

Effect of Weight-Related Concerns and Dietary Behavior on Eating Disorder Risk in Korean Women

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Abstract : This study investigated the relationships between eating disorder risk, body image perception, weight control, and dietary habits in Korean women. Body shape perception, the Eating Attitude Test (EAT-26) and dietary habit information were collected by a self-administered questionnaire to 373 adult women and the data were analyzed by the Chi-square test. 31.4% of the women were classified in the eating disorder group by a score of over 20 points on the EAT-26. Compared to the normal group, more women in the eating disorder risk group perceived that a thin body shape was the ideal body shape and were dissatisfied with their body shape. This group was also more interested in weight control and more likely to try weight control methods. The eating disorder risk group was more likely to skip meals and snacks than the normal group. In addition, they had a greater appetite and a higher frequency of overeating than the normal group. Over 30% of the Korean women surveyed were categorized at high risk of eating disorders. They were more likely to overestimate body weight and shape and tried to control their weight by inappropriate methods. To prevent eating disorders in adult women, nutrition education programs should incorporate strategies to change inaccurate self-body image and to disseminate information about healthy weight control methods.

Key Words : body image, eating disorder, weight control, adult women

I. Introduction

Many young women in Korea try to lose weight due to the current social trend that associates a slim body shape as a necessary part of an attractive personal appearance. In many cases, they try to lose weight to below-normal levels and use imprudent methods such as skipping meals and starvation. Another method of weight control is to eat large quantities of food within a short time period and then using various methods to regurgitate the food. These extreme diet patterns can lead to eating disorders such as anorexia nervosa and bulimia nervosa, as reported in several studies

(Zuckerman *et al.*, 1986; Scuaacca *et al.*, 1991). In addition, these behaviors could cause serious physical and psychological health problems such as disruption of the reproductive system, reduced bone density, and depression (Micali *et al.*, 2007; Pafumi *et al.*, 2002; Meehan *et al.*, 2006).

The prevalence of anorexia nervosa and bulimia nervosa in western countries was approximately 0.5% ~ 1.0% and 1.3% ~ 3.0%, respectively in 1993 and 1995 (Garfinkel *et al.*, 1995; Rather *et al.*, 1993). In Korea, the incidence of anorexia nervosa and bulimia nervosa in female college students and high school students has increased from 0.7% and 0.8%, in

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1990 to 2.0% and 1.2% in 1996 (Hahn *et al.*, 1990; Yoo *et al.*, 1996). Not only has the incidence of these severe eating disorders increased but the incidence of sub-clinical eating disorders has also risen (Lee *et al.*, 2001; Lee *et al.*, 2003). According to several studies carried out using the eating attitude test-26 (EAT-26), (used for diagnosing eating disorders) 12.2% of high school students and 17.9% of college students scored over 20 points on the test, indicating that they are likely to have an eating disorder (Meehan *et al.*, 2006; Garfinkel *et al.*, 1995). These rates were much higher compared to similar groups in western countries (Calro *et al.*, 2001). Recent studies in Korea have revealed that even adult women within a normal body weight range were also trying to lose weight and had experience with binge eating disorders (Nothwehr, 2004; Wong, 2003; Allaz *et al.*, 1998; Johnsen *et al.*, 2003). In addition, 30% of Korean women and 26.1% of underweight women have tried weight control schemes within the past year (Ministry of Health & welfare, 2002). It was also reported that some tried to lose weight by skipping meals, starvation, or medication, and had experienced various side effects. These results indicate that Korean women who are concerned about their body shape and willing to use weight control methods are also the most likely to have eating disorders.

Few studies have investigated the relationship between eating disorders, perception of body weight, and weight control in Korean women. In addition, most of the studies have focused on eating disorders in teenagers and college students, not adult women. This study investigated the status of sub-clinical eating disorders in Korean adult women and compared perceptions of body shape, eating patterns, and weight control methods of high risk eating disorder groups with normal groups. These results help determine the factors that affect eating disorders and to further establish a link between eating disorders, the perception of body shape, and eating habits in Korean women.

II. Methods

1. Subjects and Data Collection

400 women between the ages of 20 - 59 were involved in this study that was conducted from August 25 to September 3, 2003 in Seoul and Incheon. The objective of the study was verbally explained by the investigators before the questionnaires were distributed. Incomplete questionnaires were eliminated and a total of 373 were used in this study.

2. Questionnaires

The questionnaire was modified based on preliminary tests and previous studies (Park *et al.*, 1997; Sohng *et al.*, 2003; Jung *et al.*, 2003). This questionnaire included general questions such as age, smoking, alcohol intake, exercise, nutrient supplements, body weight status, the EAT-26 test, weight related concerns, weight control behaviors, and dietary behaviors.

1) Body Weight Status

Based on the height and weight of participants, the Body Mass Index (BMI) was calculated (weight in kilograms divided by height in meters squared). Participants were divided into three groups based on their BMI: underweight group (BMI < 18.5), normal group (18.5 ≤ BMI < 25), and overweight group (BMI ≥ 25).

2) Determination of Eating Disorder Risk

The risk status of eating disorders was determined by the EAT-26 test (developed by Garner - translated and modified by Heo). The EAT-26 is the most reliable method to test for eating disorders and consists of 26 questions. The EAT-26 considers three factors: Factor I dieting, Factor II bulimia and preoccupation with food, and Factor III oral control. On the EAT-26, subjects must rate whether each item applies 'always', 'usually', 'often', 'sometimes', 'rarely', or 'never'. The scores are ranked on a point scale with 3 points allotted to 'always', 2 points to 'usually', 1 point to 'often', and 0 points to 'sometimes',

'rarely', or 'never'. Participants with a score of greater than or equal to 20 were placed in the eating disorder (ED) risk group.

3) Weight-Related Concerns

Self-perceived weight status: To investigate how participants perceive their body shape, the study asked them how they felt about their body shape: underweight, normal weight or overweight.

Ideal body image: Participants answered whether their ideal body image was underweight, normal weight, or overweight.

Body image distortion: Examination of the relationship between BMI and perceived weight provided information to determine the degree of body distortion within each individual. For example, the BMI category answer described above was compared to the answer to the weight perception question to create three new distortion categories: underestimated, normal, or overestimated.

Satisfaction with body shape: To assess perceived satisfaction with body shape, participants were asked: "How do you feel about your body shape right now?" There were three response options: very satisfied, somewhat satisfied, or not satisfied.

4) Weight Control Behavior

Questions used in this study were modified based on preliminary tests and included questions about interest in, experience with and frequency of weight control, weight change and side effects associated with weight control.

5) Dietary Behaviors

To investigate dietary behaviors, questions were asked about meals, snack intake, appetite, food preference, and overeating.

3. Statistical Analysis

The data was analyzed by SAS (Statistical Analysis System 8.0). The data was first adjusted by factors such as age, smoking, alcohol intake, exercise, and supplementation

(which have been shown to affect eating disorders) and then statistically analyzed. Depending on the variable analyzed, average, frequency or percentage was calculated. Significance of weight-related concerns, weight control behavior and eating habits between ED risk and ED risk free groups were analyzed by the Chi-square test.

III. Results

1. General Characteristics of Subjects

The general characteristics of participants were outlined in Table 1. The average age of subjects was 38.2 years, ranging from 20 to 59 years, and the average BMI was 21.7. The body weight distribution of the subjects was shown to be 12.9% underweight, 73.4% normal weight, and 13.7% overweight. Only 5.7% of the women smoked and 51.6% participants drank alcohol. 41.6% of the

<Table 1> General Characteristics of Subjects

Characteristics	N (%)
Age	38.2 ± 11.9 ¹⁾
BMI ²⁾	21.7 ± 2.9 ¹⁾
Body weight status	
Underweight	48 (12.9)
Normal weight	274 (73.4)
Overweight	51 (13.7)
Cigarette smoking	
Yes	21 (5.7)
No	350 (94.3)
Alcohol drinking	
Yes	192 (51.6)
No	180 (48.4)
Regular exercise	
Yes	155 (41.6)
No	218 (58.5)
Using vitamin/mineral supplements	
Yes	156 (41.8)
No	217 (58.2)

1) Mean ± S.D.

2) BMI (Body Mass Index) = weight (kg)/height(m)²

women exercised regularly and 41.8% of them took nutritional supplements.

2. Determination of Eating Disorder Risk

To investigate the prevalence of eating disorders, the EAT-26 test was administered. The average EAT-26 score was 15.9 points and over 30% of participants were in the ED risk group (Table 2).

3. Weight Related Concerns

To examine the relationship between the status of ED

risk and weight-related concerns, the study investigated the difference in perception between actual and ideal body weight, weight distortion, and satisfaction with body shape. In the ED risk group, 20.5% of subjects were overweight, which was higher than the average for the risk free group (10.5%) (Table 3). However, about 50% of participants perceived that they were overweight although only 13.7% of the subjects were actually overweight. This self-perception of body weight was true in all groups with no significant difference between the groups. The ED risk group had a significantly higher preference for a slim body shape than the no risk group ($p < 0.01$). About half of the subjects had a distorted weight perception of their

<Table 2> Distribution of Eating Disorder and EAT-26 Score N (%)

	All	ED risk ¹⁾	ED free ²⁾
Number of subjects N (%)	373(100.0)	117(31.4)	256(68.6)
EAT-26 score	15.9 ± 9.2*	26.9 ± 6.7*	10.9 ± 4.7*

¹⁾ Eating disorder risk group (Eat-26 score ≥ 20), ²⁾ No risk to eating disorder (Eat-26 score < 20), * Mean ± S.D.

<Table 3> Perception on Body Weight and Weight Related Concerns N (%)

	All (N = 373)	ED risk ¹⁾ (N = 117)	ED free ²⁾ (N = 256)	P-value
Actual body weight status				
Underweight	48 (12.9)	16 (13.7)	32 (12.5)	< .05
Normal weight	274 (73.4)	77 (65.8)	197 (77.0)	
Overweight	51 (13.7)	24 (20.5)	27 (10.5)	
Self- perceived weight status				
Underweight	44 (11.8)	11 (9.4)	33 (12.9)	NS
Normal weight	143 (38.3)	39 (33.3)	104 (40.6)	
Overweight	186 (49.9)	67 (57.3)	119 (46.5)	
Perception of ideal weight				
Underweight	96 (26.0)	41 (35.3)	55 (21.7)	< .01
Normal weight	246 (66.7)	62 (53.5)	184 (72.7)	
Overweight	27 (7.3)	13 (11.2)	14 (5.5)	
Weight distortion				
Underestimated	23 (6.2)	9 (7.7)	14 (5.5)	NS
No-distortion	190 (50.9)	53 (45.3)	137 (53.5)	
Overestimated	160 (42.9)	55 (47.0)	105 (41.0)	
Satisfaction with body shape				
Very satisfied	29 (7.8)	5 (4.4)	24 (9.4)	< .001
Moderate	104 (28.0)	20 (17.4)	84 (32.8)	
Dissatisfied	238 (64.2)	90 (74.3)	148 (57.8)	

¹⁾ Eating disorder risk group, ²⁾ No risk to eating disorder, NS; No significance

body weight, mostly by overestimating (42.9%) of their actual weight, in both the ED risk and ED risk free groups. The ED risk group, however, had a significantly higher rate of dissatisfaction with their body shape (74.3%).

4. Weight Control Behaviors

The study investigated the differences in weight control

behaviors based upon the status of ED risk (Table 4). The ED risk group were more interested in weight control than the ED free group ($P < 0.01$). It was observed that more than two thirds of the subjects (70.1%) had tried weight reduction methods within the past one year. A large majority of women (92.3%) in the ED risk group had attempted weight reduction compared to only 59.8% of the no risk group, which is a highly significant difference

Table 4 Weight Control Behavior of Subjects

N (%)

	All (N=373)	ED risk ¹⁾ (N=117)	ED free ²⁾ (N=256)	P-value
Interest in weight control				
Very	232 (62.2)	87 (74.4)	145 (56.6)	< .01
Not much	100 (26.8)	20 (17.1)	80 (31.3)	
None	41 (11.0)	10 (8.6)	31 (12.1)	
Weight control experience				
Yes	260 (70.1)	108 (92.3)	152 (59.8)	<.0001
No	111 (29.9)	9 (7.7)	102 (40.2)	
Frequency of weight reduction during the past one year				
1-2 times	107 (42.8)	29 (27.6)	78 (53.8)	< .001
3-4 times	46 (18.4)	25 (23.8)	21 (14.5)	
More than 5 times	97 (38.8)	51 (48.6)	46 (31.7)	
Reasons for weight control				
For health	121 (47.5)	47 (43.5)	74 (50.3)	NS
Advice of others	8 (3.1)	2 (1.9)	6 (4.1)	
To be stylish with clothes	126 (49.4)	59 (54.6)	67 (45.6)	
Ways attaining weight control methods				
Advertisement/commercials/books	85 (35.1)	43 (40.2)	42 (31.1)	NS
Friends and neighbors	135 (55.8)	53 (49.5)	82 (60.7)	
Counseling with dietitians or health professionals	22 (9.1)	11 (10.3)	11 (8.2)	
Weight reduction practices				
Fasting, skipping meals	102 (41.1)	47 (43.9)	55 (39.0)	NS
Reducing meal portion	60 (24.2)	20 (18.7)	40 (28.4)	
Exercise only	37 (14.9)	13 (12.2)	24 (17.0)	
Exercise and diet	37 (14.9)	22 (20.6)	15 (10.6)	
Diet pills	12 (4.8)	5 (4.7)	7 (5.0)	
Participation in commercial weight reduction program				
Yes	66 (27.7)	39 (37.9)	27 (20.0)	< .01
No	172 (72.3)	64 (62.1)	108 (80.0)	
Weight changes after weight control				
Maintained through one year	86 (35.7)	29 (27.6)	57 (41.9)	< .05
Restored to original weight or increased	155 (64.3)	76 (72.4)	79 (58.1)	
Experience with adverse side effects from weight reduction				
Yes	126 (51.2)	68 (64.2)	58 (41.4)	< .001
No	120 (48.8)	38 (35.9)	82 (58.6)	

¹⁾ Eating disorder risk group, ²⁾ No risk to eating disorder, NS; No significance

between the groups. In addition, almost half of the ED risk group had tried weight control more than five times during the past one year. Regaining weight after a weight control regimen was very common in the ED risk group (72.4%). Moreover, the ED risk group also had experience with more side effects associated with weight control than the no risk group ($P < 0.001$).

5. Eating Behaviors

The study also examined differences in eating behavior

between the ED risk group and the no risk group (Table 5). The ED risk group (74.1%) skipped meals more often than the normal group (62.8%). They were also more likely to skip meals to control their weight. In addition, they had snacks more frequently than those of the no risk group. The ED risk group was reported to have a greater appetite and preference for animal foods than the no risk group. There was a highly significant difference in frequency of overeating in the ED risk group compared to the no risk group.

<Table 5> Dietary Behaviors of Subjects

N (%)

	All (N = 373)	ED risk ¹⁾ (N = 117)	ED free ²⁾ (N = 256)	P-value
Skipping meals				
Often	245 (66.4)	86 (74.1)	159 (62.8)	< .01
Seldom	124 (33.6)	30 (25.9)	94 (37.2)	
Reason for skipping meals				
Lack of appetite	50 (14.5)	9 (7.9)	41 (17.8)	< .01
Lack of time	105 (30.5)	36 (31.6)	69 (30.0)	
Eating snacks	62 (18.0)	20 (17.5)	42 (18.3)	
To control body weight	55 (16.0)	28 (24.6)	27 (11.7)	
Out of habit	38 (11.1)	15 (13.1)	23 (10.0)	
Other	34 (9.9)	6 (5.3)	28 (12.2)	
Regularity of meal times				
Regular	97 (26.1)	19 (16.4)	78 (30.5)	< .01
Somewhat regular	196 (52.7)	64 (55.2)	132 (51.5)	
Irregular	79 (21.2)	33 (28.4)	46 (18.0)	
Frequency of snacks				
Almost none	100 (26.9)	24 (20.7)	76 (29.7)	< .05
1 time/ day	160 (43.0)	48 (41.4)	112 (43.7)	
2 times/ day	86 (23.1)	30 (25.8)	56 (21.9)	
Appetite				
Good	135 (36.5)	55 (47.0)	80 (31.6)	< .05
Moderate	210 (56.8)	54 (46.2)	156 (61.7)	
Bad	25 (6.7)	8 (6.8)	17 (6.7)	
Food preference				
Vegetable foods	95 (25.6)	21 (18.0)	74 (29.0)	< .001
Animal foods	47 (12.6)	26 (22.2)	21 (8.2)	
Vegetable and animal foods	230 (61.8)	70 (59.8)	160 (62.8)	
Overeating				
Often	71 (19.0)	28 (32.5)	33 (12.9)	<.0001
Sometimes	158 (42.4)	47 (40.2)	111 (43.4)	
Never	144 (28.6)	32 (27.3)	112 (43.7)	

¹⁾ Eating disorder risk group, ²⁾ No risk to eating disorder

IV. Discussion

Although social, economic improvements, and westernized eating patterns have been implicated for the increased incidence of obesity in Korea, there has also been a growing trend of being underweight in some women. Due to the negative image of overweight women in the mass media such as newspapers, television, and magazines, many women idealize thinness as the ideal body shape and are inclined to try extreme weight reducing methods. This may increase the risk of eating disorders in women.

In this study, 31.4% of women scored over 20 points on the EAT-26 test, indicating that they had greater chance of experiencing eating disorders. These results indicate that unhealthy eating behavior is significant among Korean women, which is why eating disorders have become a serious health concern in recent years. Several other studies also reported that 12.2% and 17.9% of female Korean high school and college students demonstrated a high risk for eating disorders (Lee *et al.*, 2001; Lee *et al.*, 2003). These results are similar to the observations of eating behaviors in female college students in Switzerland (8.3%), Poland (12.6%), and Israel (18%) (Beddeberg-Fischer *et al.*, 1996; Wlodarczyk-Bisaga *et al.*, 1996; Stein *et al.*, 1997). Most of eating disorder studies were conducted with teenagers and college students because they were thought to be in more danger of eating disorders than other age groups. However, this study showed that over 30% of adult women aged 20 to 50 were at a high risk of eating disorders, which is greater than in teenagers or college students. It seems that eating disorders are not only a problem in teenagers or college student but also in adult women in Korea.

The study investigated whether eating disorder status could affect body weight perception and weight-related concerns. There was no significant difference in perception of body weight between different groups in this study. However, overall approximately 50% of participants considered themselves overweight even though only 13.7% of them were actually overweight. Even though, there was no significance of weight distortion between

groups, more people in the ED risk group overestimated their body shape than the normal group. Recent studies about the relationship between abnormal eating behaviors and weight related predictors showed that weight perception and weight distortion had a strong relationship with abnormal eating behaviors (Lee *et al.*, 2003; Valerie, 2004; Kim *et al.*, 2004; Alison *et al.*, 2004). In addition, the eating disorder group desired to have slim body and overestimated their body size more than the normal group (Masheb *et al.*, 2003).

This study observed that there was a significant difference in weight-related concerns between the ED risk group and the no risk group. More individuals in the ED risk group perceived that a thin body shape was the ideal one and were dissatisfied with their body shape than those of the no risk group. Similar results were obtained in other studies that fewer of the eating disorder group was satisfied with their body shape than the normal group, so dissatisfaction with body shape was one of the important risk factors for eating disorders (Park *et al.*, 1997; Kim *et al.*, 2004; Vander Wal *et al.*, 2004). Dissatisfaction with body shape was a direct result of a misperception of ideal body shape, a risk factor that could lead to restricted eating and possibly to eating disorders. Recent trends in Korea emphasizing slimness could influence women to have misperceptions about an ideal body shape and might indirectly contribute to the high incidence of eating disorders.

The study also investigated whether misperception and dissatisfaction of body weight could affect weight control. This study showed that the ED group was more interested in weight control than the other group. In addition, 70.1% of women had tried weight control within one year, although only 13.7% of the subjects were actually overweight, indicating that many normal weight women also tried to lose weight. Moreover, over half of the ED risk group tried more than 5 times within the past one year to lose weight. Other studies also showed that the high ED risk group had more experience with weight control than the normal group in female college students and adolescents (Lee *et al.*, 2001; Kim *et al.*, 2004). In

addition, other researchers have reported that among several factors that could cause eating disorders, experience with weight control was the most effective factor for predicting eating disorder incidence (Paek *et al.*, 2001; Patton *et al.*, 1999).

In this study, 72.4% of the ED risk group answered that they regained weight after weight loss and 64.2% had experienced side effects such as nausea, anemia and stomach pain, which were significantly higher than those for the no risk group. They had also tried repeated weight reducing schemes despite these severe side effects. These results suggest that ED risk group had more interest in weight control than the ED free group and tried to lose weight in inappropriate ways. It seems that weight reduction behavior and eating disorders may be linked.

Regarding the eating habits of participants, 66.4% skipped meals and only 26.1% of them ate meals regularly. The ED risk group skipped meals more often than the normal group. Other studies also observed that the eating disorder group was likely to skip meals at about twice the rate of the normal group and that girls who skip meals often had higher EAT-26 scores than girls who eat regularly (Lee *et al.*, 2001; Yoo, 2004). The ED risk group had significantly more snacks than the normal group, most likely due to frequent meal skipping. They also had a greater appetite and a higher frequency of overeating than the no risk group. This could be due to extreme diet restrictions that stimulate appetite and cause overeating, as shown in other studies (Kim *et al.*, 2007; Gormally *et al.*, 1982; Garner *et al.*, 1980). A restricted diet and other inappropriate eating behaviors could be one of the factors causing eating disorders.

This study showed that over 30% of Korean adult women were at risk of eating disorders along with misperceptions and dissatisfaction with their body weight. In addition, this misperception and dissatisfaction made them attempt weight control through inappropriate ways such as skipping meals and starvation, which can lead to eating disorders. To prevent eating disorders, it is necessary to develop a proper method of diagnosing eating disorders but also an educational program for

teaching adult women at high risk for eating disorders to have a more accurate perception of a normal body image, proper healthy weight control methods, and good nutrition.

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