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The Factors Associated with Breastfeeding Experience Among Koreans, 2013-2017, Cross-Sectional Study

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ABSTRACT

This study is a cross-sectional study that analyzed the factors that affect Korean woman's breastfeeding experience in Korea. The study used the results of the first and second years of the sixth and seventh Korea National Health and Nutrition Examination Survey including 1,258 toddlers aged between 12 months and 48 months (2013-2018).
The data was analyzed using R version 3.6.1 program. Results show that baby's birthweight (OR=5.843, 95% CI=2.385-14.318), level of education of the parents (OR=5.751, 95% CI=1.430-23.136), and the structures of the two generations in the family (OR=2.770, 95% CI=1.084-7.079), were factors that significantly affected the women's breast-feeding experience. In conclusion, these results provide basic data for improving Korean women breastfeeding experience and how to promote breastfeeding practices in Korea in the future.

1. Introduction

The relationship between an infant and a mother, which is the first contact since birth, begins as the most strong human relationship among the blood ties (Jang, 2012). From the social and environmental aspects, the infant's growth and development are directly and continuously influenced by the mother. Furthermore, the social-emotional development formed at such point in time would have a significant influence on the growth and development of infants as they grow (Back et al., 2018). Hence, it is very important to examine the related factors that affect the mothers' upbringing in terms of the infants' social development (Park, 2018). Breast milk, an ideal food containing all nutrients necessary for infants, helps to improve the immunity and resistance, forms a positive

relationship through the personal contact between mother and child, and offers economic, social, and eco-friendly effects.

Breastfeeding is a privilege that mothers can provide for the growth of infants, which not only enhances immunity against all nutrients and diseases, but also promotes the positive mutual relationships and ties between mothers and mothers, as well as being economical, hygienic, safe, and convenient among numerous advantages (Ha et al., 2018). The breast milk consumed around 6 months of age, which is important for the development of various organs, contains many components that can help protect the infants against diseases, such as proteins, minerals and fat-soluble vitamins, including immune antibodies (WebMD, 2022). Hence, the WHO emphasizes breastfeeding within an hour after childbirth, recommends full breastfeeding for 6 months, and recommends weaning food together with breastfeeding within 2 years of birth. Furthermore, it aims to increase the breastfeeding rates by over 50% during the first six months of life by 2025 (WHO, 2020). However, for the married women (aged 15-49), the rate of complete breastfeeding according to the age of the child was 16.1% at 1 week of age, 36.5% at 2 weeks of age, and 40.3% at 3 weeks of age, and it increases as the birth month increases, peaks at 4 weeks after birth, then rapidly decreases from 6 months (Lee, 2019).

The longer the breastfeeding period, the more immune antibodies are gained (Dede, 2020), and the balanced growth of infants may be expected because the breastfeeding plan affects not only the infant's health but also adult health as an important factor (Ha et al., 2018). As for breastfeeding, the experience of receiving education on the postpartum breastfeeding, the use of mother-and-child room at the postpartum care centers for the first few weeks after birth, the actual status of breastfeeding and management, and the continuity of employment after childbirth not only increase the practice rate of breastfeeding, but even after discharge from the hospital, for breastfeeding, it affects the practice rate that is continuously practiced (Kim, 2013). However, there are no recent studies conducted on the breastfeeding experiences that have changed, and there is no study that analyzes the characteristics of mothers of infants, fathers of infants, and the household characteristics of infants.

Currently, while the practice rate of breastfeeding has not increased, it is urgent to prepare the realistic measures, and a social support system must be established to prepare the methods and measures to improve the breastfeeding health behavior.

The purpose of this study was to analyze the factors influencing the Korean women's breastfeeding experience and provide the grounds that could be used as the basic data for preparing intervention programs and policies that could enhance the breastfeeding practice. The specific purpose of the study is as follows. First, to identify the general characteristics and breastfeeding characteristics of study subjects. Second, to identify the factors that influence the breastfeeding experiences.

2. Discussion

2.1 Subject and method of the study

2.1.1 Study subjects and materials

This study is a cross-sectional study conducted to analyze the factors affecting the breastfeeding experience using raw data from the 6th, 7th - 1st and 2nd rounds of the Korea National Health and Nutrition Examination Survey. The subjects were the infants aged 12 months to less than 48 months and their fathers and mothers. The study subjects were mainly infants, and the data of their fathers and mothers were integrated and used, while the infants aged 12 months to less than 48 months were 274 in 2013, 261 in 2014, 204 in 2015, 280 in 2016, and 239 in 2017, for a total of 1,258 infants were selected for the final analysis according to the purpose of the study.

2.1.2 Research method

This study extracted the data collected from the Korea National Health and Nutrition Examination Survey to examine and learn about the factors that affect the breastfeeding experiences. The dependent variable of this study, breastfeeding experience, was defined as ‘yes’ or ‘no’. Independent variables were the general characteristics of infants, such as gender and age 1 year old (12-23 months), 2 years old (24-35 months), and 3 years old (36-47 months), and at birth, the weight was less than 2.5 kg, 2.5-4.0 kg, greater than 4.1 kg, while the residence was classified into the downtown, non-downtown, and the administrative unit of residence, dong, eup, and myeon, and the breastfeeding type was breast milk, formula milk, and mixed, and the start time of formula was selected within 6 months and after 7 months.

The characteristics of the infants’mothers were categorized into age ‘30 years old or younger,’ ‘31 to 34 years old’, ‘35 to 39 years old’, and ‘40 years old’ or older, while their level of education is below “middle school graduation”, “high school graduation”, and “university graduation”or higher. Individual income (quartile) above ‘university graduation’ was classified into ‘low’, ‘low middle’, ‘high middle’, and ‘high’, and occupational groups were classified into ‘specialist’, ‘office worker’, ‘service’, ‘skilled worker’, ‘agriculture and fishery’, ‘simple labor’, and ‘unemployed’, and ‘regular’ and ‘non-regular’ were classified into regular workers. The subjective health status was classified into ‘average’, ‘good’, and ‘poor’, while the current smoking status was classified into ‘non-smoking’, ‘past smoking’, and ‘current smoking’, and the monthly drinking status was ‘drinking less than 1 drink per month’, and ‘drinking over one drink per month’. Recognition of stress was classified into ‘feeling less’ and ‘normal’, and the subjective body recognition was classified into ‘thin’, ‘normal’, and ‘obesity’ while the types of obesity include ‘underweight’and ‘normal’, and whether the doctor diagnosed the ‘obesity’ disease was classified into ‘none’ or ‘yes’.

The father's characteristics of infants were classified into age '30' or younger, '31-34 years old', '35-39 years old', '40 years old' or older, and the education level was 'middle school graduate' or less, 'high school graduate', 'high school graduate' 'university graduate' or higher, while the individual income (quartile) was classified into 'low', 'lower middle', 'higher middle', and 'higher', and occupational groups were classified into 'specialist', 'office worker', 'service', 'skilled worker', 'agriculture and fishery', 'simple labor', and 'unemployed', and 'regular' and 'non-regular' were classified into regular workers.

The household characteristics of infants were classified into the household structure of '2nd generation', '3rd generation' or more, with the household monthly income of '2 million won or less', '2.01-3 million won', '3.01-4 million won', and '4.01 million won' or more, while the minimum cost of living was classified into 'below the minimum cost of living' or 'above the minimum cost of living', and whether owning a house was 'none' or 'yes', and the type of housing was classified into 'single family house', 'apartment', or 'other'.

As for the statistical analysis, R Project version 3.6.1 for Windows was used, and the analytical method was the general characteristics of the infant under study, lactation characteristics, characteristics of the mother and father of the infant, and household characteristics were expressed as real numbers (N) and percentages (%). The independent variables and the breastfeeding experience were analyzed through the univariate analysis and chi-square test. In order to identify the factors that affect the breastfeeding experiences, the variables demonstrating significant differences in terms of the results of univariate analysis were subjected to the multiple logistic regression, and the related factors were analyzed by the odds ratio (OR) and 95% of the confidence interval (CI) was calculated.

2.2 Research results

Among the total of 1,258 infants studied, 659 (52.4%) were males and 599 (47.6%) were females, and as for age, 378 (30.0%) 1-year-olds with "12-23 months", 424 (33.7%) 2-year-olds with "24-35 months", 456 (36.2%) 3-year-olds with "36-47 months". 57 prematures(4.8%) weighed "less than 2.5 kg"at birth, 1,087 (92.2%) had "2.5−4.0 kg", and 35 healthy babies (3.0%) had "greater than 4.0 kg".

782 infants (62.9%) lived in metropolitan cities and Gyeonggi-do, and 462 infants (37.1%) lived in non-downtown excluding Gyeonggi-do, and 1,061 persons (dong) as the administrative unit of "dong"(84.3%), and "eupand myeon"accounted for 197 people (15.7%), with the majority of city residents. As for the breastfeeding characteristics, 1,063 (90.2%) answered "Yes"and 116 (9.8%) answered "No"for breastfeeding, and 290 (24.6%) breastfeeding only, 116 infants (9.8%) fed only formula milk, and 773 infants (65.6%) mixed-feededbreast milk and formula. As for the time to start formula milk, 641 (72.3%) were within 6 months, and 246 (27.7%) after 7 months, most of them within 6 months (Table 1).

Table 1. General characteristics and breastfeeding characteristics of study infants

Variable	N	%
Gender		
Male	659	52.4
Female	599	47.6
Age		
1 year old (12-23 months)	378	30.0
2 years old (24-35 months)	424	33.7
3 years old (36-47 months)	456	36.2
Weight at birth		
Less than 2.5kg	57	4.8
2.5-4.0kg	1,087	92.2
Over 4.1kg	35	3.0
Place of residence		
Downtown	782	62.9
Non-downtown	462	37.1
Administrative unit of place of residence		
Dong	1,061	84.3
Eup and myeon	197	15.7
Whether breast fed		
Yes	1,063	90.2
No	116	9.8
Form of breastfeeding		
Breastfeeding	290	24.6
Powdered milk	116	9.8
Mixed	773	65.6
When to start powdered milk feeding		
6 months of less	641	72.3
7 months or after	246	27.7
Total	1,258	100.0

As a result of analyzing the relationship with the breastfeeding experience according to the infant's general characteristics, breastfeeding experience was statistically and significantly related to birth weight, place of residence, administrative unit of residence, and start time of formula milk ($p<0.05$). 989 (91.1%) infants in the normal group with a birth weight of 2.5 to 4.0 kg were breastfed, and 43 (75.4%) of the group weighing less than 2.5 kg were breastfed. The rate of breastfeeding was high when it was within the normal range ($p<0.01$). By residence, 674 (91.8%) of the downtown residents and 376 (87.0%) of non-downtown residents breast-fed. As for the administrative unit of residence, 906 (91.1%) of dong residents and 157 (85.3%) of eup-myeonresidents breastfed, and the rate of breastfeeding was higher among children living in urban areas ($p<0.05$). At the time of beginning formula milk, 526 (82.1%) infants of the group within 6 months and 245 (100.0%) infants of the group after 7 months were breastfed ($p<0.001$) (Table 2).

Table 2. Relevance of breastfeeding experiences according to general characteristics of infants studied

Unit: people (%)

	Whether breast fed				
	Total	Yes	No		p value*
Gender					
Male	614 (52.1)	553	(90.1)	61 (9.9)	0.908
Female	565 (47.9)	510	(90.3)	55 (9.7)	
Weight at birth					
Less than 2.5kg	57 (4.8)	43	(75.4)	14 (24.6)	0.001
2.5-4.0kg	1,086 (92.2)	989	(91.1)	97 (8.9)	
Over 4.1kg	35 (3.0)	31	(88.6)	4 (11.4)	
Place of residence †					
Downtown	734 (63.0)	674	(91.8)	60 (8.2)	0.008
Non-downtown	432 (37.0)	376	(87.0)	56 (13.0)	
Administrative unit of place of residence					
Dong	995 (84.4)	906	(91.1)	89 (8.9)	0.017
Eup and myeon	184 (15.6)	157	(85.3)	27 (14.7)	
Form of breastfeeding					
Breastfeeding	290 (24.6)	290	(100.0)	-	-
Powdered milk	116 (9.8)	-		116 (100.0)	
Mixed	773 (65.6)	773	(100.0)	-	
When to start powdered milk feeding					
6 months of less	641 (72.3)	526	(82.1)	115 (17.9)	<0.001
7 months or after	245 (27.7)	245	(100.0)	0 (0.0)	
Total	1,179 (100.0)	1,063	(90.2)	116 (9.8)	

* By chi-square test.
† For downtown are included Seoul, Busan, Daegu, Incheon, Gwangju, Daejeon, Ulsan, and Gyeonggi, and non-downtown are included Gangwon, Chungbuk, Chungnam, Jeonbuk, Jeonnam, Gyeongbuk, Gyeongnam, and Jeju.
† Total may be different due to missing values for each variable.

As a result of analyzing the relationship with the breastfeeding experience according to the characteristics of the infants'mothers, breastfeeding experience demonstrated the statistically significant differences in education level, subjective body recognition, and prevalence of obesity ($p<0.01$). 30 (83.3%) of the infants'mothers in the research group graduated from middle school or less, 243 (86.5%) of the group graduated from high school, and 644 (94.3%) of the group graduated from university or higher, and the higher the educational level, the breastfeeding experience rate was high ($p<0.001$). Regarding the mothers' subjective body recognition, 114 (95.8%) of the skinny group, 397 (93.6%) of the normal group, and 435 (88.6%) of the obese group breastfed, and hence, the rate of breastfeeding experience decreased from the subjective body shape perception to obesity ($p<0.01$). In terms of the prevalence of obesity through BMI, 72 (94.7%) of the underweight group, 663 (92.7%) of the normal group, and 176 (85.0%) of the obese group breastfed, while the underweight group had the highest breastfeeding rate, and the obese group demonstrated the lowest rate of breastfeeding ($p<0.001$) (Table 3).

Table 3. Relevance of breastfeeding experiences according to the characteristics of infants' mothers studied

Unit: people (%)

	Whether breast fed						
	Total		Yes		No		p value*
Age							
30 years old or younger	201	(18.1)	179	(89.1)	22	(10.9)	0.123
31-34 years old	419	(37.7)	392	(93.6)	27	(6.4)	
35-39 years old	396	(35.6)	360	(90.9)	36	(9.1)	
40 years old or older	96	(8.6)	84	(87.5)	12	(12.5)	
Educational level							
Less than junior high school diploma	36	(3.6)	30	(83.3)	6	(16.7)	<0.001
High school graduation	281	(28.1)	243	(86.5)	38	(13.5)	
University graduation or higher	683	(68.3)	644	(94.3)	39	(5.7)	
Personal Income (quartiles)							
Bottom	327	(29.5)	291	(89.0)	36	(11.0)	0.159
Mid to bottom	312	(28.1)	283	(90.7)	29	(9.3)	
Mid to top	252	(22.7)	234	(92.9)	18	(7.1)	
Top	218	(19.7)	205	(94.0)	13	(6.0)	
Occupation							
Specialist, office worker	288	(28.8)	271	(94.1)	17	(5.9)	0.299
Service/function provider	72	(7.2)	67	(93.1)	5	(6.9)	
Agriculture, fisheries, simple labor	24	(2.4)	22	(91.7)	2	(8.3)	
Unemployed	616	(61.6)	557	(90.4)	59	(9.6)	
Whether full-time†							
Full-time	187	(60.9)	178	(95.2)	9	(4.8)	0.328
Part-time	120	(39.1)	111	(92.5)	9	(7.5)	
Subjective health conditions							
Normal/good	882	(87.9)	806	(91.4)	76	(8.6)	0.289
Bad	121	(12.1)	114	(94.2)	7	(5.8)	
Whether currently smoking							
Non-smoker / quit	988	(95.6)	907	(91.8)	81	(8.2)	0.095
Currently smoking	46	(4.4)	39	(84.8)	7	(15.2)	
Whether drinking per month							
Drink less than 1 drink per month	487	(47.1)	450	(92.4)	37	(7.6)	0.321
Drink at least 1 drink per month	547	(52.9)	496	(90.7)	51	(9.3)	
Stress recognition							
Less	686	(66.3)	627	(91.4)	59	(8.6)	0.884
Much	348	(33.7)	319	(91.7)	29	(8.3)	
Whether recognizing subjective body shape							
Skinny	119	(11.5)	114	(95.8)	5	(4.2)	0.005
Average	424	(41.0)	397	(93.6)	27	(6.4)	
Obese	491	(47.5)	435	(88.6)	56	(11.4)	
Prevalence of obesity							
Underweight	76	(7.6)	72	(94.7)	4	(5.3)	0.001
Normal	715	(71.6)	663	(92.7)	52	(7.3)	
Obese	207	(20.7)	176	(85.0)	31	(15.0)	
Whether disease diagnosed by physician†							
No	642	(64.0)	588	(91.6)	54	(8.4)	0.835
Yes	361	(36.0)	332	(92.0)	29	(8.0)	
Total	1,179	(100.0)	1,063	(90.2)	116	(9.8)	

* By chi-square test.
† For downtown are included Seoul, Busan, Daegu, Incheon, Gwangju, Daejeon, Ulsan, and Gyeonggi, and non-downtown are included Gangwon, Chungbuk, Chungnam, Jeonbuk, Jeonnam, Gyeongbuk, Gyeongnam, and Jeju.
† Total may be different due to missing values for each variable.

As a result of analyzing the relationship with the breastfeeding experience according to the infant's father's characteristics, age, education level, and full-time job status demonstrated statistically significant differences in the breastfeeding experience ($p<0.05$). The age of the infants'fathers in the study was 235 (95.5%) in the 31-34 year-old group, with the highest rate of breastfeeding experience, and the lowest in the 30-year-old group with 52 (85.2%). 16 fathers (66.7%) of the father's education group graduated from middle school or less, 176 fathers (85.9%) of the high school graduate group, and 512 fathers (95.5%) of the university graduate group or higher ($p<0.001$), and the higher the educational level, the breastfeeding experience rate was high ($p<0.001$). In the case of fathers, there were 434 full-time workers (93.9%) demonstrating a high rate of breastfeeding experience ($p<0.01$) (Table 4).

Table 4. Relevance of breastfeeding experiences according to the characteristics of the fathers of infants studied

Unit: people (%)

	Whether breast fed						
	Total		Yes		No		p value*
Age							
30 years old or younger	61	(6.6)	52	(85.2)	9	(14.8)	0.028
31-34 years old	246	(26.6)	235	(95.5)	11	(4.5)	
35-39 years old	405	(43.7)	374	(92.3)	31	(7.7)	
40 years old or older	214	(23.1)	193	(90.2)	21	(9.8)	
Educational level							
Less than junior high school diploma	24	(3.1)	16	(66.7)	8	(33.3)	<0.001
High school graduation	205	(26.8)	176	(85.9)	29	(14.1)	
University graduation or higher	536	(70.1)	512	(95.5)	24	(4.5)	
Personal Income (quartiles)							
Bottom	296	(32.1)	268	(90.5)	28	(9.5)	0.216
Mid to bottom	248	(26.9)	226	(91.1)	22	(8.9)	
Mid to top	214	(23.2)	201	(93.9)	13	(6.1)	
Top	165	(17.9)	157	(95.2)	8	(4.8)	
Occupation							
Specialist, office worker	388	(51.5)	364	(93.8)	24	(6.2)	0.210
Service/function provider	305	(40.5)	275	(90.2)	30	(9.8)	
Agriculture, fisheries, simple labor	38	(5.0)	36	(94.7)	2	(5.3)	
Unemployed	22	(2.9)	19	(86.4)	3	(13.6)	
Whether full-time†							
Full-time	462	(79.7)	434	(93.9)	28	(6.1)	0.002
Part-time	118	(20.3)	101	(85.6)	17	(14.4)	
Total	1,179	(100.0)	1,063	(90.2)	116	(9.8)	

* By chi-square test.
† For downtown are included Seoul, Busan, Daegu, Incheon, Gwangju, Daejeon, Ulsan, and Gyeonggi, and non-downtown are included Gangwon, Chungbuk, Chungnam, Jeonbuk, Jeonnam, Gyeongbuk, Gyeongnam, and Jeju.
‡ Total may be different due to missing values for each variable

As a result of analyzing the relationship with the breastfeeding experience according to the infants'household characteristics, the breastfeeding experience was statistically and significantly related to household structure, household monthly income, minimum cost of living, and housing type ($p<0.01$). The generation structure of the infants'households in the study was 907 (91.2%) in the 2nd generation group and 155 (84.7%) in the 3rd or older group, and the rate of breastfeeding experience was

high in the second generation, and the group with a household monthly income of 4.01 million won or more had the highest breastfeeding experience rate with 501 people (92.4%). There were 131 (83.4%) people in the group with a household monthly income of 2 million won or less, and the rate of breastfeeding experience was the lowest (p<0.01). Considering the number of household members, there were 258 people (85.4%) in the household group with less than the legal minimum cost of living, and 800 people (91.8%) in the group with over the minimum cost of living, and hence, the economically wealthy group had the highest rate of breastfeeding experiences (p<0.01). The housing type was 171 people (80.3%) for the single family house group, 769 (92.4%) in the apartment group, and 122 (91.7%) in the other group (p<0.001)(Table 5).

Table 5. Relevance of the study infants' breastfeeding experience according to household characteristics

Unit: people (%)

	Whether breast fed						
	Total		Yes		No		p value*
Household structure							
Two generations	995	(84.5)	907	(91.2)	88	(8.8)	0.007
Three generations or more	183	(15.5)	155	(84.7)	28	(15.3)	
Monthly household income							
2 million won or less	157	(13.4)	131	(83.4)	26	(16.6)	0.009
2.1-3 million won	254	(21.7)	226	(89.0)	28	(11.0)	
3.1-4 million won	218	(18.6)	198	(90.8)	20	(9.2)	
4.01 million won or more	542	(46.3)	501	(92.4)	41	(7.6)	
Minimum cost of living							
Less than minimum cost of living	302	(25.7)	258	(85.4)	44	(14.6)	0.001
Minimum cost of living or more	871	(74.3)	800	(91.8)	71	(8.2)	
Ownership of house							
No	504	(42.9)	453	(89.9)	51	(10.1)	0.799
Yes	672	(57.1)	607	(90.3)	65	(9.7)	
Type of housing							
Single family house	213	(18.1)	171	(80.3)	42	(19.7)	<0.001
Apartment	832	(70.6)	769	(92.4)	63	(7.6)	
Others	133	(11.3)	122	(91.7)	11	(8.3)	
Total	1,179	(100.0)	1,063	(90.2)	116	(9.8)	

* By chi-square test.
† For downtown are included Seoul, Busan, Daegu, Incheon, Gwangju, Daejeon, Ulsan, and Gyeonggi, and non-downtown are included Gangwon, Chungbuk, Chungnam, Jeonbuk, Jeonnam, Gyeongbuk, Gyeongnam, and Jeju.
‡ Total may be different due to missing values for each variable.

The multiple logistic regression analysis was conducted to examine and learn aboutthe factors affecting the breastfeeding experience, and as the factors influencing breastfeeding, infants' weight at birth, which demonstratedsignificant differences in univariate analysis, infant's residence administrative unit, infant mother's education level, infant mother's prevalence of obesity, infant's father's age, infant's father's education level, household structureof infant households, minimum cost of living of infant households, and housing type of infant households were included in the analysis. In the univariate analysis, the variables with similar meanings were excluded, such as infant residence, subjective body recognition, household monthly income, infant's residence administrative unit, infant

mother's prevalence of obesity, infant household's minimum cost of living, etc. The father's full-time job status was excluded from the logistic regression analysis since there were many missing values or the number of subjects was small for some items.

Of the total of 1,258 subjects, 669 subjects were analyzed except for 589 persons with missing independent variables. With The Nagelkererke'scoefficient of determination (R2) of 0.213, the regression equation demonstrated21.3% explanatory power. As a factor influencing breastfeeding, the probability of breastfeeding was 5.843 times higher for the infants whose birth weight was between 2.5 and 4.0 kg than in the less than 2.5 kg group (OR=5.843, 95% CI=2.385-14.318), and the infants' fathers' level of education, the probability of breastfeeding was 5.751 times higher in the group with higher education than the group with less than middle school graduation (OR=5.751, 95% CI=1.430-23.136). In the household structureof infant households, the probability of breastfeeding was 2.770 times higher in the 2generationhousehold group than in the 3generationor higher household group (OR=2.770, 95% CI=1.084-7.079) (Table 6).

Table 6. Factors influencing the breastfeeding experience

(N=669)

Variable	B	SE	Walds	p-value	OR	95% CI
Infant's birth weight (less than ref. 2.5kg)						
2.5～4.0kg	1.765	0.457	14.905	0.000	5.843	2.385～14.318
4.1kg or more	2.105	1.165	3.264	0.071	8.210	0.836～80.582
Administrative unit of the child's residence (ref. eup/myeon)						
Dong	-0.482	0.459	1.106	0.293	0.617	0.251～1.517
Education level of infant mothers (ref. high school graduation)						
Less than junior high school diploma	0.576	0.648	0.790	0.374	1.778	0.499～6.333
University graduation or higher	0.654	0.312	4.404	0.036	1.923	1.044～3.542
Prevalence of obesity in infants' mothers (ref. obesity)						
Underweight	1.030	0.721	2.044	0.153	2.801	0.682～11.500
Normal	0.537	0.367	2.145	0.143	1.711	0.834～3.509
Infants' father's age (ref. 30 years old or younger)						
31-34 years old	1.021	0.610	2.801	0.094	2.776	0.840～9.178
35-39 years old	0.577	0.545	1.121	0.290	1.781	0.612～5.182
40 years old or older	0.437	0.584	0.558	0.455	1.547	0.492～4.863
Education level of infants' father (ref. Less than junior high school diploma)						
High school graduation	0.803	0.677	1.406	0.236	2.233	0.592～8.424
University graduation or higher	1.749	0.710	6.068	0.014	5.751	1.430～23.136
Household structure of infant households (ref. 3 generations or more)						
Two generations	1.019	0.479	4.529	0.033	2.770	1.084～7.079
Infant household's monthly income (ref. 2 million won or less)						
2.1-3 million won	-0.130	0.613	0.045	0.832	0.878	0.264～2.919
3.1-4 million won	0.759	0.806	0.887	0.346	2.137	0.440～10.376
4.01 million won or more	0.724	0.790	0.840	0.359	2.063	0.439～9.703
Minimum cost of living for infant households (ref. Less than minimum cost of living)						
Minimum cost of living or more	-0.642	0.589	1.190	0.275	0.526	0.166～1.668
Housing type of infant households (ref. single family house)						
Apartment	0.251	0.397	0.400	0.527	1.285	0.590～2.797
Others	1.256	0.643	3.813	0.051	3.512	0.995～12.392

3. Consideration

This study is a cross-sectional study which used the 1st and 2nd raw data (2013-2017) of the 6th and 7th Korea National Health and Nutrition Examination Surveys intended to analyze the factors that affect the breastfeeding experiences by approaching from multiple factors including general characteristics of infants, lactation characteristics, mother characteristics, father characteristics, and household characteristics, etc.

As a result of this study, the factor affecting breastfeeding was the infant's birth weight, and among the total 1,258 infants studied, 1,087 (92.2%) of the infants were mostly "2.5 to 4.0 kg". Compared to the lower breastfeeding rates in the infants weighing less than 2.5 kg or greater than 4.0 kg, it was confirmed that the health status of the mother and infant influenced the breastfeeding experience. In the breastfeeding group, 290 infants (24.6%) only breastfed, 116 (9.8%) only formula fed, and 773 (65.6%) mixed breastfeeding with formula. Such results are slightly different when compared to 31.9% of breastfeeding and 32.6% of mixed feeding in one month of a previous study Ok gi Lee (2014). However, it is similar to the results of 28.1% of exclusive breastfeeding and 20.7% of formula milk by Beom man Ha et al. (2018).

As a result of analyzing the relationship with the breastfeeding experience according to the general characteristics of the infants studied, there was a statistically significant difference between the breastfeeding experience and birth weight, place of residence, administrative unit of residence, and the start time of formula milk ($p<0.05$). In terms of the breastfeeding experience of infants in the study, it was confirmed that the rate of breastfeeding was higher compared to 674 infants (91.8%) in the downtown group and 376 infants (87.0%) in the non-downtown group compared. According to the study by Hee sook Lee (2012) and the study by Beom man Ha et al. (2016), they were not consistent with the results of breastfeeding rates such that they were higher when the subjects lived in rural areas rather than downtown areas, as each study was different. The reason for the inconsistency is considered to be the comparison between the downtown and the non-downtown of the residence when data are used, and the possibility that the mother is not employed is high because extended families are composed of extended families rather than second generation families in the case of provinces or towns and villages. Hence, it is determined that there is a need for continuous research on the difference in breastfeeding rates between the downtown and non-downtown areas and related variables, and based on which, interventions according to regional characteristics will be possible.

As a result of analyzing the relationship with the breastfeeding experience according to the characteristics of the infants'mothers in the study, there was a statistically significant relationship between breastfeeding experience and education level, subjective body shape recognition, and prevalence of obesity ($p<0.01$). First, maternal factors, second, gynecological factors, and environmental factors related to childbirth are known to affect the breastfeeding rate of the previous researchers. In the case of research on the mothers, the mother's age, employment status, education level, and economic status (Myeong soon Kwak et al., 2016) are similar to the results that education level is related. In particular, in Ji hye Park's (2014) study, when breastfeeding was analyzed as a dependent variable, it is consistent with the result that the mother's income level and job status were statistically significant.

In this study, the rate of breastfeeding experience turned out to be higher as the education level of the infants'mothers was higher in the college graduate group than in the high school graduate group. This is similar to the results of a study by Joo young Lee et al. (2002) that the higher the educational level, the higher the breastfeeding rate with formula milk or breast milk mixture. Considering the results of a study in which mothers who had information about breast milk did formula milk or breast-feeding, and the mothers who had no experience about breast milk breast-feeding, it may be considered that the importance of prior education on breast-feeding is raised.

Regarding the mothers' subjective body shape recognition, 114 (95.8%) mothers were thin, 397 (93.6%) were normal, and 435 (88.6%) were obese, and their rate of breastfeeding was low in terms of their subjective body shape recognition ($p<0.01$), and in terms of the prevalence of obesity through BMI, 72 (94.7%) of the underweight group, 663 (92.7%) of the normal group, and 176 (85.0%) of the obese group breastfed. The underweight group had the highest breastfeeding rate, and the obese group had the lowest breastfeeding rate ($p<0.001$). Such results are considered to be due to factors such as the mother's characteristics and cultural values being related to the birth of the baby, and the baby's health condition, which prevents the mother from breastfeeding even if she wants to, if the birth weight is less than normal.

As a result of analyzing the relationship with the breastfeeding experience according to the characteristics of the infant's father, there was a statistically significant difference between age, education level, and full-time job status in breastfeeding status ($p<0.05$). Such results are consistent with Ji hye Park's (2014) result that mother's education level, father's education level, and income level are related.

As a result of analyzing the relationship with the breastfeeding experience according to the infants'household characteristics, the breastfeeding experience was statistically and significantly related to household structure, household monthly income, minimum cost of living, and housing type ($p<0.01$). The generation structure of infants'households in the study was 907 (91.2%) in the 2nd generation group and 155 (84.7%) in the 3rd or older group, and the rate of breastfeeding experience was high in the second generation, and the rate of breastfeeding experience was highest in the group with monthly household income of 4.01 million won or more. Considering the number of household members, there were 258 people (85.4%) in the household group with less than the legal minimum cost of living, and 800 people (91.8%) in the group with over the minimum cost of living, and the economically wealthy group had a higher breastfeeding experience rate ($p<0.01$), and the apartment group had a higher breastfeeding experience rate than the single family house group ($p<0.001$). Such research results are similar to the findings of Carman et al. (2009) that increased the mother's knowledge and expanded social support from family and friends, friends, and health professionals have positive effects on breastfeeding.

As a factor influencing the experience of breastfeeding, the probability of breastfeeding is 5.843 times higher for infants whose birth weight is between 2.5 and 4.0 kg than for those weighing less than 2.5 kg, and in terms of the father's education level, the probability of breastfeeding was 5.751 times higher in the group with a university degree or higher than in the group with a middle school graduate or less. In the household structure of infants'households, the probability of breastfeeding was 2.770 times higher in the 2nd generation household group than in the 3rd generation or higher household group, and the monthly household income was 2.063 times higher in the 4.01 million won or more group than in the 2 million won or less group. Ji hye Park (2014) claimed that

the mother's job status shows a significant difference in factors affecting the health status of breastfeeding infants according to breastfeeding practices. Since the mother's occupational status is closely related to household income, it is considered to have an effect on the breastfeeding practice. It also claimed that the continuity of employment after childbirth increases the practice rate of breastfeeding in a study by HyeryeonKim (2013). Such results are thought to be the result of observing the integrated household income, where as Hee sook Lee (2012) divided the income level of the mother and father. In a previous study by Joo young Lee et al. (2002), the mothers with a college degree or higher had a higher breastfeeding rate than mothers with a high school or lower education ($p<0.001$), and the rate of breastfeeding was higher in the group with a higher husband's education level. This is a result consistent with what was said to be higher. Abada et al. (2001) described the related determinants of breastfeeding as related diet, antenatal care by obstetricians and gynecologists, level of education, and hospital delivery.

In this study, the errors due to the subject's recall bias and various variables due to the use of secondary data were not reflected. It is necessary to supplement the limitations of the used Korea National Health and Nutrition Examination Surveys'data with a cross-sectional survey, and carry out detailed planning and related factor analysis for future longitudinal studies. That is, a comprehensive and in-depth research is needed at the individual, regional and the national levels. Furthermore, the related factors influencing the breastfeeding practice of the study subjects include postpartum breastfeeding education, use of mother-and-child room after childbirth, and use of post-partum care centers, etc., and the factors that failed to consider various variables, such as the lack of understanding and encouragement of medical personnel for mothers, have limitations of being excluded from the analysis of this study.

4. Summary and Conclusion

In this study, 1,258 infants aged between 12 and 48 months were analyzed using the data from the 6th, 7th - 1st and 2nd Korea National Health and Nutrition Examination Surveys with a view to analyze the factors affecting the breastfeeding experience in Korea, and for which the statistical analysis was performed using the R version 3.6.1 program. As a result of the study, the factors influencing the breastfeeding experience of the study subjects were the infant's birth weight, the infant's father's education level, and the mother's education level, and there were significant differences in the two generation structure. There are no studies that have changed on the recent breastfeeding experiences. In particular, given the lack of any study that analyzed the characteristics of the infants' mothers, fathers of infants, and household characteristics of infants, it is meaningful to provide the basic data for future measures to improve the breastfeeding barriers and promote practice in Korea based on such results.

Conflicts of Interest

The author declare that they have no conflict of interest.

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