

# Factors Associated with Maternal Infant Bonding During Early Postpartum Period

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## INTRODUCTION

Maternal Infant bonding (MIB) is an essential phenomenon that begins in early postpartum period and continues over the next few years. The postpartum is a period where a mother is more likely to develop attachment with her baby. Many studies have shown that MIB support socio-emotional development among infants. It enhances the mother's affection towards baby through eye contact, touch, and interaction.<sup>1-3</sup> In addition, MIB is defined as the development of the reciprocal relationship between mother and child.<sup>4</sup> Similarly, MIB is explained as an initial bonding that keep the infant close to the mother thereby enhancing the child survival rate.<sup>5</sup> Moreover, MIB is

described as the connection that occurs between mother and newborn during first time meeting and in the future. Therefore, MIB is an important aspect that supports an infant's socio-emotional development.<sup>6</sup>

MIB initiates from pregnancy and this development continues after delivery.<sup>7</sup> Studies have shown that the child's development depends upon the quality of the mother-infant interaction after birth.<sup>8</sup> The quality of the mother-child relationship naturally affects the level of trust, love, protection and prolonged breastfeeding.<sup>9</sup> Furthermore, early bonding relationships play an important role in a

## Abstract

**Introduction:** Maternal infant bonding is an essential phenomenon that begins in early postpartum period and continues over the next few years. The postpartum is a period where a mother is more likely to develop attachment with her baby. The study aims to determine the relationship between the selected factors and their influence on postpartum mother infant bonding within one to three days after delivery.

**Methods:** A descriptive cross-sectional study was conducted among postpartum women in one to three days after delivery in a tertiary care hospital from January 2023 to April 2023. The responses were collected via convenience sampling and the findings were analyzed using Mann-Whitney U test, Kruskal-Wallis test and ordinal regression.

**Results:** The factors such as occupation ( $P = 0.02$ ), support of SSC ( $P = 0.03$ ), and risk of depression ( $P = 0.00$ ) found to be statistically significant to bonding. The ordinal regression analysis showed that the mother with no risk of depression and involved in business contributed significantly to bonding ( $\chi^2 = 6.9, 8.6$ ; Exp. B = 0.3, 0.3;  $P = 0.00, 0.00$  respectively).

**Conclusions:** This study found support of skin to skin contact, no risk of depression and involvement in business to be significant determinants of maternal infant bonding.

child's psychological, cognitive and social development. There are subsequent evidences that children growing up with the experience of strong MIB are more likely to have better physical, cognitive and psychosocial outcomes as adults.<sup>10,11</sup> In contrast, poor MIB results in serious long-term negative impact on a child's development and mother-infant interactions.<sup>12,13</sup>

Studies have shown that there are various factors such as family history, socioeconomic, culture, support system, breastfeeding, postpartum skin to skin contact (SSC), postpartum depression, anxiety, preterm birth, child illness, and level of stress which could influence the MIB.<sup>14-21</sup> However, little is known in the context of Nepal as most of the studies were conducted in developed countries. In addition, there has been limited research data collected in the first week after birth. Thus, we found it essential to determine the relationship between the selected factors (age, education, occupation, parity, child planning, SSC, breastfeeding, partner support, child illness, risk of depression) and their influence on postpartum MIB within one to three days after delivery.

## METHODS

This descriptive cross-sectional study was conducted among postpartum women, one to three days after delivery at Shree Birendra Hospital, Chhauni, Kathmandu, Nepal, from January 2023 to April 2023. Study was ethically approved from the Institutional Review Committee of the Nepalese Army Institute of Health Sciences (Regd. no:123). The sampling technique adopted for the study was non-probability convenience sampling method. The inclusion criteria were women within one to three days after delivery, having given birth to a live baby, willing to cooperate, and having signed the written informed consent. The data were collected using the demographic and clinical questionnaires that included the questions related with selected variables, postpartum bonding questionnaire (PBQ) for MIB and Edinburgh Postnatal Depression Scale (EPDS) for postnatal depression. PBQ consisted of 25 questions evaluated using the 6-point Likert scale. The lowest possible score was 0 and the maximum score was 125. The higher the average scale value of responses, the worse (Less safe / lower quality) the mother-infant relationship evaluation. EPDS is a 10-item self-rating scale, scored from 0 to 3, with which women rated how they had felt over the last seven days. The lowest possible score was 0 and the maximum score was 30. Respondents who had  $\geq 10$  points were labeled as being at risk of depression and those who had  $< 10$  points were labeled as being without risk of depression. The data were analyzed using statistical package for social science (SPSS). Descriptive statistics were used to assess the characteristics of the participants. The differences in MIB and selected variables were computed using Mann-Whitney U test and Kruskal

-Wallis test. Significant predictors indicated from ordinal regression analysis. The data met the assumption for the non-parametric and ordinal regression analysis. The level of significance was set at  $P < 0.05$ .

## RESULTS

Among 120 participants, the mean age was  $29.1 \pm 4.6$  years. Most participants belonged to the age group of 20 - 29 years (55.8%). Majority (35.8%) had completed secondary level education. Furthermore, 32.5% of the participants were involved in business activities. In terms of parity, most of them (57.5%) were multipara. Most women (82.5%) had planned their child. Majority (92.5%) of the participants were provided with skin-to-skin contact. As many as (93.3%) participants breastfed their newborn. The highest number (98.3%) of the participants reported satisfaction with partner support. Approximately 88% of the participants had child without any illness. EPDS scale was used to screen the risk of depression, around 80.8% of the participants had no risk of depression (Table 1).

The factors such as occupation ( $P = 0.02$ ), support of SSC ( $P = 0.03$ ), and risk of depression ( $P = 0.00$ ) showed statistically significance to MIB. The mean score showed that the lower quality MIB was demonstrated in the mothers working as farmers ( $13.7 \pm 15.0$ ), with unsupported SSC ( $19.8 \pm 18.4$ ) and at risk of depression ( $17.2 \pm 13.1$ ) (Table 2).

The ordinal regression analysis for predicting MIB showed that the mother with no risk of depression and doing business as an occupation contributed significantly to MIB ( $\chi^2 = 6.9, 8.6$ ; Exp. B = 0.3, 0.3;  $P = 0.00, 0.00$  respectively). In other word, participants who were at risk of depression and engaged in other occupation such as house maker, farmer and service showed low level of MIB in comparison with the participants at no risk of depression and involved in business activities (Table 3).

**Table 1:** Descriptive characteristics of the participants

Characteristics (N = 120)	N (%)
Age (M = 29.1, SD = 4.6)	
20-29	67 (55.8)
30-39	49 (40.8)
40-49	4 (3.3)
Education	
Illiterate	26 (21.7)
Primary	36 (30.0)
Secondary	43 (35.8)
Higher	15 (12.5)
Occupation	
Business (Small to medium scale)	39 (32.5)
House maker	37 (30.8)
Service	24 (20.0)
Farmer	20 (16.7)
Parity	
Primiparous	51 (42.5)
Multiparous	69 (57.5)
Child planning	
Yes	99 (82.5)
No	21 (17.5)
Support of SSC	
Yes	111 (92.5)
No	9 (7.5)
Breast feeding	
Yes	112 (93.3)
No	8 (6.7)
Partner support satisfaction	
Yes	118 (98.3)
No	2 (1.7)
Child with illness	
Yes	15 (12.5)
No	105 (87.5)
Risk of depression	
Yes	23 (19.2)
No	97 (80.8)

**Table 2:** Relationship between the examined factors of PBQ

Characteristics (N = 120)	Mean (SD)	Median	P - value
Occupation			0.02 <sup>a</sup>
House maker	10.9 (6.7)	9.0	
Business	7.4 (6.6)	5.0	
Farmer	13.7 (15.0)	7.0	
Service	12.8 (8.3)	11.0	
Support of SSC			0.03 <sup>b</sup>
Yes	10.0 (7.6)	7.0	
No	19.8 (18.4)	12.0	
Risk of depression			0.00 <sup>b</sup>
Yes	17.2 (13.1)	15.0	
No	9.2 (7.2)	7.0	

Note: <sup>a</sup>Kruskal-Wallis test; <sup>b</sup>Mann-Whitney U test; P ≤ 0.05.

**Table 3:** Ordinal regression analysis predicting MIB

Variables	Ordinal Regression Analysis			
	Wald (χ <sup>2</sup> )	Exp. B	P - value	95% CI
Support of SSC	3.3	3.1	0.07	(0.9 - 10.4)
Risk of depression	6.9	0.3	0.00	(0.1 - 0.7)
Occupation	8.6	0.3	0.00	(0.1 - 0.6)

## DISCUSSION

The purpose of this study was to extend the knowledge on demographic and clinical characteristics contributing to MIB among Nepalese postnatal mothers. To our knowledge, this is the first Nepalese study examining the factors associated with MIB among this target population. The study findings showed that support of SSC, no risk of depression, and involvement in business activities were significant factors for MIB after delivery.

Similar to previous studies, the majority of the participants (92.5%) were found to support SSC.<sup>22-24</sup> In this study, mostly multiparous mothers who had the previous experienced for caring their babies. Furthermore, all of them were encouraged for SSC immediately after the birth. This is because the mother can easily understand the need of the baby and can respond to them accordingly. Thus, providing a precondition for a secure bonding between the mother and the baby. In the ordinal regression analysis, mothers with no risk of depression and those involved in business activities emerged as significant determinant of MIB. These findings are in the congruence with the previous studies that demonstrated the relationship between postpartum depression symptoms and MIB during postnatal period.<sup>22,23</sup> Moreover, the study found that postpartum depression symptoms measured at

one month after delivery is strongly associated with low MIB measured at 12 weeks after delivery.<sup>25</sup> This finding suggests that maternal depression symptoms assessed after delivery could have an effect on predicting the MIB. Thereby raising the importance of screening the mothers for risk of depression after delivery.

Furthermore, occupation was identified as other determinants of MIB. This finding concurred with those of several earlier studies<sup>26,27</sup> but stood in contrast to those of Polish study that found no significant relationship between occupation and MIB.<sup>22</sup> In this study, most of the mother were involved in the business activities rather than service. It has been found that most of the women in Nepal are involved in the small to medium enterprises.<sup>28</sup> Furthermore, the central bureau of statistics presented that 29.8% of the enterprises in Nepal are owned by women.<sup>29</sup> In addition, mothers involved in business activities are the self-employed ones and can work from home as well as their co-workers could help them with their activities. Moreover, they have high income compared to the other working mothers.

There were certain limitations that need to be acknowledged in this study. Firstly, the participants were recruited through convenience sampling technique in a specified population of Army families. So, the generalizability of the result is limited. Secondly, there were other factors such as social environment, family income, family mental health history etc. that linked to bonding quality are also considered limiting. Finally, the outcomes were limited to one time point (One to three days after delivery). Therefore, the interpretation of the study findings may be different when comparing to the other follow up length. However, being one of the first studies which delve into post partum MIB, this result can serve as base mark for the designing of the early interventions to enhance strong and healthy bond between mother and the child.

## CONCLUSIONS

This study found support of SSC, no risk of depression and involvement in business are significant determinants of MIB. Hence, midwives and nurses need to plan effective practice for screening maternal mental health and enhancing SSC, thereby promoting positive mother to MIB.

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