

Relevance of Reason for Breastfeeding to Breastfeeding Intention in Mothers One Month after Childbirth: Analysis using Text Mining

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Relevance of Reason for Breastfeeding to Breastfeeding Intention in Mothers One Month after Childbirth: Analysis using Text Mining

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Abstract

"Reasons for breastfeeding" influence "breastfeeding intention" with regard to its continuation or cessation. This study was performed to analyze the relevance of reasons for breastfeeding to breastfeeding intention with the purpose of assessing support for continuation of breastfeeding. Based on the results of an anonymous self-administered questionnaire survey among breastfeeding mothers at one month postpartum, 13 items of positive emotional reasons reflecting "desire to breastfeed" and 14 items of negative emotional reasons reflecting "lack of desire to breastfeed" were extracted.

In comparison with the group of mothers that used supplementation, the group of mothers with exclusive breastfeeding had reasons for breastfeeding intention related to attachment and emotion toward their infants. On the other hand, it was suggested that, although they understood the general advantages of breastfeeding, the supplementation group failed to find pleasure in breastfeeding due to a lack of emotional flexibility during the practice of breastfeeding.

KEY WORDS

breastfeeding, reason, intention, continuation support, text mining

Introduction

Breastfeeding has lifelong benefits for both children and mothers. WHO/UNICEF recommends exclusive breastfeeding for the first 6 months, and a continuation of partial breastfeeding until the child is 2 years old or higher¹⁾. In Japan, too, there are various breastfeeding support programs to promote this. However, according to Ministry of Health, Labor and Welfare, the ratio of breastfeeding has been 51.6% in 1 month old, 56.8% in 3 months old, and 55.8% in 4 months old, indicating no significant differences among the age groups²⁾.

Some studies on breastfeeding support report that continuous consultation with experts from before childbirth to afterwards motivate mothers to opt for breastfeeding and continue it for an extended period³⁾. However, according to a report, some medical professionals recommend breastfeeding just to avoid criticism⁴⁾. Moreover, other studies show that breastfeeding is

heavily influenced by individual feelings and awareness, family and society^{5) 6) 7)}, and that breastfeeding decision is intricately connected to mothers' experience and needs⁴⁾. It is therefore necessary that supporters carefully study the experiences of the mothers to understand the breastfeeding reasons that affect their breastfeeding intention. In Japan, there have not been any studies that focus on intention, thus it remains unclear what kinds of experience and awareness influence breastfeeding intention. Therefore, this study analyzes the breastfeeding reasons that influence intention by using a text mining method.

Methods

1. Participants

Participants were mothers of one month postpartum, at 10 obstetrical facilities in prefecture A. Participants were restricted to mothers who had satisfactory Japanese

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language ability to respond to the questionnaire and who were not prohibited to breastfeed for medical reasons.

2. Procedure

The duration of study was from March to December, 2014. After obtaining a permission from the directors of the facilities or an approval from the facility ethics committee, anonymous questionnaires along with documents explaining the research objective, method and ethical consideration were distributed to mothers who visited the facilities for a one month postpartum health examination. Responses were collected via mail to ensure quality data by participants with interest and enthusiasm toward the study⁸⁾.

3. Contents

1) Breastfeeding reason

Participants were asked to write in bullet points about their thoughts, feelings and experiences about the reasons for and against breastfeeding.

2) Breastfeeding intention

Following Rempel's questions regarding Duration Intention Score (DIS)⁵⁾, participants were asked if they intend to continue breastfeeding for at least 12 months. To facilitate evaluation, a linear analog scale was employed and self-scoring out of 100 was collected.

3) Factors of breastfeeding duration

Following previous studies^{9) 10) 11) 12)}, questions were asked regarding the attributes of mothers and children (birth history, education background, family structure, parenting history, postpartum history, delivery method, separation of mothers from children, prenatal occupation, plans to return to work after childbirth, and plans on when to return to work), feeding situation (date of initiation, and natural and artificial milk during hospitalization and present), difficulties in feeding, and feeding support by husbands, mothers, mothers in law and friends.

4. Definitions

1) Breastfeeding reason

Following Rempel⁵⁾, breastfeeding reason is based on "positive feeling" and "feeling of burden" that lead mothers to make breastfeeding decisions.

2) Breastfeeding

A method of child feeding that involves feeding of breast milk at least once a day.

3) Exclusive breastfeeding

A child receives only breast milk for the first month.

4) Breastfeeding intention

A mother's feelings and thoughts about breastfeeding in general, such as breastfeeding initiation, continuation, weaning, duration and plans.

5. Method of analysis

Statistics were obtained by SPSS Text Analytics for Surveys 4 and SPSS Statistics ver. 22.

1) Basic statistics

The average score and standard deviation regarding the relevant factors of breastfeeding continuation and breastfeeding intention in all participants were calculated.

2) Analysis of breastfeeding reasons

Responses on breastfeeding reasons were analyzed by text mining in "positive feelings" and "feelings of burden", respectively. Text mining used in this study is a method which accumulates all of the disparate text data as quantitatively representable, and identifies latent variables such as human behaviors, relations, awareness and anticipations that lie behind those data¹³⁾. Since the breastfeeding reasons in everyday feeding practice are highly complex with ambivalent and enmeshed feelings and thoughts, it is difficult to discern them on the basis of the researcher's judgment alone. Also, collecting qualitative data can be both physically and psychologically straining for the mothers. Therefore, it was decided that text mining would allow for an objective analysis in spite of short and free response by the participants.

(1) Extraction of concepts

Endorsing sensibility analysis, concepts were extracted in respect of 4 parts of speech: nouns, verbs, adjectives and adjectival verbs. Sensibility analysis is a method that extracts from a text parts that express pleasure and displeasure, and behaviors that stem from those emotions¹⁴⁾. Next, synonyms such as "good", "okay" and "well" were unified into single concepts. Also, since having too many concepts would render the subsequent analysis unmanageable, concepts that had less than 50 instantiations in "positive feelings" and less than 30 instantiations in "feelings of burden" were eliminated in accordance with the results of categorization.

(2) Categorization of concepts

Concepts were categorized in accordance with a linguistic method. This method groups together phrases with similar meanings from a linguistic standpoint, such as "child-raising", "child-rearing", and "raising"¹³⁾. Also, highly related concurrences such as "requiring + effort" and "needing + attention" were considered as constituting

a condition for categorization. To ensure sufficiency, some categories were added in accordance with a method based on frequency of occurrence.

Finally, through a close examination of the categories and concepts in light of the responses, unnecessary concepts were eliminated, and unmentioned but highly relevant concepts were added.

(3) Analysis of relation among categories

In order to analyze the relation among categories, an analysis of key components of categories were performed in “positive feelings” and “feelings of burden” separately, and the components were named in reference to the responses. Moreover, these key components of categories were ensured content validity by maternal health nursing specialist’s supervising.

3) Examination of the relation between breastfeeding reasons and breastfeeding intention, and of the relevant factors

To examine the relation between breastfeeding reasons and breastfeeding intention on the one hand and the relevant factors on the other, a stepwise regression analysis was performed. In this analysis, explanatory variables were the items determined to be correlative based on the key component scores and Pearson product-moment correlation coefficient; and objective variable was the breastfeeding intention.

6. Ethical consideration

This study was approved by the Ethics Committee of Faculty of Medical Sciences at the University of Fukui (Ethical Evaluation 24-118, obtained January 21, 2013). Privacy during the study was fully secured and a full respect for the autonomy of the participants was ensured.

Results

1. Background of participants (Table 1)

2000 questionnaires were distributed at the 10 obstetrical facilities that agreed to participate, and 726 responses were collected. Of these, 2 were removed due to insufficiency, thus 724 responses were considered for analysis (72.6% final valid response).

The average age of participants was 31.9 (SD 4.5), and the total number of primiparas was 302 (41.7%) and of multiparas was 422 (58.3%). The average gestational age was 39.0 weeks (SD 1.4) and the average birthweight was 3127.7g (SD 412.0).

Table 1 Descriptive statistics: A part of factors of breastfeeding duration and ‘Breastfeeding intention’ (n=724)

	Category	Unit	
Background of mother and child	Birth history	Primipara Multipara	n(%) 302(41.7%) 422(58.3%)
	Age		mean ± SD 31.9±4.5 range 18-48
	Gestational week of delivery		mean ± SD 39.0±1.4 range 29-42
	Delivery method	Vaginal delivery C-section	n(%) 598(82.6%) 124(17.1%)
	Birth weight		mean ± SD 3127.7±412.0 range 1758-5525
	Plans to return to work after childbirth	+	n(%) 569(78.6%)
Feeding situation	Date of initiation for breastfeeding		mean ± SD 1.2±1.7 range 0-15
	Number of breastfeeding during hospitalizations		mean ± SD 7.3±2.9 range 0-20
	Number of bottle-feeding during hospitalizations	Never Some of the time during hospitalizations Some of the time a day Everyday	n(%) 53(7.3%) 177(24.4%) 142(19.6%) 326(45%)
	Number of breastfeeding in the present		mean ± SD 8.5±2.6 range 0-20
	Number of bottle-feeding in the present	Never Some of the time during hospitalizations Some of the time a day Everyday	n(%) 211(29.1%) 201(27.8%) 193(26.7%) 109(15.1%)
	Inverted nipples	+	82(11.3%)
	Engorgement	+	127(17.5%)
	Nipple pain	+	402(55.5%)
	Cracked nipples	+	231(31.9%)
	Swelling of breasts	+	438(60.5%)
Difficulties in feeding	Insufficient breastmilk	+	177(24.4%)
	Breastfeeding intention		mean ± SD 38.6±27.2 range 0-100

Note. + = positive

2. Extraction of breastfeeding reasons (Table 2 and 3)

Responses regarding breastfeeding reasons included 706 (97.5%) “positive feelings” and 617 (85.2%) “feelings of burden”. “Positive feelings” comprised 1143 concepts and 34 categories, while “feelings of burden” comprised 1346 concepts and 35 categories.

To assess the relations among the categories, the main components of each category was analyzed in “positive feelings” and “feelings of burden” respectively, and a varimax rotation was performed to facilitate the reading of the main components. As a result, 13 items were extracted in respect of “positive feelings” and were named as follows: “Making milk formula is troublesome”, “Suckling babies are pleasant to look at”, “Breastfeeding requires less things to carry when going outside”, “Breast milk is good for the babies’ immunity”, “Breastfeeding can be done whenever babies need milk”, “Breast milk is good for babies”, “Older siblings were raised by breastfeeding”, “Breastfeeding is a special opportunity for mothers”, “People say breastfeeding decreases the chance of the babies getting sick”, “Breastfeeding is good for the mothers’ physical wellbeing”, “Breastfeeding is economical”, “Breastfeeding helps bond with babies”, and “Breast milk is nutritious”.

Table 2. Analysis of principal component: Breastfeeding reasons of "positive feelings"

New component name	Concept	Principal components loads													communality
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1 Making milk formula is troublesome	make	0.874	0.011	0.000	-0.033	0.012	0.009	0.007	0.010	0.039	-0.005	0.044	0.019	-0.013	0.77
	troublesome	0.827	-0.011	-0.031	0.028	-0.039	-0.028	-0.030	-0.029	-0.004	0.049	0.049	-0.001	0.022	0.70
	formula	0.796	0.078	0.096	0.029	0.106	0.098	0.033	0.014	0.005	-0.011	-0.031	-0.007	0.028	0.68
2 Suckling babies are pleasant to look at	suck	0.035	0.832	0.045	-0.023	0.021	0.094	0.041	-0.006	0.081	0.114	-0.022	0.021	0.053	0.73
	pleasant	0.005	0.817	-0.065	0.026	0.052	0.024	0.004	0.048	0.043	0.017	0.080	-0.091	-0.025	0.70
	look	0.023	0.779	0.019	-0.066	-0.002	-0.093	-0.022	0.031	-0.032	-0.033	0.010	0.046	-0.033	0.63
3 Breastfeeding requires less things to carry when going outside	carry	0.009	0.016	0.841	0.011	-0.036	-0.016	0.032	0.024	0.032	-0.042	-0.023	0.027	0.010	0.72
	go out	0.061	-0.015	0.841	-0.011	0.106	0.014	-0.004	0.048	-0.014	-0.045	0.004	-0.011	0.004	0.73
	breastfeeding	-0.019	-0.009	0.399	0.028	0.005	0.102	0.077	0.042	-0.026	0.087	0.289	-0.009	0.006	0.27
4 Breast milk is good for the babies' immunity	for	-0.026	-0.012	0.071	0.869	-0.066	-0.032	0.019	-0.062	0.029	0.035	0.036	0.026	0.005	0.78
	immunity	0.034	-0.043	-0.045	0.855	0.010	-0.003	-0.017	0.101	-0.033	0.004	-0.015	0.091	0.096	0.77
5 Breastfeeding can be done whenever babies need milk	do	0.027	0.039	0.063	-0.009	0.841	0.039	0.046	0.069	0.037	0.008	-0.130	0.027	-0.023	0.74
	whenever	0.025	0.045	0.004	-0.030	0.801	0.006	-0.043	-0.020	-0.001	0.034	0.120	-0.004	0.032	0.67
6 Breast milk is good for babies	good	0.036	-0.030	0.059	-0.040	-0.024	0.722	-0.155	0.015	-0.079	0.083	0.090	-0.048	0.065	0.58
	believe	0.032	0.024	0.025	0.003	0.042	0.566	0.184	-0.045	0.034	0.024	-0.133	0.072	0.043	0.39
	baby	0.001	0.068	-0.031	-0.039	-0.032	0.454	0.109	0.168	0.162	0.299	0.201	0.248	-0.082	0.48
7 Older siblings were raised by breastfeeding	older	0.034	0.025	0.081	-0.036	0.020	0.098	0.788	-0.103	0.016	-0.055	0.033	0.023	-0.115	0.67
	sibling	-0.043	-0.013	-0.006	0.025	-0.023	-0.040	0.770	0.121	-0.008	0.082	-0.024	-0.031	0.171	0.65
	breastfeeding	0.132	0.343	0.041	0.117	0.153	0.339	0.345	0.146	-0.025	0.040	-0.275	-0.086	0.216	0.56
8 Breastfeeding is a special opportunity for mothers	mother	-0.005	0.047	0.044	0.008	0.038	0.020	0.003	0.740	-0.009	0.085	0.069	-0.006	0.076	0.57
	feel	-0.045	0.028	0.077	-0.008	-0.013	0.002	0.027	0.710	0.066	0.086	-0.124	0.029	-0.040	0.54
	impossible	0.232	0.002	-0.092	0.131	0.084	0.111	-0.014	0.374	0.035	-0.292	0.225	-0.075	-0.048	0.38
9 People say breastfeeding decreases the chance of the babies getting sick	people	0.008	0.077	0.103	-0.083	-0.016	-0.025	0.011	0.061	0.790	0.042	0.009	0.132	-0.030	0.67
	say	0.060	0.015	-0.019	0.132	0.022	0.220	-0.092	0.108	0.515	0.092	-0.102	-0.329	0.345	0.60
	sick	-0.001	-0.014	-0.205	0.025	0.094	0.014	0.039	-0.045	0.514	-0.127	0.359	-0.018	-0.179	0.50
10 Breastfeeding is good for the mothers physical wellbeing	wellbeing	0.049	-0.038	-0.041	0.035	0.036	0.147	-0.001	0.130	-0.146	0.668	0.154	-0.010	-0.213	0.59
	for me	0.003	0.139	-0.002	0.031	0.034	0.052	0.018	0.030	0.137	0.650	-0.039	-0.028	0.220	0.52
11 Breastfeeding is economical	yield	-0.005	0.070	0.058	0.037	0.176	0.411	0.023	0.142	0.069	-0.245	-0.508	-0.017	-0.103	0.56
	economical	0.130	0.097	0.174	0.019	0.006	-0.031	-0.006	0.044	0.196	0.012	0.442	0.137	0.034	0.32
12 Breastfeeding helps bond with babies	physical contact	-0.014	0.003	0.033	0.148	-0.018	0.140	-0.094	-0.027	0.025	-0.094	0.129	0.736	-0.013	0.62
	bond	0.032	-0.051	0.060	0.023	0.327	-0.011	0.113	0.041	0.019	0.259	-0.040	0.487	0.228	0.49
	comfortably	-0.039	0.045	0.286	0.079	0.164	0.126	-0.042	-0.037	-0.050	0.031	0.407	-0.417	-0.103	0.49
13 Breast milk is nutritious	rich	0.040	-0.011	0.031	0.093	0.040	0.015	0.034	-0.022	-0.006	0.054	-0.004	0.063	0.752	0.59
	nutritious	-0.099	0.041	-0.113	-0.097	-0.016	0.235	0.041	0.135	-0.280	-0.265	0.363	0.118	0.453	0.61
explanatory dispersion		2.21	2.16	1.82	1.61	1.60	1.57	1.46	1.39	1.38	1.35	1.29	1.22	1.22	20.27
explanatory average		6.49	6.34	5.36	4.74	4.71	4.60	4.30	4.07	4.06	3.96	3.78	3.60	3.59	59.60

14 items were extracted in respect of "feelings of burden" and were named as follows: "Breastfeeding requires care about what mothers can eat and drink", "Breastfeeding alone does not help increase babies' weight", "Nipples hurt when breastfeeding", "Breastfeeding makes it difficult to know how much milk the babies had", "Bottle-feeding can be done by other people", "Older siblings were raised by bottle-feeding", "Lack of breastfeeding can cause swelling of breasts", "Breastfeeding during the middle of the night is troublesome", "It is uncertain whether breastfeeding is good", "Breastfeeding makes it difficult to leave babies with other people for a long time", "There is a shortage of breastmilk", "Babies start crying because they are still hungry after breastfeeding", "Breastfeeding limits the kinds of places that can be visited", and "Medicines cannot be consumed while breastfeeding".

3. Relations between breastfeeding reasons and breastfeeding intention (Figure 1)

Breastfeeding intention (viz. intention to continue breastfeeding for at least 12 months) in mothers 1

month postpartum was lower ($t(312)=5.98, p<.001$) in the supplementation group ($n=109$) that involves supplementation in every feeding than in the exclusive breastfeeding group ($n=211$).

A stepwise regression analysis was performed to examine the relation between breastfeeding reason including other relevant factors and breastfeeding intention. The scores of breastfeeding intention were inserted as dependent variables. As for explanatory variables, 27 variables from the scores of the main components of breastfeeding reasons, and 6 variables – "plans to return to work after childbirth", "number of breastfeeding occasions during hospitalization", "inverted nipples", "insufficient breastmilk" and "friends' support" – determined as correlative by breastfeeding intention and Pearson product-moment correlation coefficient were also inserted. Regression analyses were performed on the exclusive breastfeeding group and the supplementation group individually due to the significant difference in breastfeeding intention; nevertheless, the explanatory

Table 3. Analysis of principal component: Breastfeeding reasons of "feelings of burden"

New component name	Concept	Principal components loads														communality
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1 Breastfeeding requires care about what mothers can eat and drink	take care	0.803	0.010	0.073	-0.041	0.041	0.063	-0.110	0.062	-0.036	0.038	0.042	-0.009	-0.122	-0.028	0.69
	eat / drink	0.765	0.010	0.093	-0.004	0.073	-0.066	0.046	0.047	0.022	0.104	-0.051	0.005	0.028	0.222	0.67
	have to	0.720	0.040	-0.046	-0.026	-0.001	0.022	0.103	-0.030	0.071	-0.039	0.014	-0.075	0.148	-0.066	0.38
2 Breastfeeding alone does not help increase babies' weight	increase	0.043	0.925	0.021	0.040	0.011	0.033	0.058	0.021	0.060	0.008	0.031	0.030	0.006	-0.010	0.87
	weight	0.016	0.917	0.014	0.076	0.077	0.032	0.007	0.004	0.028	0.013	0.031	0.059	0.011	-0.019	0.86
3 Nipples hurt when breastfeeding	pain	0.083	0.037	0.876	0.026	0.022	-0.015	0.132	0.105	-0.047	0.032	-0.033	-0.024	0.074	0.003	0.82
	nipples	0.015	0.005	0.865	0.012	0.059	0.041	-0.063	0.123	0.020	-0.083	0.058	0.036	-0.043	0.006	0.79
4 Breastfeeding makes it difficult to know how much milk the babies had	know	-0.032	0.034	0.026	0.869	0.031	0.091	0.013	0.018	-0.001	0.003	0.013	-0.003	-0.022	0.054	0.77
	other people	-0.039	0.090	-0.001	0.837	0.079	-0.029	0.085	-0.032	0.016	0.017	0.101	0.155	0.047	-0.003	0.76
5 Bottle-feeding can be done by other people	feed	-0.002	0.102	0.013	0.008	0.715	-0.042	0.124	0.024	0.046	-0.124	-0.008	0.210	0.113	0.034	0.62
	other people	0.106	0.025	-0.005	0.047	0.710	-0.013	-0.095	-0.015	-0.024	0.414	0.032	-0.044	-0.067	-0.006	0.71
	bottle-feeding	0.045	-0.017	0.085	0.102	0.686	0.192	0.088	0.003	0.163	0.005	0.162	-0.049	0.087	0.031	0.60
6 Older siblings were raised by bottle-feeding	older	0.020	-0.035	0.013	0.039	0.019	0.820	-0.034	-0.064	0.065	0.110	-0.032	0.119	-0.028	-0.061	0.72
	sibling	0.023	0.137	0.019	0.079	0.043	0.623	0.110	0.076	0.081	0.236	0.234	0.128	0.080	-0.099	0.38
	turn out	-0.033	0.034	-0.032	-0.058	0.122	0.489	0.312	0.038	-0.018	-0.259	-0.141	-0.075	0.114	0.190	0.30
7 Lack of breastfeeding can cause swelling of breasts	breastmilk	-0.012	0.103	0.063	-0.002	0.104	0.160	0.588	-0.082	0.136	0.103	0.307	0.199	0.115	0.106	0.39
	think	0.046	0.042	-0.032	0.183	0.041	0.019	0.527	0.069	0.356	-0.089	-0.023	0.034	-0.290	-0.175	0.37
	swelling	0.079	-0.055	0.355	-0.006	-0.066	-0.118	0.523	-0.113	-0.038	0.283	0.067	0.110	0.185	-0.018	0.37
	sometimes	0.029	0.009	-0.071	0.079	0.129	0.141	0.435	0.264	-0.116	-0.008	-0.073	-0.039	0.167	0.112	0.37
8 Breastfeeding during the middle of the night is troublesome	night	0.105	-0.006	-0.030	0.003	0.043	-0.030	0.023	0.775	-0.005	-0.018	0.027	0.042	-0.013	0.004	0.62
	breastfeeding	-0.032	-0.024	0.272	0.020	0.070	-0.026	-0.131	0.696	0.008	0.085	0.022	0.029	0.081	0.023	0.60
	hard	-0.048	0.083	0.103	-0.036	-0.173	0.069	0.234	0.478	0.096	-0.010	-0.045	0.116	-0.009	0.064	0.38
9 It is uncertain whether breastfeeding is good	not	0.007	0.034	0.018	0.028	0.127	0.139	0.023	-0.038	0.681	-0.182	-0.063	0.129	0.089	-0.086	0.37
	me	0.079	-0.016	-0.018	-0.039	-0.018	-0.067	-0.016	0.027	0.677	0.265	0.080	0.103	0.082	0.102	0.38
	good	-0.041	0.208	-0.078	0.036	0.172	0.121	0.245	0.147	0.486	-0.094	0.034	-0.280	-0.135	0.125	0.34
10 Breastfeeding makes it difficult to leave babies with other people for a long time	someone's care	0.085	-0.021	-0.029	-0.021	0.135	0.137	0.133	0.001	-0.097	0.760	-0.078	0.060	-0.072	0.032	0.68
	time	-0.071	0.094	0.022	0.105	-0.120	0.098	-0.036	0.126	0.287	0.551	-0.031	-0.042	0.385	0.121	0.62
11 There is a shortage of breastmilk	low milk	0.057	-0.042	0.040	-0.032	0.058	-0.064	-0.088	-0.002	0.037	-0.103	0.753	0.163	0.096	0.027	0.64
	yield	-0.077	0.143	-0.021	0.199	0.111	0.147	0.284	0.025	-0.043	0.046	0.675	-0.068	-0.109	-0.021	0.66
12 Babies start crying because they are still hungry after breastfeeding	cry	-0.047	0.145	-0.029	0.027	-0.016	0.213	0.065	0.070	0.094	-0.046	-0.015	0.740	-0.014	-0.007	0.64
	enough	-0.035	-0.041	0.047	0.130	0.125	-0.013	0.070	0.090	0.041	0.090	0.148	0.664	-0.061	0.068	0.33
13 Breastfeeding limits the kinds of places that can be visited	do	-0.047	0.053	0.108	-0.063	0.137	0.117	0.038	0.008	0.049	-0.036	0.125	-0.118	0.735	0.028	0.63
	go out	0.291	-0.093	-0.121	0.165	0.030	-0.105	0.208	0.088	0.037	0.089	-0.185	0.124	0.566	-0.127	0.60
14 Medicines cannot be consumed while breastfeeding	medicine	0.047	-0.001	-0.064	-0.099	-0.026	-0.057	0.039	0.073	-0.018	0.001	0.101	0.015	-0.014	0.791	0.66
	take	0.059	-0.045	0.127	0.376	0.127	0.012	0.025	-0.002	0.106	0.146	-0.149	0.067	0.007	0.667	0.68
explanatory dispersion		1.93	1.88	1.82	1.79	1.75	1.60	1.60	1.52	1.51	1.30	1.38	1.36	1.33	1.31	22.27
explanatory average		5.30	5.36	5.21	5.12	5.00	4.57	4.36	4.35	4.30	4.29	3.94	3.87	3.80	3.75	63.62

variables were equally inserted.

As a result, the adjusted coefficient of determination in the exclusive breastfeeding group was $R^2=0.152$ ($p<.001$). The following 5 variables had significant scores: "Breastfeeding helps bond with babies" ($\beta=0.219$, $p<.01$), "Suckling babies are pleasant to look at" ($\beta=0.198$, $p<.05$), "Breastfeeding makes it difficult to leave babies with other people for a long time" ($\beta=-0.169$, $p<.05$), "Lack of breastfeeding can cause swelling of breasts" ($\beta=-0.177$, $p<.05$), and "Nipples hurt when breastfeeding" ($\beta=-0.175$, $p<.05$). The variance inflation factor (VIF) in each variable was 1.007~1.024 in both 2 variables.

In the supplementation group, the adjusted coefficient of determination was $R^2=0.376$ ($p<.001$). The following 6 variables had significant scores: "Breastfeeding helps bond with babies" ($\beta=-0.374$, $p<.01$), "Breastfeeding is good for the mothers' physical wellbeing" ($\beta=0.315$, $p<.001$), "People say breastfeeding decreases the chance of the babies getting sick" ($\beta=0.373$, $p<.01$), "Bottle-feeding can be done by other people" ($\beta=0.288$, $p<.01$),

"Older siblings were raised by breastfeeding" ($\beta=-0.342$, $p<.01$), and "Breast milk is nutritious" ($\beta=0.296$, $p<.05$). The variance inflation factor (VIF) in each variable was 1.076~1.326. Of the 6 variables, "Breastfeeding helps bond with babies" and "Older siblings were raised by breastfeeding" were extracted as breastfeeding reasons involving positive feeling, but they figured as negative factors with respect to the supplementation group.

Discussion

1. Background of participants

The average age of the participants was 31.9, which was approximately identical to the national primiparity average of 30.3¹⁵⁾. Since the gestational ages and birthweights were also standard, the participants were not obstetrically peculiar but reflective of the average child raising mothers of Japan.

2. Relations between breastfeeding reasons and breastfeeding intention

Through the analysis of the text data of the participants,

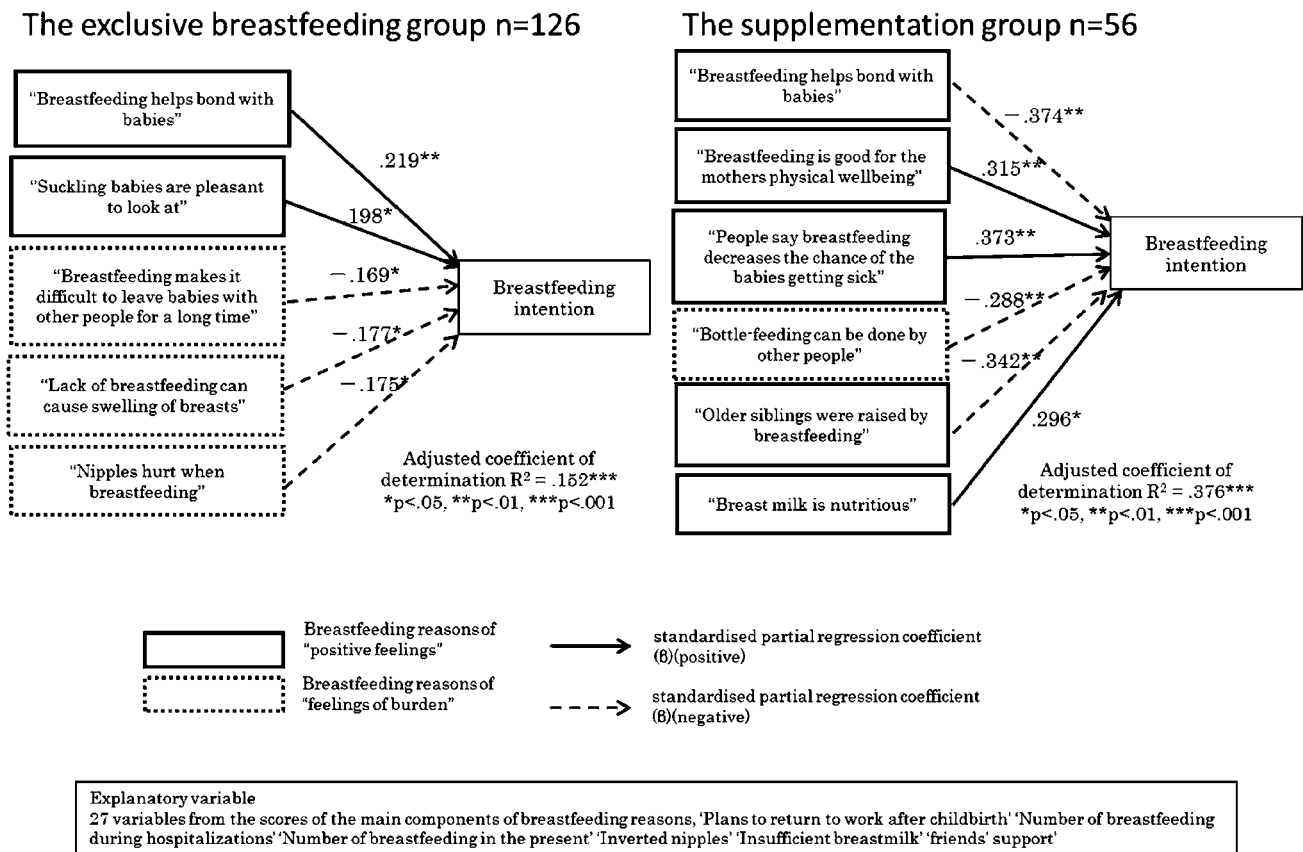


Figure 1. Each of two different breastfeeding groups between breastfeeding reasons and breastfeeding intention

breastfeeding reasons involving their feelings and identity as mothers were extracted. This result supports the preceding research that maintains that personal feelings and self-conceptions are involved in reasons for action.

The regressive analysis of breastfeeding reasons influencing breastfeeding intention showed positive influences of "Breastfeeding helps bond with babies" and "Suckling babies are pleasant to look at" in the exclusive breastfeeding group. This suggests that not only the benefits and conveniences but also reasons having to do with intimacy and affection toward infants serve as factors motivating continuation of breastfeeding. However, since the degrees of freedom adjusted coefficient of determination is 0.152, the model has little predictive power. Therefore, it can be thought that mothers practicing exclusive breastfeeding are not always consciously aware of their breastfeeding reasons but rather do so naturally.

With respect to the mothers that use supplements, practical difficulties and limitations that preceding researches suggest as relevant to continuation of breastfeeding were not selected as variables that

negatively influence breastfeeding intention. Also, even though "Breastfeeding helps bond with babies" was a reason for positive feeling that promotes breastfeeding intention, it had a negative influence on breastfeeding intention. Since breastfeeding practice is known to promote the feeling of satisfaction toward breastfeeding experience through the experience of mutual affection with infants¹⁶⁾, it is not simply a method of child raising. Thus it is necessary not only to concentrate on education and problem-solving regarding breastfeeding, but also to consider the emotions of the mothers and the mutual affection with infants to support mothers to establish their identity, which in turn promotes the enhancement of breastfeeding intention and therewith the continuation of breastfeeding.

In the present study, there were responses such as "I had been rather pessimistic about continuing, but now I think I will try a little longer", "responding to the questionnaire allowed me to reflect on myself", and "it was surprising to discover that I actually have negative thoughts about breastfeeding". Describing their experiences through participation in the study provided

an opportunity for the mothers to adopt an objective perspective on their practice and to make decisions about continuing breastfeeding. Therefore, it is necessary not only to give support in the forms of advice and instruction, but also a heuristic support that would allow mothers to continue their breastfeeding practice on their own intention and decision.

3. Limitations and tasks for future research

Since the present study focused on mothers of 1 month postpartum, the relation between breastfeeding intention and the entire process of breastfeeding practice remains unascertained. In addition, the results from this study cannot be generalized because the study has dealt only with one prefecture in Japan. A national and longitudinal study would allow for a more meticulous analysis of breastfeeding intention in each phase of the practice, which would help construct a more comprehensive support. For this pursuit, it is necessary to consider questions and response methods that would facilitate participants to express their feelings of burden more fully.

Conclusions

As a result of the text mining analysis of the relation between breastfeeding reasons and breastfeeding intention in mothers of 1 month postpartum, the following were ascertained.

1. The reasons associated with positive feelings toward breastfeeding were the following 13 items: "Making milk formula is troublesome", "Suckling babies are pleasant to look at", "Breastfeeding requires less things to carry when going outside", "Breast milk is good for the babies' immunity", "Breastfeeding can be done whenever babies need milk", "Breast milk is good for babies", "Older siblings were raised by breastfeeding", "Breastfeeding is a special opportunity for mothers", "People say breastfeeding decreases the chance of the babies getting

sick", "Breastfeeding is good for the mothers' physical wellbeing", "Breastfeeding is economical", "Breastfeeding helps bond with babies", and "Breast milk is nutritious".

2. The reasons associated with feelings of burden were the following 14 items: "Breastfeeding requires care about what mothers can eat and drink", "Breastfeeding alone does not help increase babies' weight", "Nipples hurt when breastfeeding", "Breastfeeding makes it difficult to know how much milk the babies had", "Bottle-feeding can be done by other people", "Older siblings were raised by bottle-feeding", "Lack of breastfeeding can cause swelling of breasts", "Breastfeeding during the middle of the night is troublesome", "It is uncertain whether breastfeeding is good", "Breastfeeding makes it difficult to leave babies with other people for a long time", "There is a shortage of breastmilk", "Babies start crying because they are still hungry after breastfeeding", "Breastfeeding limits the kinds of places that can be visited", and "Medicines cannot be consumed while breastfeeding".

3. With respect to breastfeeding intention, not only the reasons associated with benefits and conveniences of breastfeeding but also ones that were directly associated with mothers' feelings had influence on their intention. For this reason, it was suggested that it is necessary not only to concentrate on education and problem-solving regarding breastfeeding, but also to consider the emotions of the mothers such as of building an intimate bond with their infants and appreciating the suckling infants. It was also suggested that a support for building the intimacy with infants would promote breastfeeding intention and its continuation.

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産後 1 ヶ月の母親の『母乳育児の理由』と『母乳育児の意思』との関連 —テキストマイニングを用いた分析—

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要 旨

本研究は、母親の母乳育児を「したい、続けたい」もしくは「したくない、やめたい」という『母乳育児の意思』に影響を及ぼす『母乳育児の理由』についてテキストマイニングの手法を用いて分析し、母乳育児継続支援について検討することを目的とした。産後 1 ヶ月の母乳育児中の母親を対象とした無記名自記式質問紙調査の結果、「母乳育児をしたい」という『肯定感の理由』は 13 項目、「母乳育児をしたくない」という『負担感の理由』は 14 項目が抽出された。また、「完全母乳群」「毎回人工乳補足群」の 2 群で比較すると、「完全母乳群」は児との愛着や母親の感情に関連する『理由』が『母乳育児の意思』に影響を与えていた。一方「毎回人工乳補足群」は、母乳育児による母児への恩恵などの一般的な利点について理解していても、母乳育児中の児の反応や表情を楽しんだり応答したりする余裕がなく、母乳育児中の「快い」という感情を持てずにいることが示唆された。