

研 究

産褥早期における日記の有用性

—初産婦を対象とした出産直後3か月間の縦断的調査—

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〔論文要旨〕

本研究の目的は、産褥早期の初産婦が育児情報の日記を書くことの有用性を評価することである。分析対象は育児未経験の母親53名であり、産褥2日、2か月、3か月に児の行動の予測性と読み取り易さ、Spielbergerの状態—特性不安検査(STAI)日本語版、母親エンパワメント(MEQ)について調査した。

育児の日記を毎日書いた母親ら(n=25)を日記使用群として、それ以外を日記非使用群(n=28)とした。両群を比較したところ、状態不安平均得点と特性不安平均得点は有意な差はなく、状態不安平均得点は出産後3か月目に有意に減少した。状態不安得点は児の行動の予測しやすさと読みとり易さと強い相関があった。MEQは「私は赤ちゃんの個性を理解している」項目では、日記使用群の得点が日記非使用群に比べて有意に高かった。MEQと状態不安との間には、児の要求、泣き、哺乳、睡眠、育児が楽しい項目と相関が高かった。

本研究の調査結果から、産褥早期の初産婦が日記を書くことは、乳児の個性、とくに生物学的リズムや気質を理解するうえで有用であることが示唆された。

Key words : 産褥早期, 育児日記, 母親エンパワメント, セルフモニタリング, 自己効力感

I. Introduction

Most mothers in postpartum have concerns and anxiety about infant care¹⁾, and particularly concerned with feeding^{2,3)}. Infant care experience influences maternal competence^{4,5)}. An infant has his/her own biological rhythm and individuality⁶⁻⁹⁾.

In recent years new mothers-to-be in a hospital are encouraged to attend a prenatal class to learn the general knowledge about infant care^{10,11)}. A primipara has a tendency to apply the infant-care knowledge she learned to her infant, but it hardly fits in many cases.

Therefore, a new mother in early postpartum has to take infant care by trial and error, in order to understand her infant's individuality. Thus, a new inexperienced mother in early postpartum often becomes unconfident, unsure and worried about infant care. This negative mental effect would damage the healthy development of early mother-infant interaction.

As for the early mother-infant interaction, mother's predictability and readability to infant's behaviors as well as infant's responsiveness to mother's reactions strongly influence maternal self-efficacy^{12,13)}. A new experi-

The Effects of Diary Writing in Early Postpartum

— A Longitudinal Study with Japanese Primiparae during Three Months Postpartum —

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enced mother is supposed to have day-by-day a better understanding of infant care, including why infants cry, and rhythm of sleep, stool, feeding, and other physical and health information. Moreover, mother's sensitivity to infant is an important issue¹⁴⁾. Therefore, to have a good overview of infant's biological rhythm enables to establish a good mother-infant interaction.

Iida¹⁵⁾ proposed an idea of diary writing about infant care in six month postpartum. Infant care diary writing potentially takes an advantage of having a better understanding of infant's biological rhythm and so on. The diary here was helpful for having a good overview of growing-up progresses and in particular mothers in early postpartum were able to feel comfortable on infant care. In general, diary writing is a simple but powerful method to collect health information¹⁶⁾. Diary is also useful to observe a cycle such as biological rhythm and therefore has been used in various fields as a self-recognition tool^{17,18)}.

The aim of this study was to examine a hypothesis that diary writing about infant care would enable the primiparae in early postpartum to increase their maternal empowerment by observing infant's biological rhythm of feeding, sleep and so on.

We used the term "maternal empowerment" that means to promote and strengthen the maternal competence.

II. Subjects and Methods

In this study 126 Japanese married primiparae were selected, who delivered a term, singleton baby by vaginal birth from March 2003 to August 2003 in two hospitals in Tokai area in Japan. All participants together with their infants were in good health and they had been hospitalized for five days after delivery.

This study was fully approved by the ethics committee in the hospitals. All participants agreed with the study purpose that was ex-

plained by showing the written paper as well as by oral communication. Moreover, they understood that individual privacy was to be definitely protected and it was always possible to interrupt their participations throughout the investigation. For the investigation, they were contacted in the hospital at the second day, by postmail with a questionnaire at the second month and the third month postpartum, respectively.

Instruments

1. Personal data

The personal data of each participant was collected at the first investigation with a questionnaire. It means the demographic data, which includes age, education level, prenatal education, occupation, whether or not having infant care support by family and so on.

2. Infant's Predictability and Readability

The infant's predictability and readability were evaluated with five categories from 'very easy' to 'very difficult'.

3. State-Trait Anxiety Inventory (STAI)

We used Spielberger's State-Trait Anxiety Inventory Japanese version¹⁹⁾ to measure the degree of anxiety. It has 20 items instruments with a 4-point response scale, on which a higher score reflects greater anxiety.

4. Maternal Empowerment Questionnaire (MEQ)

MEQ includes 13 items. Its reliability and validity were positively tested²⁰⁾. It used Likert Scale with 4-point response scale, for example, 4 point for the positive response and 1 point for the negative response, on which a higher score reflects greater maternal empowerment. In case where a question is the reverse one, 1 point is given for the positive response and 4 point for the negative response.

5. Diary

A copy of the diary was given to each mother who delivered in the hospital as one of gifts from the hospital at the last day in it. The diary was used voluntarily. The double spread of the diary has the B4 size format in which an infant care person can write on feeding, stool and sleep in the one-day (24 hours) timetable, which can be used for one week. The diary can be used for six months in total^[21].

6. Procedure

At the second day after delivery, the author handed over a questionnaire to each participant in the hospital. Participants filled in and submitted it to a staff of the hospital after they sealed in the envelope. At the second and the third month after delivery, a questionnaire was sent by postmail to each participant. Participants filled in and returned it to the author by postmail.

7. Statistical analysis

The answers to questionnaires were analyzed using SPSS 11.5J for Windows. They were evaluated by χ^2 test, Mann-Whitney U test, Wilcoxon signed-rank test and Spearman's correlation coefficient, where the significance level was set to 0.05.

III. Results

Among 71 primiparae who participated three times of the investigation using questionnaires, we analyzed 53 mothers (74.6%) who answered three times to questionnaires and were inexperienced in infant care. We distinguished two groups in this study: diary group and non-diary group. Mothers of the diary group (47.2%) wrote the infant care diary everyday for three months. Other mothers (52.8%) belong to the non-diary group.

Infant care experience was categorized into five degrees as follows: (1) very rich experience

as a nursery nurse or hospital nurse, (2) rich experienced of caring an infant of relatives, (3) fair experienced, meaning that mothers had no infant care experience but some infant-touching experience (4) poor experienced, meaning that mothers had just a little infant-touching experience, and (5) No experience, meaning that mothers had no infant-touching experience. The term "inexperienced" covered the degrees (3) to (5).

The demographic data were summarized in Table 1. There were no concern about social factors due to young ages, marital status, financial affairs, educational level, family size and infants of participants were in good order. Note that they included four low birth weight infants. All participants were married and their husbands were in the regular works.

The infant care situation was shown in Table 2. Mothers who were able to take "family support except husband" were many but there was no significant difference between two groups. Breastfeeding was the majority for feeding. In feeding, there was no significant difference between two groups at each term, where at the third month the number of bottle-feeding mothers in the non-diary group increased. The easy level of predictability and readability increased after the second month. However, there was no significant difference concerning the predictability between two groups, whereas concerning the readability the number of mothers in the non-diary group were significantly larger than the mothers in the diary group at the second day and third month.

The changes of the state anxiety and trait anxiety mean score and correlation were shown in Table 3. The state anxiety mean score and trait anxiety mean score were at the normal level at each term, whereas the state anxiety mean score significantly decreased at the third month after delivery.

Table 1 Demographic data

Participants		n =126		
Respondents		2nd day n =100, 2nd month n =81, 3rd month n =71		
Analysed participants		n =53(enexperienced infant care)		
		[Diary G n=25 Non-diary G n=28		
		Average	Diary G	Non-diary G
Age (Years)		28.5±3.9(19~37)	27.8±3.4	29.2±4.2 n.s
Length of pregnancy (Weeks)		38.7±1.2(37~41)	38.5±1.1	38.9±1.2 n.s
Occupation	Working *	17(32.1)	6(24.0)	11(39.3)
	Housewife	36(67.9)	19(76.0)	17(60.7)
	Total	53(100.0)	25(100.0)	28(100.0)
Education	High school	10(18.9)	3(12.0)	7(25.0)
	Technical school	10(18.9)	7(28.0)	3(10.7)
	Junior college	19(35.8)	8(32.0)	11(39.3)
	University	14(26.4)	7(28.0)	7(25.0)
Total		53(100.0)	25(100.0)	28(100.0)
Family size	Spouse and child	46(86.8)	21(84.0)	25(89.3)
	Other relatives	7(13.2)	4(16.0)	3(10.7)
	Total	53(100.0)	25(100.0)	28(100.0)
Prenatal class atenndance	Yes	51(96.2)	24(96.0)	27(96.3)
	No	2(3.8)	1(4.0)	1(3.7)
	Total	25(100.0)	25(100.0)	28(100.0)
Infant care experience	Fair	5(9.4)	1(4.0)	4(14.3)
	Poor	14(26.4)	8(32.0)	6(21.4)
	No experience	34(64.2)	16(64.0)	18(64.3)
	Total	53(100.0)	25(100.0)	28(100.0)
Infant weight(g)		2,872±287 (2,300~3,716)	2,817±269	2,922±298 n.s
Low birth weigt infants			2,314	2,300
Diary G n=3			2,484	
Non-diary G n=1			2,336	
Infant sex	Male	27(50.9)	10(40.0)	17(60.7)
	Female	26(49.1)	15(60.0)	11(39.3)
	Total	53(100.0)	25(100.0)	28(100.0)

*All are infant care leaves. () %
Diary G : They wrote infant care diary three months. Non-diary G : They didn't write infant care diary.

There was no significant difference in the state and trait anxiety mean score between two groups. There was a significant correlation between the state anxiety score and trait anxiety score.

The correlation between the state anxiety score, demographic data and infant care condition were shown in Table 4.

At the second day, the state anxiety highly correlated with the readability for mothers in the diary group. The predictability correlated with the readability and the infant care experience, whereas the readability correlated with the infant care experience for mothers in the non-diary group.

At the second month, for mothers in the

Table 2 Infant Care Condition

		2nd day			2nd month			3rd month		
		Average ± SD	Diary G	Non- diary G	Average ± SD	Diary G	Non- diary G	Average ± SD	Diary G	Non- diary G
Family support except husband	Yes	-	-	-	26(49.1)	9(36.0)	17(60.7)	21(39.6)	8(32.0)	13(46.4)
	No	-	-	-	27(50.9)	16(64.0)	11(39.3)	32(60.4)	17(68.0)	15(53.6)
	Total	-	-	-	53(100.0)	25(100.0)	28(100.0)	53(100.0)	25(100.0)	28(100.0)
Feeding	Breast feeding	38(71.7)	16(64.0)	22(78.6)	46(86.8)	23(92.0)	23(82.1)	40(85.0)	23(92.0)	22(78.6)
	Breast & bottle feeding	5(9.4)	5(20.0)	4(14.3)	5(9.4)	1(4.0)	4(14.3)	2(3.8)	0(0.0)	2(7.1)
	Bottle feeding	2(3.8)	4(16.0)	2(7.1)	2(3.8)	1(4.0)	1(3.6)	6(11.3)	2(4.0)	4(14.3)
Total		53(100.0)	25(100.0)	28(100.0)	53(100.0)	25(100.0)	28(100.0)	53(100.0)	25(100.0)	28(100.0)
Predict- ability	Very Easy	3(5.7)	1(4.0)	2(7.1)	4(7.5)	2(8.0)	2(7.1)	10(18.9)	5(20.0)	5(17.9)
	Easy	17(32.1)	10(40.0)	7(25.0)	39(73.6)	18(72.0)	21(75.0)	36(67.9)	16(64.0)	20(71.4)
	Fair	25(47.2)	12(48.0)	13(46.4)	7(13.2)	4(16.0)	3(10.7)	6(11.3)	4(16.0)	2(7.1)
	Difficult	6(11.3)	2(8.0)	4(14.3)	3(5.7)	1(4.0)	2(7.1)	1(1.9)	0(0.0)	1(3.6)
	Very Difficult	2(3.8)	0(0.0)	2(7.1)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Total		53(100.0)	25(100.0)	28(100.0)	53(100.0)	25(100.0)	28(100.0)	53(100.0)	25(100.0)	28(100.0)
Read- ability	Very Easy	9(17.0)	2(8.0)	7(25.0)	15(28.3)	5(20.0)	10(35.7)	19(35.8)	6(24.0)	13(46.4)
	Easy	11(20.8)	5(20.0)	6(21.4)	17(32.1)	7(28.0)	10(35.7)	24(45.3)	12(48.0)	12(42.9)
	Fair	28(52.8)	14(56.0)	14(50.0)	18(34.0)	11(44.0)	7(25.0)	9(17.0)	7(28.0)	2(7.1)
	Difficult	5(9.4)	4(16.0)	1(3.6)	3(5.7)	2(8.0)	1(3.6)	1(1.9)	0(0.0)	1(3.6)
	Very Difficult	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Total		53(100.0)	25(100.0)	28(100.0)	53(100.0)	25(100.0)	28(100.0)	53(100.0)	25(100.0)	28(100.0)

*p < 0.05

Table 3 Changes of State and Trait Anxiety Score and Correlation

		2nd day		2nd month		3rd month	
State Anxiety Score		n.s		***	***		
Mean ± SD		41.5±10.2		39.3± 9.4		34.8± 9.0	
Diary G		41.1±10.2		41.3±10.2		34.6±10.5	
Non-diary G		41.9±10.9		37.4± 8.4		35.0± 7.7	
Trait Anxiety Score							
Mean ± SD		42.4± 9.5					
Diary G		41.6± 8.8					
Non-diary G		43.1±10.3					
Correlation							
		2nd day		2nd month		3rd month	
		Trait anxiety score 2nd day	State anxiety score 2nd day	Trait anxiety score 2nd day	State anxiety score 2nd month	Trait anxiety score 2nd day	State anxiety score 3rd month
Trait anxiety score 2nd day	Diary G	1		1		1	
	Non-diary G	1		1		1	
State anxiety score	Diary G	0.427*	1	0.526**	1	0.517**	1
	Non-diary G	0.558**	1	0.559**	1	0.528**	1

*p < 0.05 **p < 0.01 ***p < 0.001

diary group the state anxiety score correlated with the predictability and the readability, whereas the predictability correlated with the readability. For mothers in the non-diary group the “family support except husband” correlated negatively with the feeding.

At the third month, for mothers in the diary group the state anxiety score highly correlated with readability, whereas the family size correlated negatively with the “family

support except husband”. For mothers in the non-diary group the readability correlated with the infant care experience.

The changes of Maternal Empowerment mean score were shown in Table 5. In 12 items there were significant differences between at the second day and the second month after delivery. In 8 items there were significant differences between at the second month and at the third month after delivery.

Table 4 Correlation between State anxiety Score, Demographic data and Infant Care Condition

2nd day

		State Anxi- ety Score	Age	Education	Family size	Feeding	Predictability	Readability	Infant care experience
State anxiety Score	Diary G	1							
	Non-diary G	1							
Age	Diary G	0.126	1						
	Non-diary G	0.105	1						
Education	Diary G	0.025	0.052	1					
	Non-diary G	-0.11	-0.177	1					
Family size	Diary G	-0.008	-0.206	-0.378	1				
	Non-diary G	-0.072	-0.057	-0.113	1				
Feeding	Diary G	0.183	0.122	-0.095	0.28	1			
	Non-diary G	0.015	0.298	-0.192	-0.077	1			
Predictability	Diary G	-0.148	0.265	-0.193	0.233	0.126	1		
	Non-diary G	-0.074	0.249	0.226	-0.023	-0.221	1		
Readability	Diary G	0.635 **	0.133	0.098	0.252	0.199	0.045	1	
	Non-diary G	0.279	0.295	0.027	-0.232	-0.031	0.398 *	1	
Infant care experience	Diary G	0.262	0.248	0.043	-0.189	0.162	0.004	-0.007	1
	Non-diary G	0.151	0.154	-0.162	-0.151	-0.016	0.422 *	0.484 *	1

2nd month

		State Anxi- ety Score	Age	Education	Family size	Family support except husband	Feeding	Predictability	Readability	Infant care experience
State anxiety Score	Diary G	1								
	Non-diary G	1								
Age	Diary G	0.143	1							
	Non-diary G	-0.135	1							
Education	Diary G	-0.073	0.052	1						
	Non-diary G	-0.232	-0.177	1						
Family size	Diary G	0.114	-0.206	-0.378	1					
	Non-diary G	-0.251	0.057	-0.113	1					
Family support except husband	Diary G	-0.122	0.134	-0.162	-0.355	1				
	Non-diary G	-0.05	0.027	0.242	-0.279	1				
Feeding	Diary G	0.31	-0.057	-0.311	0.179	0.014	1			
	Non-diary G	0.029	0.067	-0.301	0.017	-0.414 *	1			
Predictability	Diary G	0.422 *	0.206	-0.281	-0.115	0.037	0.13	1		
	Non-diary G	0.343	-0.318	0.015	-0.301	-0.091	0.276	1		
Readability	Diary G	0.436 *	0.009	-0.153	0.117	-0.136	0.3	0.476 *	1	
	Non-diary G	0.121	0.297	-0.312	-0.106	-0.308	0.349	0.247	1	
Infant care experience	Diary G	-0.052	0.248	0.043	-0.189	0.330	0.1	0.029	-0.092	1
	Non-diary G	-0.026	0.154	-0.162	-0.151	-0.16	0.236	0.173	0.232	1

3rd month

		State Anxi- ety Score	Age	Education	Family size	Family support except husband	Feeding	Predictability	Readability	Infant care experience
State anxiety Score	Diary G	1								
	Non-diary G	1								
Age	Diary G	0.3	1							
	Non-diary G	0.036	1							
Education	Diary G	-0.116	0.052	1						
	Non-diary G	-0.305	-0.177	1						
Family size	Diary G	0.288	-0.206	-0.378	1					
	Non-diary G	-0.029	0.057	-0.113	1					
Family support except husband	Diary G	-0.321	-0.06	-0.056	-0.402 *	1				
	Non-diary G	-0.022	-0.022	0.163	-0.372	1				
Feeding	Diary G	0.201	0.058	-0.248	-0.009	-0.094	1			
	Non-diary G	0.277	-0.016	-0.291	-0.003	-0.035	1			
Predictability	Diary G	0.272	-0.036	-0.088	0.027	0.384	-0.257	1		
	Non-diary G	-0.019	-0.191	0.221	0.054	-0.128	-0.223	1		
Readability	Diary G	0.714 **	0.099	-0.185	0.123	-0.315	0.32	0.186	1	
	Non-diary G	0.221	0.121	-0.289	-0.158	0.029	0.294	0.107	1	
Infant care experience	Diary G	-0.122	0.248	0.043	-0.189	0.064	0.194	0.081	-0.004	1
	Non-diary G	-0.054	0.154	-0.162	-0.151	0.104	0.146	-0.022	0.488 **	1

*<0.05 **<0.01 Education : High School 2, Technical school 3, Junior college 4, University 5 Family size : Spouse and child 1, Other relatives 2 Family support : Yes 1, No 2 Feeding : Breast feeding 1, Breast & bottle feeding 2, Bottle feeding 3 Predictability : Very easy 1, Easy 2, Fair 3, difficult 4, Very difficult 5 Readability : Very easy 1, Easy 2, Fair 3, difficult 4, Very difficult 5 Infant care experience : Fair 3, poor 4, No experience 5

Table 5 Changes of Maternal Empowerment mean score

		2nd day	2nd month	3rd month
1	I can predict my baby's next feeding time		***	**
	Mean \pm SD	1.91 \pm 0.81	2.64 \pm 0.56	2.83 \pm 0.47
	Diary G	1.92 \pm 0.81	2.64 \pm 0.57	2.88 \pm 0.44
	Non-diary G	1.89 \pm 0.83 ^{n.s}	2.64 \pm 0.56 ^{n.s}	2.79 \pm 0.50 ^{n.s}
2	I can predict my baby's sleep		***	**
	Mean \pm SD	1.38 \pm 0.56	2.06 \pm 0.69	2.28 \pm 0.64
	Diary G	1.44 \pm 0.58	2.61 \pm 0.55	2.28 \pm 0.61
	Non-diary G	1.32 \pm 0.55 ^{n.s}	1.96 \pm 0.79 ^{n.s}	2.29 \pm 0.66 ^{n.s}
3	Successful prediction on my baby's requests makes me happy		***	**
	Mean \pm SD	1.81 \pm 0.76	2.49 \pm 0.70	2.74 \pm 0.65
	Diary G	1.92 \pm 0.76	2.52 \pm 0.71	2.80 \pm 0.65
	Non-diary G	1.71 \pm 0.71 ^{n.s}	2.46 \pm 0.69 ^{n.s}	2.68 \pm 0.69 ^{n.s}
4	I can predict my baby's requests		***	**
	Mean \pm SD	1.53 \pm 0.50	2.34 \pm 0.68	2.58 \pm 0.60
	Diary G	1.60 \pm 0.50	2.36 \pm 0.64	2.60 \pm 0.58
	Non-diary G	1.46 \pm 0.51 ^{n.s}	2.32 \pm 0.72 ^{n.s}	2.57 \pm 0.63 ^{n.s}
5	My baby's cry helps me predict his/her requests		***	n.s
	Mean \pm SD	1.53 \pm 0.70	2.68 \pm 0.51	2.87 \pm 0.44
	Diary G	1.68 \pm 0.69	2.68 \pm 0.48	2.88 \pm 0.44
	Non-diary G	1.39 \pm 0.69 ^{n.s}	2.68 \pm 0.55 ^{n.s}	2.86 \pm 0.45 ^{n.s}
R 6	I feel anxiety when my baby cries		***	n.s
	Mean \pm SD	2.23 \pm 0.78	2.83 \pm 0.67	3.02 \pm 0.80
	Diary G	2.32 \pm 0.80	2.68 \pm 0.69	3.00 \pm 0.91
	Non-diary G	2.14 \pm 0.76 ^{n.s}	2.96 \pm 0.64 ^{n.s}	3.04 \pm 0.45 ^{n.s}
R 7	My baby's terrible cry throws me into confusion		***	**
	Mean \pm SD	2.36 \pm 0.92	2.74 \pm 0.88	3.04 \pm 0.85
	Diary G	2.44 \pm 0.87	2.72 \pm 0.89	3.12 \pm 0.78
	Non-diary G	2.29 \pm 0.98 ^{n.s}	2.75 \pm 0.89 ^{n.s}	2.96 \pm 0.92 ^{n.s}
R 8	It takes a long time to understand my baby's requests		***	n.s
	Mean \pm SD	1.53 \pm 0.50	2.85 \pm 0.53	2.94 \pm 0.50
	Diary G	1.60 \pm 0.50	2.92 \pm 0.64	3.00 \pm 0.65
	Non-diary G	1.16 \pm 0.51 ^{n.s}	2.79 \pm 0.42 ^{n.s}	2.89 \pm 0.31 ^{n.s}
R 9	I have anxiety my baby's feeding		*	n.s
	Mean \pm SD	2.34 \pm 0.94	2.64 \pm 0.88	2.75 \pm 0.94
	Diary G	2.34 \pm 0.95	2.44 \pm 0.92	2.76 \pm 0.97
	Non-diary G	2.32 \pm 0.94 ^{n.s}	2.82 \pm 0.82 ^{n.s}	2.75 \pm 0.93 ^{n.s}
R 10	I have anxiety my baby's sleep		***	***
	Mean \pm SD	2.70 \pm 0.82	2.89 \pm 0.87	3.34 \pm 0.71
	Diary G	2.52 \pm 0.82	2.72 \pm 0.84	3.24 \pm 0.78
	Non-diary G	2.86 \pm 0.80 ^{n.s}	3.04 \pm 0.88 ^{n.s}	3.43 \pm 0.63 ^{n.s}
11	I have confidence in my baby care		***	***
	Mean \pm SD	1.66 \pm 0.68	1.94 \pm 0.60	2.25 \pm 0.65
	Diary G	1.68 \pm 0.63	1.84 \pm 0.55	2.28 \pm 0.68
	Non-diary G	1.64 \pm 0.73 ^{n.s}	2.04 \pm 0.64 ^{n.s}	2.21 \pm 0.63 ^{n.s}
12	I understand my baby's individuality		***	**
	Mean \pm SD	2.34 \pm 0.78	2.85 \pm 0.66	3.08 \pm 0.68
	Diary G	2.40 \pm 0.65	3.04 \pm 0.61*	3.32 \pm 0.56**
	Non-diary G	2.29 \pm 0.90 ^{n.s}	2.63 \pm 0.67 ^{n.s}	2.86 \pm 0.71 ^{n.s}
13	I enjoy my baby care		*	n.s
	Mean \pm SD	3.06 \pm 0.70	3.25 \pm 0.68	3.30 \pm 0.61
	Diary G	3.08 \pm 0.64	3.04 \pm 0.68*	3.24 \pm 0.52
	Non-diary G	3.07 \pm 0.77 ^{n.s}	3.43 \pm 0.63 ^{n.s}	3.36 \pm 0.68 ^{n.s}

Range: 1-4 R: reverse *p < 0.05 **p < 0.01 ***p < 0.001

It shows that mother's Maternal Empowerment increased at the second month after delivery.

Low score of Maternal Empowerment at the second day after delivery was found in the following seven items : "I can predict my baby's next feeding time", "I can predict my baby's sleep", "Successful prediction on my baby's requests makes me happy", "I can predict my baby's requests", "My baby's cry helps me predict his/her requests", "It takes a long time to understand my baby's requests", and "I have confidence in my baby care". The

highest score of Maternal Empowerment was taken in the item "I enjoy baby care".

Concerning the item "I understand my baby's individuality", there was a significant difference between the diary group and non-diary group at the second month and third month after delivery. Meanwhile, on the item "I enjoy baby care", the non-diary group was significantly higher than the diary group at the second month after delivery. The lowest score for the non-diary group was found in the item "I have confidence in my baby care" at the third month after delivery.

Table 6 Correlation between Maternal Empowerment Score and State Anxiety Score

		2nd day	2nd month	3rd month
1 I can predict my baby's next feeding time	Diary G	-0.049	-0.183	-0.07
	Non-diary G	-0.184	0.033	-0.278
2 I can predict my baby's sleep	Diary G	0.176	-0.181	-0.31
	Non-diary G	0.025	0.109	0.001
3 Successful prediction on my baby's requests makes me happy	Diary G	-0.132	-0.098	-0.236
	Non-diary G	-0.449 *	-0.346	-0.201
4 I can predict my baby's requests	Diary G	0.108	0.031	-0.017
	Non-diary G	-0.209	-0.315	-0.15
5 My baby's cry helps me predict his/her requests	Diary G	-0.049	0.03	-0.307
	Non-diary G	-0.279	-0.125	-0.126
R 6 I feel anxiety when my baby cries	Diary G	-0.092	-0.577 **	-0.679 **
	Non-diary G	-0.382 *	-0.312	-0.673 **
R 7 My baby's terrible cry throws me into confusion	Diary G	-0.426 *	-0.466 *	-0.559 **
	Non-diary G	-0.341	-0.592 **	-0.558 **
R 8 It takes a long time to underatand my baby's requests	Diary G	0.108	-0.104	-0.316
	Non-diary G	-0.209	-0.346	-0.108
R 9 I have anxiety my baby's feeding	Diary G	-0.547 **	-0.462 *	-0.424 *
	Non-diary G	-0.602 **	-0.312	-0.456 *
R 10 I have anxiety my baby's sleep	Diary G	-0.336	-0.609 **	-0.625 **
	Non-diary G	-0.355	-0.375 *	-0.338
11 I have confidence in my baby care	Diary G	-0.326	-0.223	-0.454 *
	Non-diary G	-0.173	-0.319	-0.343
12 I understand my baby's individuality	Diary G	-0.07	-0.099	-0.355
	Non-diary G	0.049	-0.256	-0.241
13 I enjoy my baby care	Diary G	-0.52 **	-0.571 **	-0.433 **
	Non-diary G	-0.642 **	-0.619 **	-0.702 **

*p<0.05 **p<0.01

The correlation between Maternal Empowerment score and the state anxiety score were shown in Table 6.

At the second day, there was a negative correlation between the state anxiety score, "My baby's terrible cry throws me into confusion", "I have anxiety my baby's feeding" and "I enjoy my baby care" for mothers in the diary group. For mothers in the non-diary group, there was a negative correlation between state anxiety score, "Successful prediction on my baby's requests makes me happy", "I feel anxiety when my baby cries", "I have anxiety my baby's feeding", and "I enjoy my baby care".

At the second month, for mothers in the diary group there was a negative correlation between state anxiety score, "I feel anxiety when my baby cries", "My baby's terrible cry throws me into confusion", "I have anxiety my baby's feeding", "I have anxiety my baby's sleep", and "I enjoy my baby care". For mothers in the non-diary group there was a negative correlation between state anxiety score, "My baby's terrible cry throws me into confusion", "I have anxiety about my baby's sleep" and "I enjoy my baby care".

At third month, for mothers in the diary group there was a negative correlation between state anxiety score, "I feel anxiety when my baby cries", "My baby's terrible cry throws me into confusion", "I have anxiety about my baby's feeding", "I have anxiety about my baby's sleep", "I have confidence in my baby care" and "I enjoy my baby care". For mothers in the non-diary group there was a negative correlation between state anxiety score, "I feel anxiety when my baby cries", "My baby's terrible cry throws me into confusion", "I have anxiety about my baby's feeding" and "I enjoy my baby care".

IV. Discussion

It is known that parents often write about

their infant care in their diaries^{22, 23)}. However, little was known about the relationship between writing about infant care in a diary (i.e., writing health information on a baby) and infant care²⁴⁾. Meanwhile, it was reported in Japan that 22.8% of mothers wrote a diary to make it use for infant care²⁵⁾. This study shows that 47.2% of participants wrote a diary everyday for three months and we then estimate that Japanese primiparae with a high percentage write a diary.

In this study, mothers in the postpartum who wrote the infant care diary and who did not write it were compared. There was a high correlation between the state anxiety score and trait anxiety score. The state anxiety score of mothers of both groups significantly decreased at the third month after delivery, whereas there was no significant difference between both groups. It supports the results of the previous study⁴⁾. Concerning the state anxiety score correlated negatively with, readability and predictability for mothers of the diary group. It suggests that the custom of infant care diary writing motivated these mothers to continuously pay careful attention to their infants on feeding, sleep, and so on. However, the decrease of the state anxiety did not correlate with ages, education and family's support for mothers of both groups. We reason that it happened mainly due to the establishment of infant's biological rhythm⁸⁾.

Maternal empowerment score increased significantly for mothers of both groups in three month postpartum. Concerning the item "I understand my baby's individuality", there is a significant difference between the diary group and non-diary group at the second month and third month after delivery. Infant's individuality includes the rhythm, state and temperament. Therefore, diary writing enables a mother to have a better understanding of infant's individuality.

On the other hand, on the item “I enjoy baby care” the non-diary group is significantly larger than the diary group at the second month after delivery. Without infant care diary writing, mothers of the non-diary group enjoyed their infant care.

However, since the second month after delivery the number of mothers in the diary group who enjoyed their infant care also has increased. This indicates that they came to understand infant’s individuality day by day and enjoy their infant care more and more.

There was a negative correlation between the state anxiety score and 7 items of MEQ including infant’s requests, crying, feeding, sleep and enjoying infant care.

The infants of our study participants were not difficult children^{9,14)}. Therefore, it indicates that having a good overview of infant’s biological rhythm would enable to increase Maternal Empowerment and decrease state anxiety score. Maternal Empowerment particularly increasing until the second month after delivery was significant. This suggests

that it is definitely important for mothers to take care of their infants without anxiety in two month postpartum.

These results support the observations by Barnard¹²⁾ and Goldberg¹³⁾ that it is important for mothers to have a good overview of infant’s behavior and cue in order to have a good relation with them. Moreover, diary writing as a self-monitoring may be able to strengthen self-efficacy and self-recognition²⁶⁾. Since each infant has his/her own individuality, parents are encouraged to find their own ways for infant care¹⁴⁾. In what ways can a mother understand infant’s individuality? Infant’s behavior can be kept in the running time as a biological rhythm²⁷⁾. It explains the reason why writing a biological rhythm in a diary enables a mother to promote a better understanding of her infant.

In early postpartum, it is the difficult time for the primiparae due to being unfamiliar to infant care and the lack of sleeping. However, it is improved by writing, in a diary, health cue information such as feeding, sleep,

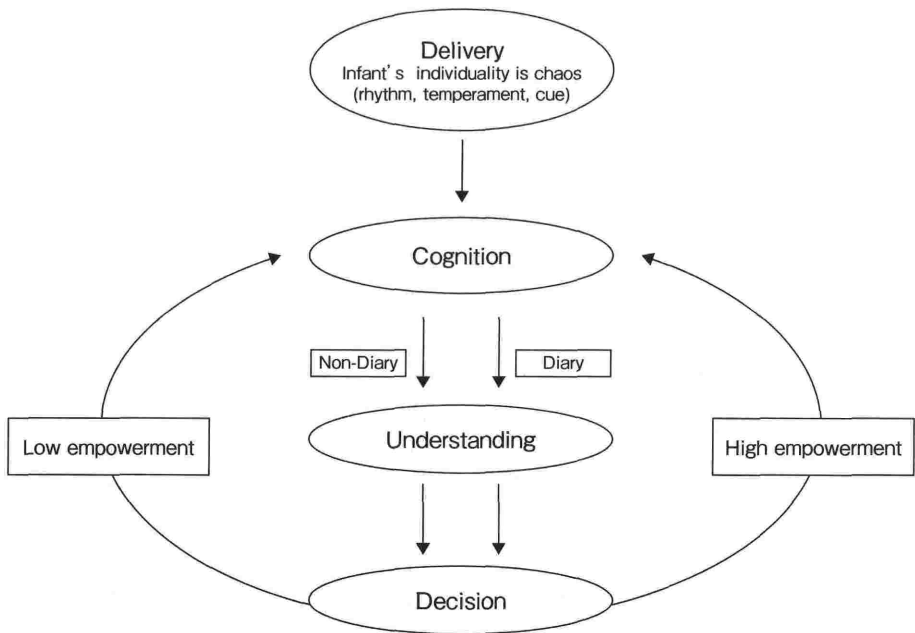


Figure 1 A Model of Maternal Empowerment Development

crying and temperament. Thus, a mother would have a good overview of her infant in term of 24 hours, one week, one month, and so on. It strengthens the mother-and-infant interaction while observing the infant's behavior, cognition, understanding and decision. It would eventually result in the Maternal Empowerment promotion, as presented in the model depicted in Figure 1. This model indicates a strong benefit of infant care diary writing for the primiparae in early postpartum in having a good overview of infant's biological rhythm and temperament.

Future study should focus on the effects of keeping a diary for multiparae, further longitudinal study for six months to one-year period, and a large number of subjects.

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[Summary]

This study evaluated the effects of infant care diary writing for the primiparae in early postpartum. We analyzed 53 infant-care-inexperienced mothers. They were contacted in two day, two month and three month postpartum in order to investigate mother's predictability and readability to infant's behaviors, and also Spielberger's State-Trait anxiety Inventory (STAI) and maternal empowerment (MEQ).

The diary group containing mothers who wrote the diary everyday (n=25) and non-diary group containing others (n=28) were compared. For all mothers of the two groups there was no significant difference between the state anxiety mean score and the trait anxiety mean score, and the state anxiety mean score significantly decreased at the third month after the delivery. The analysis of MEQ showed that there was a significant difference concerning "I understand my baby's individuality" between the diary group (larger) and the non-diary group. Moreover, there was a high correlation concerning infant's requests, crying, feeding, sleep and "I enjoy my infant care" between MEQ and the state anxiety.

The results of this study imply a strong benefit of infant care diary writing for the primiparae in early postpartum in order to promote their maternal empowerment by observing infant's individuality such as biological rhythm and temperament.

[Key words]

early postpartum, infant care diary, maternal empowerment, self-monitoring, self-efficacy