

Investigation of the relationship between changes in mothers' perception of infant's behavior and perception of breast milk as insufficient from early postpartum to one month postpartum

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# Investigation of the relationship between changes in mothers' perception of infant's behavior and perception of breast milk as insufficient from early postpartum to one month postpartum

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## Abstract

Breastfeeding has been demonstrated to provide various health benefits for the mother and child in both the short-term and long-term. One factor, however, that impedes the continuation of breastfeeding is the perception that breast milk is insufficient. Despite good infant development drinking breast milk alone, the mother may feel anxious regarding the amount of breast milk she is producing and unnecessarily supplement with artificial milk. Cross-sectional studies have revealed many factors involved in this perception of breast milk insufficiency, such as inadequate knowledge of breastfeeding and maternal stress, especially with regard to infant's behavior, including crying.

This study was performed to clarify the relationship between mothers' perception of breast milk insufficiency with their perception of infant's behavior between the early postpartum period and one month postpartum.

Inclusion criteria for subjects were 1) a full-term birth between 37 weeks and 42 weeks of gestation, 2) singleton birth, 3) normal pregnancy for both mother and child, and 4) infant birthweight of at least 2500 g. Data were collected from January 2012 to August 2013. Connectable anonymous self-administered questionnaire surveys were conducted twice—once during hospitalization and once at the one-month checkup. Of the 78 subjects that consented to participate in the study, 12 subjects that did not meet the requirements were excluded, leaving 66 subjects (84.6%) for the analysis.

The perceptions of breast milk insufficiency in the early postpartum period and at the one-month checkup were  $12.4 \pm 2.5$  points (mean  $\pm$  SD) and  $12.1 \pm 3.7$  points, respectively. Thus, a strong positive correlation was observed between a perception of breast milk insufficiency in the early postpartum period and at one month postpartum ( $r=.74$ ,  $p<.01$ ). Mothers' perception of their infant's behavior changed from the early postpartum period to one month postpartum.

## KEY WORDS

Breastfeeding, Assessment, Tool, Evaluation, Education

## Introduction

It has been clarified that breastfeeding offers various health benefits for the mother and child both in the short-term and the long-term<sup>1)</sup>. The Global Strategy for Infant and Young Child Feeding<sup>2)</sup> recommends breastfeeding worldwide, citing targets of exclusive breastfeeding for the first six months and continuing breastfeeding for at least two years.

In Japan, in the "Healthy Parents and Children 21"

initiative theme of "promoting the peaceful mental development of children and reducing childrearing anxiety", increasing the proportion of mothers breastfeeding at one month after giving birth is cited as an objective. However, although 96.0% of mothers who are pregnant "want to breastfeed", only 42.4% of mothers are exclusively breastfeeding at one month after birth<sup>3)</sup>. There have been many studies<sup>4-11)</sup> conducted to investigate factors related to breastfeeding continuance, with early contact

between mother and child and prenatal education said to be effective<sup>12</sup>. Academic history, income, motivation to breastfeed, and family and community support are said to be influencing factors during the breastfeeding continuance period.

One factor, however, that impedes the continuance of breastfeeding is a perception of breastmilk being insufficient. Despite the infant developing well drinking breastmilk alone, the mother may feel anxious regarding the amount of breastmilk she is producing and unnecessarily supplement artificial milk. A perception of breastmilk being insufficient is thought to lead to early discontinuance of breastfeeding and lower the rate of exclusive breastfeeding<sup>12</sup>. It has been shown that 23 to 56% of mothers who discontinue breastfeeding feel a perception of breastmilk insufficiency, with 63% of mothers who discontinue breastfeeding within the first week after birth citing this as the reason<sup>13</sup>. A perception of breastmilk being insufficient is most common during the first one to four weeks after birth<sup>14</sup>. Thus, reducing this perception of breastmilk insufficiency is an important key to improve breastfeeding rates and has been reported as an problem that is common throughout the world<sup>15-17</sup>.

In Japan, 20.2% of mothers exclusively breastfeeding, 44.7% of mothers supplementing artificial milk, and 6.9% of mothers feeding their infants artificial milk are worried about the amount of breastmilk they are producing at one month after birth; indeed, this perception of insufficiency is

the top worry held by mothers regarding breastfeeding. A perception of breastmilk being insufficient is also thought to be a problem impeding breastfeeding in Japan.

Reasons for feeling this perception of breastmilk insufficiency include the infant crying and frequent feeding, infant fussing. Infant crying is said to be a particularly strong influencing factor<sup>15-19</sup>, and these results are consistent with those of past studies in Japan.

Therefore, we believe that it is important to clarify mothers' perceptions regarding their infant's behavior, the relationship with a perception of breastmilk insufficiency, and subsequent changes in the first four weeks after birth, as this is the time when the exclusive breastfeeding rate drops at the one month checkup and mothers are most susceptible to a perception of breastmilk insufficiency. Furthermore, based on these findings, we believe that it is necessary to investigate a method of care for effective intervention for a perception of breastmilk insufficiency. The objective of this study was to clarify the relationship between mothers' perception of breastmilk insufficient with their perception of infant's behavior period between the early postpartum and one month postpartum.

**Methods**

**1. Definitions of terms**

1) Perception of breastmilk insufficiency

A mother's feeling that despite producing enough breastmilk to lead to sufficient weight increase of the

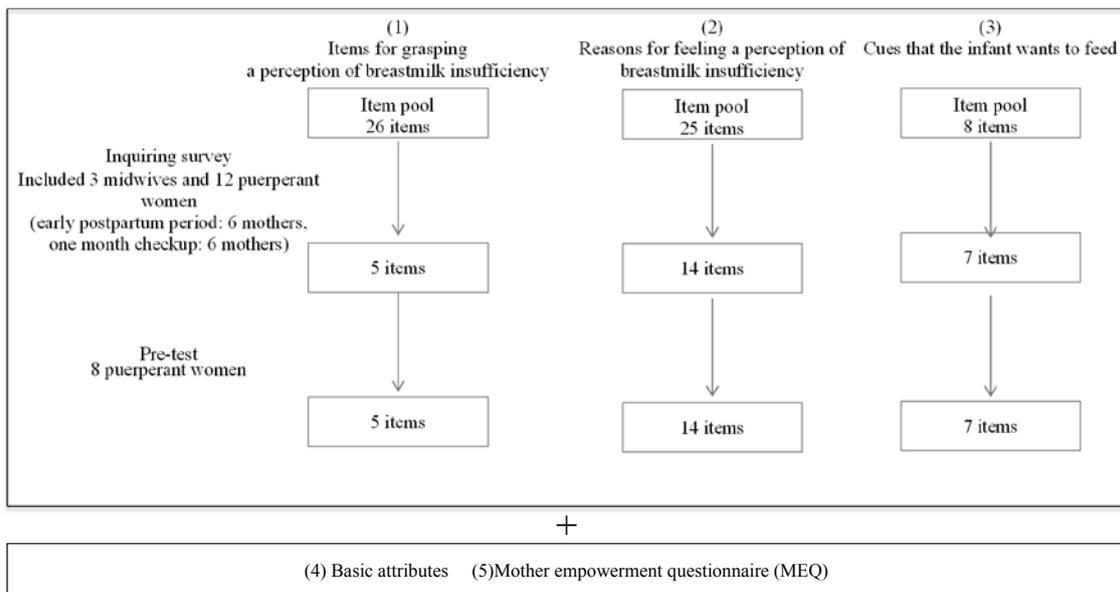


Figure1 : Procedure for survey questionnaire preparation

infant and the infant ingesting a sufficient amount, her breastmilk is inadequate in amount or nutritional quality to meet her infant's needs.

2) The early postpartum  
Within a week after birth.

## 2. Research participants

Recruiting was conducted at two obstetrics facilities that manage approximately 300 births per year in prefecture A. Inclusion criteria for research participants were 1) a full-term birth between 37 weeks to 42 weeks gestation, 2) single birth, 3) normal pregnancy for both mother and child and 4) infant birthweight of at least 2,500 g. Data was collected from January 2012 to August 2013.

## 3. Measurement devices (Figure1)

1) Questionnaire (Table1)

(1) Perception of breastmilk insufficiency

We extracted five items based on the definition of a perception of breastmilk insufficiency from previous studies<sup>20, 21)</sup> and interview. The five items were ranked on a six-point scale from "not at all: 5 points" to "yes, very much: 0 points" and total scores ranged from 0 to 25 points. Higher total scores signified a stronger perception of breastmilk insufficiency. The question items were expressed positively and two items was the reverse item.

① Investigation of content validity and face validity

We conducted interview with three midwives, six mothers in the early postpartum period, and six mothers

Table1. Questionnaire

(1) A perception of breastmilk insufficiency		scores
1	My breastmilk looks like it its nutritional quality to meet my baby	0 1 2 3 4 5
2	My breastmilk looks like it its adequate in amount to meet my baby	0 1 2 3 4 5
3	My baby seem to be satisfied after feeding	0 1 2 3 4 5
4	My baby seems to like to breastfeed	0 1 2 3 4 5
5	I feel successful at breast feeding my beby	0 1 2 3 4 5
(2) Reasons for feeling a perception of breastmilk insufficiency		scores
Q	When do you perceive insufficient breastmilk supply ?	
1	Baby was not appearing satisfied after breastfeeding	0 1 2 3 4 5
2	There no chancee to chek baby's body weight	0 1 2 3 4 5
3	Short interval between feedings	0 1 2 3 4 5
4	No breast milk when express breast milk	0 1 2 3 4 5
5	Baby Crying	0 1 2 3 4 5
6	Breasts engorgement	0 1 2 3 4 5
7	Baby doesn't breastfeed	0 1 2 3 4 5
8	Baby doesn't pull away from breast	0 1 2 3 4 5
9	Drinks formula if given	0 1 2 3 4 5
10	Goes to sleep if given formula	0 1 2 3 4 5
11	Count the number of excretion of urine and stool	0 1 2 3 4 5
12	Frequency of feeding has changed	0 1 2 3 4 5
13	No milk ejection	0 1 2 3 4 5
14	No lactogenic action	0 1 2 3 4 5
(3) Cues that the infant wants to feed		scores
Q	Do you start breafeeding when you saw what kind of behavior of your infant ?	
1	Baby Crying	0 1 2 3 4 5
2	Fussy baby	0 1 2 3 4 5
3	Sucking movements	0 1 2 3 4 5
4	Hand-to-mouth movements	0 1 2 3 4 5
5	Baby stay awake	0 1 2 3 4 5
6	Eye movemnt	0 1 2 3 4 5
7	Make velvety voice sound	0 1 2 3 4 5

at the one month checkup. For these surveys, we deleted overlapping items and revised expressions. And furthermore, we also conducted a pre-test on four mothers in the early postpartum period and four mothers at the one month checkup and made some revisions based on their opinions regarding the question methods.

② Investigation of criterion-related validity

To investigate criterion-related validity, the Pearson's product-moment correlation coefficient for perception of breastmilk insufficiency questionnaire scores and Mother Empowerment Questionnaire (MEQ) scores were calculated. "Mother empowerment" was defined by Iida<sup>22)</sup> as "the mother understanding the infant's state and cries and being able to predict the infant's demands, resulting in reduced childrearing anxiety and confidence in childrearing". Targeted subjects were in postpartum period from directly following birth to three to four months later. The 13 question items were ranked from 1 to 4 points on a four-rank scale, with total scores ranging from 13 to 52 points. Higher scores indicated greater mother empowerment. Cronbach's alpha coefficient was 0.83, indicating validity. We used this as a scale for measuring mother confidence in order to investigate criterion-related validity.

Results indicated that the correlation coefficient with MEQ at each period was in the early postpartum period ( $r = 0.67, p < .01$ ) and at the one month checkup ( $r = 0.66, p < .01$ ).

③ To investigation of reliability

To investigate stability in order to examine reliability, as breast and breastfeeding state change daily, we calculated Cronbach's alpha coefficient rather than using the re-test method. Results of 0.83 in the early postpartum period and 0.89 at the one month checkup confirmed that internal consistency was maintained.

(2) Reason for a perception of breastmilk sufficiency

Reasons for mothers feeling a perception of breastmilk insufficiency were gathered from a past inquiring survey and 25 items were summarized into 14 items.

(3) Cues that the infant wants to feed

To confirm mothers' knowledge and understanding of signs that the infant wants to feed, eight items for signs that the infant wants to feed were extracted from past studies and summarized into seven items.

(2) and (3) included some overlapping items but we left these unchanged as their meanings were different.

① Investigation of content validity and face validity

We also conducted inquiring surveys regarding (2) and (3) on three midwives, six mothers in the early postpartum period, and six mothers at the one month checkup. For these surveys, we deleted overlapping items and revised expressions. We also conducted a pre-test on four mothers in the early postpartum period and four mothers at the one month checkup and made some revisions based on their opinions regarding the question methods.

2) Basic attributes

We gathered information from the questionnaire survey, interview survey and nursing records regarding age, academic history, annual income, reproductive history, employment, income, family structure, gestational weeks, history of breastfeeding and details, infant birthweight, minimum weight and weight at discharge, decreasing ratio in physiological weight, and supplementing with artificial milk.

3) Mother Empowerment Questionnaire (MEQ)

As previously noted the 13 question items were ranked from 1 to 4 points on a four-rank scale.

#### 4. Procedure

1) Survey procedure (Figure 2)

Connectable anonymous self-administered questionnaire surveys were conducted twice. once during hospitalization and once at the one month checkup.

For the survey during hospitalization, mothers were given the questionnaire together with a document requesting cooperation in which an outline of the study and ethical considerations were included. These were distributed to mothers who provided their verbal consent. The questionnaire survey was then conducted and survey sheets were collected on the spot. Consent to cooperate was once again confirmed at the one month checkup, after which the questionnaire survey was performed.

Consent was considered to have been received when survey sheets were collected on the spot or sent back.

2) Differentiation from actual breastmilk insufficiency

Satisfactory standards for breastfeeding have been issued by UNICEF & WHO<sup>23)</sup>, La Leche League (LLL)<sup>24)</sup> and the International Lactation Consultant Association<sup>25)·26)</sup>. In this study, to determine whether breastmilk production is sufficient based on the range of daily weight increases and physiological weight decreases, we used the following

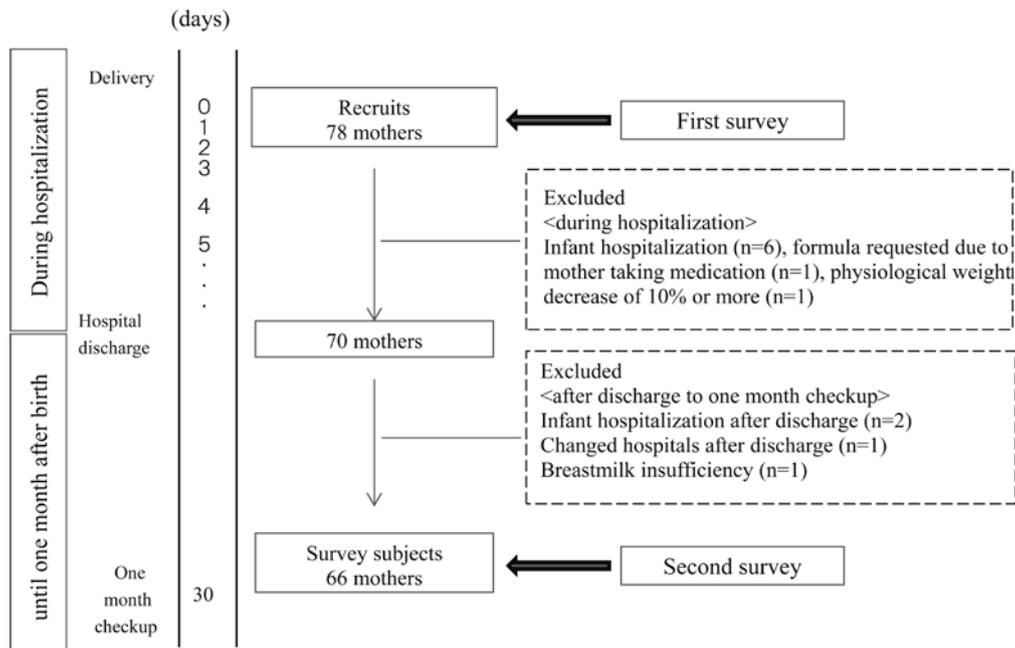


Figure2 : Survey procedure

standards by UNICEF & WHO. (1) Minimum weight is decrease of within 10% of the birthweight and (2) daily weight increases of 18 to 30 g until six months after birth. When mothers fulfilled (1) and (2), had no congenital disease related to breastmilk insufficiency, and had acquired breastfeeding skills including positioning and latching-on, they were diagnosed with breastmilk insufficiency.

### 3) Determining the acquisition of breastfeeding skills

The acquisition of breastfeeding skills including positioning and latching-on was judged by at least two midwives who were involved in the mother's care until discharge.

### 4) Determining the need for supplementation with artificial milk

When mothers were supplementing with artificial milk after discharge based on their own judgment, the necessity of artificial milk supplementation was determined by consultation of at least two midwives.

## 5. Analysis methods

Data collection and analysis was conducted using the SPSS 19.0 for Windows statistical software using the following methods.

Basic statistics for each variable were calculated and mean values were compared using Chi-squared test. Criterion-related validity was investigated by calculating

Pearson's correlation coefficient for the relationship between a perception of breastmilk insufficiency and MEQ. Comparison between two groups was conducted using Shapiro-Wilk test, paired t-test and Wilcoxon rank sum test or the Mann-Whitney U test. For all analyses, the level of significance was set at 5%.

## 6. Ethical considerations

Participants were given written explanations of the research clearly outlining the following matters and also given verbal explanations of the purpose of the study.

- Participation in this study is voluntary and no disadvantages will be caused if you decline participation.
- The survey is anonymous and private information will be protected.
- Research results may be published at academic societies or in specialist journals.
- Data acquired will not be used for any non-research purposes and will be destroyed after a fixed amount of time.

This study was approved by the Kanazawa University Medical Ethical Board. (No346)

## Results

### 1. Basic attributes of participants

Of the 78 subjects who consented to participate in this study, 11 subjects (14.1%) who did not meet the

requirements and one subject (1.3%) who did not answer the survey at the one month checkup were excluded, leaving us with 66 subjects for analysis (Figure2).

The mean age of participants was 30.1±4.2years (Mean ± SD). Subjects included 48 primipara (72.7%) and 18 multipara (27.3%) (Table2). The mean number of days hospitalized was 6.5±1.1 and mean number of days following birth at the one month checkup was 29.6±2.0 days. With regards to delivery style, 52 subjects had a vaginal delivery (78.8%) and 14 subjects had a cesarean section (21.2%). Subjects were excluded if they switched to artificial milk feeding due to infant hospitalization or exacerbation of the

mother's complications during their postpartum course.

2. Factors related to a perception of breastmilk insufficiency

1) Perception of breastmilk insufficiency

Perception of breastmilk insufficiency in the early postpartum period and at the one month checkup was 12.4 ± 2.5 points (mean ± SD) and 12.1 ± 3.7 points, respectively (Figure3). Thus, a strong positive correlation was observed between a perception of breastmilk insufficiency in the early postpartum period and at the one month checkup (r=.74, p<.01).

There was a significant correlation between a

Table2. Basic attributes of participants

						n=66
Variables		Mean	±	SD	Min	MAX
Mother age (years)		30.1	±	4.2	( 23.0 –	42.0 )
Gestational weeks (weeks)		38.7	±	1.1	( 37.0 –	41.0 )
Birthweight (g)		2922.1	±	306.0	( 2500.0 –	3910.0 )
Minimum weight (g)		2712.5	±	273.5	( 2246.0 –	3564.0 )
Physiological weight decreasing ratio (%)		6.6	±	1.7	( 2.6 –	9.6 )
Weight at discharge (g)		2849	±	314.8	( 2405.0 –	3846.0 )
Hospitalization days (days)		6.5	±	1.1	( 5.0 –	10.0 )
One month checkup (days after birth)		29.6	±	2.0	( 26.0 –	34.0 )
Weight at one month checkup (g)		3911	±	444.2	( 3162.0 –	4970.0 )
Weight gain per day at one month checkup (g)		39.3	±	9.7	( 22.0 –	66.0 )

Variables		N	%	$\chi^2$ value	df	p-value
Parity	Primipara	48	( 72.7 )	51.9	2	p<.01
	Multipara	18	( 27.3 )			
Delivery style	Vaginal delivery	52	( 78.8 )	21.9	1	p<.01
	Cesarean section	14	( 21.2 )			
Final education level	Postgraduate education	4	( 6.1 )	104.5	4	p<.01
	University	46	( 69.7 )			
	Junior college	9	( 13.6 )			
	Vocational school	6	( 9.1 )			
	Highschool	1	( 1.5 )			
Marital status	Married	65	( 98.5 )	62.1	1	p<.01
	Single	1	( 1.5 )			
Fertility treatment	Yes	17	( 25.8 )	15.5	1	p<.01
	No	49	( 74.2 )			
Family composition	Nuclear family	65	( 98.5 )	62.1	1	p<.01
	Extended family	1	( 1.5 )			
Return to parent's home for birth	Yes	52	( 78.7 )	21.9	1	p<.01
	No	14	( 21.2 )			
Employment	Yes	40	( 60.6 )	3.0	1	p=.08
	No	26	( 39.4 )			
Annual income	<4 million yen	23	( 34.8 )	6.1	1	p<.05
	≥4 million yen	43	( 65.2 )			

perception of breastmilk insufficiency and amount of supplementation with artificial milk per day at one month postpartum ( $r=.79, p<.01$ ).

2) Changes of mothers' perception of infant's behavior period between the early postpartum and one month postpartum (Table3)

It was compared to the average of a perception of breastmilk insufficiency in the early postpartum and one

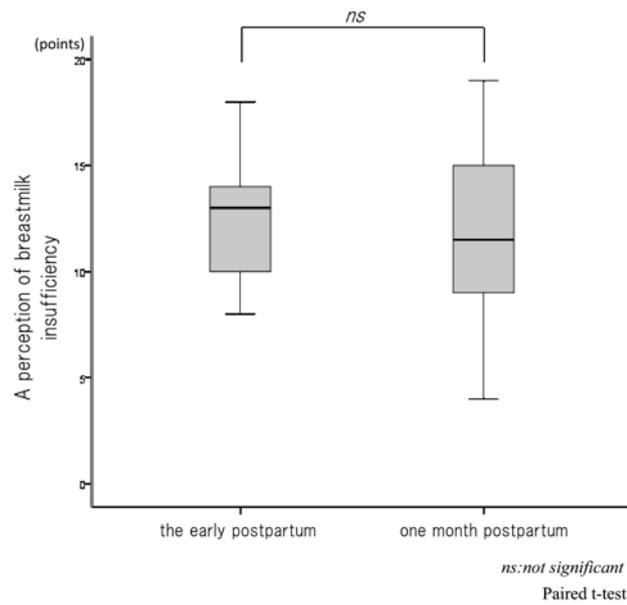


Figure3 : Comparison of a perception of breastmilk insufficiency

month postpartum. Although it significantly increased in one month postpartum from the early postpartum, in the order of item 3, 5, 1, 10, 9, 2, it significantly-decreased in one month postpartum from the early postpartum, in the order of item 6, 12, 13.

3) The correlation between a perception of breastmilk insufficiency and reason for feeling a perception of breastmilk insufficiency (Table 4)

It was classified 2 groups on the basis of the average points, the low-scoring group and the high scoring group.

In low-scoring group, there was a significant correlation between a perception of breastmilk insufficiency and item no.5 ( $r=-0.26, p<0.05$ ) in early postpartum, item no. 1, 2, 3, 4, 5, 9, 10 at one month postpartum.

In high-scoring group, there was a significant correlation between a perception of breastmilk insufficiency and item no.12, 13 in early postpartum, item no.1, 3, 5, 9, 10, 13 at one month postpartum. It showed that the number of item has increased each scoring group.

4) The correlation between a perception of breastmilk insufficiency and cues that the infants want to feed (Table 5)

In early postpartum, there was a significant correlation between a perception of breastmilk insufficiency and item no.1 in low-scoring group.

And at one month postpartum, there was a significant

Table3. Comparison of Reasons for feeling a perception of breastmilk Insufficiency

No.	Reasons for feeling a perception of breastmilk insufficiency	A perception of breastmilk insufficiency		p-value
		the early postpartum	one month postpartum	
1	Baby was not appearing satisfied after breastfeeding	4.52	4.09	p<.01
2	There no chancee to chek baby's body weight	4.82	4.70	p<.01
3	Short interval between feedings	4.45	3.89	p<.01
4	No breast milk when express breast milk	3.68	3.68	ns
5	Baby Crying	4.42	3.89	p<.01
6	Breasts engorgement	2.92	3.64	p<.01
7	Baby doesn't breastfeed	3.09	3.17	ns
8	Baby doesn't pull away from breast	3.91	3.80	ns
9	Drinks formula if given	4.15	3.91	p<.05
10	Goes to sleep if given formula	4.18	3.89	p<.01
11	Count the number of excretion of urine and stool	1.71	1.71	ns
12	Frequency of feeding has changed	2.79	3.20	p<.01
13	No milk ejection	2.94	3.20	p<.01
14	No lactogenic action	3.39	3.48	ns

ns: not significant  
student's t -test

correlation between a perception of breastmilk insufficiency and item no. 1, 2, 3, 5 in low-scoring group, item no.3 and 4 in high-scoring group.

5) A perception of breastmilk insufficiency and care in a hospital

Figure 5 showed we classified 4 groups on the basis of

the average points.

Group A, 26 mothers (89.7%) continue exclusive breastfeeding, otherwise, Group D, 21 mothers (84.0%) supplied unnecessary artificial milk. And all of the 21 mothers experienced add unnecessary artificial milk to their infants in hospitalization (Table6).

Table4 : The correlation between a perception of breastmilk insufficiency and reasons for feeling a perception of breastmilk insufficiency

No.	Reasons for feeling a perception of breastmilk insufficiency	Pecieved Insufficient Breatmilk Supply			
		Low-scoring		High-scoring	
		the early postpartum	one month postpartum	the early postpartum	one month postpartum
1	Baby was not appearing satisfied after breastfeeding	.18	.81 **	.14	.69 **
2	There no chancee to chek baby's bode weight	.20	.32 *	.19	.38 *
3	Short interval between feedings	.02	.44 **	.13	.88 **
4	No breast milk when express breast milk	.03	.32 *	.05	.23
5	Baby Crying	.36 *	.67 **	.15	.78 **
6	Breasts engorgement	-.13 *	.14	-.30	.32
7	Baby doesn't breastfeed	.06	.22	-.05	.20
8	Baby doesn't pull away from breast	.01	.26	.02	.15
9	Drinks formula if given	.22	.59 **	.05	.66 **
10	Goes to sleep if given formula	.08	.57 **	.22	.71 **
11	Count the number of excretion of urine and stool	.18	.25	.00	-.18
12	Frequency of feeding has changed	.19	.21	-.37 *	.20
13	No milk ejection	.06	-.05	.43 **	.37 *
14	No lactogenic action	.09	.18	.11	.29

\*p<.05, \*\*p<.01

Table5 : The correlation between a perception of breastmilk insufficiency and cues that the infant wants to feed

No.	Cues that the infant wants to feed	Pecieved Insufficient Breatmilk Supply			
		Low-scoring		High-scoring	
		the early postpartum	one month postpartum	the early postpartum	one month postpartum
1	Baby Crying	.36 *	.53 **	.15	.20
2	Fussy baby	.14	.52 **	.14	.29
3	Sucking movements	.17	.35 *	.14	.61 **
4	Hand-to-mouth movements	.16	.14	.28	.71 **
5	Baby stay awake	.15	.56 **	.19	.11
6	Eye movements	.06	-.30	-.07	-.19
7	Make velvety voice sound	-.01	-.23	—	.15

\*p<.05, \*\*p<.01

**Discussion**

**1. Change of a perception of breastmilk insufficiency**

The average of a perception of breastmilk insufficiency, showed no significantly different between in the early postpartum and at the one month postpartum, but a strong positive correlation was observed between them. Thus, we can understand how mothers perceived insufficiency breastmilk supply, and we can know what

		One month postpartum	
		low-scoring group (N = 39)	high-scoring group (N = 27)
Early postpartum	low-scoring group (N = 31)	<b>A</b> N=29 (43.9%)	<b>C</b> N=2 (3.0%)
	high-scoring group (N = 35)	<b>B</b> N=10 (15.2%)	<b>D</b> N=25 (37.9%)

Figure4 : Grouped according to Score of a perception of breastmilk insufficiency

their perception is going to be.

**2. Change of mother's perception**

1) Perception of infant's cues

At one month postpartum, we compared low-scoring group and high-scoring group, mothers of low-scoring group understood many cues that infants want to feed more than mothers of high-scoring group. For example, item no.3 of cues that the infant want to feed is related one of neonatal reflex. It is difficult to judge reflex from cues of hunger themselves.

Teaching mothers to interpret her infant's readiness-to-feed behaviors and to judge satiety after feeding will help her feel more competent and satisfied with her experience of breastfeeding<sup>27 · 28</sup>. So health caregivers should support they could judge themselves in hospitalization, it will cause to add artificial milk to their infants. Mothers of low-scoring group in the early postpartum can grow in their own ability of they can understand what infants' cue means, thus, their scores in one month will not increase.

2) Perception of mother's physical changes

Although item no.6 and 12 of reasons for feeling a perception of breastmilk insufficiency are sign of mother's physical changes, these are very close to infants' behavior. Following birth, the mother's body undergoes normal and progressive changes. The breasts increase in size

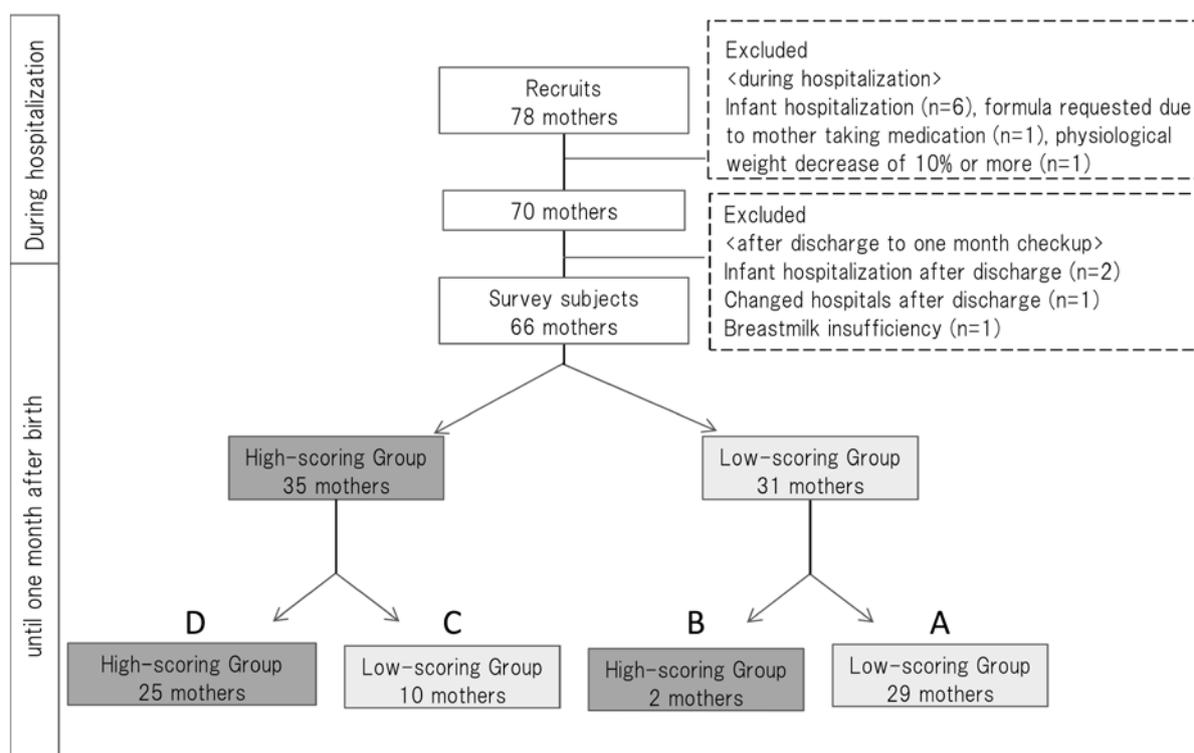


Figure5 : Analysis Subject

Table6. Breastfeeding rate at one month postpartum

Group	n	%	One month postpartum			
			Breastfeeding		Mixed feeding	
			n	%	n	%
A	29	( 43.9 )	26	( 89.7 )	3	( 10.3 )
B	2	( 3.0 )	1	( 50.0 )	1	( 50.0 )
C	10	( 15.2 )	9	( 90.0 )	1	( 10.0 )
D	25	( 37.9 )	4	( 16.0 )	21	( 84.0 )

n=66

significantly and the breastfeeding situation changes daily. The breastmilk production mechanism is divided into the endocrine period and autocrine period, with the switchover occurring approximately 10 days after birth<sup>21)</sup>. Currently, postpartum hospitalization periods in Japan are becoming shorter, with the mean postpartum hospital stay currently five days. Because changes in the breastmilk production mechanism are likely to occur after hospital discharge, mothers may feel that their breastmilk production differs at home compared to when they were hospitalized. In particular, if “breast engorgement” and “Breastmilk ejection” are used as a sign of healthy breastmilk production<sup>22)</sup>, a decrease breast engorgement and breastmilk ejection will occur after hospital discharge may cause mothers to feel a perception of breastmilk insufficiency. Affirming her body’s ability to produce breastmilk for an infant will support a mother and decreasing her anxiety<sup>13)</sup>. Therefore, mothers must be given explanations in a hospital that help them to understand such physical changes after hospital discharge.

### 3) Mother’s experience in hospitalization

Mothers of group D experienced their infants go to sleep after drink artificial milk, on the basis of this experience they feels insufficient breast milk supply strongly.

So we think it has the biggest impact on their breastfeeding after discharge, and they are easy to give their infants artificial milk. Once infants’ behavior is perceived as hunger, formula is often added to the infant’s diet by the mother’s own judgment. And frequency and completeness of breastmilk removal from the breast decrease, and diminishing milk production ensure with the establishment of insufficient breastmilk<sup>30)</sup>.

In Japan, 53.4% of hospitals still give artificial milk

infant unnecessary<sup>31)</sup>. We should understand mothers who perceived insufficient breast milk supply strongly, and if they experience that health caregiver give artificial milk to their infant, it is high risk to wean breastfeeding.<sup>32)·33)</sup>

### 3. Limitations of this study and future issues

This study was region-specific to Japan and participants were also limited to mothers and infants who could be continuously contacted. Therefore, further study needs to be conducted in the future with an expanded subject region and increased sample size. As our survey was only conducted twice, including once during the early postpartum period and once at the one month checkup, mothers’ perceptions need to be grasped in more detail by means of a continuous survey.

### Conclusions

The results of our investigation of the relationship between a perception of breastmilk insufficiency and mothers’ perceptions of their infant’s behavior clarified that mothers were understanding cues that the infants want to feed. As many mothers feel a perception of breastmilk insufficiency, they need to be supported so that they can acquire accurate knowledge about physical changes and infant’s cues to want to feed, and furthermore judge infants’ cues by themselves.

### Acknowledgements

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## 産後 1 カ月までの母親の母乳不足感と新生児のサインに対する認識の変化

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### 要 旨

母乳育児はその長期的・短期的利点から推進されているが、母乳育児を妨げる要因として母乳不足感が世界共通の問題とされている。母乳不足感とは、自分の母乳が児の欲求を満たしていないと感じることであり、分娩後 1-4 週間が最も感じやすいとされる。日本でも産後 1 カ月までに、母乳不足感から人工乳の補足が行われている。母乳不足感を感じる理由には母親の知識不足や育児へのストレスなどがあるが、先行研究から児の啼泣など新生児の行動に対する母親の認識の重要性が指摘されている。そこで本研究の目的を産褥早期と産後 1 カ月における新生児のサインに対する母親の認識と母乳不足感の変化を調査し、その関連を明らかにすることとした。

研究協力者は、1) 妊娠 37 週以降 42 週未満の正期産、2) 単胎、3) 正常な妊娠経過を経た母子、4) 児の出生体重が 2500g 以上とした。データ収集期間は 2012 年 1 月から 2013 年 8 月末であった。独自の質問紙を作成し、母乳不足感と新生児のサインに対する母親の認識について産後早期と 1 カ月健診時に調査を行った。研究の同意を得られた 78 名のうち、条件を満たさなかった 12 名を除いた 66 名 (84.6%) を分析対象とした。

産褥早期と産後 1 ヶ月の母乳不足感はそれぞれ  $12.4 \pm 2.5$  点 (平均点  $\pm$  SD)、 $12.1 \pm 3.7$  点であり、強い正の相関がみられた ( $r=.74$ ,  $p < .01$ )。また、産褥早期と産後 1 ヶ月では新生児のサインに対する母親の認識には変化がみられた。