

Eating Disorders Among High Performance Athletes

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The purpose of this study was to examine whether athletes in certain sports display a higher tendency toward eating disorders than athletes in other sports. The Eating Attitudes Test (EAT) was administered to 191 athletes (104 females, 87 males). The athletes were classified into three groups (i.e., sport classes) according to type of sport. Overall, 10.6% of the female athletes and 4.6% of the male athletes scored over 30 in the EAT, placing them in the "anorexic" range. The prevalence of the results for the female athletes is comparable to other research on college university populations, while male athletes appeared to have a higher tendency toward eating disorders than the general population. Significant differences between sport classes were found for only among the female athletes' groups. Activities that emphasize leanness and athletes in weight-matched activities were related to higher EAT scores than in nonweight-restricting activities. The study indicates that different groups of athletes may be at different risks for developing eating disorders.

INTRODUCTION

Two of the most common types of eating disorders are anorexia nervosa and bulimia. Anorexia nervosa is usually characterized by self-induced weight loss of at least 25% of original body weight through ex-

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cessive dieting and/or exercise, refusal to maintain a body weight over a minimal normal weight for age and height, amenorrhea (in females), a morbid fear of becoming obese, and a disturbance of body image. Bulimia is characterized by episodic binge eating, fear of not being able to control amounts eaten, episodes of overeating followed by self-induced vomiting or purging or both, and similar to anorexics, bulimics have a morbid fear of becoming obese (*Diagnostic and Statistical Manual of Mental Disorders [DSM-III]*—American Psychiatric Association, 1980; Russell, 1979). Sufferers of eating disorders find themselves caught in a paradoxical situation where they attempt to improve themselves through dysfunctional and self-destructive behavior, the consequences of which can be life-threatening.

Recent research indicates that dancers, models, and athletes are among those possibly at high-risk for developing eating disorders. Within these “high-risk” populations, certain subgroups may be more vulnerable than their counterparts. Factors such as high level of competition and leanness being linked to success have been cited as possible predisposing factors for developing eating disorders (Borgen and Corbin, 1987; Garner and Garfinkel, 1980).

Many experts feel the world of high performance sports is a likely arena for the development of eating disorders. Studies have shown a positive correlation between amount of exercise and subjects displaying tendencies toward eating disorders (Crisp *et al.*, 1980; Epling and Pierce, 1984; Richert and Hummers, 1986). Athletes share many characteristics that have been found in anorexia patients. McSherry (cited in Slavin, 1987) noted that athletes and anorexics share such features as dietary faddism, controlled calorie consumption, specific carbohydrate avoidance, low body weight, resting bradycardia and hypotension, increased physical activity, and amenorrhea.

Leichner (1986) draws a parallel between athletes and individuals with eating disorders on such traits as high self-expectations, rigid and obsessional approach to reaching goals, perfectionistic, and high emphasis on emotional control. Other factors include the propensity to self-deprivation and isolation (Moriarty and Moriarty, 1986), and the intense pressure to be slim and perform (Garner and Garfinkel, 1980).

This demand for optimal leanness for better athletic performance and the unrealistic cultural expectations to be thin combine to create strong pressures on many young athletes to reject and minimize body fatness. This negative attitude toward fatness is perpetuated by reinforcement commonly received from coaches, teammates, and parents. Athletes are often introduced to pathogenic methods of weight control such as purging and self-induced vomiting by well-meaning but unknowledgeable teammates and

coaches (Combs, 1982; Henry, 1982; Rosen *et al.*, 1986; Smith, 1980; Zucker *et al.*, 1985).

There is research that argues against the existence of a higher incidence of eating disorders or anorexic-like psychopathology among athletes as compared to the general population (Blumenthal *et al.*, 1984; Lindboe and Slettebo, 1984). The argument stems from a perceived difference in motivation for slimness; athletes are thought to exercise to lose weight in order to improve their performance while anorexics exercise to burn calories and become thin. Another difference thought to exist is that athletes do not have a morbid fear of being fat, which is characteristic of anorexics (Leichner, 1986).

Overall, the research in the area of eating disorders and sports is just leaving the anecdotal stage. Many experts are divided as to whether or not athletes are a high-risk group for developing eating disorders. Though much of the research in this area is conflicting, there does appear to be evidence that certain subgroups of athletes have a higher tendency toward eating disorders than others. Athletes participating in activities that emphasize leanness for the sake of better performance and appearance, as in gymnastics, long-distance running, and diving are more prone to develop eating disorders than athletes in nonweight-restricting sports (Borgen and Corbin, 1987; Combs, 1982; Henry, 1982; Rosen *et al.*, 1986; Yates *et al.*, 1983). Experts' opinions are also split on the reasons for eating disorders among athletes. Present views include the following: individuals with a predisposition toward eating disorders are attracted to certain "thin" types of sports (Henry, 1982; Zucker *et al.*, 1985), the demand and expectations of competitive sport precipitates the onset of eating disorders (Borgin and Corbin, 1987; Garner and Garfinkel, 1980; Rosen *et al.*, 1986), or it is a combination of both that causes eating disorders in sports.

The purpose of this study is to examine whether athletes in sports that emphasize leanness differ from athletes in other sports with regard to eating attitudes and disposition toward eating disorders. Much of the research to date has looked at athletes as a group without differentiating properly between different subgroups of athletes (Burckes-Miller and Black, 1988; Smith, 1980; Zucker *et al.*, 1985). Studies that have examined certain subgroups of athletes are still remiss in that they do not discriminate between athletes who experience an implicit demand to be lean and athletes who experience an explicit demand to be a specific weight, not for appearance sake but in order to be able to compete at a specific weight category. As well as looking at athletes in sports that emphasize leanness, the current study also looks at athletes in sports that require specific weight requirements to be met before being allowed to compete.

METHOD

Sample

The study was conducted on a population of postsecondary level athletes participating in the sports of gymnastics, diving, lightweight rowing, judo, volleyball, and heavyweight rowing. The athletes were grouped according to the type of sport they participate in (female and male athletes were treated as independent samples):

1. activities that emphasize leanness (gymnastics and diving),
2. activities that require athletes to weigh in before competition (lightweight rowing and judo), and
3. activities that do not require weight restrictions or emphasize leanness (volleyball and heavyweight rowing).

All universities and colleges, as well as various sports clubs, across Canada that had athletes competing in the designated sports and appeared to meet the outlined criteria were sent surveys.

As a result, samples were mainly drawn from 14 universities and approximately 12 clubs throughout Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. Only "high-performance" college and university athletes were to be included in the study. "High performance" is defined as athletes that train a minimum of 11 hours per week and have competed at provincial, national, and/or international levels. The total available population was less than 700 participants.

The athletes were categorized into three groups: (1) WM, those whose activities require athletes to weigh in before competition (lightweight rowing and judo), $N = 54$ (32 females, 22 males); (2) L, those whose activities emphasize leanness (gymnastics and diving), $N = 46$ (26 females, 20 males), and (3) NW, those whose activities do not emphasize leanness (volleyball and heavyweight rowing, $N = 91$ (46 females, 45 males).

Activities emphasizing leanness were defined as those in which appearance is considered highly important to success. Activities not emphasizing leanness were those in which appearance is deemed less essential to success (Borgen and Corbin, 1987).

Instruments

A packet consisting of a demographic questionnaire and the Eating Attitudes Test (EAT) was given to each participant in the study.

The demographic questionnaire was created to obtain information regarding the athlete's sex, club affiliation, age, occupation, sport, hours of training per week, and years and level of experience in their respective sports. The EAT is a 40-item self-report measure used to screen for actual or incipient cases of anorexia nervosa in populations at high risk for the disorder. It has been used frequently in the research of eating disorders and has been reported as valuable in the identification of symptomatic behaviors and attitudes found in anorexia nervosa (Garner and Garfinkel, 1979; Pumariega and LaBarbera, 1986).

Garner *et al.*, (1982) performed a factor analysis on the 40 items on the EAT for a sample of 160 anorexia nervosa patients. They ended up with three factors that accounted for 40.2% of the total variance. Factor I was labeled "Dieting" and related to items that reflected a pathological avoidance of fattening food and a preoccupation with being thinner. Factor II, called "Bulimia and Food Preoccupation," consisted of items that dealt with thoughts about food as well as bulimia. The third factor, "Oral Control," loaded on items that demonstrated self-control surrounding eating and perceived social pressure to gain weight. The authors suggest that the results from this factor analysis of the EAT should be viewed with caution since it is preferred that the number of subjects be 10 times the number of items included in the analysis when performing this kind of analysis. However, the authors feel that it is indicated that the EAT may be divided into three distinct factors or subscales.

Data Collection

Initial solicitation of participation was done through a letter of introduction to the athletic directors and coaches of the various universities and sport clubs in February of 1989. The athletes were informed by their coach or trainer that the researcher was looking at the eating attitudes of athletes in a number of different sports. The option of not participating was made available to all the athletes. The participants were ensured confidentiality and anonymity as no identification other than their age, sex, sport, and team affiliation were required.

The athletes were requested to complete and return the questionnaires to their coaches, sealed in the brown envelope provided. The coaches were then responsible for mailing the completed and unused questionnaires back to the researcher. In a number of cases the researcher personally collected the questionnaires directly from coaches and athletes. At the end of the data collection process, 277 completed questionnaires were returned from the 693 sent out, giving a return rate of 40%. Of the 277 returns, 86

were eliminated from the study sample since they did not meet the criteria of being high-performance college or university athletes, or were incomplete. This left 191 athletes (104 female, 87 males) in the final study sample. Table I shows the distribution of the sample by sport and gender.

RESULTS

A one-way analysis of variance ($p < .05$) was done to check for differences between female and male athletes. Significant differences were found ($F = 16.13, p = .0001$), therefore the data on the male and female athletes were looked at independently. For each of the three groups (i.e., WM, L, and NW) a t test, ($p < .05$), was performed to check for differences between the two sports. Significant within-group differences occurred in the female nonweight-restricted (NW) group ($T = 2.34, df = 44, p = .024$). As a result, the female sample was collapsed into four groups instead of three. A one-way analysis of variance was implemented whereby athletes in each group were compared with athletes in each of the other groups. This was done for both males and females independently. A Tukey test was employed to determine which groups differed significantly from each other and to what extent.

There were 15 athletes (7.9%) in the total sample who had EAT scores within the "anorexic range" as determined by the 30 point cutoff: 11 females (10.6% of the female sample) and 4 males (4.6% of the male sample). Table II shows the number of athletes scoring 30 or above in each sport. The mean EAT scores for both females and males for each sport are presented in detail in Table III.

Female Athletes

The female sample was collapsed into four groups; weight matched (WM; lightweight rowing and judo), $n = 32$; leanness (L; gymnastics and diving), $n = 26$; nonweight-restricted 1 (NW1; volleyball), $n = 28$; and nonweight-restricted 2 (NW2; heavyweight rowing), $n = 18$. A one-way analysis of variance was then run on these four groups. Significant differences between groups were revealed ($F = 4.479, p = .0054$). Athletes participating in lightweight rowing, judo, diving, and gymnastics (the weight-matched and leanness sport classes) had significantly higher mean EAT scores than the volleyball athletes (nonweight restricted sport class).

Table I. Study Sample by Sport and Gender

Sport	Gender		
	<i>n</i>	Female	Male
Lightweight rowing	35	22	13
Judo	19	10	9
Gymnastics	28	17	11
Diving	18	9	9
Volleyball	50	28	22
Heavyweight rowing	41	18	23
Total	191	104	87

Table II. Athletes with EAT Scores >30 by Sport and Gender

Sport	Gender			
	<i>n</i>		Female %	Male %
Lightweight rowing	3	2	(9.1)	1 (7.7)
Judo	2	1	(10.0)	1 (11.1)
Gymnastics	3	3	(17.6)	0 (0)
Diving	2	2	(22.2)	0 (0)
Volleyball	2	1	(3.6)	1 (4.5)
Heavyweight rowing	3	2	(11.1)	1 (4.3)
Total	15	11	(10.6)	4 (4.6)

Male Athletes

No significant differences were found between sports within each sport class; therefore the data were collapsed across sports resulting in the following three sport classes: WM (lightweight rowing and judo), $n = 22$; L (diving and gymnastics), $n = 20$; and NW (heavyweight rowing and volleyball), $n = 45$. Comparing the variables of mean EAT score and sport class, a one-way analysis of variance revealed no significant differences between any of these three groups.

EAT Subscales

A one-way analysis of variance was run on the sport classes and the Diet subscale scores. There were no significant differences found between the sport classes for either the men or the women, however, differences

Table III. Mean EAT Scores by Sport and Gender

Sport	Gender	
	Female	Male
Lightweight rowing		
<i>M</i>	21.46	13.62
<i>SD</i>	10.98	9.88
Judo		
<i>M</i>	17.50	14.33
<i>SD</i>	9.16	1.86
Gymnastics		
<i>M</i>	17.59	10.73
<i>SD</i>	10.21	5.26
Diving		
<i>M</i>	19.89	8.11
<i>SD</i>	13.61	4.89
Volleyball		
<i>M</i>	11.29	10.09
<i>SD</i>	8.75	7.02
Heavyweight rowing		
<i>M</i>	17.17	11.65
<i>SD</i>	7.63	8.75
Total		
<i>M</i>	16.83	11.35
<i>SD</i>	10.30	8.19

between the women's sport classes did approach significance ($F = 2.622$, $p = .0548$). This is attributed to the (i.e., gymnastics and diving) sport class having, on the average, higher scores on the Diet subscale than the NW1 sport class (i.e., volleyball).

On the Bulimia subscale, a one-way analysis of variance, comparing mean subscale scores and different sport classes, revealed no significant differences for the male athletes. However, significant differences were found for the female athletes on these variables ($F = 4.1461$, $p = .0081$); therefore a Tukey ($p = .05$) was performed identifying the WM sport class (i.e., judo and lightweight rowing) as having a significantly higher mean Bulimia subscale score than the NW1 sport class (volleyball).

Competitiveness of Setting

None of the athletes that competed solely at a provincial level scored within the anorexic range. The only athletes that scored 30 or more on the

EAT were engaged in a national and/or international level of competition. This trend was apparent for both the male and female athletes.

DISCUSSION

The use of self-reporting, investigative techniques is limiting in that they are subject to socially desirable responses and incongruencies between reported and actual behavior. However, if inaccuracies exist in the study they would likely be in the direction of an underreporting rather than an overreporting of pathogenic eating behaviors.

Unfortunate timing may account for a limitation of the study. The questionnaires were distributed in March when many varsity teams who had not made it to the Canadian Interuniversity Athletic Union Championships were disbanding for the year, making access to the athletes more difficult. Overall, given that data collection involving mailed questionnaires is known for low return rates, a 40% return is considered to be an acceptable return rate (Lehman and Mehrens, 1979).

Although it is felt the data obtained in this study is an adequate representation of the existing population, it is acknowledged that the implications drawn from this study should only be a starting point from which larger scale and more extensive studies could be based.

Overall, 10.6% of the female athletes and 4.6% of the male athletes scored over 30 on the EAT, placing them in the anorexic range. The prevalence of the results for the female athletes is comparable to what has been reported in other studies on general college and university populations (Button and Whitehouse, 1981; Garner and Garfinkel, 1979; Garner *et al.*, 1982). The prevalence of disturbed eating patterns for the male athletes, on the other hand, was higher than that reported for the general and college population (Button and Whitehouse, 1981; Garner and Garfinkel, 1979).

Significant differences between sport classes were found for some of the female athletes groups. Athletes participating in activities that emphasize leanness (gymnastics and diving) and athletes in weight matched activities (lightweight rowing and judo) had higher EAT scores than athletes in nonweight-restricting activities (volleyball). The highest percentage of female athletes scoring >30 are from sports that emphasize leanness (gymnastics 17.6%, diving 22.2%), while male athletes in weight-matched sports, such as lightweight rowing and judo, have the highest percentages of male athletes scoring in this anorexic range (7.7% and 11.1% respectively). This data support other researchers' contention that, as a group, athletes are not at higher risk for eating disorders than the general population; however,

there is evidence that certain subgroups of athletes may be at greater risk than others.

That only athletes competing at a national and/or international level score greater or equal to 30 on the EAT provides support for a link between achievement pressures and/or expectations and a tendency toward the expression of eating disorders. Past research indicate that it is not the competitive environment alone that appears to contribute to greater eating difficulties but its combination with the pressure to be slim (Garner and Garfinkel, 1980; Henry, 1982).

However, these data reveal that female athletes in activities that require certain weight requirements, but not necessarily a slim physique, also have significantly more preoccupation with food and weight than female athletes in nonweight restricting sports. This may support a more direct link to the intrinsic pressures created by a sport itself rather than reflecting possible sociocultural demands and expectations in terms of appearances or the attraction of certain predisposed individuals to "thin" sports.

Differences between subgroups of athletes are also indicated when looking at the factor derived subscales of EAT (specifically, Factor I, Dieting, and Factor II, Bulimia). Female athletes in the leanness sport class demonstrate a greater abnormal avoidance of fattening food and shape preoccupation (Diet subscale) than athletes in nonweight-restricted sports such as volleyball. This is consistent with the demands of sports such as gymnastics and diving, which associate an aesthetically pleasing (i.e., thin) physique with performance success. Female judo athletes and lightweight rowers are less concerned with shape than divers and gymnasts, but have significantly more preoccupation with food in general as well as symptoms indicative of bulimia than female athletes in nonweight restricted sports (Bulimia subscale). This is also consistent with the demands of a weight-matched sport where the emphasis is not on body shape and size, but rather on being below a certain competitive weight. These athletes do not focus on how they look but on what the weigh-in scale says. It is understandable how in an effort to manipulate and control the scales these athletes may become vulnerable to the binge/purge cycle that is characteristic of bulimia.

Although, on average, the leanness and weight-matched athletes are within the normal ranges on these subscales, it is important to recognize the trends that exist. The different focus and eating attitudes of athletes from different sports appear to correlate with the characteristics associated with the type of sport an athlete is involved in. This again may be evidence of the influence various sports may have on their athletes as suggested by Guthrie's 1986 study, which revealed that the majority of eating-disordered athletes attributed the onset and/or development of their eating pathology to their athletic participation. However, no causal link can be determined

at this point and caution must be used with these speculations as research on these subscales is basically in the preliminary stages.

Given previous research on women with eating disorders that focuses on personality characteristics related to perfectionism and high achievement expectations (Bruch, 1973, 1981; Crisp *et al.*, 1980; Muuss, 1985; Pumariega and LaBarbera, 1986), the question remains, "To what degree are personal and contextual variables involved in eating disorders in high-performance athletes?"

REFERENCES

- American Psychiatric Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.). Author, Washington, DC.
- Blumental, J. A., O'Toole, L. C., Chang, J. L. (1984). Is running an analogue of anorexia? An empirical study of obligatory running and anorexia nervosa. *JAMA* 252: 520-523.
- Borgen, J. S., and Corbin, C. B. P. (1987). Eating disorders among female athletes. *Psychol. Today* 15: 89-95.
- Bruch, H. (1973). *Eating Disorders: Obesity, Anorexia Nervosa and the Person Within*. Basic Books, New York.
- Bruch, H. (1981). Developmental considerations of anorexia nervosa and obesity. *Can. J. Psychiat.* 26: 212-217.
- Burckes-Miller, M. E., and Black, D. R. (1988). Male and female college athletes: prevalence of anorexia nervosa and bulimia nervosa. *Athletic Train.* 23: 137-140.
- Button, E. J., and Whitehouse, A. (1981). Subclinical anorexia nervosa. *Psychol. Med.* 11: 509-516.
- Combs, M. R. (1982). By food possessed. *Women's Sports* 4: 12-17.
- Crisp, A. H., Hsu, L. K. G., Harding, B., and Hartshorn, J. (1980). Clinical features of anorexia nervosa: A study of a consecutive series of 102 female patients. *J. Psychosom. Res.* 24: 179-191.
- Epling, W. F., and Pierce, W. D. (1984). Activity based anorexia in rats as a function of opportunity to run on an activity wheel. *Nutrit. Behav.* 2: 37-49.
- Garner, D. M., and Garfinkel, P. E. (1979). The eating attitudes test: An index of the symptoms of anorexia nervosa. *Psychol. Med.* 9: 273-279.
- Garner, D. M., and Garfinkel, P. E. (1980). Sociocultural factors in the development of anorexia nervosa. *Psychol. Med.* 10: 647-656.
- Garner, D. M., Olmsted, M. P., Bohr, Y., and Garfinkel, P. E. (1982). The eating attitudes test: Psychometric features and clinical correlates. *Psychol. Med.* 12: 871-878.
- Guthrie, S. R. (1986, Fall). Eating disorders among intercollegiate athletes. *Delta Psi Kappa Foil*, pp. 10-12.
- Henry, S., Jr. (1982, March). The price of perfection. Why some young women runners fall victim to anorexia nervosa. *Runner*, 35-39.
- Lehman, I. J., and Mehrens, W. A. (eds.). (1979). *Educational Research Readings in Focus* (2nd ed.). Holt, Rinehart, and Winston, New York.
- Leichner, P. (1986, March/April). Anorexia nervosa, bulimia and exercise. *Coach. Rev.* pp. 66-68.
- Lindboe, C. F., and Sletteboe, M. (1984). Are young female gymnasts malnourished? *Eur. J. Appl. Physiol.* 52: 457-462.
- Moriarty, D., and Moriarty, M. (1986, July/August). Sport/fitness programs and sociocultural influences in eating disorders. *CAHPER J.* pp. 4-9.
- Muuss, R. E. (1985, Fall). Adolescent eating disorder: Anorexia nervosa. *Adolescence* 20: 525-536.

- Pumariega, A. J., and LaBarbera, J. D. (1986). Eating attitudes and personality variables in a nonclinical sample. *Int. J. Eat. Disord.* 5: 285-294.
- Richert, A. J., and Hummers, J. (1986). Patterns of physical activity in college students at possible risk for eating disorder. *Int. J. Eat. Disord.* 5: 79-86.
- Rosen, L. W., McKeag, D. B., Hough, D. O., and Curley, V. (1986). Pathogenic weight control behavior in female athletes. *Physic. Sports Med.* 15: 79-86.
- Russell, G. F. M. (1979). Bulimia nervosa: An ominous variant of anorexia nervosa. *Psychol. Med.* 9: 429-448.
- Slavin, J. L. (1987, March). Eating disorders in athletes. *JOPERD*, 33-36.
- Smith, N. J. (1980). Excessive weight loss and food aversion in athletes simulating anorexia nervosa. *Pediatrics* 66: 139-142.
- Wheeler, G. D., Wall, S. R., Belcasto, A. N., Conger, P., and Cumming, D. C. (1986). Are anorexic tendencies prevalent in the habitual runner? *Br. J. Sports Med.* 20: 22-81.
- Yates, A., Leehey, K., and Shisslak, C. M. (1983). Running an analogue of anorexia? *NEngl. J. Med.* 308: 251-255.
- Zucker, P., Avenier, J., Boyder, S., et al. (1985, November). Eating disorders in young athletes. *Physic. Sports Med.* 13: 88-106.