



Maternal-Infant Bonding in the Postpartum Period

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Abstract

Background: One of the most important predictors of a child's emotional, cognitive, and social development is the relationship between mother and child during the postnatal period; any disruptions in this process may cause long-term bonding issues for both the mother and their child.

Aim: To determine the level of maternal-infant bonding among Iraqi postpartum mothers and to look at the correlations between bonding and specific demographic characteristics such as age, education, economic position, and birth order.

Method: Study was a descriptive cross-sectional, which carried out at Bint Al-Huda Teaching Hospital in Nasiriyah, Iraq, extended from July to December 2025. The Postpartum Bonding Questionnaire (PBQ), translated into Arabic, was administered to the carefully chosen sample of 108 postpartum women in Nasiriyah. SPSS version 26 was used to analyze the data by using descriptive and inferential statistics.

Results: The study's findings which related to mothers' bonding, showed that 74.1% had excellent, 22.2% were moderate, and 3.7% of mothers had low attachment. In addition, the economic status ($P = 0.04$), maternal age ($P = 0.02$), the child's birth order ($P = 0.01$), and were all statistically substantially correlated with bonding levels. There were no significant correlations with residence or education.

Conclusion: The current study referred that the level of Maternal-Infant Bonding was generally adequate, a small percentage of mothers exhibited low levels of this bond, attributed to young age, first birth, and economic status. These findings suggest the need for early screening and tailored psychological interventions in postpartum care to maintain healthy mother-infant bonds and prevent any potential problems in this bond.

Keywords: Infant, Bonding, Nursing, Maternity, Postpartum, Pediatric.

1. Introduction

The mother and infant's bond developed throughout the postpartum phase is arguably one of the most crucial foundations of early-age child development. The mother-infant bond is one part of the more general attachment system. It forms early within hours or days after delivery and helps the infant securely attach, manage emotions, and develop both socially and cognitively (Liu et al., 2023; Keller and Kärtner, 2021). During this sensitive period, the elevation of the maternal hormone oxytocin triggers soothing and calming behaviors such as gentle stroking and soft vocalizations, which strengthen the mother's and infant's emotional attachment (Scatliffe et al., 2022; Vittner and McGrath, 2021).

Furthermore, the bond between mother and infant influences the infant's development as well as the mother's psychological health. Emotional connection between the mother and child improves the intimacy and sensitivity of the mother's caregiving (Dubber et al., 2022; Prevatt and Desmarais, 2023). On the other hand, bonding disruptions due to trauma experienced during birth, postpartum mental health issues, hormonal dysregulations, or social support deficits can lead to postpartum bonding disorder. The mother may in these cases feel overwhelmed, emotionally and

socially distant, which deteriorates the quality of caregiving and infant development (Wang et al., 2022; Pilkington et al., 2021).

The advanced technique in neuro-imaging have showed the brain regions involved in maternal attachment such as the amygdala, prefrontal cortex, and striatum. These findings suggest that maternal-infant attachment is not simply a behavioral-emotional process but is also neurobiological and influenced by intrinsic and extrinsic factors (Feldman et al., 2022; Swain and Ho, 2021). Understanding these neural pathways could offer valuable insight into the enormous effect of maternal bonding on the mother's and child's brain development.

Maternal-infant bonding does not have the same quality in all societies and even differs within the same society depending on healthcare access. Iraq and many other low- to middle-income countries (LMICs) have restricted or unequal access to perinatal care. Mental health stigma, culture, and barriers to healthcare all shape the maternal experience (Ahmed and Al-Jawadi, 2023; Al-Hamad and Al-Nashmi, 2021). Understanding these barriers is vital for formatting the bonding and maternal mental health-focused interventions that are sensitive to the culture.

2. Methodology

2.1 Study Design

A descriptive cross-sectional approach used in the current study to assess postpartum maternal-infant bonding and evaluate the presence of bonding disorders. Data collection was conducted at Bint Al-Huda Teaching Hospital in Al-Nasiriyah City, Iraq, during the period extended from 1st July to 31st December 2025. This extended duration allowed for a more varied sample and reduced the potential for bias, thus enhancing the generalizability of the outcomes.

2.2 Study Sample

The researchers used to select 108 postpartum mothers, a non-probability purposive sampling technique. Participants were included according to the following criteria:

- Mothers who had recently given birth (within 6 weeks postpartum).
- Mothers who consented to participate voluntarily.

Study Instrument

The main tool used in this study was a structured, then Arabic-language questionnaire developed after an extensive literature review. The questionnaire consisted of two parts:

Part I: The demographic characteristics include (e.g., age, education, economic status, number and order of children, residence).

Part II: Items which used to assess the bonding between mothers and their infants were adopted from the Postpartum Bonding Questionnaire (PBQ) by Brockington et al. (2006), adapted and validated for the current study.

The scoring items was interpreted as follows:

Low bonding: Mean score less than 1.66.

Modest bonding: Mean score between 1.67 and 2.33.

High bonding: Mean score more or equal to 2.34.

Pilot Study:

To evaluate the feasibility, clarity, timing, and reliability of the questionnaire, ten individuals were included in a pilot study. Some modifications were made to ensure content adequacy and ease of administration, and based on the results and expert feedback.

Validity and Reliability:

A committee from the College of Nursing at Thi-Qar University, consist of seven specialists, was evaluating the content to determine its validity. Cronbach's alpha coefficient was used to confirm the instrument's reliability, the result was a coefficient of 0.87, representative a strong internal consistency.

Data Collection Procedure:

The data was collected via face-to-face interviews directed by the researcher. Each interview taken approximately 20-25 minutes in each interview, and written consent was obtained from all participants. The researcher clarified the study's objective and assured participants of data confidentiality before distributing the questionnaire.

Statistical Analysis

By using SPSS version 26, the data were analyzed. The analysis included:
Descriptive statistics: mean, standard deviation, frequencies, and percentages.

Inferential statistics:

To examine associations between bonding levels and nominal demographic variables; the Chi-square test was used. To compare bonding scores amongst more than two groups, ANOVA test was used. While the independent t-test used to assess differences between two independent groups.

Ethical Consideration:

This work received ethical approval from the Research Ethics Committee at Middle Euphrates Technical University (Ref. No. AATUCMHTLAB-June. 6225). After participants were fully informed of the study's objectives and methodology and their right to withdraw at any time without affecting their care, each participant provided written informed consent. Privacy and confidentiality were maintained throughout the study.

Study Results:

Table 1: Participants' Demographic Characteristics

Variables	Category	Frequency	Percentage
Age Group	17 - 22 years	28	25.9
	23 - 28 years	42	38.9
	29 - 34 years	26	24.1
	35 years and above	12	11.1
	Mean $\pm$ SD: 26.46 $\pm$ 4.76		
	Range: 17 - 43 years		
Education Level	Not reading & writing	15	13.9
	Primary school	37	34.3
	High school	39	36.1
	College / University	17	15.7
Residence	Urban	84	77.8
	Rural	24	22.2
Economic Status	Not enough	12	11.1
	Enough	57	52.8
	Very enough	39	36.1
Birth Order of Child	First	36	33.3
	Second	32	29.6
	Third	21	19.4
	Fourth or more	19	17.6

The table overhead shows the demographic characteristics of the participating mothers. where 38.9% of them were 23–28 years old, with the mean age of 26.46 years (standard deviation = 4.76), and ages arranged between 17 and 43 years. 77.8% of the sample lived in urban areas, and 70.4% had completed at least one primary or secondary education. The majority of the participants were of the economic status of “acceptable” (52.8%). For birth order, the first-time mothers had the largest percent by birth order (33.3%).

Table 2: Overall Bonding Level Distribution

Bonding Level	Frequency	Percentage	Mean	SD	Result
Low	4	3.7%	2.52	0.28	High
Moderate	24	22.2%			(Overall)
High	80	74.1%			
Total	108	100%			

The table presents all classifications of bonding levels. The high bonding levels with children were demonstrated by the majority of participants (74.1%), while the moderate bonding was 22.2%, and 3.7% showed low bonding levels. In general, this distribution indicates a strong mother-child bond, while approving that a minority may experience bonding difficulties.

Table 3: The relation between Bonding Level and all Demographic Variables:

Variables	Chi-Square Value	df	Asymptotic Significance (2-sided)
Age Group	32.45	18	0.02
Education Level	15.78	15	0.47
Economic Status	20.34	12	0.04
Birth Order of Child	28.67	15	0.01
Residence	8.92	6	0.18

This table shows the results of the chi-square test, which explores the relationships between levels of correlation and demographic variables. Significant associations were found for the age group ($P = 0.02$), economic status ($P = 0.04$), and birth order of child ($P = 0.01$). This indicates that the younger mothers, with difficulties in economic status, and mothers with a first-born child were more likely to experience bonding challenges. In addition, there is no significant association between the other demographic variables and bonding levels.

3. Discussion

The current study aimed to assess the levels of bonding between mothers and their children, as well as the relations between demographic factors and the bonding quality. The results highlighted the pivotal role of maternal age, socio-economic status, and birth order in forming emotional bonds.

In alignment with previous studies, the maternal age was significantly associated with the correlation ($P=0.02$); particularly, those younger mothers aged 17-22 years appeared to have greater difficulty building close emotional relationships with their children. This may be related to the lower emotional maturity and higher stress levels, in addition to a few life experiences that can interfere with emotional availability and supple caregiving. often more emotionally mature and financially secure, founded in the older mothers, may hold caregiving skills and emotional self-regulation, which reflecting in facilitating a stronger connection with their infants (Aas and Nordheim, 2021; Bozzatello et al., 2021).

Remarkably, the mothers' educational level did not show a statistically significant relation to mother-child bonding ($p < 0.05$). While higher education may provide mothers with better problem-solving skills and the ability to search for information about child growth and development, the findings suggest that bonding is fundamentally an innate emotional process which is not enhanced by formal education as automatically. This finding is supported by a study which demonstrated that educational attainment alone is a weaker determinant of attachment than emotional availability and inherent nurturing behaviors (Harding and Paulsell, 2020; Tichelman et al., 2022).

The significant connotation between economic status and bonding ($P = 0.04$), was one of the most important findings of this study. The mothers who reported "not enough" for their economic status were more probable to exhibit moderate or low bonding levels. This supports by a body of literature which indicate that financial difficulties can cause a chronic stress, anxiety, and depression, which in turn reduce a mother's emotional abilities and responsiveness in caregiving (Giallo et al., 2020; Kim and Bianco, 2021). Economic stress may shift a mother's focus towards meeting basic survival needs, causing less emotional energy to nurture the subtle mother-infant's bond.

In the line of bonding, the study found a strong connection between the child's birth order and bonding ($P = 0.01$), where the mothers displayed a higher tendency to build a strong bond emotionally with their firstborn child. This is because first-time mothers can give over-focused and intentional attention to their first child. The mother's attention and caregiving become distributed with subsequent children, which may lead to a qualitatively different form of attachment that may be not necessarily insecure. This concurs with Baranowska and Tataj-Puzyna (2021), who found that first-time mothers experience a lot of emotional intense issues, novelty-oriented by bonding process.

Finally, the current study institute no significant association between urban vs. rural residence and bonding ($p = 0.18$). This result proposes that in the specific socio-cultural line of this sample, other factors, such as access to healthcare in cities or family support centers in rural areas, might counterbalance one another. It promotes the idea that proximal factors like maternal mental health and caregiving behavior are more predictive of attachment than location-based on geographic alone (Hussein et al., 2022; Li and Liu, 2020).

The distribution of attachment levels (74.1% high, 22.2% medium, and 3.7% low) is encouraging, indicating that the majority of mothers are able to establish stable attachment bonds. Nevertheless, there is a clinical significance when identifying the group with moderate attachment and a small group with low attachment. Those mothers, particularly young mothers from low socio-economic backgrounds or first-time mothers, may benefit from aimed interventions. Medium attachment may represent a suboptimal emotional connection that can be, with appropriate support, strengthened, potentially preventing the long-term relational difficulties (Tichelman et al., 2022).

4. Limitations of the Current Study

There are some restrictions to be aware of, while the study provides valuable insights into maternal-infant bonding in this population. At first, bonding is taken at a single moment in time through the cross-sectional design, causing a reduced ability to understand how bonding develops or changes through the postpartum period. Second, the results may not be applicable to all Iraqi postpartum women due to the sample technique which was used from a single hospital in Al-Nasiriyah. Third, data collection was dependent on a self-report questionnaire (PBQ), This could cause bias due to social desirability, where mothers might over-report positive bonding experiences. Fourth, the factors related to the mother's mental health status (such as depression and anxiety) and other variables which may have significantly influenced the study were not assessed, nor was the quality level of the marital rapport or the availability of social care, which mostly influences bonding. Future research is useful to employ longitudinal designs, include multiple sites across Iraq, and incorporate objective measures and assessments of mental health to build upon this study's results.

5. Nursing Role

The nurses considered as the first line of support for evaluating, fostering, and nourishing mother-child attachment, particularly in the delicate postpartum phase. Nurses are ideally positioned to conduct initial assessments using reliable tools like the PBQ (Brockington et al., 2006). In addition, it's crucial for nurses to educate mothers about typical infant behaviors and the ways to encourage responsive caregiving, which is essential to fostering secure attachment (Tichelman et al., 2022). The nurses as well provide essential emotional support, offering a compassionate care and counselling to relieve maternal worries and enhancing comfort. Furthermore, the nurses help the child bonding by connecting families with further resources, such as lactation consultants, social workers, or mental health services, ensuring a comprehensive support system (Dubber et al., 2022). At last, nurses act as guardians, which can accessible through careful assessment, skilled intervention, and a caring presence, helping to preserve the vital bond between mother and infant, in addition to supporting the children develop mentally and emotionally.

6. Conclusion

The current study proves the complex nature of the normal mother-infant bonding during the postpartum period. The findings showed that although the majority (74.1%) of participants mothers developed a good bond with their newborns, a sizeable minority (22.2% moderate, 3.7% low) struggle with bonding. Definitely, younger maternal age ($P = 0.02$), economic level difficulties ($P = 0.04$), and having a first-born child ($P = 0.01$) were identified as vital risk

factors associated with lower bonding levels. In addition, the maternal education and urban/rural residence did not show a significant correlation. These results underscore the need for targeted, culturally sensitive interventions. Healthcare providers should prioritize early screening for bonding difficulties, particularly for mothers who exhibit recognized risk factors. The supporting young mothers, reducing the economic stress through the convenient social support referrals, and providing extra guidance to first-time mothers, were the effective strategies to promote secure attachment and foster healthy emotional, social, and cognitive development in children.

7. Recommendations

Considering the results of the current study, which carried out in Iraq, the PBQ tool can be used for maternal-infant bonding to routinely examine young, primipara, and economically disadvantaged moms. Also, the support programmers should be initiated by healthcare centers and nursing counselling services as supported ways that enhance maternal-infant attachment. Training courses in bonding assessment and intervention should be included in nursing education. Postnatal care facilities should be provided by policymakers and funds invested in the support of maternal mental health. In addition, for future research the longitudinal study designs and an examination of the underlying psychological and cultural mechanisms influencing bonding are required.

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