51(3), 232–236. <https://doi.org/10.5152/eurasianjmed.2019.15302>
- Pasricha, M., Kochhar, S., Shah, A., & Bhatia, A. (2021). Sense of Coherence, Social Support, Maternal-Fetal Attachment, and Antenatal Mental Health: A Survey of Expecting Mothers in Urban India. *Frontiers in Global Women's Health*, 2, 714182. <https://doi.org/10.3389/fgwh.2021.714182>
- Pollock, D., Davies, E. L., Peters, M. D. J., Tricco, A. C., Alexander, L., McInerney, P., Godfrey, C. M., Khalil, H., & Munn, Z. (2021). Undertaking a scoping review: A practical guide for nursing and midwifery students, clinicians, researchers, and academics. *Journal of Advanced Nursing*, 77(4), 2102–2113. <https://doi.org/10.1111/jan.14743>
- Punamäki, R., Diab, S. Y., Isosävi, S., Kuittinen, S., Qouta, S. R., (2017). Psychological Trauma : Theory , Research , Practice , and Policy Maternal Pre- and Postnatal Mental Health and Infant Development in War Conditions. *Psychological Trauma: Theory, Research, Practice and Policy, First Publ*(13 April). <https://doi.org/http://dx.doi.org/10.1037/tra0000275>
- Ramsdell, E. L., Franz, M., & Brock, R. L. (2020). A Multifaceted and Dyadic Examination of Intimate Relationship Quality during Pregnancy: Implications for Global Relationship Satisfaction. *Family Process*, 59(2), 556–570. <https://doi.org/10.1111/FAMP.12424>
- Ranjbar, F., Catja Warmelink Comma Comma, J., Mousavi, R., & Gharacheh, M. (2021). Maternal-fetal attachment and anxiety in pregnant women who conceived through assisted reproductive technology: A longitudinal study. *International Journal of Reproductive Biomedicine*, 19(12), 1075–1084. <https://doi.org/10.18502/ijrm.v19i12.10058>
- Røhder, K., Væver, M. S., Aarestrup, A. K., Jacobsen, R. K., Smith-Nielsen, J., & Schiøtz, M. L. (2020). Maternal-fetal bonding among pregnant women at psychosocial risk: The roles of adult attachment style, prenatal parental reflective functioning, and depressive symptoms. *PLoS ONE*, 15(9 Septembe). <https://doi.org/10.1371/journal.pone.0239208>
- Rookesh, Z., Kaviani, M., Zarshenas, M., Marzieh, & Akbarzadeh. (2021). Comparison of Maternal-Infant Attachment in Cesarean Delivery Based on Robson Classification : A Cross-Sectional Study. *Iranian Journal of Nursing and Midwifery Research*, 25(6), 500–507. <https://doi.org/10.4103/ijnmr.IJNMR>
- Ross, L. E., Goldberg, A. E., Tarasoff, L. A., & Guo, C. (2018). Perceptions of partner support among pregnant plurisexual women: A qualitative study. *Sexual and Relationship Therapy*, 33(1–2), 59–78. <https://doi.org/10.1080/14681994.2017.1419562>
- Schmidt, D., Seehagen, S., Vocks, S., Schneider, S., & Teismann, T. (2016). Predictive Importance of Antenatal Depressive Rumination and Worrying for Maternal-Foetal Attachment and Maternal Well-Being. *Cognitive Therapy and Research*, 40(4), 565–576. <https://doi.org/10.1007/s10608-016-9759-z>
- Shamasbi, S. G., Barkin, J. L., Ghanbari-homayi, S., Eyvazzadeh, O., & Mirghafourvand, M. (2020). The Relationship between Maternal Functioning and Mental Health after Childbirth in Iranian Women. *International Journal of Environment Research and Public Health*, 26 February, 1–11. <https://doi.org/doi:10.3390/ijerph17051558>
- Silahlı, M., Tekin, M., Vatandaş, N. Ş., & Atay, G. (2021). The relationship between prenatal attachment and postnatal adaptation, maternal anxiety and breast milk sodium level. *Comprehensive Psychoneuroendocrinology*, 8, 100085. <https://doi.org/10.1016/j.cpnc.2021.100085>
- Smorti, M., Ponti, L., Simoncini, T., Pancetti, F., Mauri, G., & Gemignani, A. (2020). Psychological factors and maternal-fetal attachment in relation to epidural choice. *Midwifery*, 88. <https://doi.org/10.1016/j.midw.2020.102762>
- Suryaningsih, E. K., Gau, M. L., & Wantonoro. (2020). Concept analysis of maternal-fetal attachment. *Belitung Nursing Journal*, 6(5), 157–164. <https://doi.org/10.33546/bnj.1194>
- Torous, J., Kelly, L., Macdougall, S., Jerrott, S., Clark, S., Campbell, L. A., Murphy, A., & Wozney, L. (2021). Text Message Interventions in Adolescent Mental Health and Addiction Services: Scoping Review. *JMIR Ment Health*, 8(1). <https://doi.org/10.2196/16508>
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D. (2018). Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist SECTION. In *Ann Intern Med* (Vol. 169, Issue 7, pp. 11–12). <https://doi.org/10.7326/M18-08502>
- Wallace, K., & Arajı, S. (2020). An Overview of Maternal Anxiety During Pregnancy and the Post-Partum Period. *Journal of*

Mental Health & Clinical Psychology, 4(4), 47–56.
<https://doi.org/10.29245/2578-2959/2020/4.1221>

- Wang, Y.-N., Yuan, Z.-J., Leng, W.-C., Xia, L.-Y., Wang, R.-X., Li, Z.-Z., Zhou, Y.-J., & Zhang, X.-Y. (2021). Role of perceived family support in psychological distress for pregnant women during the COVID-19 pandemic. *World Journal of Psychiatry*, 11(7), 365–374. <https://doi.org/10.5498/wjpv11.i7.365>
- Whitburn, L. Y., Jones, L. E., Davey, M., & Small, R. (2017). *The meaning of labour pain: how the social environment and other contextual factors shape women ' s experiences*. 1–10. <https://doi.org/10.1186/s12884-017-1343-3>
- Yoon, S.-H., & Sung, M.-H. (2021). Does family support mediate the effect of anxiety and depression on maternal-fetal attachment in high-risk pregnant women admitted to the maternal-fetal intensive care unit? *Korean Journal of Women Health Nursing*, 27(2), 104–112. <https://doi.org/10.4069/kjwhn.2021.05.14>
- Zachary Munn, Micah D.J. peters. Cindy Stern, Catalin Tufanaru, A. M. and E. A. (2018). The Routledge International Handbook of Embodied Perspectives in Psychotherapy. In H. Payne, S. Koch, J. Tantia, & T. Fuchs (Eds.), *BMC, Medical Research Methodology* (Vol. 18, Issue 143). Routledge. <https://doi.org/10.4324/9781315159416>
- Zhang, L., Wang, L., Yuan, Q., Huang, C., Cui, S., Zhang, K., & Zhou, X. (2021). The mediating role of prenatal depression in adult attachment and maternal-fetal attachment in primigravida. *BMC Pregnancy and Childbirth*, 21(1), 307. <https://doi.org/10.1186/s12884-021-03779-5>

