

Examining the Relationship between Fear of Childbirth, Maternal-Infant Attachment, and Postpartum Depression

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Article Info

Article type:

Original Research

How to cite this article:

Zenhari, A., & Vaziri, S. (2024). Examining the Relationship between Fear of Childbirth, Maternal-Infant Attachment, and Postpartum Depression. *KMAN Counseling and Psychology Nexus*, 2(1), 104-110.

<http://doi.org/10.61838/kman.psynexus.2.1.16>



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ABSTRACT

The purpose of this study was to examine the relationship between fear of childbirth, maternal-infant attachment, and postpartum depression. This research employed a descriptive correlational method, with the study population consisting of all mothers who attended healthcare centers in the city of Hamedan to receive prenatal services. From this population, a sample of 153 individuals was selected using multi-stage cluster sampling and responded to the Childbirth Fear Questionnaire (Wijma, 2001), the Maternal-Infant Attachment Questionnaire (Condon & Corkindale, 1991), and the Edinburgh Postnatal Depression Scale (Cox, Holden, & Sagovsky, 1991). The collected data were analyzed using SPSS software version 23. Findings showed that regression coefficients indicated that fear of childbirth could explain 33% of the variance in maternal-infant attachment. Additionally, fear of childbirth explained 34% of the variance in postpartum depression. Consequently, fear of childbirth is associated with maternal-infant attachment and postpartum depression, suggesting that by controlling fear of childbirth, it may be possible to positively impact postpartum depression and maternal-infant attachment.

Keywords: *postpartum depression, fear of childbirth, maternal-infant attachment*

1. Introduction

Pregnancy is considered the most significant event in a woman's life, yet it is not always a positive experience for all women and, if not properly managed, can impose considerable stress on the mother and her surroundings (Ionio et al., 2021). The postpartum period is a time when women are vulnerable to physical and emotional challenges. The prevalence of postpartum depression among Iranian women has been reported at 22.2% (Abdollahi et al., 2020; Golmakani et al., 2020). Pregnancy and childbirth are physiological events that are generally positive but may sometimes involve complications that, if not addressed, can be hazardous for the mother (Barber et al., 2021). Pregnancy is regarded as a significant source of stress in a woman's life, with fear of childbirth being one of the main challenges during both pregnancy and the postpartum period.

Fear of childbirth is a persistent anxiety disorder characterized by symptoms such as nightmares, physical complaints, and difficulty focusing on work and social or family activities (Mardani, 2021). This condition is often associated with requests for cesarean section as the preferred delivery method. Multiple psychological and social factors influence fear of childbirth, including fear of the unknown, desire to avoid pain, need for physical and emotional comfort, maternal personality traits, genetic predispositions toward stress, unpleasant experiences, encouragement from others, concerns about adverse maternal outcomes, inadequate interaction with healthcare staff, fear of death or loneliness, concern for the infant's health, and lack of sufficient social support (Tabee Bordbar et al., 2024).

One intervention that helps mothers learn stress and anxiety management strategies is through various methods to enhance maternal attachment to the fetus (Golmakani et al., 2020). Maternal attachment to the fetus forms a unique emotional bond between mother and child, which begins before birth during pregnancy. Fear of childbirth and pregnancy can be linked to maternal socio-stress factors, and the type and quality of health education in maternal care should be considered (Vahidi et al., 2023). Evidence shows the development of maternal-fetal attachment during pregnancy, reflected in maternal behaviors. A mother who forms an attachment to her fetus during pregnancy is prepared to establish a positive relationship with the newborn after birth (Golmakani et al., 2020). Attachment is a type of emotional bond used to conceptualize and measure the quality of emotional relationships between two

individuals, with its most important feature being the psychological security it provides (Zhang et al., 2020).

In fact, attachment is an organized behavioral pattern that maintains emotional relationships and lasts throughout life. Its goal is to maintain and regulate the child's closeness to important individuals in their life (Noroozi et al., 2020). This attachment is influenced by several complex factors that depend on culture and environment. Maternal depression in the first weeks and months postpartum may weaken the mother-child bond, which, over time, can lead to more behavioral issues in the child (Junge-Hoffmeister et al., 2022). According to the DSM-5, postpartum depression is diagnosed as a depressive disorder occurring within the first four weeks postpartum, identified as a major unipolar disorder that begins within four to six weeks after delivery and continues for at least two consecutive weeks. Key symptoms of depression include fatigue, depressed mood, loss of interest in most activities, weight and appetite changes, sleepiness or insomnia, psychomotor changes, feelings of worthlessness or guilt, concentration issues, and recurrent thoughts of death or suicide (Ahmadpour et al., 2023; Febriani et al., 2024; Hildingsson & Rubertsson, 2022).

Anxiety disorders may have complications for mothers and fetal development, including mood disorders in children, severe cardiovascular diseases, premature delivery, blood pressure disorders, intrauterine growth retardation, low birth weight, prolonged labor stages, maternal complications, and postpartum depression (Navaee et al., 2024). Several studies have examined factors influencing pregnancy anxiety, including socio-economic conditions, quality of healthcare, psychological and physical issues caused by pregnancy, parenting challenges, fetal health, and fear of childbirth, particularly vaginal delivery (Abdollahi et al., 2020; Ahmadpour et al., 2023; Dal Moro et al., 2023; Demirel et al., 2022).

According to studies conducted in Iran, it is estimated that 0.5 to 20 percent of pregnant women experience fear of childbirth. Among every five pregnant women, one experiences severe and disabling fear (Moradi et al., 2022). Human attachment plays a significant role in emotional and social relationships throughout life (Febriani et al., 2024). Given these research gaps, the question arises: Is there a relationship between fear of childbirth, maternal-infant attachment, and postpartum depression?

2. Methods and Materials

2.1. Study Design and Participants

This study is applied in terms of its purpose and descriptive correlational in terms of methodology. The research population included all mothers attending healthcare centers in the city of Hamedan for prenatal services. The sample selection was carried out using multi-stage cluster sampling. Hamedan has four urban areas, of which three were selected. Two clinics were chosen from each of these areas, and 26 mothers from each clinic (and 25 from one clinic) were selected for the sample. This approach was used to gather data from pregnant mothers in the chosen healthcare centers. Inclusion criteria were pregnant women aged 18 to 45 and the presence of postpartum depression. Exclusion criteria were lack of informed consent to participate and the absence of postpartum depression.

2.2. Measures

2.2.1. Pregnancy Fear

This revised 10-item questionnaire covers common fears during pregnancy, including general pregnancy concerns, concerns for infant health and life, fear of the delivery process (pain, obstetric injuries, risk of death during delivery, loss of control during delivery, inability to deliver, and distrust in healthcare staff during delivery), as well as fear of parenthood and the impact of childbirth on marital and family relationships (Fisher et al., 2006). This questionnaire aims to enhance response diversity and accuracy, employing appropriate statistical analyses to examine pregnancy-related fears. Scores range from 0 to 150, with higher scores indicating greater fear of childbirth and associated challenges.

2.2.2. Maternal-Infant Attachment

The Postnatal Attachment Scale is a self-report tool assessing the mother-child relationship, completed by the mother. It is designed for ages 0–36 months and was developed by Condon and Corkindale in 1991, with a Persian translation and initial study by Zeinali in 2012. This 19-item questionnaire includes three subscales (attachment intensity, lack of hostility, and satisfaction with interaction). It is completed by the mother or primary caregiver for children under 36 months, with higher scores indicating greater maternal attachment. The total of subscale scores provides an overall attachment score. Some items have

varied response options; for instance, items 1 to 3 have five options, while item 4 has three. The internal consistency of the scale was 0.81 in Condon and Corkindale's study (1991), with scores ranging from 19 to 95. Test-retest reliability coefficients at 2, 4, and 32 weeks were 0.61, 0.76, and 0.41, respectively. In Zeinali's study (2012) among 200 mothers, internal consistency for the entire scale and its components was 0.83, 0.56, 0.75, and 0.69, respectively (Zeinali et al., 2012).

2.2.3. Postnatal Depression

Edinburgh Postnatal Depression Scale is a 10-item scale assesses postpartum depression and designed to facilitate depression detection starting from six weeks postpartum. Scores range from 0 to 30, with a score of 12 or higher indicating postpartum depression. Validity has been assessed in several countries, with Cox et al. (1987) reporting reliability of 0.81. In Isfahan, Montazeri et al. (2001) assessed reliability among 100 women, with Cronbach's alpha coefficients of 78% and 86% at 1–6 and 12–14 weeks postpartum, respectively. In this study, a score of 13 or higher indicated postpartum depression, with affected mothers referred to a psychiatrist for accurate diagnosis and further action (Ahmadpour et al., 2023). In the present study, Cronbach's alpha for the questionnaire was 0.90.

2.3. Data analysis

SPSS software version 23 was used for data analysis, employing multivariate regression.

3. Findings and Results

The age distribution of respondents, among 153 participants, was as follows: 41 individuals (31.3%) were between 11-23 years, 91 individuals (59.5%) between 24-28 years, and 14 individuals (9.2%) between 29-34 years. Educational level among respondents included 34 individuals (22.2%) with less than a high school diploma, 51 individuals (31.3%) with a high school diploma, 29 individuals (19%) with an associate degree, and 33 individuals (21.6%) with a bachelor's degree. Employment status included 31 individuals (24.1%) as skilled employees, 21 individuals (13.1%) as unskilled employees, 81 individuals (52.9%) as homemakers, and 20 individuals (13.1%) in self-employment. Spouse employment status included 19 individuals (12.4%) as skilled employees, 52

individuals (34%) as unskilled employees, 64 individuals (41.4%) in self-employment, and 8 individuals (5.2%) as laborers. Pregnancy intention was reported as desired by 99 individuals (64.1%), undesired by 39 individuals (25.5%), and unexpectedly welcomed by 15 individuals (9.1%). Delivery method among respondents included 121 individuals (13%) with insurance and 11 individuals (11%)

without insurance. Fear of childbirth intensity among respondents was as follows: 30 individuals (9.6%) reported severe fear, 84 individuals (54.9%) moderate fear, and 39 individuals (25.5%) mild fear. Table 1 presents the descriptive statistics findings of research variables and shows the normality of data.

Table 1

Descriptive Statistics Table

Variable	Mean	SD	Skewness	Kurtosis
Maternal-Infant Attachment	3.42	0.98	-0.29	0.61
Postpartum Depression	2.74	1.23	0.34	-0.88
General Fear	1.92	0.89	0.25	-0.23
Fear for Infant Health	2.34	0.91	0.41	0.78
Fear of Delivery Outcomes	2.17	0.75	-0.19	-0.11
Fear of Delivery Inability	1.45	1.02	0.37	0.66
Fear for Health Risks	2.63	0.88	0.22	-0.42
Fear of Delivery Staff	1.84	0.95	-0.33	0.19
Fear of Infant Care	2.08	1.07	0.15	-0.37
Fear of Infant's Gender	1.25	0.82	-0.45	0.49

To test the significance of the regression model, the statistical method of analysis of variance was used.

Table 2

Stepwise Regression of Childbirth Fear based on Maternal-Infant Attachment and Postpartum Depression at a significance level of zero

Model	Source	Sum of Squares	df	Mean Square	F	R	R Squared	Adjusted R
1	Regression	7929.264	8	991.158	24.169	0.572	0.327	0.314
	Residual	16294.709	144	1131.158				
	Total	24223.974	152					
2	Regression	8826.141	8	1103.267	32.917	0.480	0.341	0.332
	Residual	16658.252	144	115.680				
	Total	25848.393	152					

Based on Table 2 of the regression model summary, it can be concluded that the variable of childbirth fear explained 32.1% of the variance in maternal-infant attachment among women. The assumption of independence of errors was assessed using the Durbin-Watson statistic, which reported a value of 1.898. Since the test statistic is within the range of 0 to 4, it can be concluded that there is no correlation among

model errors, and errors are independent. Additionally, childbirth fear accounted for 34.1% of the variance in postpartum depression among women. The assumption of independence of errors was verified again with the Durbin-Watson statistic, which indicated a value of 2.141, falling within the acceptable range of 0 to 4, confirming the independence of errors.

Table 3

Standardized and Unstandardized Coefficients to Identify the Intensity and Direction of Each Research Variable's Impact

Model	Variable	B	Std. Error	Beta
Maternal-Infant Attachment	General fear	-0.262	0.099	-0.148
	Fear for infant health	-0.529	0.101	-0.257
	Fear of delivery outcomes	-0.157	0.035	-0.186
	Fear of delivery inability	0.137	0.057	-0.108
	Fear for health risks	-0.388	0.110	-0.141

Postpartum Depression	Fear of delivery staff	-0.265	0.135	-0.110
	Fear of infant care	-0.109	0.098	-0.087
	Fear of infant's gender	-0.111	0.117	-0.065
	General fear	1.092	0.195	0.290
	Fear for infant health	0.890	0.192	0.227
	Fear of delivery outcomes	0.330	0.199	0.082
	Fear of delivery inability	1.054	0.184	0.281
	Fear for health risks	0.649	0.227	0.140
	Fear of delivery staff	0.895	0.188	0.081
	Fear of infant care	0.212	0.236	0.054
	Fear of infant's gender	0.111	0.117	0.048

Table 3 presents the standardized and unstandardized coefficients, showing the intensity and direction of each research variable's impact on maternal-infant attachment and postpartum depression. In terms of maternal-infant attachment, variables such as general fear ($B = -0.262$, $Beta = -0.148$) and fear for infant health ($B = -0.529$, $Beta = -0.257$) show negative associations, indicating that increased fear in these areas reduces attachment levels. Similarly, fear of delivery outcomes ($B = -0.157$, $Beta = -0.186$) and fear for health risks ($B = -0.388$, $Beta = -0.141$) also negatively impact attachment. For postpartum depression, general fear ($B = 1.092$, $Beta = 0.290$) and fear of delivery inability ($B = 1.054$, $Beta = 0.281$) are positively associated, suggesting that higher fear levels contribute to increased depression symptoms. Other fear dimensions, like fear for infant health ($B = 0.890$, $Beta = 0.227$) and fear for health risks ($B = 0.649$, $Beta = 0.140$), also show a positive relationship with postpartum depression, emphasizing the detrimental effect of childbirth-related fears on both attachment and mental health outcomes.

4. Discussion and Conclusion

This study aimed to examine the relationship between fear of childbirth, maternal-infant attachment, and postpartum depression. Results demonstrated a significant relationship between fear of childbirth, maternal-infant attachment, and postpartum depression. These findings align with prior studies (Febriani et al., 2024; Hildingsson & Rubertsson, 2022; Ponti et al., 2020; Seefeld et al., 2022). This study confirmed a significant relationship between childbirth fear and maternal-infant attachment. Fear of childbirth is common among many women, especially those giving birth for the first time, and is recognized as a disruptive aspect of the delivery process. This fear encompasses concerns about labor pain, complications due to physiological changes in pregnancy, risk of death, fetal injuries and abnormalities, skills and behaviors of delivery room staff, the infant's gender, and abilities to care for the

infant, all of which impact the quality of maternal-infant attachment.

Mothers who experience severe fear and high stress may not only lack satisfaction in interacting with their infants but may also face difficulties in affectionate behaviors such as eye contact, caressing, close and secure behaviors like holding the infant, skin-to-skin contact, and caregiving tasks like diaper changing, breastfeeding, and bathing. Given that the infant's early life is a "critical period" for developing and strengthening maternal-infant attachment, any reduction or absence of these behaviors may impair attachment quality. Stress due to fear of childbirth during pregnancy can hinder the formation of the maternal-fetal bond. Reducing this stress during pregnancy can promote better maternal-infant interaction.

Fear of childbirth, an anxiety disorder, or a focused fear, presents with psychological symptoms, physical complaints, and difficulties in concentrating on work and social activities. For many women, labor pain is perceived as the most painful experience, understood only personally and subjectively, heightening the risk of postpartum depression. Postpartum depression negatively affects the continuity of care for the mother and her surroundings, with the lack of continuity in maternal care being one of the factors increasing childbirth fear. In most women, fear of childbirth correlates with increased pain, prolonged labor, and unpleasant birth experiences.

In summary, women in the postpartum vulnerability period, especially those with depression, anxiety, and psychological issues, are at greater risk for postpartum depression. Untreated postpartum depression can be distressing or even hazardous, worsening the condition if not addressed. It is important to note that this condition is highly treatable. Psychological treatments can provide supportive care for these individuals, enabling gradual improvement over time.

The statistical analysis was limited to mothers attending healthcare centers in a single city, which may impose certain

limitations on the findings. Additional influencing factors include the mother's stage of pregnancy, education level, and economic status. Furthermore, time constraints restricted the scope for periodic reviews, potentially impacting the accuracy and comprehensiveness of the results. It is recommended that similar studies be conducted in other provinces, and results be compared to gain a better understanding of childbirth fear and its contributing factors across different regions. Additionally, it is suggested to use longitudinal research methods to gain precise results and better analyze changes over time. This approach can identify patterns and trends influencing childbirth fear and its impact on maternal mental health.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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