

Comparisons of Infant Feeding Patterns Among Koreans Living in Texas, USA and Local Populations

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ABSTRACT

This study was conducted to find some differences in infant feeding patterns between well educated Koreans and local populations living in Texas, USA. Initiation rate of exclusive breastfeeding in the hospital was 35.9% in Koreans and 60.4% in Americans. At 2, 4 and 6 months, exclusive breastfeeding rates were 34.0%, 20.8% and 13.2% for Koreans and 47.2%, 34.0% and 27.2% for Americans respectively. There was a significant difference in age of weaning from breast between these two groups ($p < 0.01$). In Koreans the most common reason for the early termination before 4 months was maternal report of milk insufficiency. 55.6% of Koreans and 42.3% of Americans fed infants on scheduled rather on demand feeding. Primary sources of advice about feeding were medical professionals in Americans while baby's grandmother was the main source in Koreans. In Americans, choice of breastfeeding was not associated with ethnicity, maternal education, and family income in the study. Interventions to promote and support participants of Women Infants and Children(WIC) may play a role in Americans. It might be suggested that effective nutrition education programs targeting for Korean mothers to promote breastfeeding should be needed urgently and systematically.

KEY WORDS : infant feeding pattern · exclusive breastfeeding · formula feeding mixed feeding.

Introduction

There is a growing concern that infant nutrition can have long term effects on the health of individuals. Breastfeeding, the best form of infant nutrition, has been known to have profound effects on nutrition and physical and psychological health to both infant and mother¹⁻⁴.

In the United States, the declines in breastfeeding in 1970s have been reversed recently. In 1984, incidence of breastfeeding infants in the hospital was re-

ported 59.7%⁵. Practice of breastfeeding is positively associated with maternal education, high income, white ethnicity and increased maternal age⁶.

Conversely, in Korea the reverse trend was occurring simultaneously. Up to late 1960s the majority of Korean women breastfed their babies especially in rural areas⁷. However, recent research indicates that there has been the sharp decline in the prevalence and duration of breastfeeding. This change appears to be occurring fast in the well educated and economically advantaged groups in urban areas⁸⁻⁹.

Despite importance of breastfeeding in public

health, information on factors influencing the prevalence of breastfeeding in different populations with opposite trends is limited. Thus more research on factors influencing the decline of breastfeeding should be needed. In this study, we investigated the association of prevalence of breastfeeding and other socioeconomic and demographic variables in two sample populations with very different cultural backgrounds and possibly lifestyles to find out some differences in infant feeding practices between Koreans and Americans. One was a group of highly educated Korean subjects living in the United States. The other group consisted of local populations living in the same area, USA. The result from this study will provide reliable basic data for effective nutrition education program for mothers not only in Korea but also in USA.

Materials and Methods

A roster of Korean students was obtained from the Korean Student Association. With the help of Korean community, 106 voluntary Korean mothers, wives of students of Texas A & M University in College Station and University of Texas in Austin, Texas, were recruited from May 1994 to August 1994. One hundred and six voluntary American participants were recruited in the hospital, a WIC(Women, Infants and Children) office and a kindergarten in College Station, Texas from July 1994 to November 1994. Among subjects, 25.5% of American volunteers were from WIC participants.

Mothers of infants up to 3 years were interviewed or asked to fill out survey form. The structured survey forms included questions on infant feeding practices, breastfeeding problems and socioeconomic, cultural, demographic characteristics. The survey forms were prepared either in English or in Korean. This study was approved by the University's Institutional Review Board, Human Subjects in Research at Texas A & M University.

The data was analyzed by computer using the SAS statistical package. Student's t test and chi-square analysis were used to compare group characteristics¹⁰.

The level of statistical significance used was $p < 0.05$.

Results and Discussion

Table 1 shows general characteristics of subjects in the study. Since Korean mothers were current wives of graduate students, demographic characteristics among Korean participants were very similar in terms of distributions of maternal age, family monthly income and education level attained. All Korean mothers had attained a college level of education or higher, but household incomes were generally low. Of those reported their incomes, 89.6% had monthly incomes below \$ 2000. Except for 9 mothers working as students, most of them were unemployed.

American sample consisted of racially diverse mothers. Age ranged from 19 to 37 years and 86.2% of the subjects attained a high school level or higher. Of these mothers 63.7% of subjects graduated from college or graduate school. 43.6% of subjects were unemployed. 46.8% of American subjects had monthly household incomes below \$ 3000.

Characteristics of infants are presented in Table 2. There were no significant differences between Korean infant and American infant group with respect to distribution of age, birth weight and birth length, though both birth weight and birth length of Korean infant group were slightly lower than those of American infant group.

Table 3 shows infant feeding patterns for first six months in these two groups. Rate of exclusive breastfeeding in hospital for American group was 60.4% compared with a rate of 35.9% among Koreans. Thus initiation rate of breastfeeding for Americans was 1.68 times higher than for Korean mothers. At 2 months 47.2% of American mothers breastfed their baby while 34.0% of Koreans did. At 3 months, rate of exclusive breastfeeding for each group was 34.0% and 20.8% respectively. By 6 months of age, 27.2% of American mothers still maintained exclusive breastfeeding, compared with 13.2% of Koreans.

It was reported that the average breastfeeding initiation rates for Americans were 59.7% in 1984 and

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52.2% in 1989, whereas at 5–6 months of age 23.8% of mothers still breastfed¹¹⁾. Other studies reported similar findings⁵⁾⁶⁾¹¹⁾. Thus, the results from our study were agreeable to others.

On the other hand, the exclusive breastfeeding rate for Koreans at 6 months in Seoul area was known to be 29.1%⁸⁾. In another study 16.1% of Korean mothers breastfed⁹⁾. The value in this study, 13.2%, was lower than these two. Since practice of breastfeeding was negatively associated with maternal education lev-

el in Korea, it might be possible to result in lower breastfeeding incidence of well educated mothers in the study.

In this study the exclusive breastfeeding rates for Americans were uniformly higher than Koreans from the initiation of breastfeeding in hospital. Thus not only did an increasing proportion of American mothers begin breastfeeding but increasing proportions also breastfed for 6 months. Steadily 13.2% declines in exclusive breastfeeding rates for Americans soon after

Table 1. General characteristics of subjects

Characteristics		American subjects (n = 106) n(%)	Korean subjects (n = 106) n(%)
Age(years)	<20	4(3.9)	0
	20 – 24	22(21.4)	0
	25 – 29	17(16.5)	37(34.9)
	30 – 34	30(29.1)	59(55.7)
	≥35	30(29.1)	10(9.4)
Education level	<High school	14(13.7)	0
	High school	23(22.5)	0
	≥College	65(63.7)	106(100)
Employment	Employed	57(56.4)	11(10.4)
	Unemployed	44(43.6)	95(89.6)
Family's monthly income	<\$1000	15(19)	36(34.0)
	\$1000 – 1999	14(17.7)	59(55.7)
	\$2000 – 2999	8(10.1)	11(10.4)
	≥\$3000	42(53.2)	0
Ethnicity	White	75(77.3)	
	Black	8(8.2)	
	Hispanic	8(8.2)	
	Asian	6(6.2)	

Table 2. Characteristics of infants¹⁾

Variables	Americans(n = 106)	Koreans(n = 106)
Age(months)	25.7±16.9 ²⁾	25.7±17.5
Birth weight(kg)	3.4± 0.6	3.3± 0.4
Birth length(cm)	51.7± 3.4	51.0± 2.3

1) There were no significant($p < 0.05$) between group differences

2) Values are means±SD

Table 3. Infant feeding patterns during the first six months

	Infant Age											
	In hospital			2 months			4 months			6 months		
	A	B	C	A	B	C	A	B	C	A	B	C
American group	64 ¹⁾ (60.4)	37 (34.9)	5 (4.7)	50 (47.2)	43 (40.6)	13 (12.3)	36 (34.0)	45 (42.5)	25 (23.6)	28 (27.2)	54 (52.4)	21 (20.4)
Korean group	38 (35.9)	50 (47.2)	18 (17.0)	36 (34.0)	21 (29.3)	39 (36.8)	22 (20.8)	61 (57.6)	23 (21.7)	14 (13.2)	79 (74.5)	13 (12.3)
All	102 (48.1)	87 (41.0)	23 (10.9)	86 (40.6)	74 (34.9)	52 (24.5)	58 (27.4)	106 (50.0)	48 (22.6)	42 (20.1)	133 (63.6)	34 (16.3)

1) Values are n(%)

A : Exclusive breast feeding B : Formula Feeding C : Mixed Feeding

delivery as well as after 2 months were observed, compared to a very slight decrease for Koreans between at birth and 2 months. Obviously, this kind of infant feeding pattern of Koreans was different from that of Americans.

Unexpectedly, higher mixed feeding and lower formula feeding rates at 2 months were noted in Koreans when compared with American counterparts. However, at 4 and 6 months, formula feeding rates for Koreans were higher than Americans. These results suggested that most Koreans tried to breastfeed either exclusively or partially for a short time between at birth and 2 months of age and they terminated breastfeeding much earlier than Americans. In fact, most Korean mothers reported that they gave colostrum to their infants, in spite of lower incidence of exclusive breastfeeding rates. This was consistent with other study¹²⁾.

Traditionally, mother in most parts of the world is to breastfeed for two to three years¹³⁾. Many women, however, wean the child from the breast at about one year of age¹⁴⁾. Table 4 shows age of weaning from the breast or terminating breastfeeding of breastfed mothers. The average duration of exclusive or partial breastfeeding was 9.16 months with a standard deviation of 9.04 in Americans and 3.95 months with a standard deviation of 3.75 in Koreans. In this study American subjects breastfed their infants 5.21 months longer than Koreans and had a wider variation. Thus, there was a statistically significant difference in age of weaning between these two groups($p < 0.01$). Two

mothers reported that they finished breastfeeding in 2 days after delivery. Twelve Korean mothers stated they stopped breastfeeding in first two weeks. In contrast, an American reported that she terminated breastfeeding at 45 months.

The most common reasons for the early termination of breastfeeding in Koreans were maternal report of milk insufficiency, illness and work (Table 5).

Table 4. Age of weaning from breast

Age(month)	American group n(%)	Korean group n(%)
< 1	1(1.6)	12(14.0)
1	4(6.3)	10(11.6)
2	4(6.3)	19(22.1)
3 - 4	12(19.0)	19(22.1)
5 - 6	10(15.9)	10(11.6)
7 - 8	8(12.6)	7(8.1)
9 - 10	5(7.9)	5(6.0)
11 - 12	8(12.6)	3(3.5)
13 - 24	8(12.6)	1(1.2)
24 - 48	3(4.8)	

Table 5. The reasons for early termination of breast feeding by Koreans

Reason	Number	Percentage(%)
Insufficient milk	38	56.7
Body rejected breast	1	1.5
Baby's illness	3	4.5
Maternal illness	9	13.4
Inconvenience	6	9.0
Employment and study	9	13.4
Inverted nipples	1	1.5

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More than half of Korean mothers(56.7%) indicated they stopped breastfeeding before 4 months of age due to insufficient milk. In American group, however, only 6.3%, contrast to 56.1% of Koreans, mentioned insufficient milk and 7.9% indicated employment was the obstacle to continue breastfeeding.

Dettwyler et al,¹⁵⁾ argued that report of perceived insufficient milk was a maternal misunderstanding of normal breastfeeding patterns. This was never reported based on weight gain. Van Esterik¹⁶⁾ maintained that this is simply a socially acceptable excuse to introduce early supplementary bottles or to stop breastfeeding prematurely. However, we did not test this hypothesis in the study. Ways of increasing milk production, breastfeeding technique as well as mother's confidence in successful lactation and lactogenesis related to hormon's role¹⁴⁾¹⁷⁾ might be informed to mothers accurately and timley.

Table 6 shows the breastfeeding frequency pattern in two groups. Rates of demand feeding was 55.8% in American group and 41.1% in Korean group. The result in the study indicated more American mothers breastfed their infants whenever mother felt the baby wanted while more Koreans nursed the babies on schedule.

Demand feedings are known to have a beneficial effect in the milk supply. It was suggested that frequency of breastfeeding may influence the breast milk composition. Quandt¹⁸⁾ explained that frequent nursing leads to frequent release of prolactin and elevate serum prolactin concentration, which result in higher fat levels in mother's milk. Also Woolridge et al,¹⁹⁾ reported that the greater the interval between feedings, the average fat content would be lower. Hence, the more frequent feeding results in higher fat content and the infant is easily to be satisfied. The more scheduled feeding may lead to unsuccessful lactation episodes in Koreans.

When sources of advice about feeding(Table 7) were compared between these two groups, Americans mentioned primary sources were from professional groups such as doctor and nurses while Koreans responded their advice about feeding was from baby's

grandmother. Furthermore 24.3% of Korean mothers indicated they did not get advice from any sources. Instead they decided by themselves. Thus Koreans in USA did not have enough supporting groups for breastfeeding after delivery. Since most Korean mothers lived apart from their mother or mother in law, they might need considerable support and guidance from some other sources for successful breastfeeding. For international families, health professionals need to be good at efficient cross-cultural educational strategies and health counseling²⁰⁾.

It has been known that the demographic factors that were significantly positively associated with the choice of breastfeeding included white ethnicity, college education, higher total family income and increased maternal age in USA. Since Koreans do not have variations with respect to distribution of educational level, family income and employment. a test was done to determine the association of type of feeding with above demographic factors only in Americans(Table 8). These demographic factors in American group did not influence the type of feeding at 4 months in the study. Though women with above 3000\$ tended to breastfeed and women with below

Table 6. Breastfeeding frequency pattern in two groups

Method	Group	
	American group(%)	Korean group(%)
Demand feeding	55.8	41.7
Scheduled feeding	42.3	55.6
Other	1.9	2.7

Table 7. Sources of advice about feeding

	Americans(%)	Koreans(%)
Doctor	23.9	16.5
Nurse	20.1	15.5
Family	17.5	
(mother, husband, sister, sister in law, mother in law)		35
Friend	18.4	0
Books	8.1	0
Myself	3.8	24.3
Other	8.2	8.7

Table 8. Mother factors affecting feeding methods of US samples

		Breast feeding	Bottle feeding	Mixed feeding	Total	
		N(%)	N(%)	N(%)		
Employment	Employed	17(29.8)	23(40.4)	17(29.8)	57	$x^2 = 2.952$
	Unemployed	18(40.9)	19(43.2)	7(15.9)	44	$p = 0.7714$
Income	<1000	3(20)	11(73.3)	1(6.7)	15	$x^2 = 19.24$
	1000 - 1999	3(21.4)	7(50)	4(28)	14	$p = 0.9962$
	2000 - 2999	2(12.5)	5(62.5)	2(25)	8	
	≥3000	23(54.8)	8(19.0)	11(26.2)	42	
Education Level	<High school	1(7.1)	11(78.6)	2(14.3)	14	$x^2 = 21.419$
	High school	3(13.0)	15(65.2)	5(21.7)	23	$p = 0.997$
	≥College	31(47.7)	17(26.2)	17(26.2)	65	
Ethnicity	White	32(42.7)	25(33.3)	18(24)	75	$x^2 = 10.740$
	Black	0(0)	7(87.5)	1(12.5)	8	$p = 0.9034$
	Hispanic	2(25)	3(37.5)	3(37.5)	8	
	Asian	2(33.3)	2(33.3)	2(33.3)	6	

1000\$ tended to bottlefeed, there was no significant association between income and feeding methods. This same phenomena were shown in other demographic variables such as educational level and ethnicity. Though tendencies of associations of exclusive breastfeeding pattern at 4 months with other known factors were observed, they were not significantly different when we examined the associations. Thus it was obvious that the increased incidence of breastfeeding did not limit to higher income, well educated mother and white ethnicity in this study.

In fact, there was a limitation of getting representative sample, especially Americans, and obtaining accurate data from retrospective survey because of problems inherent in the methodology. Since part of subjects in the study were from WIC was participants in this area and a high percentage of them were African American, Hispanic and of low educational level and economic status, the different results from others^(5,6) might be due to the fact that education intervention targeted for WIC participants was successful in promoting breastfeeding in this area. Positive role of breastfeeding promotion program at WIC was reported in other study too⁽²¹⁾. It might be suggested that further research on evaluation of breastfeeding patterns of WIC participants be conducted in the fu-

ture.

Conclusion

The results from this study showed that rates of initiation and continuation of breastfeeding for six months in well educated Korean mothers was less than those of local populations living in Texas, USA. Furthermore Korean mothers breastfed infants on schedule and terminated breastfeeding much earlier than American counterparts, due to milk insufficiency.

While Americans including the disadvantaged, seemed to be exposed to accurate information, encouragement and support to increase the incidence and duration of breastfeeding through intervention such as WIC's breastfeeding promotion programs, Korean mothers living in Texas as student's wives, have little or no access to a wide variety of community nutrition education programs. They urgently need reliable and timely nutrition education intervention programs to promote and support breastfeeding. It might be suggested that effective nutrition education programs toward Korean mothers should be developed to breastfeed early and frequently to establish lactation and support continuation of breastfeeding.

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= 국 문 초 록 =

미국 텍사스주에 거주하는 한국인과 그 지역주민들의
영아수유 패턴에 관한 비교 연구

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서로 다른 수유경향을 지닌 것으로 알려진 미국인과 한국인의 수유실태를 비교하기 위해 만 3세 이전의 영유아를 양육하는 미국 Texas주에 거주하고 있는 한국인 어머니와 미국인 어머니를 대상으로 수유 실태조사가 행해졌다. 병원에서, 2개월, 4개월 및 6개월까지의 모유수유는 한국인은 각각 35.9%, 34.0%, 20.8%, 13.2%였으며, 미국인은 60.4%, 47.2%, 34.0%, 27.2%여서 두 집단간에 다른 수유율을 보여주었다. 단유시기는 한국인은 3.95 ± 3.75 개월, 미국인은 9.19 ± 9.04 개월로 유의적인 차이가 있었다 ($p < 0.01$).

4개월 이전에 단유한 한국인의 가장 흔한 단유 이유는 모유부족이었으며, 모유 수유시의 수유방법에 있어서 한국인은 55.6%가, 미국인은 42.3%가 스케줄에 따라 수유를 했다. 수유하는데 가장 영향력을 준사람은 한국인은 아기의 할머니이었으나 미국인은 의사, 간호원 순이었다. 미국인에서 직업, 수입, 교육, 인종 등의 변수와 수유방법과의 관련성 여부는 유의성이 없었다. 아마도 이 지역의 WIC program에서 실시하고 있는 모유수유에 대한 영양교육의 영향같다. 한국인을 대상으로 모유수유율을 높이고 지속시키기 위한 효율적인 영양교육이 시급한 것으로 사료되어진다.