

**Excessive Exercising, Obsessive-Compulsive Tendencies,  
Body Image, and Eating Disorders**

by

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**Abstract**

*One hundred thirty-four volunteers (60 men, 74 women) participated in a study designed to evaluate the relationship between excessive exercise, obsessive-compulsive tendencies, eating disorders, and body image. High levels of exercise were positively related to eating disorders, body dissatisfaction, and obsessive-compulsive tendencies. These positive relations notwithstanding, the women displayed significantly higher eating disorder, body dissatisfaction, and obsessive-compulsive scores than did the men.*

A significant amount of attention has been given to the role of exercise in the enhancement of psychological, as well as physical, health. The popular notion that exercise, in addition to improving appearance and health, will enhance mood, self-concept, and general psychological well-being has perpetuated the exercise craze. Although many studies have evaluated the positive benefits of exercise, little research has been done to examine psychological problems that may be associated with excessive exercise.

Involvement in physical activity can increase persons' awareness of their physique and result in an overemphasis on appearance. This overemphasis may result in an eating disorder, such as anorexia nervosa or bulimia. In this regard it is noteworthy that eating disorders are the major health problem confronted by women athletes (Noden, 1994). Anorexia nervosa is characterized by a relentless pursuit of thinness that is achieved through self-starvation. Bulimia involves episodes of binge-eating followed by some form of purging, such as self-

induced vomiting, laxative abuse, fasting, or excessive exercise (Johnson & Tobin, 1991).

Obsessive-compulsive tendencies are an aspect of excessive exercise and eating disorders that have received little research attention. Although the relationship between obsessive-compulsive disorder (OCD) and anorexia remains unclear, Davis, Brewer, and Ratusny (1993) reported exercise was strongly related to weight preoccupation among men and women and exercise and obsessive-compulsiveness were positively related in men. These results support claims that exercising and the obsessive-compulsive personality may be related.

Because dissatisfaction with body image is thought to be a key factor in the etiology of eating disorders (Drewnowski & Yee, 1987), it seems reasonable to suggest concern with body image may also be positively related to level of exercise. The logic of this prediction notwithstanding, Davis (1990) reported groups of exercising and non-exercising women did not differ significantly on measures of self-perceived body shape. However, by testing only women who exercised and those who did not, Davis may have obscured differences between individuals who differed in degree of exercise involvement. It is arguable the predicted relationship would be shown, perhaps exclusively, by individuals who engage in excessive exercise.

In view of these considerations, the present study was designed to examine the relationship between excessive exercise, obsessive-compulsive tendencies, eating disorders, and body image. It was predicted excessive exercisers will display more obsessive-compulsive tendencies, more eating disorders, and greater concerns with body image than non-excessive exercisers.

## Method

### Participants

The participants were volunteers (60 men, 74 women) from a YMCA in a metropolitan area in the Midwest. The men ranged in age from 18 to 81 years ( $M = 41.09$ ); whereas the women ranged in age from 25 to 59 years ( $M = 39.76$ ).

### Testing Instruments

Exercise Saliency Scale. The Exercise Saliency Scale (ESS) is an instrument designed to assess exercise dependence. Kline, Franken, and Rowland (1994) report good validity for the ESS.

Padua Inventory. The Padua Inventory (PI) is a 60-item self-report inventory that measures obsessions and compulsions. Each item, rated on a five-point scale, measures the degree of disturbance caused by the thought or behavior. The PI has good validity in clinical and nonclinical populations (Sanavio, 1988; Sternberger & Burns, 1991). The PI was selected because according to Sternberger and Burns it is currently the most comprehensive self-report measure of obsessive-compulsive disorder.

Eating Disorder Inventory. The Eating Disorder Inventory (EDI) is a measure of eight attitudinal and behavioral dimensions associated with anorexia nervosa and bulimia. The EDI has been used with nonclinical populations to indicate which individuals are likely to be preoccupied with their weight (Garner & Olmstead, 1984).

Body Dissatisfaction Scale. The Body Dissatisfaction Scale of the EDI measures an individual's body-esteem. Scale items are rated on a six-point scale from "always" to "never;" higher scores reflect greater preoccupation with thinness, food control, and the size and shape of body parts (Waddell-Krall & Thomas, 1990).

### Procedure

A self-administering questionnaire booklet was composed of the testing instruments and a demographics sheet requesting information about age, height, weight, number of exercise days per week, number of hours exercised per day, and percent of aerobic exercise. Once the participants had signed and returned an informed consent document, they completed the questionnaire booklet. All participants completed the booklet within 45 minutes.

## Results

Prior to analysis, the participants were divided into three groups based on the level of exercise dependence (ESS) score: high (40 and above), medium (20-39), and low (19 and below). Other than combining the high, very high, and extremely high designations into one category in order to have a sufficient sample, these score ranges are in accord with those employed by Kline et al. (1994).

Group Similarities and Differences

In order to ascertain group similarities and differences, a series of 2 x 3 factorial analyses of variance (ANOVA) incorporating gender (men vs women) and level of exercise (low, medium, and high) was performed on the age, height, weight, days of exercise, hours of exercise, and percent aerobic exercise data. Group means for these demographic factors are presented in Tables 1 and 2.

Table 1. Group mean age, height, and weight by sex and level of exercise involvement.

	Level of Exercise Involvement			
	Men	Low	Medium	High
Age (years)	45.50	38.77	39.11	
Height (inches)	71.73	70.77	72.11	
Weight (pounds)	195.13	192.08	190.26	
<u>Women</u>				
Age (years)	40.58	39.00	39.70	
Height (inches)	64.53	64.54	65.05	
Weight (pounds)	139.84	152.74	149.80	

Table 2. Group mean days of exercise, hours of exercise, and percent aerobic exercise by gender and level of exercise involvement.

Level of Exercise Involvement

	Men	Low	Medium	High
Days (per week)	3.27	3.42	3.74	
Hours (per period)	1.23	1.24	1.38	
Percent aerobic	69.33	61.92	78.95	
<u>Women</u>				
Days (per week)	2.32	3.66	4.70	
Hours (per period)	0.72	0.99	1.24	
Percent aerobic	70.00	81.29	84.35	

In all instances an alpha level of 0.05 was employed to determine significance. The results of these analyses are summarized below.

Age. No significant differences were found for gender,  $F(1, 128) = .43, p > .05$ , level of exercise,  $F(2, 128) = 1.61, p > .05$ , and gender x level of exercise,  $F(2, 128) = .74, p > .05$ , factors.

Height. Analysis of the height data yielded significance for the gender factor,  $F(1, 128) = 176.47, p < .001$ ; men were taller than women. The level of exercise,  $F(2, 128) = 1.07, p > .05$ , and gender x level of exercise,  $F(2, 128) = .35, p > .05$ , factors failed to achieve significance.

Weight. As in the height analysis, the weight analysis also yielded significance for the gender,  $F(1, 128) = 55.85, p < .001$ , factor; men were heavier than women. The level of exercise,  $F(2, 128) = .22, p > .05$ , and gender x level of exercise,  $F(2, 128) = .73, p > .05$ , factors were not significant.

Days of exercise. Analysis of the days of exercise data yielded significance for the levels of exercise factor,  $F(2, 128) = 15.91, p < .001$ , factor. Subsequent Newman-Keuls tests indicated the high exercise participants exercised significantly ( $p < .05$ ) more than the medium and low exercise participants. In turn, the medium exercise participants exercised significantly ( $p < .05$ ) more than the low exercise participants. The gender,  $F(1, 128) = .47, p > .05$ , and gender x level of exercise,  $F(1, 128) = 2.11, p > .05$ , factors were not significant.

Hours of exercise. Analysis of the hours of exercise data yielded significance for the sex,  $F(1, 128) = 7.12, p < .01$ , factor; men exercised longer than women. The level of exercise factor achieved marginal significance,  $F(2, 128) = 2.87, p = .058$ . As with the days of exercise analysis, there was a trend for hours of exercise to increase from the low to medium to high level of exercise category. The gender x level of exercise factor was not significant,  $F(2, 128) = .91, p > .05$ .

Percent aerobic exercise. No factors achieved significance with this analysis: gender,  $F(1, 128) = 2.66, p > .05$ ; level of exercise,  $F(2, 128) = 2.05, p > .05$ ; and gender x level of exercise,  $F(2, 128) = 1.17, p > .05$ .

In summary, the men and women differed only in terms of height, weight, and the number of hours engaged in exercise. The low, medium, and high exercise groups differed only in terms of days of exercise; increased days of exercise were associated with the more intensely dedicated exercisers.

#### Analysis of Eating Disorders, Body Image, and Obsessive-Compulsive Data

A similar series of 2 x 3 factorial ANOVAs was conducted to evaluate the eating disorders body image and obsessive-compulsive data. Group means for these factors are presented in Table 3.

Table 3. Group mean eating disorder (EDI-2), body image (Body Dissatisfaction subscale of the EDI-2), and obsessive-compulsive (PI) scores by gender and level of exercise involvement.

	<u>Level of Exercise Involvement</u>			
	<u>Men</u>	<u>Low</u>	<u>Medium</u>	<u>High</u>
EDI-2		22.47	25.69	40.42
Body Image		3.27	4.81	6.42
PI		10.20	18.58	30.84

<u>Women</u>			
EDI-2	34.50	39.51	61.45
Body Image	10.47	12.77	15.15
PI	16.05	19.80	43.05

Eating disorder data. Analysis of the EDI-2 scores yielded significance for the gender,  $F(1, 128) = 10.12, p < .01$ , and level of exercise,  $F(2, 128) = 7.85, p < .001$ , effects. The women had significantly higher eating disorder scores than the men. Newman-Keuls tests were used to probe the significant level of exercise factor and indicated the EDI-2 scores of the high exercise participants were significantly ( $p < .05$ ) higher than those of the low and medium exercise participants. The low and medium exercise participants did not differ significantly. The gender x level of exercise factor was not significant,  $F(2, 128) = .31, p > .05$ .

Body image data. Analysis of the Body Dissatisfaction subscale of the EDI-2 yielded significance for the gender,  $F(1, 128) = 45.56, p < .001$ , and level of exercise,  $F(2, 128) = 3.67, p < .03$ , factors. The women had higher body dissatisfaction scores than the men. Newman-Keuls tests indicated the high exercise participants had significantly higher ( $p < .05$ ) body dissatisfaction scores than did the low and medium exercise participants, which, in turn, did not differ significantly. The gender x level of exercise factor was not significant,  $F(2, 128) = .14, p > .05$ .

Obsessive-compulsive data. Analysis of the PI scores also yielded significance for the gender,  $F(1, 128) = 4.58, p < .04$ , and level of exercise,  $F(2, 128) = 22.64, p < .001$ , factors. Women reported higher obsessive-compulsive concerns than did men. Newman-Keuls tests indicated the high exercise participants had significantly ( $p < .05$ ) higher obsessive-compulsive scores than did the low and medium exercise participants, which, in turn, did not differ significantly. The gender x level of exercise factor was not significant,  $F(1, 128) = 1.12, p > .05$ .

## Discussion

The present study attempted to demonstrate a relationship between excessive exercise, eating disorders, body dissatisfaction, and obsessive-compulsive tendencies in men and women. It was hypothesized and shown that amount of exercise was positively related to eating disorder characteristics, greater body dissatisfaction, and obsessive-compulsive tendencies. Although these relationships were shown by both men and women, the female participants displayed significantly higher eating disorder, body dissatisfaction, and obsessive-compulsive scores than did the male participants.

These results are in accord with previous research suggesting that excessive exercise can initiate, and possibly sustain, an eating disorder (Katz, 1986). They also corroborate previous research showing anorexia nervosa and bulimia are eating disorders that affect women, predominantly adolescents and young adults (Johnson & Tobin, 1991). Because dissatisfaction with body image is thought to be a key factor in the etiology of eating disorders, the higher body dissatisfaction scores shown by the women is understandable.

However, unlike Davis et al. (1993) who reported exercise to be positively related to obsessive-compulsiveness only among men, the present study found these tendencies increased for both men and women as the level of activity increased. As noted, the women participants displayed significantly higher eating disorder and obsessive-compulsive scores than the men. Given this pattern of results, it is not surprising to find eating disorders are one of the biggest health problems faced by female athletes. Based on the present results, one might surmise that the number of obsessive-compulsive tendencies would be exceptionally high in this group; this relationship is an area deserving further research attention.

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