

Korean adolescents' perceptions of nutrition and health towards fast foods in Busan area*

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Abstract

Adolescents in Busan area were asked in a survey about their perception and attitudes towards fast food. Most respondents answered that they consume fast food once a month because it is fast, easily accessible and tasty. Although they perceived fast food as unhealthy and less nutritious, they were less aware of its effect on their health and nutritional status. The more knowledgeable respondents were about nutrition and health the less likely they were to choose fast food over other meals. However, respondents who had little or no knowledge about the nutritional factors of fast food accounted for 43.1%. As to their source of dietary information, students relied on themselves (31.0%), parents (20.5%) and friends (19.9%). The medium through which students got the most nutrition and health information was television (66.8%), followed by the Internet (36.7%) and magazines (29.7%). This study will enable educators to plan more effective strategies for improving the dietary knowledge of the adolescent population.

Key Words: Fast foods, adolescents, perception, attitude, Korean

Introduction

The fast food restaurant is one typical form of the global restaurant business (Emerson, 1990). As Korea is not exceptional in this stream, the nation's fast food industry has grown rapidly since the 1988 Seoul Olympic Games due to changing socio-cultural aspects such as rising incomes, changing lifestyle, and growing number of working women. It has been reported that the Korean fast food industry has developed by an average of 39.7% over the last fifteen years (Han *et al.*, 2005; Park, 2004).

Many Korean adolescents are becoming increasingly more westernized and pursuing greater convenience when eating out. For these reasons, fast food restaurants have become especially popular among adolescents (Park, 2004). In fact, the main customer group of fast food restaurants is adolescents. According to a surveyed report, 54% of adolescents reported fast food as their favorite away-from-home food (Jeon *et al.*, 1990; Sim & Kim, 1993).

Several dietary factors inherent in fast food may cause a variety of negative health effects, including obesity, hypercholesterolemia, cardiovascular disease and some cancers due to massive portion

of fast food, high energy density, palatability (appealing to primordial taste preferences for fats, sugar and salt), high content of saturated and trans fat, high glycemic load, and low content of fiber (Appledorf & Kelly, 1979; Kesteloot & Joossens, 1992; Prentice & Jebb, 2003). In addition to concerns about high fat and total energy intake, eating in fast food restaurants is of concern because of its association with low calcium intake and high soft drink consumption. It may encourage the consumption of soft drinks and displace calcium-rich foods. This may contribute to lower bone mineral density gains in adolescents and cause increasing risk of osteoporosis later in life (French *et al.*, 2001a; Guthrie & Morton 2000; Harmack *et al.*, 1999).

In order to induce adolescents to have a correct understanding of the problems associated with fast food and to form a good dietary habit, it is necessary to realize how adolescents perceive the influence of fast food on their health and nutrition. The purpose of this study is to examine the Korean adolescents' perceptions and attitudes towards fast foods. A better understanding of the behavioral and psychosocial factors associated with eating fast food could provide useful descriptive information for potential intervention development.

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Subjects and Methods

Subjects

A survey was conducted on secondary school students in December 2004 to identify their perceived knowledge and attitudes toward fast foods. The population in this study consisted of 1,050 middle and high school students aged 14–19 from five school districts in Busan, Korea. The survey data were collected after trained school teachers administered the survey in their classrooms. The student survey was completed by 968 students (response rate: 92%) which included 541 middle school and 435 high school students.

Questionnaires

A written questionnaire was developed using previously published findings (Cho & Han, 1996; Jeon *et al.*, 1990; Kim & Cho, 1994; Kim *et al.*, 2004; Sim & Kim, 1993) as well as questions about dietary information providers, channels of nutrition information about fast foods, perceptions of fast food influences on health and nutrition and nutrition and health considerations when selecting fast foods. The student survey measured a variety of personal and behavioral factors associated with fast food consumption, frequency of fast food restaurant usage, and perceptions of fast foods. Sources of items were diverse and included items from previous studies and items written specifically for the study. The questionnaire consisted of the following questions: gender; grade (middle school, high school); regularity of meals (regular, irregular); favorite types of fast food restaurants (hamburger, chicken); frequency of eating at fast food restaurants (rarely, 1/month, 2/month, 1/week, \geq 2/week); fast food preferences (likes, dislikes, neither like nor dislike); amount of fast food per meal (adequate, inadequate, neither adequate nor inadequate); amount of intake per serving (sufficient for a meal, sufficient for a snack, just beverage); methods for ordering (set menu, item by item); nutritional knowledge about fast food (extensive, average, little); purpose of using fast food restaurants (hanging out with friends, eating, spending free time, relaxing, others); perceptions of fast food influence on health and nutrition (1: very bad ~ 5: very good); nutrition and health consideration when selecting fast foods (1: not at all considered ~ 5: always consider); fast food nutrition information needs (1: not at all needed ~ 5: very much needed), fast food nutrition information accessibility (1: very difficult to access ~ 5: very easy to access); dietary information provider (self-provided, parents, friends, school teacher, dietitian, others); channels for nutrition information about fast foods (television, internet, fast food restaurants, magazine/newspaper, leaflet from school, bulletin board in school cafeteria). The questionnaire was validated before the start of the study by 5 faculty members in the field of food and nutrition and 5 dietitians in schools. Twenty students (10 middle school students and 10 high school

students) pilot tested the survey to clarify language and response options.

Statistical analysis

Descriptive statistics were used, such as means, standard deviations, frequency distributions and percentages. Comparison of differences was analyzed using χ^2 , *t*-test and ANOVA. All tests were done using the computerized statistical package, SPSS 10.0. A 5% probability level was designated as the level of significance, but higher levels of significance ($P < .01$ and $P < .001$) were also indicated.

Results

Usage patterns of fast food restaurants

The patterns with which Korean students use fast food restaurants are indicated in Table 1. More than half of the respondents (59.7%) went to hamburger restaurants and 70.4% to chicken restaurants at least once a month.

The purpose of using fast food restaurants are as shown in Table 1. Most respondents used fast food restaurant for eating (67.1%). Students also used fast food restaurants as the place for social gatherings (18.4%) or a rest place (6.4%).

Perceived fast food influence on health and nutrition by personal factors

Respondents were asked about the influence of fast food on health and nutrition. The associations between how fast food was perceived and personal factors are shown in Table 2. Females and males significantly differed in their perception about fast foods ($P < .01$). Females had higher perceptions of fast foods as being unhealthy (1.88) and mal-nutritious (2.13) than males (2.02 and 2.28 respectively).

School grades had a significant association with the perception of fast food nutrition ($P < .05$). High school students perceived fast food as having a bad influence on their nutritional status (2.14) more than middle school students did (2.33). The assumption was that high school students would be more knowledgeable about nutrition than middle school students since high school students would have had more opportunities of nutritional education.

It was found that the majority of students (63.6%) regularly had three meals a day. It also indicated that there was a significant difference in the perception of fast food depending on whether their eating habits were regular or not ($P < .01$). Students with irregular eating habits rated fast foods as having more of a bad influence on their health and nutrition than students with regular eating habits.

In terms of fast food preferences, students who disliked fast

Table 1. Korean adolescents' usage patterns of fast food restaurants

Items	Respondents N (%)						Total
	Middle school			High school			
	Male	Female	Sub total	Male	Female	Sub total	
Frequency of hamburger restaurant use							
Rarely	76 (37.3)	107 (34.7)	183 (35.7)	84 (42.6)	99 (49.3)	183 (46.0)	366 (40.2)
1/month	87 (42.6)	127 (41.2)	214 (41.6)	68 (34.5)	72 (35.8)	140 (35.2)	354 (38.9)
2/month	23 (11.3)	52 (16.9)	75 (14.6)	23 (11.7)	18 (9.0)	41 (10.3)	116 (12.7)
1/week	14 (6.9)	16 (5.2)	30 (5.9)	10 (5.1)	8 (4.0)	18 (4.5)	48 (5.3)
≥ 2/week	4 (2.0)	6 (1.9)	10 (2.0)	12 (6.1)	4 (2.0)	16 (4.0)	26 (2.9)
	$\chi^2=3.494^{(1)}$			$\chi^2=6.136$			910 (100.0)
	$\chi^2=15.785^{(2)**}$						
Frequency of chicken restaurant use							
Rarely	56 (29.9)	80 (28.9)	136 (29.3)	65 (34.0)	51 (50.8)	116 (29.9)	252 (29.6)
1/month	65 (34.8)	128 (46.2)	193 (41.6)	59 (30.9)	87 (44.2)	146 (37.6)	339 (39.8)
2/month	50 (26.7)	48 (17.3)	98 (21.1)	43 (22.5)	31 (15.7)	74 (19.1)	172 (20.2)
1/week	10 (5.3)	14 (5.1)	24 (5.2)	17 (8.9)	26 (13.2)	43 (11.1)	67 (7.9)
≥ 2/week	6 (3.2)	7 (2.5)	13 (2.8)	7 (3.7)	2 (1.0)	9 (2.3)	22 (2.6)
	$\chi^2=8.455$			$\chi^2=13.577^{**}$			852 (100.0)
	$\chi^2=10.875^*$						
Purpose of using fast food restaurant							
Hanging out with friends	30 (14.2)	52 (16.5)	82 (15.5)	39 (18.8)	55 (24.8)	82 (20.0)	176 (18.4)
Eating	149 (70.3)	228 (72.2)	377 (71.4)	143 (69.1)	122 (55.0)	265 (63.5)	642 (67.1)
Spending free time	1 (0.5)	5 (1.6)	6 (1.1)	11 (4.8)	24 (10.8)	35 (8.2)	41 (4.3)
Relaxating	17 (8.0)	19 (3.8)	36 (6.8)	9 (4.3)	16 (7.2)	25 (6.0)	61 (6.4)
Others	15 (7.1)	27 (5.1)	27 (5.1)	5 (2.4)	5 (2.3)	10 (2.3)	37 (3.9)
	$\chi^2= 5.288$			$\chi^2= 10.665^*$			957 (100.0)
	$\chi^2=40.860^{**}$						

¹⁾ χ^2 Results by gender²⁾ χ^2 Results between middle and high school* $p < .05$ ** $p < .01$

foods perceived them as being less healthy (1.54) and nutritious (1.83) than students with a preference for fast foods (2.12, 2.36).

Data showed that more than half of the respondents (56.9%) considered that they had above average knowledge about nutrition. It was also found that the more knowledge about nutrition they had, the more they considered fast foods as not being good for their health ($P < .01$).

Nutrition and health consideration when selecting fast foods

The degree of nutrition and health consideration when selecting fast foods was compared based on personal factors (Table 3).

In terms of fast food preference patterns, the more they liked fast foods, the less concerned they were about nutrition and health. Moreover, the more amounts of fast food they ate per serving, the less they cared about nutrition and health ($P < .01$).

There was a significant difference between middle and high school students. Middle school students were more concerned about their nutrition (2.43) and health (2.80) than high school students (2.21, 2.60) when selecting the types of fast food.

The more nutritional knowledge the students had regarding fast foods, the more they pondered over their nutrition and health

when choosing their fast food menus ($P < .01$). The overall results, however, showed that Korean adolescents do not consider nutrition (2.33) and health (2.70) carefully when choosing to eat fast foods. This result suggests that providing sufficient nutritional education for adolescents is very important in order to improve their food choice and dietary habits.

Needs and accessibility to nutrition information

Table 4 shows adolescents' needs and accessibility to nutritional information. The data indicated that students agreed to the necessity of nutritional information about fast food (3.45). On the contrary, they were not satisfied with the accessibility to fast food information (2.77). High school students felt that it was difficult to access information about the nutritional factors of fast food (2.88) more than middle school students (2.65).

The necessity of fast food nutrition information was rated significantly higher by students with regular eating habits ($P < .01$). Preference to fast foods influenced students' perception of the need for fast food nutritional information. Students who enjoy fast foods regarded the necessity of nutritional information far less than respondents who dislike fast foods ($P < .01$). The

Table 2. Perceived fast food influences on health and nutrition by personal factors

Factors	N (%)	Fast food influence on health and nutrition ¹⁾	
		Nutrition (Mean ± SD)	Health (Mean ± SD)
	Total (Mean ± SD)	2.19 ± 0.71	1.94 ± 0.77
Gender			
Male	427 (44.0)	2.28 ± 0.75	2.02 ± 0.85
Female	541 (55.9)	2.13 ± 0.66	1.88 ± 0.70
	T value	3.221**	2.695**
Grade			
Middle school (aged 13~15)	532 (55.0)	2.23 ± 0.67	1.93 ± 0.71
High school (aged 16~18)	436 (45.0)	2.14 ± 0.75	1.95 ± 0.85
	T value	1.979*	-0.457
Regularity of meals			
Regular	598 (63.6)	2.13 ± 0.67	2.02 ± 0.85
Irregular	342 (36.4)	2.07 ± 0.85	1.88 ± 0.70
	T value	-3.437**	-3.939**
Fast food preference			
Like	45 (4.7)	2.36 ± 0.72 ^c	2.12 ± 0.84 ^c
Neither like nor dislike	460 (47.9)	2.06 ± 0.62 ^b	1.80 ± 0.82 ^b
Dislike	455 (47.4)	1.83 ± 0.87 ^a	1.54 ± 0.85 ^a
	F value	27.695**	26.426**
Amount of fast food per meal			
Inadequate	236 (25.0)	2.11 ± 0.80 ^a	1.84 ± 0.89 ^a
Neither adequate nor inadequate	305 (32.2)	2.31 ± 0.67 ^b	2.07 ± 0.74 ^b
Adequate	405 (42.8)	2.15 ± 0.66 ^a	1.90 ± 0.70 ^a
	F value	6.702**	7.220**
Amount of intake per serving			
Sufficient for a meal	379 (39.5)	2.25 ± 0.76 ^b	1.99 ± 0.82 ^b
Sufficient for a snack	481 (50.2)	2.20 ± 0.64 ^b	1.94 ± 0.71 ^b
Just beverage value	99 (10.3)	1.92 ± 0.74 ^a	1.75 ± 0.81 ^a
	F value	8.103**	3.796**
Method for ordering			
Set menu	604 (64.3)	2.22 ± 0.72	1.99 ± 0.81
Item by item	336 (35.7)	2.14 ± 0.68	1.86 ± 0.67
	T value	1.772	3.038**
Nutritional knowledge about fast food			
Extensive	171 (18.1)	1.87 ± 0.73	1.67 ± 0.70 ^a
Average	365 (38.8)	2.22 ± 0.69	1.94 ± 0.74 ^b
Little	405 (43.1)	2.30 ± 0.67	2.05 ± 0.79 ^b
	F value	0.637	15.220**

¹⁾ Descriptor : 1, very bad ~5, very good

*p < .05

**p < .01

amount of fast food intake per serving also affected the perceived need for nutritional information. The lesser amounts of fast foods students consumed per serving, the more they perceived the necessity of nutritional information about fast foods ($P < .05$).

Respondents with sufficient knowledge of fast foods felt a greater need for nutritional information than students with limited

Table 3. Nutrition and health considerations when selecting fast foods

Factors	Respondents N (%)	Nutrition & Health Consideration ¹⁾	
		Nutrition (Mean ± SD)	Health (Mean ± SD)
		2.33 ± 1.06	2.70 ± 1.12
Gender			
Male	427 (44.0)	2.36 ± 1.11	2.76 ± 1.18
Female	541 (55.9)	2.31 ± 1.03	2.67 ± 1.08
	t value	0.631	1.229
Grade			
Middle school	532 (55.0)	2.43 ± 1.03	2.80 ± 1.15
High school	436 (45.0)	2.21 ± 1.09	2.60 ± 1.09
	t value	3.813**	2.690**
Regularity of meals			
Regular	598 (63.6)	2.37 ± 1.05	2.83 ± 1.12
Irregular	342 (36.4)	2.25 ± 1.08	2.51 ± 1.12
	t value	1.608	4.120**
Fast food preference			
Like	45 (4.7)	2.25 ± 1.08 ^a	2.53 ± 1.10 ^a
Neither like nor dislike	460 (47.9)	2.38 ± 1.01 ^{ab}	2.83 ± 1.09 ^b
Dislike	455 (47.4)	2.62 ± 1.37 ^b	3.28 ± 1.37 ^c
	F value	3.517*	14.407*
Amount of fast food per meal			
Inadequate	236 (25.0)	2.28 ± 1.09	2.77 ± 1.22
Neither adequate nor inadequate	305 (32.2)	2.37 ± 0.93	2.66 ± 0.97
Adequate	405 (42.8)	2.31 ± 1.14	2.70 ± 1.17
	F value	0.398	0.631
Amount of intake for serving			
Sufficient for a meal	379 (39.5)	2.21 ± 1.05 ^a	2.54 ± 1.14 ^a
Sufficient for a snack	481 (50.2)	2.37 ± 1.04 ^a	2.75 ± 1.06 ^a
Just beverage value	99 (10.3)	2.60 ± 1.21 ^b	3.12 ± 1.25 ^b
	F value	5.899**	10.885**
Method for ordering			
Set menu	604 (64.3)	2.29 ± 1.05	2.64 ± 1.09
Item by item	336 (35.7)	2.41 ± 1.09	2.84 ± 1.18
	T value	-1.677	-2.576
Nutritional knowledge about fast food			
Extensive	171 (16.1)	3.14 ± 1.31 ^c	3.50 ± 1.23 ^a
Average	365 (38.8)	2.48 ± 0.91 ^b	3.15 ± 0.82 ^{ab}
Little	405 (43.1)	2.30 ± 0.67 ^a	3.23 ± 0.92 ^a
	F value	112.377**	76.987**

¹⁾ Descriptor : 1, not at all considered ~5, always consider

*p < .05

**p < .01

knowledge ($P < .01$). On the other hand, the more knowledge students had about the nutritional factors of fast foods, the easier they felt they were able to access nutritional information ($P < .05$).

Research was also conducted to investigate the providers of food and nutritional information, including information about fast foods (Table 5). The main sources of dietary information were students themselves (31.0%), parents (20.5%), and friends (19.0%). Only a few selected school dietitians (3.2%) were indicated as a source. There was a significant difference between middle school and high school students. Parents were the main

Table 4. Needs and accessibility to nutrition information

Factors	Respondents N (%)	Need & Accessibility of Fast Food Information	
		Necessity ¹⁾ (Mean \pm SD)	Accessibility ²⁾ (Mean \pm SD)
		3.45 \pm 1.05	2.77 \pm 1.07
Gender			
Male	427 (44.0)	3.41 \pm 1.09	2.78 \pm 1.11
Female	541 (55.9)	3.47 \pm 1.00	2.77 \pm 1.01
	t value	-0.801	0.043
Grade			
Middle school	532 (55.0)	3.45 \pm 1.02	2.88 \pm 1.05
High school	436 (45.0)	3.43 \pm 1.06	2.65 \pm 1.05
	t value	0.251	3.356**
Regularity of meals			
Regular	598 (63.6)	3.54 \pm 1.01	2.78 \pm 1.05
Irregular	342 (36.4)	3.28 \pm 1.09	2.74 \pm 1.08
	t value	3.630**	0.542
Fast food preference			
Like	45 (4.7)	3.33 \pm 1.02 ^a	2.81 \pm 1.07
Neither like nor dislike	460 (47.9)	3.53 \pm 1.02 ^{ab}	2.76 \pm 1.01
Dislike	455 (47.4)	3.68 \pm 1.23 ^b	2.55 \pm 1.28
	F value	5.478**	1.346
Amount of fast food per meal			
Inadequate	236 (25.0)	3.43 \pm 1.18 ^{ab}	2.56 \pm 1.08 ^a
Neither adequate nor inadequate	305 (32.2)	3.28 \pm 0.85 ^a	2.76 \pm 0.90 ^b
Adequate	405 (42.8)	3.57 \pm 1.05 ^b	2.90 \pm 1.13 ^b
	F value	6.790**	7.613**
Amount of intake for serving			
Sufficient for a meal	379 (39.5)	3.38 \pm 1.09 ^a	2.74 \pm 1.06
Sufficient for a snack	481 (50.2)	3.34 \pm 0.99 ^a	2.76 \pm 1.04
Just beverage value	99 (10.3)	3.72 \pm 1.06 ^b	2.93 \pm 1.07
	F value	4.086*	1.309
Method for ordering			
Set menu	604 (64.3)	3.39 \pm 1.05	2.74 \pm 1.05
Item by item	336 (35.7)	3.53 \pm 1.02	2.84 \pm 1.06
	t value	1.753	1.403*
Nutritional knowledge about fast food			
Extensive	171 (18.1)	3.86 \pm 1.08 ^b	3.30 \pm 1.24 ^c
Average	365 (38.8)	3.33 \pm 0.95 ^a	2.87 \pm 0.91 ^b
Little	405 (43.1)	3.36 \pm 1.05 ^a	2.47 \pm 0.99 ^a
	F value	17.365**	43.049**

¹⁾ Descriptor : 1, not at all needed ~5, very much needed

²⁾ Descriptor : 1, very difficult to access ~ 5, very easy to access

*p < .05

**p < .01

source of nutrition information for middle school students (27.5%), while high school students relied on themselves (31.0%) as the first source of nutritional information.

The medium most frequently used for nutritional information about fast foods included television (66.8%), the Internet (36.7%), and magazines or newspapers (29.7%), while bulletin boards of the school cafeteria were rarely used (4.9%) (Table 6).

Table 5. Dietary information provider

Provider	Respondents N (%)		
	Middle school	High school	Total
Self-provided	128 (24.5)	168 (39.0)	296 (31.0)
Parents	144 (27.5)	52 (12.1)	196 (20.5)
Friends	115 (22.0)	75 (17.4)	190 (19.9)
Others	52 (9.9)	86 (20.0)	138 (14.5)
School teacher	68 (13.0)	35 (8.1)	103 (10.8)
Dietitian	16 (3.1)	15 (3.5)	31 (3.2)

$\chi^2 = 67.750^{**}$

**p < .01

Table 6. Channels for nutrition information about fast foods

Channel	Respondents N (%)		
	Middle school	High school	Total
Television	358 (67.3)	289 (66.3)	647 (66.8)
Internet	201 (37.8)	154 (35.2)	355 (36.7)
Fast food restaurants	157 (29.5)	72 (16.5)	229 (23.7)
Magazine/newspaper	165 (31.0)	123 (28.1)	288 (29.7)
Leaflet from school	65 (12.2)	30 (6.9)	95 (9.8)
Bulletin board in school cafeteria	23 (4.3)	24 (5.5)	47 (4.9)

$\chi^2 = 67.750^{**}$

**p < .01

Discussion

This study examined the perceptions and attitudes of adolescents in Korea concerning fast foods. Data showed that 65.1% adolescents went to fast food restaurants at least once a month. The main reasons of using fast food restaurants included easy to access (69.5%), good taste (53.6%), and quick service (43.8%). This result coincides with the food consumption patterns of university students in another research. In a study on the food consumption patterns of university students by Patricia and Azanza (2001), student consumers considered taste, fast service, and proximity to their home or school as factors for choosing fast food restaurants. Park (2004) also found that taste and quick service were important attributes of fast food restaurants.

Significant difference was observed by gender with regard to the perception about fast foods in the present study. Females had a higher perception of fast foods as being unhealthy and mal-nutritious than males. In the study on the adolescents' perception of food, Subratty *et al.* (2002) found that adolescent girls were more concerned about health than boys. Nowak and Crawford (1998) have also reported that girls placed greater importance on health issues than boys. A possible reason for this could be that females tend to have more interest in and knowledge about nutrition (Monneuse *et al.*, 1997), and thus, they would perceive fast food as less healthy and nutritious more than males.

More than half of the respondents (56.9%) included in the current study reported having above average knowledge about fast food nutrition. The results were similar to the study conducted on nutritional awareness and food preferences of

young consumers (11-16 years) in which the research found that young consumers were clearly aware of healthy eating requirements (Brown *et al.*, 2000). Results of the present study show that the fast food preferences were associated with the perceived nutrition values of fast foods. This finding is consistent with the literature on the correlation of adolescent usage of fast food restaurants (French *et al.*, 2001b). Personal variables associated with greater fast food restaurant usage among adolescents included being less concerned about eating healthy (French *et al.*, 2001b).

Data showed that high school students were less concerned about their nutritional status and health than middle school students when selecting fast foods. This finding is consistent with the literature on adolescent fast food restaurant usage, which showed that male students in the 7th and 8th grades were less likely to visit fast food restaurants than students in the 9th-12th grades (French *et al.*, 2001b). It exemplified that the younger aged students cared more about their health and nutrition when choosing what to eat. The research suggests that students' considerations for nutrition and health may appear to diminish along with regards to adolescent independence and their food preference behavior (Brown *et al.*, 2000).

Even though there were significant differences depending on various factors, the results showed that Korean adolescents do not consider nutrition and health carefully when selecting fast foods. It implies that there is a gap between nutritional awareness in theory and putting this knowledge into practice by adolescents in their food preference behaviors. These findings were consistent with the literature on the correlation of adolescents' food choices in which researchers found that perceived benefits of healthy eating was not associated with frequency of fast food restaurant usage (French *et al.*, 2001b; Harmack *et al.*, 1999). Warwick *et al.* (1997) also identified that young consumers were aware of healthy food choices in theory, however, many still chose not to put them into practice. Time and convenience were important factors for adolescents' food choices. Although health and nutrition concerns were overall not important motivators for choosing what to eat, food selection was better among those adolescents who are motivated by concerns about their health (French *et al.*, 2001b).

Although Korean adolescents in the current study agreed on the necessity of nutrition information about fast food, they were not satisfied with the accessibility to fast food information, especially for high school students. This may be due to the Korean college-preparatory education. Korean high school students do not have spare time for nutritional education because most of their time is spent on other subjects which are critical for the national college entrance exam. However, adolescence is a critical phase in which to adopt a regular, consistent and healthy eating lifestyle (Subratty *et al.*, 2002). To improve accessibility to information on food and nutrition, therefore, requires multifaceted education strategies for the time constrained adolescents in Korea.

In the current study, adolescents having preference to and limited knowledge of fast foods were more likely to have positive opinions about fast foods and to ignore nutritional and health influences of choosing fast foods. Even though there were significant differences depending on various factors, respondents were less likely to report that fast foods affect their health and nutrition. As to the results of the study, it can be said that many adolescents who are aware of nutritional information and potential implementation may, in fact, neglect putting what they know into practice.

The medium used for nutritional information about fast foods were television (66.8%), the Internet (36.7%) and the main sources of dietary information were students themselves (31.0%), parents (20.5%), and friends (19.0%). A small portion of adolescents in the current study asked for advice from dietitians (3.2%) and were interested in the bulletin boards of school cafeterias (4.9%) about nutritional information on fast foods. Given its pervasiveness in the lives of youth, television would seem to be an important environmental exposure that could affect the perception of fast foods and food choices among adolescents. Adolescents may acquire nutrition information from food advertisements on TV. According to a report on monitoring food advertising commercials in Korea, 62.9% of the monitored commercials were inappropriate (Ko *et al.*, 2006). Inappropriate food advertisements which exaggerate inaccurate or false nutritional information would have a bad influence on the dietary habits of consumers who have been exposed to them (Mackenzie, 1986). Halford *et al.* (2004) cited that the exposure to food commercials on TV could affect a child's eating behavior, intake of diverse foods and exaggeration of unhealthy food choices. Robinson *et al.* (2001) also suggested that television is linked to the changes in food choice. It is, therefore, important that adolescents develop the ability to make the right judgment about the food they choose and the nutritional information they obtain from TV. To do so, adolescents need to form healthy dietary habits and understand food and nutrition through various mediums of nutrition education which can provide accurate information about food and nutrition (Ko *et al.*, 2006). Nutritional education within the school emphasized a need to change young consumers' behaviors towards food preferences (Brown *et al.*, 2000). Therefore, it is important to find out ways to facilitate school dietitians so that they may become main mediators for students to choose healthier food.

The findings of the current study cannot be generalized for all adolescents' perception and attitudes about fast foods throughout the world, not even Korea; however, these findings are in agreement with the limited numbers of studies published on the similar topics in other countries, though food habits often differ from countries. Intervention to reduce frequency of fast food consumption or to improve the food choices at fast food restaurants may need to address not only the perceived convenience but also the importance of nutritious and healthy eating habits among adolescents (French *et al.*, 2001b). Strategies

are needed to ensure that food choices made when eating out of the home are comprised of healthier foods that are high in nutrient density. If it is possible to access fast food restaurants, having such establishments carry more healthy menus could be enforced by requiring them to label nutritional factors on fast food packages, restricting portion sizes of higher fast food choices, or using pricing structures that encourage more healthful food choices (French *et al.*, 2001a; Nestle & Jacobson, 2000). This study also suggested that developing effective nutritional and health education within the schools would have a significant effect on the adolescent population.

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