

FACTORS ASSOCIATED WITH EARLY POSTPARTUM MATERNITY BLUES AND DEPRESSION TENDENCY AMONG JAPANESE MOTHERS WITH FULL-TERM HEALTHY INFANTS

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ABSTRACT

Maternity blues and postpartum depression are common mental health problems during the early postpartum period. However, few studies have examined the factors associated with maternity blues and postpartum depression in healthy mothers with spontaneous births of healthy full-term infants. This study aimed to determine the demographic and obstetric factors, various feelings during pregnancy, and psychological factors by using the Maternity Blues Scale (MBS) and Edinburgh Postnatal Depression scale (EPDS) among healthy Japanese mothers. We distributed the MBS and EPDS self-administered questionnaires to 100 Japanese mothers during their 4–5 day hospitalization and at a health check-up 1-month after delivery, respectively. Multiple regression analyses were performed including the above-mentioned variables as independent variables and the maximum MBS or EPDS scores as dependent variables. The answers “Having a friend I can talk to about maternity life or child rearing” [β (95% confidence interval) = -1.53 ($-2.68 - -0.378$)] and “Satogaeri bunben”, a Japanese traditional support system wherein a postnatal woman lives with her husband/parents [-2.82 ($-4.73 - -0.898$)] were significantly associated with MBS scores. The answer “Having a friend I can talk to about maternity life or child rearing” [-2.83 ($-4.76 - -0.903$)] was also significantly associated with EPDS scores, although the association between the partner’s age and these scores was marginally significant [-0.106 ($-0.008 - 0.221$)]. This study shows that it is important to provide support for healthy women without delivery complications, both at home and in the community.

Key Words: Maternity blues, Postpartum depression, Edinburgh Postnatal Depression Scale, Satogaeri bunben

INTRODUCTION

Pregnancy and the postpartum period are the most dynamic events in a woman’s life cycle and affect both her body and mind. After giving birth, women are required to adapt to a new role as mothers, resulting in changes in their relationships with their husband and family members, as well as family in functions. The first month after delivery is the most critical time for mothers with psychiatric symptoms, as this period is associated with a three-fold increased risk of depression.¹⁾ Maternity blues is characterized by transient mood swings to a low mood

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and crying that usually abates within the first few days after delivery.²⁻⁴⁾ Whereas, postpartum depression occurs a few weeks after delivery and lasts for a few weeks or months.⁵⁾ Mothers with postpartum depression sometimes need intervention or medical treatment. Above all, maternity blues and postpartum depression are common symptoms/complications associated with childbearing. According to a recent Cochrane review,⁶⁾ the rate of postpartum depression in women is between 3–25% in the first year following delivery. Some reviews have reported that significant factors related to postpartum depression were depression or anxiety during pregnancy, social support from friends and relatives, life events like the death of a loved one, divorce, job loss, marital relationship, obstetric factors, pregnancy-related complications such as premature labor, and socioeconomic status.^{5), 7-13)} Some studies have investigated the relationship between maternity blues and postnatal depression.¹⁴⁻¹⁷⁾ Mothers with postpartum depression or psychological illness find it difficult to care for their children. Postpartum depression also causes impaired maternal-infant interactions,¹⁸⁾ such as negative perceptions of infant behavior, which have been linked to attachment insecurity in children.¹⁹⁻²¹⁾ Therefore, mental instability in the mother is considered a critical public health problem.

Most previous studies included mothers with various obstetric complications and infant conditions (premature infants, anomalies etc.), or psychological anamnesis. According to the Journal of Health and Welfare Statistics,²²⁾ 90.5% of boys and 88.7% of girls are born with a birth weight of 2500–4000 g, while the term delivery rate is 94.0%. From this, we can conclude that postpartum depression most often occurs in mothers with normal pregnancies who give birth to healthy babies. This fact highlights the importance of not only a high-risk strategy but also a population-wide strategy for maternal mental health. However, few studies have been conducted on healthy mothers who spontaneously give birth to healthy full-term infants. This study aimed to evaluate the contribution of demographic and obstetric factors, including “satogaeri bunben,” various feelings during pregnancy, and psychological factors by using the Maternity Blues Scale (MBS) and Edinburgh Postnatal Depression Scale (EPDS).

METHODS

We conducted a longitudinal study of 147 women who had normal deliveries at two maternity hospitals in Aichi Prefecture, Japan, from January to October 2009. Maternal inclusion criteria were spontaneous birth of a singleton full-term healthy infant and uncomplicated pregnancy and delivery. Maternal exclusion criteria were past mental health disorder in the mothers, signs of fetal distress during labor, and cesarean section. Infant exclusion criteria were any congenital anomaly and obvious birth asphyxia as assessed through either 1-minute or 5-minute Apgar score of ≤ 7 . According to the above-mentioned criteria, we distributed and collected the questionnaires in person during hospitalization and by mail one month after birth. Finally, the current analysis was restricted to 100 mothers because of a response rate of 88.7%. This study protocol was approved by the Ethics Review Committee at Nagoya University School of Medicine, Nagoya, Japan. On admission to hospital, the mothers gave written informed consent for participation in this study and the use of their personal information.

Demographic data were collected from medical records during hospitalization. Stein’s MBS³⁾ is a self-rating, 13-item scale for measuring maternity blues. We used the Japanese version of the MBS that is validated by Yamashita.²³⁾ The sum of the score for each item with a range of 0–26 was provided daily during hospitalization (4 or 5 days). The maximum of the daily scores was used as a representative score of each mother. A score of ≥ 8 often signifies that a significant mood swing has occurred.

The EPDS is a self-rating, 10-item scale used in screening for postpartum depression.²⁴⁾ The EPDS was translated into Japanese and standardized.^{14), 25)} Each questionnaire item is scored on a 4-point scale from 0–3, with the minimum and maximum total scores being 0 and 30 points, respectively. The cut-off point is 8/9 in this study for the assessment of postpartum depression. At one month after delivery, the subjects were sent the EPDS questionnaire by mail.

We also distributed the Maternal Attachment Inventory (MAI) to the subjects at 3 days, 5 days, and 1 month after delivery. MAI is a self-reported, 26-item questionnaire designed to measure maternal affectionate attachment to infants.²⁶⁾ The MAI was translated into Japanese and was verified for concurrent validity.²⁷⁾ Each item is scored on a 4-point scale from 1–4, the minimum and maximum total scores being 26 and 104 points, respectively; a higher score indicates a stronger attachment to the infant.

We asked questions about feeling and mood regarding pregnancy, childbirth, and their husbands/partners on the first day after delivery. These questions were based on the original 8-item rating scale, which was scored according to the following a 5-step scale: 1, strongly disagree; 2, somewhat disagree; 3, neutral; 4, somewhat agree; and 5, strongly agree. As most respondents selected option 5 (Table 2), this category was rescored as agree overall and the other categories were combined. In the analyses mentioned below, they were used as categorical data.

Statistical analysis was performed by using SPSS version 17.0 for Windows. Descriptive statistics were used to summarize the demographic factors. All continuous variables were shown as mean \pm standard deviation (SD), and categorical data were presented based on frequency and percentage. The correlation of MBS and EPDS scores with other study variables was given by using Pearson's correlation coefficients or Spearman's rank-correlation coefficient. Multiple regression analysis was performed by using the forced entry method to estimate the contribution of study variables to MBS and EPDS scores. The dependent variable was either MBS or EPDS score. The independent variables had a borderline significant association with MBS or EPDS scores (p -value <0.1). A p -value <0.05 was considered significant.

RESULTS

Table 1 shows the characteristics of the study subjects and their infants. The mean age of the mothers who participated in this study was 30.1 ± 4.8 years (range: 18.0–39.0 years), the mean duration of hospitalization was 5.4 ± 0.6 days postpartum, and the routine medical examination at 1 month after birth was performed at 30.9 ± 3.0 days postpartum. The mean of the maximum MBS score was 4.4 ± 3.1 (range: 0.0–14.0). The mean EDPS at 1 month was 3.6 ± 3.0 (range: 0.0–13.0). Fifteen mothers (15.0%) had an MBS score of ≥ 8 and 10 mothers (10.0%) had an EPDS score of ≥ 9 . Four mothers (4.0%) had both an MBS score of ≥ 8 and an EPDS score of ≥ 9 . All mothers and newborn infants were in good physical condition.

Table 2 shows the feeling and mood regarding pregnancy, childbirth, and their husbands/partners. The proportion of strongly agree was 70–90% for each of the questions.

Table 3 shows the associations among MBS and EPDS scores, and the study variables shown in Tables 1 and 2. A positive association between MBS and EPDS scores was observed (correlation coefficients: $r=0.472$). Delivery in the area where the subjects' parents live ($r=-0.223$), so-called "satogaeri bunben" indicating that postnatal women live with their own parents, and "I have a friend I can talk to about maternity life or child rearing" ($r=-0.233$), were significantly associated with MBS scores. "I have a friend I can talk to about maternity life or child rearing" ($r=-0.226$), MAI at day 5 ($r=-0.185$), and at 1 month ($r=-0.207$), were significantly and inversely associated with EPDS scores. The husband's/partner's age also had borderline significant

Table 1 Parental and infant characteristics

	Mean	±	SD	Min	–	Max
<i>n</i> =100						
Parental variables						
Mother's age, years	30.1	±	4.8	18.0	–	39.0
Previous pregnancies	0.9	±	1.0	0.0	–	4.0
Previous deliveries	0.7	±	0.7	0.0	–	3.0
Duration of labor, min	608.6	±	582.0	67.0	–	3600.0
Amount of bleeding, g	328.7	±	234.4	80.0	–	1665.0
Duration of Skin-to-skin contact, min	74.8	±	18.7	27.0	–	107.0
Duration of hospital care, days	5.4	±	0.6	4.0	–	6.0
Husband's/partner's age, years	31.9	±	5.1	20.0	–	43.0
Infant variables						
Gestation age at birth, weeks	39.8	±	1.0	37.3	–	42.0
Birth weight, g	3080.4	±	359.6	2202.0	–	4098.0
Baby's sex (boy/girl)	(50	/	50)			
Weight at 1 M, g	4108.2	±	511.1	2838.0	–	5512.0
Medical examination 1 month after birth	30.9	±	3.0	23.0		45.0
Scores for each rating scale						
Infant attachment score on Day 3	97.1	±	6.6	69.0	–	104.0
Infant attachment score on Day 5	99.6	±	5.6	75.0	–	104.0
Infant attachment score at 1 M	100.1	±	4.9	76.0	–	104.0
Maternity blues during first 4 days	10.7	±	8.2	0.0	–	43.0
Maximum maternity blues score	4.4	±	3.1	0.0	–	14.0
Edinburgh Postnatal Depression scale at 1 M	3.6	±	3.0	0.0	–	13.0
	<i>N</i>		(%)			
Parity						
Primipara	46		46.0			
Multipara	54		54.0			
Mother's employment						
Full-time housewife	60		60.0			
Full-time worker	34		34.0			
Part-time worker	6		6.0			
Husband's/partner's employment						
Yes	99		99.0			
No	1		1.0			
Postnatal stay with her family						
Yes	48		48.0			
No	52		52.0			
Supporter						
Yes	98		98.0			
No	2		2.0			
Induction						
Yes	22		22.0			
No	78		78.0			
Epidural anesthesia						
Yes	7		7.0			
No	93		93.0			
Husband/partner present at delivery						
Yes	75		75.0			
No	25		25.0			

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Table 2 Mother's feelings about her pregnancy, delivery, husband/partner and reaction of husband/partner
n=100

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)
I was happy when I learned I was pregnant	1 (1.0)	0 (0.0)	0 (0.0)	11 (11.0)	88 (88.0)
I was happy when I felt fetal movement	0 (0.0)	1(1.0)	1 (1.0)	13 (13.0)	85 (85.0)
I tried to do something for the baby during my pregnancy	2 (2.0)	13 (13.0)	1 (1.0)	38 (38.0)	46 (46.0)
My husband/partner was happy when told of my pregnancy	0 (0.0)	2 (2.0)	3 (3.0)	15 (15.0)	80 (80.0)
My husband/partner cooperated with me during my pregnancy	1 (1.0)	4 (4.0)	4 (4.0)	21 (21.0)	70 (70.0)
I was satisfied with our marriage	0 (0.0)	0 (0.0)	3 (3.0)	8 (8.0)	89 (89.0)
I have a friend I can talk to about maternity life or child rearing	1 (1.0)	3 (3.0)	0 (0.0)	6 (6.0)	90 (90.0)
I was satisfied with my delivery experience	0 (0.0)	1 (1.0)	1 (1.0)	13 (13.0)	85 (85.0)

Table 3 Correlation coefficients between study variables and MBS and EPDS scores*n*=100

Ozbtetric factors	Maximum MBS	EDPS at 1 M
Previous pregnancies	0.015	-0.051
Previous deliveries	-0.072	-0.140
Duration of labor	-0.035	-0.011
Amount of bleeding	-0.095	-0.128
Duration of Skin-to-skin contact	0.125	0.150
Husband/partner present at delivery	-0.034	-0.112
Birth weight	-0.104	-0.063
Rate of infant weight increase at 1 month	0.090	0.022
Infant weight at 1 month	-0.147	
Feelings regarding pregnancy, childbirth, husband and psychiatric scales	Maximum MBS	EDPS at 1 M
I was happy when I learned I was pregnant	-.054	0.097
I was happy when I felt fetal movement	-.018	0.152
I tried to do something for the baby during my pregnancy	.052	0.123
My husband/partner was happy when told of my pregnancy	-.080	0.007
My husband/partner cooperated with me during my pregnancy	.049	0.093
I was satisfied with our marriage	-.090	0.114
I have a friend I can talk to about maternity life or child rearing	-0.223**	-0.226**
I was satisfied with my delivery experience	-.115	0.054
Infant attachment score on day 3	-.114	-0.142
Infant attachment score on day 5	-.175	-0.185**
Infant attachment score at 1 month		-0.207**
Maximum maternity blues score		.472**

Sociodemographic factors		
	Maximum MBS	EDPS at 1 M
Mother's age	.133	0.194*
Husband's/partner's age	.069	0.164
Mother's employment states (Yes/No)	-.135	-0.124
Husband's/partner's employment states (Yes/No)	-.161	-0.053
Satogaeri bunben (Yes/No)	-.223*	-0.016
Presence of support figure (Yes/No)	-.090	-0.125

*p<0.10,
**p<0.05

Table 4 Factors associated with MBS and EDPS scores based on multiple regression analyses

	β	95% C.I.	standardized β	p value
Maximum MBS	F=7.154. R ² =0.129. adjusted R ² =0.111			
I have a friend I can talk to about my maternity life or childrearing	-1.530	-2.681 to -0.378	-0.251	0.010**
Presence of Satogaeri Bunben	-2.815	-4.732 to -0.898	-0.277	0.004**
EDPS at 1 month	F=4.881. R ² =0.170. adjusted R ² =0.136			
I have a friend I can talk to about maternity life or child rearing	-2.829	-4.756 to -0.903	-0.285	0.004**
Infant attachment score on Day 5	-0.042	-0.149 to 0.064	-0.080	0.429
Husband's/partner's age	0.106	-0.008 to 0.221	0.181	0.068*

95% C.I. indicates 95% confidence interval, forced entry method

**P<0.05, *P<0.10

association with EDPS scores. Neither MBS nor EPDS scores were significantly associated with obstetric factors. Multiple regression analyses, including the variables associated with MBS or EPDS scores as independent variables, are shown in Table 4. "I have a friend I can talk to about maternity life or child rearing" [β (95% confidence interval) = -1.53 (-2.68 - -0.378), standardized β = -0.251, $p < 0.05$] and "satogaeri bunben" [β (95% confidence interval) = -2.82 (-4.73 - -0.898), standardized β = -0.277, $p < 0.01$] were mutually and independently associated with MBS scores. Only "I have a friend I can talk to about maternity life or child rearing" [β (95% CI) = -2.83 (-4.76 - -0.903) and, standardized β = -0.285, $p < 0.01$] was significantly associated with EPDS scores, although the association of the husband's/partner's age with EPDS scores was marginally significant [β (95% CI) = -0.106 (-0.008-0.221), standardized β = 0.181, $p = 0.068$].

DISCUSSION

The present study evaluated the demographic, obstetric, emotional, and psychological factors in healthy mothers who had normal birth by using the MAI questionnaire and EPDS scale. In this study, 15 mothers (15.0%) were categorized as having had maternity blues, and 10 (10.0%) were suspected to have postpartum depression. In previous studies, the prevalence of maternity blues in Japanese women was 4–50%,¹⁵⁾ whereas in Western countries it was reported to be about 50%.^{4), 13), 28), 29)} On the other hand, postpartum depression affects approximately 10–19% of Japanese women,^{14), 30)} which is similar to rates seen in Western countries.²⁹⁾ In our study, the

prevalence rate of maternity blues and postpartum depression was lower than in previous studies. Our subject criteria originally included no complication-related pregnancy and delivery, no mental diseases in the past, normal birth, and healthy normal infants. However, among our study subjects, maternity blues were significantly and positively associated with postpartum depression at 1 month after delivery. In previous European and American studies, Henshaw *et al.*¹⁷⁾ reported that British women with severe blues are 2.8 times as likely to experience postpartum depression at 6 months as those without. In Turkish women with postpartum depression, Kirpinar *et al.*¹³⁾ reported a significant positive correlation between the prevalence of postpartum depression symptomatology at 1 and 6 weeks (Kendall's tau_b correlation coefficient: $r=0.60$, $p<0.001$). Adewuya³¹⁾ showed that Nigerian women with maternity blues at day 5 are 12 times more likely to be diagnosed at 4 weeks and 10 times more likely to be diagnosed as depressed at 8 weeks postpartum than those without the maternity blues. These results suggest that the prevention of maternity blues in the early postpartum phase leads to the prevention of postpartum depression later.

Most research on the factors associated with postpartum depressive mood have evaluated postpartum depression over 1 month; however, a few studies report the association of maternity blues or early postpartum depressive symptoms with obstetric, psychological, and sociodemographic factors. Bloch *et al.*³²⁾ assessed Israeli women during the first 3 days after delivery by using the EPDS scale. The results showed that a history of depression, including such psychological factors as premenstrual dysphoric disorder and psychiatric symptoms during pregnancy, were associated with early postpartum mood symptoms. However, they did not consider obstetric or sociodemographic factors. On the other hand, the subjects of our study were women with no history of disease including psychiatric disorders. Interestingly, our findings show that "I have a friend I can talk to about maternity and childrearing" or "satogaeri bunben" were inversely associated with MBS scores.

Until 5 days after birth, the strongest relevant factor with MB was "satogaeri bunben." In general, most Japanese mothers deliver at a hospital, and are hospitalized for about a week after birth, after which, they return to their family home to stay with their parents and family members. This provides the mother with sufficient support and allows her to rest physically and psychologically for one month after birth; this is "satogaeri bunben." To the best of our knowledge, only 2 studies have reported a relation between "satogaeri bunben" and postpartum depression. Tamaki *et al.*¹²⁾ surveyed women by using the EPDS scale at 1, 3, and 4 months postpartum, and reported that "satogaeri bunben" was not associated with postpartum depression. Yoshida *et al.*³³⁾ also demonstrated no relationship between "satogaeri bunben" and the onset of postpartum depression at 6 months. Our study showed that "satogaeri bunben" was not a relevant factor for EPDS scores at 1 month but was independently and inversely associated with MBS scores during the 5 days of hospitalization. Thus, the MBS score among women who selected "satogaeri bunben" was lower than in those who did not. Murata *et al.*³⁴⁾ suggested that the mother-daughter relationship affects the childbearing attitude; it is one of the effects of "satogaeri bunben." Although "satogaeri bunben" does not directly affect the development of postpartum depression 1 month after delivery, it may indirectly prevent it by preventing maternity blues symptoms early after birth.

Most previous researchers have indicated that poor social support was a predisposing factor for maternity blues and postpartum depression.^{5), 10), 36)} Three individuals can provide support to mothers after delivery: her husband/partner, those she can depend on during pregnancy and after birth, and her own parents who are associated with the effectiveness of the "satogaeri bunben." In our study, "I have a friend I can talk to about maternity and child rearing" was independently associated with MBS and EPDS scores at 1 month. For mothers, discussing maternity and child rearing issues with a friend stabilizes their psychological condition. Furthermore, it is very

important for mothers to have a place to meet for these discussions, where they can readily talk about maternity and child rearing.

The husband/partner is the key person in the life of postpartum women. Kirpinar *et al.*¹³⁾ studied postpartum depression by using the EPDS scale, and found that a high EPDS score was related to a poor marital relationship in the first postpartum week. O'Hara and Swain⁵⁾ reported that a poor marital relationship led to postpartum depression. In our study, those with older husbands/partners had higher EPDS scores at 1 month after delivery. However, we did not obtain any information about the relationship between postpartum women and their husbands/partners and the amount of cooperation given by husbands/partners. In Japan, as a husband/partner ages, his social standing increases, and he will spend less time helping with housework and child rearing. We need to investigate the factor(s) involved in the relationship between husband/partner age and postpartum depression.

Some previous studies reported that the mother's psychiatric symptoms and early postpartum depressive symptoms were associated with poor mother-infant interaction^{35), 37)} or poor maternal attachment.³⁸⁾ We found an inverse association between MAI and EPDS scores at 1 month. Therefore, screening for maternity blues and postpartum depression in the early postpartum period may contribute to a healthy mother-infant relationship.

Our study has both strengths and limitations. One of its strengths is the exclusion of women with medical conditions such as psychiatric disease, chronic disease, and obstetric conditions that affect postpartum mood symptoms. Furthermore, we limited study subjects to healthy mothers and infants. Given the strong association between a history of psychiatric disease and postpartum depression in previous studies,^{7), 13), 17)} it was difficult to detect the association between factors other than a history of psychiatric disease and postpartum depression. There are several limitations that should be duly considered. First, we followed the subjects only until one month after birth. However, previous studies showed that the psychiatric mood at one month was strongly associated with the psychiatric mood thereafter; from a prevention standpoint, it is valuable to elucidate factors relating to maternity blues in our study. Second, our study was conducted in Japan. Our findings may not apply to other populations with different customs and ideologies.

In conclusion, we determined the relevant factors associated with MBS and EPDS scores at 1 month after delivery, and showed that the Japanese custom of "satogaeri bunben," the presence of a friend with whom the mother can discuss maternity and child rearing, and husband/partner age, were associated with postpartum mood. However, no relationship was found with obstetric factors. The risk of depression following delivery was low among the subjects of our study. The importance of support from inside and outside the family should not be underestimated in postpartum women.

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