Dietary behaviors and body image recognition of college students according to the self-rated health condition

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Received May 19, 2008; Revised June 7, 2008; Accepted June 17, 2008

Abstract

This study was done to investigate the relationship between the perception of body image, body weight satisfaction or dietary behavior and self-rated health status in Korean college students. Subjects, 285 college students, were divided into three groups (healthy, normal, and unhealthy) according to the answer for the self-rated health question. Information about demographic status, self-rated health condition, height and weight, perception of body image, satisfaction of body weight, concern for body weight control, dietary behavior, nutritional knowledge, and health-related characteristics collected by a self-reported questionnaire. The proportion of men and women in each group was not significantly different. The academic year, major, experience of nutritional education, and type of residence were not significantly related with self-rated health but the pocket money range was significantly associated (p<0.05) with self-rated health. The proportion of subjects rated their health as unhealthy was the lowest in 210-300 thousand won pocket money range and was increased in less than 210 thousand won or over 300 thousand won pocket money ranges. There were no significant differences for age, height, weight and BMI between the groups. The body image perception and body weight satisfaction levels of healthy group was significantly higher than those of unhealthy group (p<0.01 and p<0.001, respectively), but the level of concern for body weight control in healthy subjects was significantly lower than that in unhealthy subjects (p<0.05). The proportion of subjects reported as healthy was significantly increased with increased frequencies of following food behaviors; weekly use of protein foods (p<0.01), vegetables (p<0.05) and dairy products (p<0.01), and food habits such as "regularity of meal time" (p<0.01), "eating in moderation" (p<0.05), and "eating breakfast" (p<0.001). Overall results suggested that the college students have tended to have a better perception of health when they have better body image perception, body weight satisfaction and dietary behaviors.

Key Words: Self-rated health, body image perception, body weight satisfaction, dietary behavior

Introduction

Physical health status can be estimated by various measures such as biochemical indicators and blood pressure, and are associated with several health related factors such as dietary behaviors and obesity. However, when individuals rated self-recognition of health condition, it is related with various other factors. While self-rated health has shown to be related with mortality (Idler & Angel, 1990), other factors such as age, gender, and socioeconomic factors (Ahn & Joung, 2006; Vaez & Laflamme, 2003) were also shown to affect self-recognition of health status. In a study of the 2001 Korean National Health and Nutrition Examination Survey, adults aged between 20-69 showed better self-rated health when they were younger, male and with higher education, higher income, better living condition, no metabolic syndrome and higher dietary variety (Ahn & Joung, 2006). In a study of Canadian adolescence, students' self rated physical health was related with financial situation, gender, child-parent relationship, school achievement, tobacco use, and self-esteem (Vingilis *et al.*, 1998).

Body image refers the perception of one's physical appearance or exterior to look. Body image or body weight perception has shown to play an important role in weight control in college students (Wharton, 2008), and unnecessary weight control leads the students to improper food habits (Ryu & Yoon, 2000). College students are in the transition from adolescence to adult, and in physically and mentally active times of life. Developing proper eating habits and adequate nutritional status are important for people in this age group in order to have better health in the later stage of life. However, distorted perception of body image and weight tends to lead college students to improper diets and life styles.

Distorted perception of body image and weight further negatively influence on body image satisfaction, which may turn to be a psychological risk factor. When young people habitually had negative body image thinking, they dissatisfy their body image, which affected self-esteem and tendency of eating disturbance (Verplanken & Velsvik 2008). In addition, diss-atisfaction of body image and/or weight was further related with the development of depression (Rierdan & Koff, 1997).

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Food behaviors of college students have shown to be affected by various factors such as gender, health consciousness, body mass index, and life style (Cheong *et al.*, 2007; Kim *et al.*, 2007; Lee, 1999). In addition, individual's perceived health has shown to be related with age, gender, health-related life style, psychological factors in young people (Vaez & Laflamme, 2003; Vingilis *et al.*, 1998). However, it is not fully known how the self perception of health is related with body image, and how the dietary habits are affected by self perception of health in young people, especially college students. Therefore, the purpose of the current study was to examine dietary behaviors, perception of body shape and body-weight satisfaction of college students, and their relation with self-rated health.

Subjects and Methods

Subjects

Subjects were selected by 285 college students, who attended at the general physical education course of university located in Seoul, Korea, during the months of December in 2006. Information about demographic status, self-rated health condition, anthropometric data including the height and weight, perception of body image, satisfaction of body weight, concern for body weight control, dietary behavior, nutritional knowledge, and health-related characteristics such as drinking and smoking status were collected by a self-reported questionnaire. Subjects were divided into three groups according to the answer for the self-rated health question.

Measures

1) General characteristics and anthropometric factors

Socio-demographic variables examined were age, gender, grade, major, experience of nutritional education, type of residence, and pocket money. The anthropometric data, including height and weight, were collected by a self-reported questionnaire. Body mass index (BMI) was calculated by using the individuals' heights and weights, and classified into four categories: underweight (BMI<18.5 kg/m^2), normal weight (18.5-22.9 kg/m^2), overweight (23-24.9 kg/m^2), and obesity (over 25 kg/m^2).

2) Health status and body image recognition

Health status was assessed by self-rated health. The participants were asked to rate their health on a three point scale with the following response alternatives: "healthy", "normal", and "unhealthy". Body image recognition was asked by three questions: "What do you think about your body shape?", "Are you satisfied with your body weight?", and "Are you concerned with body weight control?". The question for body image was assessed by a four point scale (slim, moderate, fatty, and very

fatty) and others were detected by a five point scale.

3) Health related characteristics

Health related characteristics were investigated by smoking and drinking status, sleep condition, dietary behavior, and nutritional knowledge. Smoking status was divided into two categories on smoker and non-smoker. The number of cigarettes smoked per day was investigated. Drinking status was also divided into two groups (drinker and non-drinker) and frequency of drinking of drinker was assessed. Sleeping time was investigated by a five point scale (1=less 4 hours a day, 2=4-6 hours a day, 3=7-8 hours a day, 4=9-10 hours a day, and 5=over 11 hours a day).

Dietary behavior was measured by modified the method of Kim and Kim (2005), which was comprised of 10 items; regularity of meal time, eating in moderation, frequency of protein food (meats, fish, egg and beans) about two meals a day, vegetable, using plant oil, dairy product, fruits and fruit juice, and seaweed, eating meal slowly, and regularity of breakfast. Nutritional knowledge was assessed by using the modified questionnaire of Kim *et al.* (2002), comprised of 20 items. Each item was granted one point when the answer was right, but zero point when the answer was false or no answer.

Statistical analysis

Statistical programs available in SAS program (version 8.01, SAS Inc, Cary, NC) were utilized for data analysis. Means and standard deviation values for the continuous variables are calculated while differences among the self-rated health status groups were assessed using one-way analysis of variance and Duncan's Multiple Range test. The frequencies and cross-tabulations were determined by X^2-test, and a significance test on all results was conducted at level of $p<0.05$ unless otherwise stated.

Results

General characteristics and anthropometric factors

Subjects were 285 college students aged between 18 and 28 years, of whom 75.8% (n=216) were men and 24.2% (n=69) were women. The general characteristics variables with each of the self-reported health subscales are shown in Table 1. The numbers of subjects in each of health status group were 119 persons (41.7%) in healthy group, 129 persons (45.3%) in normal group, and 37 persons (13.0%) in unhealthy group. The proportion of men and women was not significantly different among the groups, however the proportion of men (n=97, 44.4%) who answered their self-rated health was "healthy" was higher than that of women (n=23, 33.3%). On the other hand, the proportion of men (n=24, 11.1%) who answered their self-rated health was "unhealthy" was lower than that of women (n=13, 18.8%). In

Table 1. General characteristics of subjects according to self-rated health

		Healthy	Normal	Unhealthy	Total	x^2
Number		119 (41.7)[1]	129 (45.3)	37 (13.0)	285 (100.0)	
Gender	Men	96 (44.4)	96 (44.4)	24 (11.1)	216 (75.8)	4.0849
	Women	23 (33.3)	33 (47.8)	13 (18.8)	69 (24.2)	
Grade	Freshman	26 (45.6)	22 (38.6)	9 (15.8)	57 (20.1)	7.4517
	Sophomore	47 (42.3)	50 (45.1)	14 (12.6)	111 (39.2)	
	Junior	30 (49.2)	26 (42.6)	5 (8.2)	61 (21.6)	
	Senior	15 (27.8)	30 (55.6)	9 (16.7)	54 (19.1)	
Major	Humanities or Social science	38 (38.8)	43 (43.9)	17 (17.4)	98 (34.4)	2.5723
	Natural science or Engineering	81 (43.3)	86 (46.0)	20 (10.7)	187 (65.6)	
Experience of nutritional education	Yes	6 (40.0)	5 (33.3)	4 (26.7)	15 (5.3)	2.7541
	No	110 (41.2)	124 (46.4)	33 (12.4)	26 (94.7)	
Type of residence	Home with parents	93 (42.3)	100 (45.5)	27 (12.3)	220 (77.2)	13.5068
	Dormitory	3 (50.0)	3 (50.0)	0 (0.0)	6 (2.1)	
	Boarding-house	1 (25.0)	2 (50.0)	1 (25.0)	4 (1.4)	
	Relative house	5 (100.0)	0 (0.0)	0 (0.0)	5 (1.8)	
	Cooking for oneself	15 (31.9)	24 (51.1)	8 (17.0)	47 (16.5)	
	The others	2 (66.7)	0 (0.0)	1 (33.3)	3 (1.0)	
Monthly money for personal use (thousand won)	≤100	9 (64.3)	2 (14.3)	3 (21.4)	14 (4.9)	19.1861*
	110-200	12 (32.4)	20 (54.1)	5 (13.5)	37 (13.1)	
	210-300	56 (47.5)	53 (44.9)	9 (7.6)	118 (41.7)	
	310-400	28 (42.4)	30 (45.5)	8 (12.1)	66 (23.3)	
	≥410	12 (25.0)	24 (50.0)	12 (25.0)	48 (17.0)	

[1] Number of subjects, ( ) : % of subjects
* : significantly different at p < 0.05 by chi-square test

case of the academic years, the percentage of subjects whose perceived health were "healthy" was lower and the percentage of subjects whose perceived health were "unhealthy" was showed a tendency to be higher in senior than in other academic years, but there was no significance. There were no significant associations between major, experience of nutritional education or type of residence and self perception of health status, but the pocket money range was significantly associated with self-rated health status. The proportion of subjects rated their health as unhealthy was the lowest in 210-300 thousand won pocket money range and was increased in less 210 thousand won or over 300 thousand won pocket money ranges, while the proportion of subjects rated their health as healthy was the highest in less 100 thousand won and was the lowest in over 410 thousand won pocket money range (Table 1).

The average age was 22.5 years old in the healthy group (men; 23.0 years old, women; 20.3 years old), 22.6 years old in the normal group (men; 23.1 years old, women; 21.3 years old), and 22.6 years old in the unhealthy group (men; 23.4 years old, women; 19.4 years old). There was no significantly difference for age among the three groups, but in case of women, the mean age of normal group was higher than that of the unhealthy group. The average of height, weight, and BMI were 173.4 cm (men; 175.9 cm, women; 161.5 cm), 66.2 kg (men; 69.1 kg, women; 51.4 kg), and 21.9 kg/m² (men; 22.3 kg/m², women; 19.7 kg/m²) in the healthy group, 172.6 cm (men; 175.7 cm, women; 163.5 cm), 65.7 kg (men; 69.0 kg, women; 52.3 kg), and 21.7 kg/m²

Table 2. Height, weight and BMI of subjects according to self-rated health

		Healthy	Normal	Unhealthy	Total
Age (years)	Men	23.0 ± 2.3[1]NS	23.1 ± 2.5	23.4 ± 1.8	23.1 ± 2.4***
	Women	20.3 ± 1.2[ab]	21.3 ± 1.6[a]	19.4 ± 5.5[b]	20.6 ± 2.8
	Total	22.5 ± 2.4NS	22.6 ± 2.4	22.6 ± 2.2	22.5 ± 2.4
Height (cm)	Men	175.9 ± 5.1NS	175.7 ± 6.2	175.2 ± 5.2	175.7 ± 5.6***
	Women	161.5 ± 4.2	163.5 ± 4.8	163.1 ± 5.3	162.8 ± 4.7
	Total	173.4 ± 7.3NS	172.6 ± 7.9	171.2 ± 7.8	172.7 ± 7.6
Weight (kg)	Men	69.1 ± 7.2NS	69.0 ± 9.1	70.5 ± 6.8	69.2 ± 5.6***
	Women	51.4 ± 4.4NS	52.3 ± 4.8	52.9 ± 7.9	52.2 ± 5.3
	Total	66.2 ± 9.5NS	65.7 ± 10.8	65.3 ± 10.7	65.8 ± 10.2
BMI (kg/m²)[2]	Men	22.3 ± 2.0NS	22.3 ± 2.2	23.0 ± 2.1	23.1 ± 2.4***
	Women	19.7 ± 1.6NS	18.2 ± 5.6	19.8 ± 2.0	19.1 ± 4.1
	Total	21.9 ± 2.1NS	21.7 ± 3.6	22.1 ± 2.5	21.7 ± 2.9

[1] Mean ± SD,
NS : Not significantly different by ANOVA,
Means with different superscripts within each row are significantly different at p < 0.05 by Duncan's multiple range test,
*** : significantly different between men and women at p < 0.001 by t-test
[2] BMI: Body mass index = body weight (kg)/ (height (m))²

(men; 22.3 kg/m², women; 18.2 kg/m²) in the normal group, and 171.2 cm (men; 175.2 cm, women; 163.1 cm), 65.3 kg (men; 70.5 kg, women; 52.9 kg), and 22.1 kg/m² (men; 23.0 kg/m², women; 19.8 kg/m²) in the unhealthy group. There were no significant differences for height, weight and BMI in each of the three group (Table 2).

According to the result of comparison between BMI categories

Table 3. BMI of subjects according to self-rated health

		Healthy	Normal	Unhealthy	Total	x^2
BMI[2]	Underweight	8 (6.7)[1]	13 (10.1)	5 (13.5)	26 (9.1)	5.7701
	Normal	75 (63.0)	84 (65.1)	18 (48.7)	177 (62.1)	
	Overweight	27 (22.7)	21 (16.3)	9 (24.3)	57 (20.0)	
	Obesity	9 (7.6)	11 (8.5)	5 (13.5)	25 (8.8)	

[1] Number of subjects, ( ): % of subjects
[2] BMI: Body mass index

Table 4. Self-perception of body image and satisfaction of body weight of subjects according to self-rated health

	Healthy	Normal	Unhealthy	Total	x^2
Perception of body image					
Slim	19 (16.1)	22 (17.3)	5 (13.5)	46 (16.3)	18.6080**
Moderate	72 (61.0)	66 (52.0)	14 (37.8)	152 (53.9)	
Fatty	23 (19.5)	36 (28.4)	12 (32.4)	71 (25.2)	
Very fatty	4 (3.4)	3 (2.4)	6 (16.2)	13 (4.6)	
Satisfaction of body weight					
Very satisfied	5 (4.2)	2 (1.5)	0 (0.0)	7 (2.5)	40.0874***
Satisfied	43 (36.1)	28 (21.7)	1 (2.7)	72 (25.3)	
Normal	40 (33.6)	48 (37.2)	11 (29.7)	99 (34.7)	
Dissatisfied	27 (22.7)	42 (32.6)	14 (37.8)	83 (29.1)	
Very dissatisfied	4 (3.4)	9 (7.0)	11 (29.7)	24 (8.4)	
Concern for body weight control					
Very concerned	35 (29.4)	43 (33.9)	20 (54.1)	98 (34.6)	15.5677*
Concerned	50 (42.0)	61 (48.0)	13 (35.1)	124 (43.8)	
Normal	18 (15.1)	18 (14.2)	2 (5.4)	38 (13.4)	
Unconcerned	9 (7.6)	3 (2.4)	1 (2.7)	13 (4.6)	
Very unconcerned	7 (5.9)	2 (1.6)	1 (2.7)	10 (3.5)	

[1] Number of subjects, ( ): % of subjects
*, **, *** : significantly different at $p < 0.05$, $p < 0.01$ and $p < 0.001$ by chi-square test

and self-rated health, the proportion of normal BMI in healthy subjects was higher than that in unhealthy subjects. In addition, the proportions of underweight, overweight and obesity in the healthy group were lower than those in the unhealthy group, but there was no significant association between BMI and self perception of health status (Table 3). It seems a tendency that the person who was to normal BMI range has better self-rated health status.

Body image recognition

In case of self-perception of body image, the proportions of subjects reporting "slim" and "moderate" in the healthy group were higher than those in the unhealthy group, and the proportions of subjects reporting "fatty" and "very fatty" in the healthy group were lower than those in the unhealthy group ($p < 0.01$)(Table 4).

The body weight satisfaction level of the healthy group was significantly higher than that of the unhealthy group ($p < 0.001$), but the level of concern for body weight control in healthy subjects was significantly lower than that in unhealthy subjects ($p < 0.05$). The proportions of subjects answered "very satisfied", "satisfied", and "normal" to the question about body weight satisfaction were higher in the healthy group as compared to the unhealthy group, but the proportions of subjects answered "dissatisfied" and "very dissatisfied" were lower in the healthy group than the unhealthy group. The proportions of subjects responded "very concerned" to the question about the interest

Table 5. Sleeping, drinking and smoking status of subjects according to self-rated health

		Healthy	Normal	Unhealthy	Total	x^2
Adequacy of sleeping time	Very adequate	16 (13.5)[1]	8 (6.2)	3 (5.4)	26 (9.1)	22.3486**
	Adequate	50 (42.0)	34 (26.4)	6 (16.2)	90 (31.6)	
	Nomal	36 (30.3)	58 (45.0)	17 (46.0)	111 (39.0)	
	Inadequate	13 (10.9)	23 (17.8)	8 (21.6)	44 (15.4)	
	Very inadequate	4 (3.4)	6 (4.7)	4 (10.8)	14 (4.9)	
Times of sleeping[3]		2.7 ± 0.7[2]NS	2.7 ± 0.7	2.6 ± 0.9	2.7 ± 0.7	
Drinking	Yes	110 (92.4)[1]	120 (93.0)	36 (97.3)	266 (93.3)	1.1080
	No	9 (7.6)	9 (7.0)	1 (2.7)	19 (6.7)	
Frequency of drinking	Less than once a month	17 (15.5)	19 (15.8)	2 (5.6)	38 (14.3)	9.2516
	1-3 times a month	41 (37.3)	42 (35.0)	11 (30.6)	94 (35.3)	
	1-2 times a week	37 (33.6)	38 (31.7)	16 (44.4)	91 (34.2)	
	3-4 times a week	12 (10.9)	19 (15.8)	4 (11.1)	35 (13.2)	
	Over 5 times a week	3 (2.7)	2 (1.7)	3 (8.3)	8 (3.0)	
Smoking	Yes	32 (27.1)	40 (31.5)	12 (32.4)	84 (29.8)	0.7029
	No	86 (72.9)	87 (68.5)	25 (67.6)	198 (70.2)	
Smoking level (cigarettes/day)		11.0 ± 6.4[2]NS	13.7 ± 8.0	12.1 ± 6.4	12.4 ± 7.2	
Nutrition knowledge score		15.8 ± 3.5[ab]	15.5 ± 3.7[b]	16.9 ± 3.3[a]	15.8 ± 3.5	

[1] Number of subjects, ( ): % of subjects
** : significantly different at $p < 0.01$ by chi-square test
[2] Mean ± SD,
NS: not significantly different,
Means with different superscripts within each row are significantly different at $p < 0.05$ by Duncan's multiple range test
[3] Means of five point scale : 1=less 4 hours a day, 2=4-6 hours a day, 3=7-8 hours a day, 4=9-10 hours a day, 5=over 11 hours a day

in body weight control were lower in the healthy group than the unhealthy group, but the proportions of subjects answered "concerned", "normal", "unconcerned", and "very unconcerned" to that question in the healthy group were higher than those in the unhealthy group (Table 4).

Health related habits

The health related habits of subjects are shown in Table 5. According to the result of the adequacy of sleeping time, the

Table 6. Dietary behavior of subjects according to self-rated health

	Healthy	Normal	Unhealthy	Total	x^2
Regularity of meal time					
0-2 times a week	33 (29.5)[1]	61 (54.5)	18 (16.1)	112 (39.3)	20.8290**
3-5 times a week	41 (40.2)	47 (46.1)	14 (13.7)	102 (35.8)	
6-7 times a week	45 (63.4)	21 (29.6)	5 (7.0)	71 (24.9)	
Eat in moderation					
0-2 times a week	18 (26.9)	35 (52.2)	14 (20.9)	67 (23.5)	10.9849*
3-5 times a week	63 (44.1)	63 (44.1)	17 (11.9)	143 (50.2)	
6-7 times a week	38 (50.7)	31 (41.3)	6 (8.0)	75 (26.3)	
Frequency of protein food					
0-2 times a week	18 (23.1)	46 (59.0)	14 (17.9)	78 (27.4)	17.8289**
3-5 times a week	72 (45.9)	67 (42.7)	18 (11.5)	157 (55.1)	
6-7 times a week	29 (58.0)	16 (32.0)	5 (10.0)	50 (17.5)	
Frequency of vegetable					
0-2 times a week	11 (22.9)	28 (58.3)	9 (18.8)	48 (16.9)	10.6811*
3-5 times a week	64 (41.8)	69 (45.1)	20 (13.1)	153 (53.9)	
6-7 times a week	43 (51.8)	32 (38.6)	8 (9.6)	83 (29.2)	
Frequency of vegetable oil					
0-2 times a week	28 (34.2)	38 (46.3)	16 (19.5)	82 (28.8)	8.1526
3-5 times a week	67 (42.1)	76 (47.8)	16 (10.1)	159 (55.8)	
6-7 times a week	24 (54.6)	15 (34.1)	5 (11.4)	44 (15.4)	
Frequency of dairy product					
0-2 times a week	20 (24.7)	46 (56.8)	15 (18.5)	81 (28.4)	14.4565**
3-5 times a week	59 (46.8)	52 (41.3)	15 (11.9)	126 (44.2)	
6-7 times a week	40 (51.3)	31 (39.7)	7 (9.0)	78 (27.4)	
Frequency of fruits and fruit juice					
0-2 times a week	35 (33.4)	53 (50.5)	17 (16.2)	105 (37.0)	5.8183
3-5 times a week	55 (45.1)	53 (43.4)	14 (11.5)	122 (43.0)	
6-7 times a week	29 (50.9)	22 (38.6)	6 (10.5)	57 (20.1)	
Frequency of seaweed					
0-2 times a week	58 (37.4)	77 (49.7)	20 (12.9)	155 (54.6)	4.5426
3-5 times a week	48 (44.9)	45 (42.1)	14 (13.1)	107 (37.7)	
6-7 times a week	13 (59.1)	7 (31.8)	2 (9.1)	22 (7.8)	
Eat meals slowly					
0-2 times a week	61 (41.2)	65 (43.9)	22 (14.9)	148 (52.3)	4.0292
3-5 times a week	30 (36.6)	43 (52.4)	9 (11.0)	82 (29.0)	
6-7 times a week	27 (50.9)	20 (37.7)	6 (11.3)	53 (18.7)	
Eat breakfast					
0-2 times a week	28 (26.9)	59 (56.7)	17 (16.4)	104 (37.0)	19.2670***
3-5 times a week	40 (44.9)	37 (41.6)	12 (13.5)	89 (31.7)	
6-7 times a week	51 (58.0)	29 (33.0)	8 (9.1)	88 (31.3)	

[1] Number of subjects, ( ) : % of subjects
*, **, *** : significantly different at $p < 0.05$, $p < 0.01$ and $p < 0.001$ by chi-square test

percentages of persons replied "very adequate" and "adequate" in healthy subjects were significantly higher than those in unhealthy subjects, but the proportions of persons replied "normal", "inadequate", and "very inadequate" in healthy subjects were lower than those in unhealthy subjects. However, the mean of sleeping time was not significantly different in each group.

There were no significant differences for the percentages of smoker and drinker, the number of cigarettes per day, and frequency of drinking among three self-rated health status groups. But, the proportion of drinker and smoker and the frequency of drinking in healthy group showed tend to be lower than those in unhealthy group. The sum score of nutritional knowledge in unhealthy group was the highest and significantly higher than that in normal group ($p < 0.05$) (healthy 15.8, normal 15.5, and unhealthy 16.9). Of the 20 questions regarding nutritional knowledge, the ratios of right for "Without having oil in your diet, you could be healthy" and "A meal comprised of Bibimbab and milk supplies more balanced nutrition than a meal which is composed of Gomtang and rice" were significantly higher in unhealthy group than in normal group, but there were not significantly difference between unhealthy and healthy groups. It seems that the person who has worse self-rated health condition has more concern about health, such as function of nutrients and food choice for health, than the person who perceived normal health condition.

Dietary behaviors

Table 6 shows the dietary behaviors of subjects according to self-rated health. Of the 10 questions regarding dietary behaviors, the frequency of regularity of meal time, eating in moderation, and eating breakfast was significantly increased, respectively, with an increased proportion of subjects whose perceived health were "healthy." Frequency of weekly use of protein foods (including meats, fish, egg and beans in two meals a day) ($p < 0.01$), vegetables ($p < 0.05$) or dairy foods ($p < 0.01$) was also significantly increased as the proportion of individuals who rated themselves as healthy was increased. In addition, a similar trend was observed in food habit such as "eating slowly" and weekly use of plant oil, fruit and fruit juice and seaweed, respectively.

Discussion

This study examined the perception of body image, body weight satisfaction and dietary behaviors of college students, and their relations with self-rated health. Self-rated health status of students was found to be related with age, gender, income, family structure, school achievement, and self-esteem (Vingilis *et al.*, 1998). In this study, there were no significant differences for age and the proportion of men and women among self-rated health status groups. However the proportion of men rated their

health as healthy was slightly higher than that of women, while the proportion of men rated their health as unhealthy was lower than that of women. Vingilis *et al.* (1998) reported that the physical health was not rated differently by gender but showed gender differences in favor of male reporting higher levels of psychological health. In case of the academic years, the percentage of subjects rated their health as unhealthy showed a tendency to be higher in senior than in other academic years, but that was not significant different. The study of Mechanic and Hansell (1987) for adolescents reported that there was no grade difference on self-rated health and another study reported that age or grade would be assumed no or minimal difference in self-rated health (Vingilis *et al.*, 1998). In addition, there were no significant associations between major, experience of nutritional education, or type of residence and self perception of health status; however, the pocket money range was significantly associated with self-rated health status. Ahn and Joung (2006) also reported that higher income was related with a better self-rated health in Korean adults. The financial situation was shown to affect on personal health status, self-esteem, school achievement, and health compromising life-style behaviors. It was suggested that the financial situation might have both direct and indirect effects on perceptions of both physical and psychological health status (Vingilis *et al.*, 1998).

In this study, there were no significant differences for height, weight and BMI in each of three groups. Although the result of BMI categories was not also significantly associated with self-rated health status, the proportion of normal BMI in healthy subjects was higher than that in unhealthy subjects. It is assumed that the individuals with normal BMI might perceive themselves as healthy.

According to the result of body image recognition, the proportions of subjects answered "slim" and "moderate" to the question of body image perception and the body weight satisfaction level was significantly higher in healthy subjects than those in unhealthy subjects. A study with college students (Kim *et al.*, 2002) also showed similar results that self-perception of health had significantly positive correlation with the satisfaction of body weight and body image. Kim *et al.* (2005) reported that college students showed better self-rated health when they were lower body fat percentage and higher body weight satisfaction. Body image or body weight perception was negatively associated with weight control in college students (Wharton, 2008), and unnecessary weight control leads the students to improper food habits (Ryu & Yoon, 2000). In this study, it was showed that the level of concern for body weight control was significantly lower in healthy subjects than unhealthy subjects.

As the result of dietary behaviors, subjects showed better self-rated health when they had better dietary behaviors such as higher frequencies of regularity of meal time, eating in moderation, protein food (meats, fish, egg, and beans) in two meals a day, vegetable, dairy product and regularity of breakfast. Kim (2006) reported that the level of health perception was

increased by better dietary behaviors, and Lee (1999) also reported that the frequency of breakfast and the level of meal time regularity and eating in moderation were higher in the group with a high health consciousness than the groups with middle and low health consciousness.

In this study, there were no significant differences for smoking and drinking status in students with three different self-rated health but the proportion of drinkers and smokers and the frequency of drinking in healthy group tended to be lower than those in unhealthy group. Lee (1999) reported that there were no significant differences for smoking and drinking status among the health consciousness groups. The sum of nutritional knowledge score in the unhealthy group was significantly higher than that in the normal group, but there was no difference between the unhealthy and healthy groups. In a study by Kim (2006), it was reported that the nutritional knowledge score was not correlated with the health perception level. Of the 20 questions regarding nutritional knowledge, the ratios of right for two questions related to food choice and health were significantly higher in unhealthy group than in normal group. It seems that the person who has worse self-rated health condition tended to have more concern about health and nutritional balance than the person with normal self-rated health condition.

Overall results were shown that the college students whose perceived health was healthy were to normal BMI range, had better body image perception and body weight satisfaction levels, health related habits, and dietary behaviors. Therefore, it was suggested that the nutritional educations about dietary behavior for health, health related life-style, and body image recognition for college students were needed to estimate their health condition properly and increase perceptive level of their health.

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