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A Study on Body Image Perception and Obesity Stress by the Degree of Obesity in College Women

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Abstract

The principal objective of this study was to assess the weight control behavior, body shape satisfaction, and obesity stress depending on the degree of obesity in college students who applied for a weight control program. The average BMI of the participants was 21.4 kg/m^2 which was in the normal range, and 76.3% of the participants were of normal body weight. Ideal BMI in this participant was 18.1 kg/m^2, which is in the underweight range. In terms of body perception, participants generally overestimated their body weight. The overweight and normal weight groups were less satisfied with their body shape than was the underweight group. The overweight group also expressed fears of showing their bodies to others. Additionally, the overweight and normal groups exhibited higher obesity stress than the underweight group. 97.0% of participants were interested in weight control as a way to improve their appearance. They usually obtained their weight control information from the internet and mass media. More than 80% of participants had weight control experience, having undergone weight control attempts for duration of less than a month. However, after the discontinuation of weight control efforts, these participants regained the weight. As a consequence, they were generally unsatisfied with the outcomes of weight control programs. This study demonstrated that the college women who had applied for the weight control program were unsatisfied with their body shape owing to distorted notions of the ideal body shape, and these women had generally undertaken frequent efforts to control their body weights. These results underline the importance of educating college-aged women on proper body perception and the maintenance of healthy body weight and shape.

Key words: weight control, body image perception, obesity stress, college women

INTRODUCTION

Many contemporary studies have demonstrated that overweight and obesity are closely linked to chronic diseases such as hypertension, diabetes, and cardiovascular disease (1-3). Moreover, the incidence of overweight or obesity has increased dramatically in Korean, and the Korean government has responded by implementing public education campaigns to reverse the trend. However, the ideal of an abnormally slim body image has become a prevailing social and cultural norm among young women in Korea and other countries, thus resulting in a rise in irrelevant or dangerous weight control strategies, such as extreme caloric restriction (4). Other studies have reported that the desire for thinness can cause a variety of health problems in the younger generation, most notably eating disorders (5,6). The Third Korean National Health & Nutrition Examination Survey (KNHANES III) reported that the 20~29 age group of Korean women contained more underweight individuals than any other age group (7). Moreover, it is well known that underweight can cause health problems during pregnancy and breast-feeding in pre-menopausal women (8). To counteract this risk, other countries have developed educational programs designed to help young adults perceive their body weights properly and maintain healthy body weights.

Several studies have determined that individuals who attempt to lose weight usually misperceived their body shape (9-15), and thus correct perception of one's body shape is expected to facilitate the maintenance of a healthy weight. Perception of body shape is affected by several factors, including the desire for a slim body shape, satisfaction with one's body shape, age, race, gender, and social and cultural norms (9-12). Garner showed that individuals who desired a slim body shape often attempt to lose weight even if they were in the underweight or normal weight range (9). Additionally, Noles reported that the difference between subjective body shape and objective body shape caused individuals to experience dissatisfaction with their body shape (10). Another study demonstrated that more than 50% of women of normal body weight were dissatisfied with their body weight and attempted to lose weight (16). Yet

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another study demonstrated that women in their twenties exhibited the lowest levels of satisfaction with their body shape, and the researchers in these studies further suggested that this dissatisfaction might account for health problems in this group, as the result of unnecessary dieting and severe weight control strategies (17,18).

Misconception of body shape and unrealistic ideas regarding weight control could alter dietary patterns, which could lead to altered meal quality, thus ultimately resulting in health problems and eating disorders (19). Other researchers have shown that normal and underweight adolescent girls frequently perceived themselves as overweight, and this misperception causes eating disorders, malnutrition, and other health problems (20). Therefore, it is crucial that people be educated in implementing healthy dietary patterns and to perceive properly their body shape.

In this study, we assessed perceptions of body shape and body weight control behavior in college-age students who had applied for a weight control program. This study will provide basic data to educate students regarding healthy dietary patterns and proper body perception.

SUBJECTS AND METHODS

Subjects

This study was conducted from September 1～19, 2008 in college students who applied for weight control program in Chung-Ang University. Of the 189 surveys administered and collected, 25 were excluded due to incompleteness, so a total 164 samples were analyzed in this study.

The questionnaires utilized in this study were reformatted in accordance with our previous survey questionnaires and other references (21,22). The questionnaires included general characteristics including age, type of residence, pocket money, exercise, alcohol intake, and smoking. Ideal height and ideal weight, body image perceptions, and weight control behavior were also included in our questionnaire. Height and weight were measured to 0.1 cm and 0.1 kg, then averaged. Weight distribution was divided into 3 groups by BMI based on the Korean Society recommendations for obesity (23); underweight (<18.5 kg/m^2), normal weight (18.5 kg/m$^2\leq$ BMI$<$ 23 kg/m^2), and overweight ($\geq$23 kg/m^2) by body mass index (BMI; kg/m^2).

Body image perception

Body image perception was determined using the body shape questionnaire developed by Cooper (21,24). The questionnaire consisted of 34 questions and considered 4 factors; fear of being obese (14 questions), fear of showing one's body shape (6 questions), experience of vomiting (2 questions), and dissatisfaction with body shape (10 questions). On the body shape questionnaire, subjects were instructed to rate whether each item applies 'always', 'usually', 'often', 'sometimes', 'rarely', or 'never'. The score was ranked on a point scale with 6 points allotted to 'always', 5 points to 'usually', 4 points to 'often', 3 points to 'sometimes', 2 points to 'rarely', and 1 point to 'never'. Higher scores represent higher dissatisfaction with body shape.

Obesity stress

Obesity stress was measured using the obesity stress questionnaire developed by Jeon (25). Obesity stress questionnaires consisted of 20 questions, which were scaled with 5 points allotted to 'always', 4 points to 'often', 3 points to 'sometimes', 2 points to 'rarely', and 1 point to 'never'. Persons with higher obesity stress have increased stress regarding body weight.

Statistical analysis

Our data were analyzed by SAS (Statistical Analysis System 8.0). Depending on the variable analyzed, either the average, frequency, or percentage was calculated. The significance of distortion of body shape, perception of weight control, and weight control behavior were assessed via the chi-square test. Significance of ideal body image, body image perception, and obesity stress were evaluated via one-way ANOVA.

RESULTS AND DISCUSSION

General characteristics

The general characteristics of participants were outlined in Table 1. The average age of subjects was 21.6 years, and more than 60% of participants lived with their parents. The average amount of pocket money reported was approximately 300,000～400,000 won. Only 30.5% of participants exercised regularly. 81.2% of subjects drank alcohol and only 7.9% of them smoked.

Distribution of body weight

The average weight, height, and BMI of participants are provided in Table 2. BMI and distribution of body weight were calculated on the basis of height and weight. The average height and weight were 161.7 cm and 55.9 kg, and the average BMI was 21.4, which is in the normal weight range.

The body weight distribution of the subjects was 5.6% underweight, 76.3% normal weight, and 18.1% overweight. However, the KNHANES III demonstrated that 12.1% of women aged 20 to 29 were underweight (7). It has also been shown in another study that 27% of college

Table 1. General characteristics of the study subjects

Items		N (%)
Age		21.57±2.03[1)]
Type of residence	Own house	104 (63.4)[2)]
	Dormitory	4 (2.4)
	Live by herself	51 (31.1)
	Board and room	5 (3.1)
	Others	0 (0.0)
Pocket money (Won)	Less than 200,000	17 (10.4)
	200,000～300,000	45 (27.4)
	300,000～400,000	57 (34.8)
	400,000～500,000	20 (12.2)
	More than 500,000	25 (15.2)
Regular exercise	Yes	50 (30.5)
	No	114 (69.5)
Alcohol intake	Yes	133 (81.1)
	No	31 (18.9)
Smoking	Yes	4 (2.4)
	Quitted	9 (5.5)
	No	151 (92.1)

[1)]Mean±SD. [2)]N (%).

Table 2. The physical characteristics and degree of obesity

Items		
Height (cm)		161.65±4.82[1)]
Weight (kg)		55.88±6.28
BMI (kg/m^2)		21.38±2.27
Degree of obesity	Underweight (<18.5)	9 (5.5)[2)]
	Normal (18.5≤ BMI< 23)	124 (75.6)
	Overweight (≥23)	31 (18.9)

[1)]Mean±SD. [2)]N (%).

women are in the underweight range (26). In this study, there were less participants in the underweight range than in other studies, largely because the data was collected from a population of college women who had applied for a weight control program.

Ideal body shape and perception of body image

We subsequently assessed the ideal body shape of the participants (Table 3). Their ideal height, weight, and BMI were 165.6 cm, 49.5 kg, and 18.1 kg/m^2. Most of participants perceived a slim body shape, in the underweight range, as their ideal body shape. Other studies also demonstrated that more than 60% of college students saw a slim body shape as ideal (18,26,27), and thus the fact that young women considered a tall and slim body shape to be ideal is not surprising.

Depending on weight distribution, however, ideal body shape differed significantly in our study population ($p<0.05$). Underweight and normal weight groups perceived a taller and thinner body shape as their ideal, and thus the ideal BMI values were 17.3 and 17.9, both of which are in the underweight range. However, the overweight group perceived 18.9, within the normal weight range, as their ideal BMI.

We also attempted to assess the body shape perceptions of the participants (Table 4). Even though 18.1% of participants were overweight, 68.6% of them perceived themselves as overweight. In particular, 65.3% and 66.7% of the normal weight and underweight groups, respectively, believed themselves to be either overweight or of normal weight. Other studies have also demonstrated that young women generally misperceived their body shape (19,28,29). In this study, college students not only misperceived their body shape but also attempted to control their weight through participation in a weight control program, behavior which can potentially result in serious health problems. Therefore, we should educate college students to perceive their body weight correctly, and help them to maintain healthy body

Table 3. Ideal body image depending on the degree of obesity

Items	BMI			Total (n=164)
	Underweight (n=9)	Normal (n=124)	Overweight (n=31)	
Ideal height	166.4±1.9[1)a2)]	165.9±2.9[a]	164.0±3.3[b]	165.6±3.0
Ideal weight	47.9±3.5[b]	49.3±2.9[ab]	50.9±2.3[a]	49.5±2.9
Ideal BMI	17.3±1.2[b]	17.9±1.1[b]	18.9±1.0[a]	18.1±1.1

[1)]Mean±SD.
[2)]Values with different letters within a same row are significantly different by Duncan's multiple range test.

Table 4. Distortion of body shape depending on the degree of obesity

Items		BMI			Total (n=164)	x^2
		Underweight (n=9)	Normal (n=124)	Overweight (n=31)		
Perception of their body shape	Underweight	3 (33.3)[1)]	0 (0.0)	0 (0.0)	3 (1.8)	76.83[***]
	Normal	6 (66.7)	43 (34.7)	0 (0.0)	49 (29.9)	
	Overweight	0 (0.0)	81 (65.3)	31 (100.0)	112 (68.3)	

[1)]N (%). [***]$p<0.001$; Differences of each variable were tested by Pearson's chi-square test.

weight.

Body shape satisfaction

Body shape satisfaction was assessed in accordance with weight distribution (Table 5). Higher scores indicated that the subjects were interested in their body shape, believed themselves to be obese, and were generally unsatisfied with their body shape. The average score was approximately 131.8, which was relatively high, and the normal and overweight groups scored significantly higher than the underweight group ($p<0.05$). Additionally, the normal and overweight groups were dissatisfied with their body shape and were afraid of being obese. Other studies have also reported that obese women had lower body satisfaction than normal or underweight women, and were afraid of showing their bodies to others (30,31). However, underweight college students evidenced higher body satisfaction than was noted in other weight groups (32). These results demonstrated that most of participants in this study misperceived their body shape and considered a slim body shape to be their ideal body image; thus, they were unsatisfied with their body shape.

Obesity stress

To investigate the obesity stress depending on body weight, obesity stress scores were determined (Table 6). The average score for obesity stress was 51.9. The underweight group scored significantly lower on the obesity stress score than the normal and overweight groups ($p<0.05$). Another study also demonstrated that the overweight group had higher obesity stress than the under-

Table 5. Comparison of body shape satisfaction depending on the degree of obesity

Items	BMI			Total (n=164)
	Underweight (n=9)	Normal (n=124)	Overweight (n=31)	
Afraid of being obese (84)	50.9±11.7[2)b3)]	62.5±9.6[a]	64.0±10.3[a]	62.1±10.3
Afraid of showing their body shape (36)	13.7±3.6[b]	18.0±5.5[a]	21.0±10.3[a]	18.3±5.5
Experience of vomiting (12)	3.1±2.0	3.2±1.9	3.2±1.9	3.2±1.8
Dissatisfaction of their body shape (60)	31.9±10.5[b]	39.2±8.3[a]	42.0±9.1[a]	39.2±8.8
Total (204)[1)]	107.4±26.1[b]	132.3±22.9[a]	138.9±24.5[a]	131.8±24.2

[1)]Total body shape satisfaction score.
[2)]Mean±SD.
[3)]Values with different letters within a same row are significantly different by Duncan's multiple range test.

Table 6. Comparison of obesity stress depending on the degree of obesity

Items	BMI			Total (n=164)
	Underweight (n=9)	Normal (n=124)	Overweight (n=31)	
I'm afraid of being fat.	3.4±1.0[1)b2)]	4.3±0.7[a]	4.4±0.7[a]	4.2±0.8
I sometimes skip the meal because I don't want to be fat.	2.3±1.0	2.7±1.1	2.8±1.1	2.7±1.1
I'm afraid of being fat whenever I eat three meals per day.	1.9±0.8	2.5±1.2	2.6±1.5	2.5±1.3
I intentionally vomit food for weight control.	1.4±0.7	1.4±0.7	1.3±0.7	1.4±0.7
I try not to eat carbohydrate-rich food for weight control.	1.9±0.8[b]	2.5±1.1[ab]	2.6±1.1[a]	2.5±1.1
I don't eat any food after 6~7 p.m.	1.6±0.5[b]	2.3±1.5[a]	2.5±1.0[a]	2.3±1.0
I always think about the food calories.	2.2±1.2[b]	3.0±1.2[a]	3.0±1.1[a]	3.0±1.2
I don't like to eat.	1.7±0.7	1.7±0.7	1.5±0.7	1.6±0.7
I feel guilty after overeating.	2.2±0.8	2.9±1.3	2.9±1.6	2.9±1.3
I impulsively vomit after meal.	1.4±0.9	1.9±1.2	1.7±1.1	1.9±1.2
I spend most of my time to think about weight control.	1.1±0.3[b]	1.9±0.9[a]	2.0±1.1[a]	1.9±1.0
I am controlling of my weight by diet.	1.9±0.9[b]	2.7±1.1[a]	2.8±1.2[a]	2.6±1.1
I am not happy because of my body shape.	1.4±0.7[b]	2.0±1.0[b]	2.8±1.3[a]	2.1±1.1
I was thought about suicide because of my body shape.	1.1±0.3	1.3±0.6	1.3±0.7	1.3±0.6
I don't have self-confidence because of my body shape.	2.2±1.3[b]	2.7±1.1[b]	3.5±1.3[a]	2.8±1.2
I am not satisfied with my body shape.	2.8±1.3[b]	3.7±0.9[a]	4.1±0.8[a]	3.7±1.0
I think that other people underestimate me because of my body shape.	2.3±1.3[b]	3.0±1.1[ab]	3.5±1.1[a]	3.0±1.1
I usually compared my body shape with actresses on TV.	3.6±1.2	4.0±0.9	3.8±1.0	3.9±0.9
I can't focus on my work because of my body shape and weight.	2.1±1.1	2.4±1.0	2.5±1.3	2.4±1.1
I frequently check my body weight.	2.6±1.2	3.3±1.3	2.8±1.1	3.1±1.3
Total	41.2±9.8[b]	52.2±11.7[a]	54.8±13.1[a]	51.9±12.3

[1)]Mean±SD.
[2)]Values with different letters within a same row are significantly different by Duncan's multiple range test.

weight group (22).

In this study, the normal and overweight groups generally avoided high carbohydrate foods, didn't have snacks after 6 p.m., and kept track of their energy intake. Additionally, these groups evidenced lower body satisfaction and were concerned about their body weight. These results indicated that our participants preferred to have a slim body shape and overestimated their body weight such that they were unsatisfied with their body shape, which might be responsible for increased obesity stress. Another study also demonstrated that the perception of body shape was related more strongly to subjective body perception than objective body perception (33). Additionally, Grunewald reported that college women controlled their body weight in accordance with their perceived body weight, but not their objective body weight (34). Therefore, in order to reduce obesity stress, we should educate young women to perceive their body shape appropriately.

Perception on weight control and weight control behavior

Perception on weight control: In this study, we also investigated the perceptions of these subjects regarding weight control (Table 7). 97% of subjects were interested in weight control, which was higher than in other studies (35). Participants in this study had applied for a weight control program, and thus they already had a greater interest in weight control than other groups. Depending on the weight distribution, the normal and overweight groups evidenced greater interest in weight control than was observed in the underweight group ($p<0.001$).

More than 50% of participants were motivated to control their body weight in order to maintain a normal body shape. Additionally, 19.1% and 10.5% of the participants were motivated to control their weight by the mass media and by their friends. Other studies also demonstrated that young women were interested in weight control because of mass media, as well as their family and friends (36-38).

Participants obtained weight control information from the internet (44.4%), mass media (26.5%), and their family and friends (23.5%). More than 80% of subjects perceived that exercise and diet, but not medication, was the most effective method of weight control.

Our participants believed that either exercise or diet was the proper way to control their body weight, but obtained their weight control information from the internet or mass media, rather than from experts or health professionals. These behaviors could mislead them and cause them to attempt to lose weight in improper ways. Therefore, we should not only educate college-age women to perceive their body shape correctly but also to lose

Table 7. Perception of weight control depending on the degree of obesity

Items		BMI			Total (n=164)	x^2
		Underweight (n=9)	Normal (n=124)	Overweight (n=31)		
Interest in weight control	Very interest	7 (77.8)[1)]	121 (97.6)	31 (100.0)	159 (97.0)	22.76***
	Somewhat	2 (22.2)	1 (0.8)	0 (0.0)	3 (1.8)	
	Not much interest	0 (0.0)	2 (1.6)	0 (0.0)	2 (1.2)	
Motivation of weight control	Mass communication	1 (11.2)	25 (20.5)	5 (16.1)	31 (19.1)	12.13
	School curriculum	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.6)	
	Family	0 (0.0)	5 (4.1)	1 (3.2)	6 (3.7)	
	Friends	2 (22.2)	13 (10.7)	2 (6.5)	17 (10.5)	
	Boy friends	2 (22.2)	7 (5.7)	1 (3.2)	10 (6.2)	
	To have normal body shape	2 (22.2)	62 (50.8)	20 (64.5)	84 (51.9)	
	Others	2 (22.2)	9 (7.4)	2 (6.4)	13 (8.0)	
Information source of weight control	Family or friends	5 (55.6)	27 (22.1)	6 (19.4)	38 (23.5)	6.50
	Internet	3 (33.3)	53 (43.4)	16 (51.6)	72 (44.4)	
	Health professionals or Nutritionist	0 (0.0)	2 (1.6)	1 (3.2)	3 (1.9)	
	School curriculum	0 (0.0)	3 (2.5)	1 (3.2)	4 (2.5)	
	Mass communication	1 (11.1)	35 (28.8)	7 (22.6)	43 (26.5)	
	Others	0 (0.0)	2 (1.6)	0 (0.0)	2 (1.2)	
Effective weight control method	Exercise	6 (66.7)	58 (47.5)	17 (54.8)	81 (50.0)	3.14
	Diet	2 (22.2)	48 (39.4)	10 (32.2)	60 (37.0)	
	Alternative medication	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.6)	
	Medication	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
	Obesity clinics	1 (11.1)	12 (9.8)	3 (9.8)	16 (9.9)	
	Others	0 (0.0)	3 (2.5)	1 (3.2)	4 (2.5)	

[1)]N (%). ***$p<0.001$; Differences of each variable were tested by Pearson's chi-square test.

Table 8. Difference of weight control behavior depending on the degree of obesity

Items		BMI			Total (n=164)	x^2
		Underweight (n=9)	Normal (n=124)	Overweight (n=31)		
Experience of weight control	Yes	5 (55.6)[1)]	102 (82.3)	26 (83.9)	133 (81.1)	3.94
	No	4 (44.4)	22 (17.7)	5 (16.1)	31 (20.1)	
Number of weight control experience in the past one year	1～2 times	5 (100.0)	60 (58.8)	15 (57.7)	80 (60.2)	2.86
	3～4 times	0 (0.0)	25 (24.5)	7 (26.9)	32 (24.1)	
	More than 5 times	0 (0.0)	17 (16.6)	4 (15.4)	21 (15.7)	
Duration of weight control in each time	Less than 1 week	4 (80.0)	19 (18.6)	4 (15.4)	27 (20.3)	10.79
	Less than one month	1 (20.0)	42 (41.2)	11 (42.3)	54 (40.6)	
	Less than two month	0 (0.0)	18 (17.6)	6 (23.1)	24 (18.0)	
	Less than three month	0 (0.0)	17 (16.7)	2 (7.7)	19 (14.3)	
	More than three months	0 (0.0)	6 (5.9)	3 (11.5)	9 (6.8)	
Reason for weight control	Current health problems	0 (0.0)	0 (0.0)	3 (11.5)	3 (2.3)	17.42***
	To improve my health	0 (0.0)	9 (8.8)	2 (7.7)	11 (8.3)	
	For better appearance	5 (100.0)	92(90.2)	19 (73.1)	116 (87.1)	
	Others	0 (0.0)	1 (1.0)	2 (7.7)	3 (2.3)	
Weight changes after weight control	Increased more	3 (60.0)	54 (52.9)	14 (53.9)	71 (53.4)	4.57
	Maintained controlled weight	1 (20.0)	11 (10.8)	0 (0.0)	12 (9.0)	
	Returned to normal weight	1 (20.0)	37 (36.3)	12 (46.1)	50 (37.6)	
Degree of Satisfaction on weight control	Satisfied	0 (0.0)	13 (12.7)	5 (19.2)	18 (13.5)	3.99
	Somewhat	1 (20.0)	38 (37.3)	5 (19.2)	44 (33.1)	
	Not satisfied	4 (80.0)	51 (50.0)	16 (61.6)	71 (53.4)	

[1)]N (%). ***$p<0.001$; Differences of each variable were tested by Pearson's chi-square test.

weight via appropriate and healthy methods.

Weight control behavior: Finally, we assessed the weight control experiences and behavior of our participants (Table 8). 81.1% of subjects had experiences with weight control methods in the past one year, and we noted no differences in their experiences with weight control according to weight distribution. 55.6% and 82.3% of the members of the underweight and normal weight groups had experiences with weight control programs, even though they didn't need to lose weight. Other studies also demonstrated that more than 50% of underweight and normal college students had attempted to lose weight (39,40).

In this study, approximately 40% of subjects engaged in weight control attempts more than three times during the last one year, and the duration of these weight control efforts was generally less than one month. After the discontinuation of these weight control efforts, more than 50% of subjects regained the lost weight. These results illustrated that participants continuously tried to lose weight, but were unable to maintain their reduced body weights. In order to maintain body weight, one must permanently alter unhealthy lifestyle and dietary habits. However, our participants didn't change their life-style or dietary habits, and thus they were unable to maintain their reduced body weights. Therefore, it is clearly necessary to educate these women on proper methods for the maintenance of healthy body weight.

We also assessed the reasons that the participants in this study engaged in weight control programs. 87.1% of participants answered that they tried to lose weight for better appearance and only 10.6% of them reported health as their primary motivator. Additionally, 53.4% of participants were not satisfied with the results of their weight control efforts, and only 13.5% of them reported being satisfied. These results demonstrated that the majority of subjects controlled their weight for a short period of time, and were unable to maintain their reduced weights, and were thus unsatisfied with the consequences of their weight control attempts.

The participants in this study had applied for a weight control program to achieve a slim body shape, even though most of them were either underweight or of normal weight. Additionally, their misperceptions of body shape caused them to become dissatisfied with their body shape, which in turn caused them to continuously engage in weight control measures. This suggests that it is important to educate young women regarding body image and body shape perception, so that they will be able to maintain healthy body weights.

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