

# Weight Control Related Eating Habits and Nutritional Knowledge of Male and Female College Students

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## Abstract

**Background/Objectives:** In this study, 400 college students in Cheongju were surveyed for weight control related eating habits and nutritional knowledge to provide basic data for healthy eating in adulthood.

**Methods/Statistical analysis:** Frequency analysis was performed on general information of college students, and BMI, weight control experience, and residence were analyzed by  $\chi^2$ -test for distribution of men and women, and for weight control satisfaction, taste preference, eating habits, and nutritional knowledge, the mean and standard deviation were calculated and then an independent-samples t-test was conducted for both sexes

**Findings:** The results showed that the BMI distribution of the college students was normal 54.3%, underweight 20.3%, overweight 12.0% and obese 13.4%, among which weight control experience was 68.7%. There was a significant difference in the distribution of male students in the BMI distribution as the proportion of obese was higher than female students ( $p<0.001$ ), but weight control experience was more frequent in female students than male students ( $p<0.001$ ). The average score of college students for weight control related nutritional knowledge was 76.50 out of 100. Among nutritional knowledge items, 'vitamins and minerals provide calories, thus causing weight gain with excessive consumption' showed 43.9%, and 'skipping meals (fasting) is effective in reducing weight' showed low response rate of 53.2%. The mean score of all students' eating habits was 2.81 out of 5, showing a score under average (3 points). Among eating habits items showing low scores, there were 'I eat three meals a day regularly' with 2.32, 'I eat breakfast regularly' with 2.34, 'I eat fruits every day' with 2.56.

**Improvements/Applications:** It is necessary establish a health-related subject as a liberal arts subject to have accurate nutritional knowledge and correct eating habits, and to provide a plan for nutrition management program.

**Keywords:** BMI, college students, weight control, eating habits, nutritional knowledge

## 1. Introduction

The average weight of adults in Korea is gradually increasing due to westernization of diet and change of life patterns, and in 2017, the prevalence rate of obesity was 41.6% for males and 25.6% for females, and it can be seen that male obesity is increasing compared to 36.4% of males and 24.8% of females in 2010, and 31.8% of males and 27.4% of females in 2001[1]. Obesity is an excess of fat in the body, which increases the likelihood of causing health impairment, and obesity can increase the incidence of hypertension, cardiovascular disease, non-insulin dependent diabetes mellitus, colorectal cancer, and breast cancer. Therefore, obesity should also be regarded as a disease, and its prevention is becoming more important [2]. In the past, the traditional vegetarian based Korean eating habits have become increasingly westernized, resulting in an increase in the intake of fats and sugars due to increased meat intake and increased intake of instant foods and carbonated beverages, and as the use of smart phones and computers became commonplace, the amount of physical activity of young people in particular was drastically reduced [3]. Most college students who are early in adulthood have more opportunities to freely use their time off from the time they were under parental control, but they have shown many problems such as irregular meals frequent meal skipping, night snacks, indiscriminate ingestion of carbonated drinks and alcoholic beverages, instant foods, commercial marketing exposures, excessive diet attempts and lack of exercise in daily life [4,5].

With the tendency of the modern society to prefer a skinny body, college students of younger age who are likely to be exposed to the mass media are keenly interested in weight control. In many cases, the image of their body shape is often inferior due to the excessive recognition of their appearance and the false perception of their preference for underweight when the values of the healthy body are not established. They are dissatisfied with their body shape despite their normal weight, and in some cases, they try to lose weight in an unhealthy way to lose weight [6,7,8]. Inappropriate methods of weight control may lead to certain nutrient deficiencies, gastrointestinal disorders, constipation, and other side effects, as well as leading to underweight, overweight, and

obese body weight polarization may occur [3,9]. Therefore, the study investigated weight control related eating habits and nutritional knowledge of male and female college students to provide basic data for healthy eating in adulthood.

## 2. Methods

### 2.1. Research subjects and method

In this study, 400 male and female college students in Cheongju were surveyed about weight control related eating habits and nutritional knowledge. The survey was conducted from December 3 to December 21, 2018. For the survey method, the questionnaire was distributed to the students in lecture rooms and student resting rooms where the male and female college students from Cheongju city were gathered. A total of 400 questionnaires were completed and 374 copies of the questionnaires were analyzed using a statistical program excluding those written incorrectly.

### 2.2. Survey contents

The questionnaire used in this study was based on studies on weight control related eating habits and nutritional knowledge [5,9,10,11,12], and was modified and supplemented to fit the eating habits and nutritional knowledge survey related to the weight control of male and female college students. The questionnaire consisted of general information, weight control satisfaction, taste preference, weight control related eating habits and nutritional knowledge. In general information, age, gender, height, weight, residence type, and weight control experience were asked, and 10 questions on eating habits and nutritional knowledge were presented including the degree of satisfaction for the 5 items of weight control, preference on sweet taste, salty taste, sour taste, greasy taste, and sour taste. Satisfaction, taste preference, eating habits, and nutritional knowledge used Likert's 5 point scale (1 point : strongly disagree ~ 5 points : strongly agree). Cronbach's  $\alpha$  values for satisfaction, taste preference, eating habits, and nutritional knowledge were 0.829, 0.607, 0.616, and 0.635, respectively, in reliability of the survey tool.

### 2.3. Data Analysis

Statistical analysis in the study was performed using SPSS ver. 18.0 for windows (Statistical Package for Social Science, Chicago, IL, USA). Frequency analysis was performed on general information of male and female college students, and BMI was calculated by height and weight. BMI, weight control experience, and residence were analyzed by  $\chi^2$ -test for distribution of men and women, and for weight control satisfaction, taste preference, eating habits, and nutritional knowledge, the mean and standard deviation were calculated and then an independent-samples t-test was conducted for both sexes. BMI was classified as underweight at 18.5, normal at 18.5 to 22.9, overweight at 23 to 24.9, and obese at 25 or more with reference to Asian demographics-based data [13,14].

## 3. Result

### 3.1. General aspects of research subjects

The general information of male and female college students is shown in Table 1. Of the total 374 students, 102 (27.3%) were male students and 277 (72.7%) were female students. The average height and weight of male and female students were 176.96cm and 73.53kg, and 163.09cm and 54.58kg respectively. Among the total college students, 203 (54.3%) were normal and 76 (20.3%) were underweight in BMI distribution. The weight control experience was shown in 257 (68.7%), and while in the BMI distribution, the proportion of obese male students was higher than that of female students and there was a significant difference in distribution ( $p<0.001$ ), weight control experience showed a significant difference in the distribution with more female students compared to male students ( $p<0.001$ ).

**Table 1. Demographic characteristics according to the gender**

Characteristics		Gender		Total (N=374)	$\chi^2$
		Male (N=102)	Female (N=277)		
BMI <sup>1)</sup>	Low weight	6(5.9) <sup>2)</sup>	70(25.7)	76(20.3)	52.037***
	Normal	46(45.1)	157(57.7)	203(54.3)	
	Overweight	19(18.6)	26(9.6)	45(12.0)	

	<b>Obesity</b>	31(30.4)	19(7.0)	50(13.4)	
<b>Experience of weight control</b>	<b>Yes</b>	53(52.0)	204(75.0)	257(68.7)	18.317***
	<b>No</b>	49(48.0)	68(25.0)	117(31.3)	
<b>Residence type</b>	<b>Parents' house</b>	31(30.4)	119(43.8)	150(40.1)	40.271***
	<b>Self-boarding</b>	54(52.9)	66(24.3)	120(32.1)	
	<b>Lodging</b>	2(2.0)	0(0.0)	2(0.5)	
	<b>Dormitory</b>	12(11.8)	83(30.5)	95(25.4)	
	<b>Relatives' house</b>	2(2.0)	1(0.4)	3(0.8)	
	<b>Others</b>	1(1.0)	3(1.1)	4(1.1)	
		<b>Male</b>		<b>Female</b>	
<b>Age</b>		22.35±2.86 <sup>3)</sup>		20.94±2.12	
<b>Height</b>		176.96±5.16		163.09±4.60	
<b>Current weight</b>		73.53±12.39		54.58±6.92	
<b>Desired weight</b>		68.81±10.21		49.15±3.60	
<b>BMI</b>		23.54±3.76		20.55±2.69	

<sup>1)</sup>BMI: Low weight( < 18.5), Normal (18.5 ≤ < 23), Overweight (23 ≤ < 25), Obesity( ≥ 25)

<sup>2)</sup>N(%), <sup>3)</sup>Mean±S.D. \*\**p*<0.01, \*\*\**p*<0.001

### 3.2. Weight control satisfaction and degree of preference for taste.

The weight control satisfaction and taste preferences of male and female college students are shown in Tables 2 and 3. The average of satisfaction was significantly higher with 4.01 for male students and 3.86 for female students (*p*<0.05), and satisfaction with increased health and satisfaction through increased attractiveness to the opposite sex was significantly higher in male students compared to female students (*p*<0.01, *p*<0.001). In preference for taste, the preference of female students in sweet taste, spicy taste and sour taste was significantly higher than male students (*p*<0.05, *p*<0.01), and salty taste in male students was significantly higher than that of female students (*p*<0.05). Of the 5 tastes, the highest score was 3.96 for greasy taste. Male students had higher greasy taste and salty taste preference, and female students had higher sour taste and greasy taste preference scores.

**Table 2. Weight control satisfaction according to the gender.**

Contents	Degree of satisfaction			t-test
	Male (N=102)	Female (N=272)	Total (N=374)	
<b>Becoming healthy</b>	4.15±0.74 <sup>1)</sup>	3.79±0.80	3.89±0.89	3.925***
<b>Confidence in appearance</b>	3.90±0.78	3.98±0.70	3.96±0.72	-0.864
<b>Increase of sexual attraction</b>	3.75±0.74	3.47±0.81	3.55±0.80	3.097**
<b>Increase of self-esteem</b>	4.06±0.79	3.96±0.73	3.99±0.75	1.143
<b>Overall satisfaction</b>	4.20±0.65	4.10±0.65	4.13±0.65	1.242
<b>Total</b>	4.01±0.61	3.86±0.56	3.93±0.57	2.284*

<sup>1)</sup> Mean±S.D. \**p*<0.05, \*\**p*<0.01, \*\*\**p*<0.001, Mean score: very dissatisfied (1 point) ~ very satisfied (5 points).

**Table 3. Degree of preference for taste according to the gender.**

Taste	Degree of preference			t-test
	Male (N=102)	Female (N=272)	Total (N=374)	
<b>Sweet taste</b>	3.56±0.99 <sup>1)</sup>	3.80±0.92	3.74±0.94	-2.224*
<b>Salty taste</b>	3.72±0.91	3.44±0.98	3.52±0.97	2.426*
<b>Spicy taste</b>	3.34±1.15	3.68±1.04	3.59±1.08	-2.736**
<b>Fatty taste</b>	4.07±0.69	3.92±0.77	3.96±0.75	1.672
<b>Sour taste</b>	3.62±0.97	3.99±0.84	3.89±0.89	-3.461**

<sup>1)</sup> Mean±SD, \**p*<0.05, \*\**p*<0.01, Mean score: very dislike (1 point) ~ very like (5 points).

### 3.3. The nutrition knowledge related to weight control according to the gender.

The weight control related nutritional knowledge scores of the male and female college students surveyed are shown in Table 4. The average overall score of male and female college students was 76.50 out of 100. Among nutritional knowledge items, the item with the lowest rate of correct answers was 'vitamins and minerals provide calories, thus causing weight gain with excessive consumption', with 43.9%, next was 'skipping meals (fasting) is effective in reducing weight', with 53.2%. In the comparison of rate of correct answers between genders, 'alcohol is high in calories can increase weight' and 'fruits are a good source of vitamins, so you can eat as much as you want for weight control' were significantly higher in female students compared to male students ( $p<0.05, p<0.001$ ).

**Table 4. The correct answer rate of nutrition knowledge related to weight control.**

Questions	Gender		Total	$\chi^2$
	Male	Female		
1. Eating a lot of food for late dinner or late night snack can cause weight gain.	93.1 <sup>1)</sup>	97.1	96.0	2.963
2. Skipping meals can help you lose weight.	53.9	52.9	53.2	0.029
3. Eating slowly is helpful for weight control.	87.3	91.5	90.4	1.569
4. Alcohol is high in calories and can increase your weight.	76.5	86.0	83.4	4.901*
5. Smoking helps to lose weight.	69.6	73.5	72.2	0.467
6. Drinking lots of fruit juice and instant coffee mix does not affect weight gain.	83.3	87.9	86.6	1.317
7. Vitamins and minerals give you calories, which can cause you to gain weight if you eat too much.	47.1	42.6	43.9	0.586
8. High nutrition means high calories.	65.7	75.0	72.5	3.225
9. Fruit is a good source of vitamins, so you can eat as much as you like to lose weight.	70.6	87.5	82.9	14.958***
10. Since water also has calories, you should reduce your intake during weight control.	84.3	83.8	84.0	0.013
Total mean score <sup>2)</sup>	73.13± 2.12	77.76± 1.75	76.50± 1.87	-1.963

<sup>1)</sup>Correct answer rate(%) <sup>2)</sup>Perfect score is 100, \* $p<0.05$ , \*\*\* $p<0.001$ .

### 3.4. The eating habits related to weight control according to the gender.

The comparison of scores and averages of weight control related eating habits of male and female college students are shown in Table 5. The average score of all students was 2.81 on a scale of 5, showing a score of under 3 (average), 'I eat slowly' was 2.66 for male students and 3.05 for female students, showing the highest difference, and male students showed significantly lower scores than female students ( $p<0.001$ ). 'I eat protein containing foods (meat, fish, eggs, tofu, beans, etc.) more than two meals a day' and 'I often eat sweet foods (candy, soda, chocolate, biscuits, etc.)' were significantly higher in male students than female students ( $p<0.05, p<0.01$ ), and 'I eat fruit every day' was significantly higher in female students compared to male students ( $p<0.05$ ).

**Table 5. The eating habits related to weight control according to the gender.**

Contents	Male (N=102)	Female (N=272)	Total (N=374)	t-test
1. I eat breakfast regularly.	2.36±1.18 <sup>1)</sup>	2.33±1.16	2.34±1.16	0.236
2. I eat a moderate amount of food.	3.19±0.91	3.16±0.77	3.17±0.81	0.242

3. I eat three meals a day regularly.	2.31±1.03	2.32±0.96	2.32±0.98	-0.086
4. I eat slowly.	2.66±0.94	3.05±0.92	2.94±0.94	-3.686***
5. I eat vegetables more than once a day. (e.g. kimchi, vegetables, raw vegetables, etc.)	3.34±0.95	3.32±0.96	3.32±0.96	0.242
6. I eat fruit every day.	2.35±0.98	2.64±0.99	2.56±0.99	-2.504*
7. I eat protein foods for more than two meals a day. (e.g. meat, fish, eggs, tofu, beans, etc.)	3.54±0.91	3.21±0.85	3.30±0.88	3.242**
8. I don't eat sweet foods such as candy, soda, chocolate, and cookies.	3.09±1.08	2.85±0.99	2.91±1.02	2.052*
9. I don't eat salty and spicy food.	2.73±1.03	2.58±0.98	2.62±0.99	1.286
10. I don't eat greasy food.	2.58±0.78	2.63±0.79	2.62±0.78	-0.593
<b>Total</b>	2.82±0.48	2.80±0.46	2.81±0.46	1.103

<sup>1)</sup>Mean±SD, \* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.001$ , Mean score: not quite so 1 point) ~ very much so (5 points).

### 3.5. The correlation and the effect of eating habits, the nutrition knowledge, and taste preference on BMI.

The correlation and the effect of eating habits, the nutrition knowledge, and taste preference on BMI is shown in Table 6. Correlation analysis showed that the preferences of salty taste (+), greasy taste (+) and sour taste (-) were significantly correlated with BMI ( $p<0.05$ ,  $p<0.01$ ), and sweet taste, salty taste, and greasy taste showed a significant negative (-) correlation with eating habits ( $p<0.01$ ).

In the result of regression analysis on the effect of weight control related eating habits, nutritional knowledge, and taste preference on BMI (Table 7), it was found to be statistically significant ( $p<0.001$ ), and the contribution rate ( $R^2$ ) was 19.1%. Sour taste, greasy taste, and sweet taste had a significant influence on BMI, and the contribution of predicting the BMI of sour taste ( $t=-3.636$ ,  $p<0.001$ ) was higher than that of greasy taste ( $t=3.214$ ,  $p<0.01$ ) or sweet taste ( $t=1.195$ ,  $p<0.001$ ).

**Table 6. The correlation coefficients between BMI, the eating habits, the nutrition knowledge, and taste preference.**

	BMI	Eating habits	Nutrition knowledge	Sweet	Salty	Spicy	Fatty	Sour
<b>BMI</b>	1.00							
<b>Eating habits</b>	-0.083	1.00						
<b>Nutrition knowledge</b>	0.073	-0.006	1.00					
<b>Sweet preference</b>	0.051	-0.210**	0.012	1.00				
<b>Salty preference</b>	0.125*	-0.228**	-0.046	0.259**	1.00			
<b>Spicy preference</b>	-0.012	-0.084	0.011	0.085	0.278**	1.00		
<b>Fatty taste</b>	0.169**	-0.268**	0.034	0.310**	0.332**	0.047	1.00	
<b>Sour taste</b>	-0.175**	0.065	0.127*	0.147**	0.035	0.206**	0.102*	1.00

\* $p<0.05$ , \*\* $p<0.01$  by Pearson Correlation Analysis.

**Table 7. The effect of eating habits, the nutrition knowledge, and taste preference on BMI.**

	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>
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Constant	20.400	1.920		10.627***
<b>Eating habits</b>	-0.157	0.379	-0.022	-0.413
<b>Nutrition knowledge</b>	0.166	0.089	0.094	1.864
<b>Sweet preference</b>	0.377	0.189	0.108	1.195*
<b>Salty preference</b>	0.340	0.192	0.100	1.769
<b>Spicy taste</b>	-0.006	0.162	-0.002	-0.038
<b>Fatty taste</b>	0.786	0.245	0.179	3.214**
<b>Sour taste</b>	-0.706	0.194	-0.191	-3.636***
$R^2$	0.190			
$F$	5.186***			

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

#### 4. Discussion

The study investigated the taste preference, weight control related eating habits and nutritional knowledge of male and female college students in Cheongju, and aimed to provide basic data for healthy eating habits of college students in adulthood by analyzing the effect on BMI.

According to the results of the study, when comparing the current weight and the desired weight of the college students, the average of male students was current weight 73.53kg and desired weight 68.81kg, the average of female students was current weight 54.58kg and desired weight 49.15kg, and it was shown that male and female students desired 6.42% and 9.95% lower weight respectively. In addition, overweight and obese of BMI were 12.0% and 13.0%, respectively, but experience of weight loss was 68.7%, indicating that many of the normal weight students tried to lose weight. In particular, female students were 25.7% underweight and 57.7% normal weight, but 75.0% answered that they were trying to lose weight. This was similar in the study by Holly *et al* [15], showed 25.1% overweight, 19.0% obese, and 53.1% healthy young women aged between 18 and 30 years, but 78.1% were dissatisfied with their current weight, and the desired weight was -12.3% of the current weight, and the majority wanted to lose weight. Grieve *et al* [6] and Markey & Markey [7] reported that unhealthy weight loss practices can be attempted by women who are dissatisfied with their weight, such as skipping meals or vomiting, taking diuretics or laxatives, and these erroneous methods may lead to eating disorders such as anorexia.

The results of this study showed that female students consumed fruit more frequently than male students and less protein foods such as meat, fish, eggs, and tofu, but in Finland, a study of eating habits in male and female college students [5] showed that female students consumed significantly more fruits and meats than male students and consumed less fish, showing differences to this study. In the study by Grieve *et al* [6], male students tend to increase their body weight in order to gain muscle, unlike female students who want to lose weight, and it is similar to male college students being more likely to consume more protein than female students in this study.

In the present study, the weight control related nutritional knowledge of male and female college students was found to be 76.50 out of 100 points, indicating that the level of nutritional knowledge was not high. Matvienko *et al* [16] found that nutrition course for 1 year was a significant contributor to nutritional intake and weight management of college students, and it is determined that it would be beneficial to induce students to participate in nutrition-related liberal arts courses and curriculum for correct eating habits and health of college students. In addition, college students who use smart phones or computers are exposed to mass media such as social media, and due to influences of things such as commercial advertising tend to lead to misinterpreting their body images [17, 18]. It is stated that dissatisfaction with weight can negatively affect self-efficacy and self-confidence, and external and internal motivation plays an important role in the healthy weight management of college students [19]. Therefore, in order to ensure healthy nutrition of college students and proper settlement of early adulthood eating habits, a school counseling center and nutrition management program should be provided to provide active support for psychological factors.

#### 5. Conclusions

The study investigated weight control related eating habits and nutritional knowledge of male and female college students to provide basic data for healthy eating habits in adulthood. As a result of the study, it was found that many of the students had more weight control experience compared to the actual overweight and obese ratios, and the desired weight was also significantly lower than the current weight. The weight control related eating habits of the college students in this study were 2.81 points out of 5 points which was below average, and the average nutritional knowledge score was 76.5 points out of 100 which was not high. Therefore, in order to prevent undiscerning weight control of college students in early adulthood, and to provide proper eating habits and healthy nutrition, it is determined that it is necessary to provide active support through college courses such as nutrition-related liberal arts courses, in-school health counseling centers and nutrition management programs.

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