

A Study on the Characteristics in Dietary Behavior and Dish Preference of Elementary School Children in Seoul and Kangwha Area*

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ABSTRACT

This study was conducted to provide current information on dietary behaviors and dish preferences of elementary school children and to suggest guidelines for proper dietary behaviors. To accomplish study objectives survey was executed using the questionnaire for 420 fifth and sixth grade school children, chosen from schools in Kangwha-gun and East River District of Seoul. A questionnaire largely consists of categories including general characteristics, dietary behavior and preferences of the subjects for some dishes. Results showed 30% of the subjects had breakfast irregularly. A majority of the subjects took Korean style dishes of cooked rice and soup for breakfast. Fifty-eight percent of subjects had a regular meal time. Imbalanced diet(avoiding specific food group thereby causing unbalance in nutrient intake) habit group was estimated to be 47.3%. Twenty one percent had a habit of overeating. In choosing the snack, taste was considered to be a more important factor than nutrition. Advertisement of the snack was shown to be one of the important factors in selecting the snack. The girls were more concerned about weight control than the boys. Also the girls were likely to rely on the diet to control weight since they exercised only in the physical class while the boys exercised regularly. Generally, children liked animal protein containing foods and the preference for vegetables was low. In order to improve overall dietary behavior, systematic nutrition education programs reflecting sex difference should be developed. Dish preference data would be very useful in selecting substitutive dish for the school lunch menu to improve imbalanced diet. (*J Community Nutrition* 3(2) : 69~76, 2001)

KEY WORDS : dietary behavior · dish preference · imbalanced diet · nutrition education · weight control

Introduction

School children need to take higher amount of nutrients per body weight than adult since they are very active and have larger body surface area. Each children's growing speed are different depending on their biological, genetic and environmental factors. It was claimed that lifelong nutritional status is affected by the nutrition intake of the school children formed during their childhood(Moor & Davies 2001). Because higher grade elementary school children are also on the verge of growing into adolescent age, sufficient nutrition supply, proper exercise and proper rest are

the most important factors for their growth(Hong 1984). In adolescents, there are rapid changes of body and physiological functions(Kretchmer & Zimmermann 1997). Therefore, more balanced nutrition and desirable dietary behavior are important for health of them, and for a later life.

Inappropriate food intake can result from frequent snacks, skipped meals, monotonous diets, frequent use of fast foods, and excessive use of dietary supplements(Brevard & Ricketts 1996 ; Han et al. 1999 ; Jacobson 1995 ; Gordon et al. 1995).

Food intake pattern of the children is mostly affected by the advertisement or the programs shown on the mass media like TV. These children like to have instant food, processed food, cold drinks and sweet food. Excessive intake of foods with additive, sugar or caffeine may cause hyperactivity(Kim et al. 1999). Number of children with obesity is increasing since they overeat and spend too much time in watching TV or doing computer game without sufficient ex-

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ercise.

Once fixed, eating habits are very hard to be corrected and have to be adjusted only by the various education received at home, school and society for the long period of time (Lee & Choi 1999). For nutrition education to be effective, factors influencing behavior should be investigated. Also nutrition education should be focused on positive goals that are practical and achievable.

Therefore, the purpose of this study was to provide current information on dietary behavior and dish preference of fifth and sixth grade school children on the verge of the adolescent ages chosen from schools in Kangwha-gun and East River District of Seoul and suggest guidelines for proper dietary behavior.

Subjects and Methods

1. Subjects

Subjects for this study were boys and girls chosen from four schools from the fifth and sixth grade of three elementary schools in Kangwha-gun (n=200) and three schools in East River District of Seoul (n=240). Two areas presumably assumed to have geographical association to each other were selected: East River District of Seoul is on the outskirts of the capital city while Kangwha-gun is closely located to that capital city. This survey was conducted from June 8th till July 10th 1998.

2. Method

This study was conducted using a self-administrated questionnaire to compare dietary behavior and dish preference between boys and girls. After preparative questionnaire was conducted for 20 students, it was reconstructed to be appropriate for this study. Final questionnaires were distributed to 200 and 240 elementary school children in each region respectively. After tentative analysis, a total of 420 results, 227 from Seoul and 193 from Kangwha-gun, were carefully selected for further process except for those containing inconsistent and faulty responses.

A questionnaire largely consists of categories including general characteristics, dietary behavior and preferences of the subjects for some dishes.

1) General characteristics

In order to investigate the general characteristics of the subjects, family background information including number of family members, number of brothers and sisters, order of birth, parent's educational background, mother's job status, and parent age were obtained.

2) Dietary behavior

Dietary behavior included items to determine number of daily meals, consistency of mealtime, skipping breakfast, imbalanced diet, overeating, number of snack intake, snack selecting criteria, recognition of manufacturer, term of validity. Since the concern for the body shape may affect dietary behavior, following questions were included in the questionnaire as concern for weight control, self estimated body shape, frequencies of exercise.

3) Dish preferences

To observe the preference of the subjects for some dishes, series of dish list were made considering the menu of the four schools in East River District of Seoul and relevant research results. Preference levels for each corresponding dishes were assigned to following three answers as "like", "average" and "dislike". Scores of 1, 2 and 3 were assigned to "dislike", "average" and "like" respectively. Calculated results were compared with respect to sex.

3. Statistical analysis

Study results were processed and analyzed using SAS (Statistical Analysis System) program. Frequencies and percentiles were calculated using the results of the subjects's general characteristics and dietary behavior. In order to verify how each variables are significantly different, χ^2 or Mantel-Haenszel χ^2 were introduced. The difference between each groups with respect to the subject's preferences was checked using student's t-test.

Results and Discussion

1. General characteristics

The characteristics of general background of children are shown in Table 1. Among the subject, 45% is 5th grade and 55% is 6th grade. The proportion of

boys and girls are the same. As a family member composition, 72% of the subjects were in families of two children, 57% of children were the first in the order of

Table 1. General characteristics of the school children

Variables	N(%)
Grade	
5th	188(44.8)
6th	232(55.2)
Sex	
Boy	209(49.8)
Girl	211(50.2)
Region	
Kangwha province	193(46.0)
Seoul	227(54.0)
Number of family members	
Less than 4	278(66.2)
5 - 6	121(28.8)
More than 7	21(5.0)
Number of brothers and sisters	
None	48(11.4)
1	301(71.7)
2	50(11.9)
More than 3	21(5.0)
Order of birth	
First	239(57.0)
Second	156(37.1)
Third and over	25(6.0)
Father's education background	
Lower than middle school	35(9.0)
High school	182(46.7)
Higher than college	173(44.4)
Mother's education background	
Lower than middle school	52(13.3)
High school	222(57.0)
Higher than college	116(29.7)
Father's age	
Less than 39	73(17.4)
40 or over	347(82.6)
Mother's age	
Less than 39	241(57.4)
40 or over	179(42.6)
Mother's job status	
Occupied	190(45.3)
None	229(54.7)
Meal provider	
Mother	372(88.6)
Father	22(5.2)
Grand mother	16(3.8)
Others	10(2.4)

birth, and 37% were the second. Answers regarding parents' education indicated that 91% of fathers and 87% of mothers among the subjects had higher educational background than high school. Therefore most subjects had relatively well educated parents. As for the employment status, relatively high proportion as 45% of subjects' mothers were employed. Most of children's meal provider were mother, too.

2. Dietary behavior

1) Eating habit

Dietary behavior of the elementary school children are of interest in part because these behaviors may reflect their future health as they become national manpower sources. Results of dietary behavior by sex in elementary school subjects are shown in Table 2. From the result the number of meals per day was mostly three and 10 percent of the children skipped meals at least once a day.

As for the regularity of taking meals, 30% of the subjects had breakfast irregularly(sometimes and usually) which was less frequent than the results found in Anyang area study(Yeon & Rhie 2000) in which 40% of subjects were irregular. Skipping breakfast may often lead to a more frequent intake of snacks by children. The reasons for children's skipping meals reported were having no time for meals, feeling no appetite, disliking side dishes, and reducing weight(Joo & Park 1998).

Majority of the subject took Korean style dish with cooked rice and soup for the breakfast, while 15% of the subject took western style dishes such as bread, milk or corn flake. 57.9% of subjects had a meal time regularly and most of the subjects ate meals at a normal speed.

Eating rapidly and having a good appetite were suspected as one of the dominant reasons causing obesity among children, however food habit would be little different(Kim et al. 1998). Among the subject, rather high rate of imbalanced diet habit as 47.3% was estimated. 75.5% of the subjects was taking proper amount of the meal, but 21% had a habit of overeating. They showed a tendency of overeating when the food tasted good.

2) Snacks

Table 3 shows the eating behavior for snacks of the subjects. Most frequently eating snacks were fruit or fruit juice(36.0%) and cookies(25.7%). More girls preferred fruit for snack, while more boys preferred Ra Myoen and milk($p < 0.05$). About forty-four percent of the subjects were shown to take snacks regularly.

Most of the snacks were taken between lunch and dinner.

The reason for taking snacks was that they' simply felt like having them. In choosing the snack, taste was more important factor than nutrition and 76.1% of them checked the manufacturer and term of validity. Advertisement of the snack was shown to be one of

Table 2. Eating habit of school children

N(%)

Variables	Sex		Total	Misc
	Boy	Girl		
Number of meals per day				
1	2(1.0)	1(0.5)	3(0.7)	
2	19(9.1)	24(11.4)	43(10.3)	$\chi^2 = 6.940$ DF = 3
3	171(82.2)	181(85.7)	352(84.0)	
4	16(7.7)	5(2.4)	21(5.0)	
Number of breakfast per week				
None	9(4.3)	9(4.3)	18(4.3)	
1~2	23(11.0)	22(10.4)	45(10.7)	$\chi^2 = 2.093$ DF = 3
3~4	27(12.9)	38(18.0)	65(15.5)	
5~7	150(71.8)	142(67.3)	292(69.5)	
Breakfast menu				
Korean style	161(77.0)	159(75.3)	320(76.2)	
Western style	33(15.8)	36(17.1)	69(16.4)	$\chi^2 = 0.424$ DF = 3
Milk only	6(2.9)	5(2.4)	11(2.6)	
Others	9(4.3)	11(5.2)	20(4.8)	
Meal time regularity				
Regular	116(55.5)	127(60.2)	243(57.9)	$\chi^2 = 0.946$ DF=3
Irregular	93(44.5)	84(39.8)	177(42.1)	
Eating speed**				
Slow	29(13.9)	29(13.7)	58(13.8)	$\chi^2 = 13.507$ DF = 2
Normal	139(65.1)	164(77.8)	300(71.4)	
Fast	44(21.0)	18(8.5)	62(14.8)	
Imbalanced diet				
Yes	106(51.0)	92(43.6)	198(47.3)	$\chi^2 = 2.276$ DF = 1
No	102(49.0)	119(56.4)	221(52.7)	
Amount of having a meal				
Heavy	54(25.8)	34(16.1)	88(21.0)	$\chi^2 = 6.080$ DF = 2
Proper	149(71.3)	169(80.1)	318(75.7)	
Light	6(2.9)	8(3.8)	14(3.3)	
Reason of overeating				
Good taste	101(48.3)	106(50.5)	207(49.4)	$\chi^2 = 0.294$ DF = 2
Anger or stress	14(6.7)	12(5.7)	26(6.2)	
Hungriness	94(45.0)	92(43.8)	186(44.4)	
Feeling regret for overeating				
Often	6(2.9)	9(4.3)	15(3.6)	$\chi^2 = 2.902$ DF = 2
Seldom	73(35.1)	88(41.7)	161(38.4)	
None	129(62.0)	114(54.0)	243(58.0)	

** : $p < 0.01$

the important factors in selecting the snack since more than 57.4% of the subjects were affected by the advertisement in one way or another. This verifies the fact that food intake pattern of children is mostly affected by the advertisement or the program on mass media like TV(Mo et al. 1998).

3) Concern for body shape

Concern for body shape of the subjects are shown in Table 4. 61.2% of the subjects thought that their body shape estimated by themselves were normal. More than a half of subjects(66.8% of the girls and 55.5% of the boys) thought that their weight were normal.

38.3% of the subjects were concerned for weight control. Boys were less concerned with the weight control, while girls showed higher concern($p < 0.005$). Earlier study reported the similar tendency that boys ignore the health risks associated with obesity(Moses et al. 1989).

The proportion of the groups that exercise at least three times per week in addition to the exercise during the regular physical class was estimated to be 73.5%. More boys were found to do exercise regularly compared to the girls($p < 0.005$). Similar results were also found in the earlier studies(Lee et al. 1997 ; Yoon 1995). The girls were more concerned about weight

Table 3. Eating behavior for snacks of school children

N(%)

Variables	Sex		Total	Misc
	Boy	Girl		
Type of snack*				
Breads	25(12.0)	27(12.8)	52(12.4)	
Cookies	56(26.8)	52(24.4)	108(25.7)	
Milk products	28(13.4)	25(11.8)	53(12.5)	$\chi^2 = 12.356$
Ra myoen, fries	38(18.2)	18(8.5)	26(13.3)	DF = 4
Fruit, fruit juice	62(29.6)	89(42.3)	151(36.0)	
Number of snacks per day				
Irregular	111(53.9)	121(57.6)	232(55.8)	
1	53(25.7)	43(20.5)	96(23.1)	$\chi^2 = 3.073$
2	26(12.6)	34(16.2)	60(14.4)	DF = 3
Over 3	16(7.8)	12(5.7)	28(6.7)	
Snack time				
Before breakfast	8(3.8)	1(0.5)	9(2.1)	
Breakfast-lunch	12(5.7)	15(7.1)	27(6.4)	
Lunch-dinner	101(48.3)	119(56.4)	220(52.4)	$\chi^2 = 8.562$
After dinner	16(7.7)	17(8.1)	33(7.9)	DF = 4
Not fixed	72(34.5)	59(27.9)	131(31.2)	
Reason for taking snacks				
Desire	125(60.4)	140(66.3)	265(63.4)	
Hungriness	66(31.9)	58(27.5)	124(29.7)	$\chi^2 = 1.637$
Curiosity	16(7.7)	13(6.2)	29(6.9)	DF = 2
Criteria in selecting snacks*				
Taste	128(61.2)	139(65.9)	267(63.6)	
Nutrition	57(27.3)	64(30.3)	121(28.8)	$\chi^2 = 8.849$
Price	24(11.5)	8(3.8)	32(7.6)	DF = 2
Checking brand or term of validity**				
Yes	143(68.8)	175(83.3)	318(76.1)	$\chi^2 = 12.211$
No	65(31.2)	35(16.7)	100(23.9)	DF = 1
Preference for advertised snacks				
High	14(6.7)	5(2.4)	19(4.5)	
Normal	106(50.7)	104(49.3)	210(50.0)	$\chi^2 = 5.158$
Low	89(42.6)	102(48.3)	191(45.5)	DF = 2

* : $p < 0.05$, ** : $p < 0.01$

Table 4. Concern for body shape of school children

N(%)

Variables	Sex		Total	Misc
	Boy	Girl		
Concern for weight control				
Interested	56(26.8)	105(49.8)	161(38.3)	$\chi^2 = 23.999$ DF = 2
Slightly interested	88(42.1)	66(31.2)	154(36.7)	
Not interested	65(31.1)	40(19.0)	105(25.0)	
Self estimated body shape*				
Over weight	45(21.5)	37(17.5)	82(19.5)	$\chi^2 = 5.981$ DF = 2
Normal	116(55.5)	141(66.8)	257(61.2)	
Lean	48(23.0)	33(15.7)	81(19.5)	
Frequencies of exercise**				
Regular, everyday	74(35.4)	40(19.0)	114(27.1)	$\chi^2 = 14.586$ DF = 2
Only in the physical class	47(22.5)	64(30.3)	111(26.4)	
3~4 times after class	88(42.1)	107(50.7)	195(46.4)	

* : $p < 0.05$, ** : $p < 0.01$ **Table 5.** The comparison of dish preference of school children by sexMean \pm SD

Dish	Dish preference ¹⁾		
	Boys	Girls	Total
Cooked rice dishes			
Cooked rice with bean	2.1 \pm 0.7	1.8 \pm 0.8	2.0 \pm 0.8
Cooked rice with barley	2.4 \pm 0.7	2.4 \pm 0.6	2.4 \pm 0.7
Cooked rice with soybean sprout	2.2 \pm 0.7	2.3 \pm 0.7	2.3 \pm 0.7
Cooked rice with red bean	2.0 \pm 0.8	1.7 \pm 0.7	1.9 \pm 0.8
One dishes			
Kimchi frizzled rice	2.8 \pm 0.5	2.8 \pm 0.5	2.8 \pm 0.5
Bi bim bab*	2.9 \pm 0.6	2.9 \pm 0.1	2.9 \pm 0.4
Omu rice**	2.9 \pm 0.3	2.8 \pm 0.4	2.9 \pm 0.4
Curry and rice**	2.9 \pm 0.4	2.8 \pm 0.6	2.9 \pm 0.5
Frizzled rice**	2.9 \pm 0.3	2.8 \pm 0.4	2.9 \pm 0.4
Cha jang and rice**	2.9 \pm 0.3	2.7 \pm 0.6	2.8 \pm 0.5
Noodle, bread and rice cake			
Teuk bok ki	2.8 \pm 0.4	2.9 \pm 0.4	2.9 \pm 0.4
Noodle	2.7 \pm 0.6	2.6 \pm 0.6	2.7 \pm 0.6
Rice cakes soup	2.9 \pm 0.4	2.8 \pm 0.4	2.9 \pm 0.4
Dumpling soup**	2.9 \pm 0.4	2.8 \pm 0.5	2.9 \pm 0.5
Pizza	2.8 \pm 0.5	2.8 \pm 0.4	2.8 \pm 0.5
Ra myoen**	2.9 \pm 0.4	2.8 \pm 0.5	0.8 \pm 0.5
Cha jang and noodle	2.9 \pm 0.4	2.8 \pm 0.4	0.8 \pm 0.4
Spaghetti	2.8 \pm 0.5	2.8 \pm 0.5	0.8 \pm 0.5
Hamburgers**	2.9 \pm 0.4	2.7 \pm 0.5	0.8 \pm 0.5
Soup and stew			
Kimchi stew*	2.7 \pm 0.6	2.8 \pm 0.5	2.8 \pm 0.5
Korean cabbage and soybean paste stew	2.0 \pm 0.8	2.0 \pm 0.8	2.0 \pm 0.8
Spinach and soybean paste stew	2.0 \pm 0.8	2.0 \pm 0.8	2.0 \pm 0.8
Sea mustard soup	2.8 \pm 0.5	2.8 \pm 0.5	2.8 \pm 0.5
Beef rib soup**	2.8 \pm 0.5	2.6 \pm 0.6	2.7 \pm 0.6
Dry pollack soup	2.1 \pm 0.8	2.0 \pm 0.8	2.1 \pm 0.8

* : $p < 0.05$ ** : $p < 0.01$ ¹⁾Scores of 1, 2 and 3 were assigned to "dislike", "average" and "like" respectively.

control than the boys and were likely to rely on the diet since they exercised only in the physical class.

3. Dish preference

Children showed the highest preferences for cooked rice with barley and cooked rice with soybean sprout among the cooked rice dish group. The least preferences were cooked rice with red bean or black soy bean. Children liked one-dish food items in the following order : frizzled rice, Bi Bim Bab, Cha Jang with rice, curry and rice, kimchi frizzled rice. Noodles and rice cake were also on the high preference lists. As for the soup and stew, kimchi stew, seaweed soup, beef rib soup were preferred while dried pollack soup, Korean cabbage and soybean paste stew, spinach and soybean paste stew were not.

In the result of the study by Kim et al.(1998), most children liked fruits, meats, biscuits and boiled rice mixed with other grains.

The most popular salad was fruit salad. Bulgogi and stir fried sausage were also popular in the stir fried food category.

Children liked dishes with meat since braised beef rib was the highest preference among braised dishes. As for the fried food, sweet and sour pork was the most popular dish followed by fried chicken and fried potato. Similar to the previous study(Lee 1997), high preference for fried dishes was observed. In the category of snacks, fruits were favored. Various cooking method for the salad should be developed since the salad dish group was the least preferred one among the side dishes.

Generally, children liked animal protein containing food and preference for vegetables were low. Girls preferred soybean sprout, kimchi, tangerines, strawberry and grape($p < 0.01$). Boys preferred Bibimbab, Cha Jang with rice, Ra Myoen, hamburger, Beef rib stew, Bulgogi and stir fried sausage($p < 0.01$).

Because food preference can be affected by cooking method(Koo · Park 1998), newly developed cooking methods may change children's preference for foods.

Conclusion

This study was undertaken with 420 fifth and sixth

grade elementary school children by using questionnaire to investigate the characteristics in dietary behavior and dish preference in Seoul and Kangwha area.

From the results, following conclusions could be reached. Serious problems of the subject's eating habit were observed especially in respect of overeating, skipping breakfast and imbalanced diet. The eating habit and the preference for the dishes were significantly different between each sexes. Therefore systematic nutrition education was recommended considering subject's sex instead of using identical curriculum regardless of the students' characteristics. Better eating habit of the subjects was observed when the meal provider was mother. Therefore, practical nutrition education for mother is required, too. Dish preference data would be very useful in selecting substitutive dish for the school lunch menu to improve imbalanced diet.

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