Journal of Athletic Training 2014;49(3):406–410
doi: 10.4085/1062-6050-49.2.16

www.natajournals.org

Susceptibility to Eating Disorders Among Collegiate Female Student–Athletes

Cherilyn N. McLester, PhD*; Robin Hardin, PhD†; Stephanie Hoppe, MS‡

*Department of Exercise Science and Sport Management, Kennesaw State University, GA; †Department of Kinesiology, Recreation, and Sport Studies, University of Tennessee, Knoxville; ‡Columbia Gorge Community College, The Dalles, OR

Context: Research has suggested that the prevalence of young women with eating disorders (EDs) is increasing, but determining the exact prevalence of EDs within the female student–athlete (FS-A) population is difficult. Looking at certain traits may help us to identify their level of susceptibility to developing an ED.

Objective: To determine the susceptibility of FS-As to EDs in relation to self-concept, including self-esteem and body image.

Design: Cross-sectional study.

Setting: Athletic training and health centers at National Collegiate Athletic Association Division I, II, and III institutions via e-mail questionnaire correspondence.

Patients or Other Participants: A total of 439 FS-As from 17 participating institutions completed the questionnaires. The sample was primarily white (83.1%) and underclass (61.8%).

Main Outcome Measure(s): The questionnaire consisted of 4 parts: 3 subscales of the Eating Disorder Inventory-2, the Rosenberg Self-Esteem Scale, the Body Cathexis Scale, and demographic items.

Results: A total of 6.8% of FS-As were susceptible to anorexia and 1.8% were susceptible to bulimia. The majority of FS-As (61%) reported normal self-esteem levels, whereas 29.4% had high self-esteem. Overall, 64.5% were satisfied and 23% were very satisfied with their body image.

Conclusions: These results are generally positive in that they suggest FS-As have high levels of self-concept and are at low risk to develop EDs. However, these findings do not mean that all concerns should be dismissed. Although more than 90% of the respondents were not susceptible to an ED, there are still FS-As who may be. Athletic departments should evaluate their FS-As' levels of self-concept so that their susceptibility to EDs can be addressed. The emotional aspect of health care should be included in providing holistic care for student–athletes. Athletic trainers often are the primary health care providers for FS-As, so they should be made aware of this concern.

Key Words: anorexia, bulimia, self-esteem, body image

Key Points

- This sample of collegiate female student-athletes demonstrated high levels of self-concept and a low risk of developing an eating disorder.
- Despite these encouraging findings, health care professionals and athletic departments must remain vigilant in identifying student–athletes who may be at risk for an eating disorder.

Preventing eating disorders in collegiate female athletes is an ongoing concern for coaches, athletic trainers, and others involved in the care of these individuals.[1–3] Determining the exact prevalence of eating disorders and disordered eating behaviors is difficult because those affected may not report the behavior or not seek treatment, thus making occurrence estimates somewhat unreliable.[4] Researchers[5–9] have been studying the nature and scope of eating-related problems among female athletes for many years, and identifying at-risk athletes remains a challenge. Interestingly, results are mixed as to which female athletes are more susceptible to eating disorders and disordered eating behaviors and whether athletes are at a higher risk compared with females in the general population.[7,10–13] Estimates of these behaviors may differ widely because of factors such as sample size, competition level of athletes, type of sport, and social and cultural norms that may vary geographically. Therefore, the prevalence of eating disorders among various groups remains unclear. However, investigators[7,10,14] have consistently shown that certain groups—college-aged people, females, and athletes—may be at higher risk for developing an eating disorder than the general population.

A previous author[15] suggested that the prevalence of young women with eating disorders was increasing, with 4% to 22% of college-age females engaged in disordered eating behaviors. Recent findings[16] support the trend toward an increase in these behaviors in college-age females, with a significant increase over a 13-year period. Although the exact prevalence of female athletes with eating disorders or behaviors associated with eating disorders remains unclear,[8,9] prevalence may differ by competition level[5]; however, National Collegiate Athletic Association Division I, II, and III female athletes have not been directly compared. In addition, few authors have examined the specific relationship between body satisfaction and self-esteem in collegiate female student–athletes.

Eating disorders are serious illnesses and can lead to other illnesses. Therefore, the professionals involved in the overall care of these individuals must understand the relationship between athletes and eating disorders.[1–3] Individuals may have personality and psychological characteristics, such as their self-concept and satisfaction with their body and appearance, which affect their susceptibility to eating disorders.[17] *Body image*, defined as the degree of satisfaction and dissatisfaction with the various parts or processes of the body,[18] is just one of the variables used to assess physical self-perception and is related to overall self-esteem. Body dissatisfaction is also related to gender, with women routinely reporting less satisfaction with their bodies than men.[19] Even though body dissatisfaction concerns have been linked to female athletes, some female nonathletes have similar or higher levels of body dissatisfaction than female athletes, which suggests that negative body image can be found among various female populations.[7,10,11]

For coaches and athletic trainers who work specifically with female athletes, identifying those who are at risk for developing a clinical eating disorder is an important step in preventing disordered eating.[1] The high demands of collegiate athletics, in addition to the perceived difficulties of a collegiate lifestyle, may put collegiate athletes at further risk for developing an eating disorder. Quatromoni[4] suggested that strong competitive pressures, a lack of financial resources, and underdeveloped life skills may lead to eating disorders among collegiate athletes. However, the climate of women's athletics continues to change: with more resources and exposure come higher expectations, which may increase the number of female athletes at risk for disordered eating.[1] It is important to determine which athletes are more susceptible to eating disorders in order to develop appropriate educational and counseling programs for them. Examining the relationship between self-esteem and body image and competing at the Division I, II, or III level will expand on the existing knowledge associated with high-risk populations for eating disorders and the etiology of eating disorders. Therefore, the purpose of our study was to examine the relationship among susceptibility to eating disorders, self-esteem, and body image in collegiate female athletes and to compare Division I, II, and III female athletes to determine if competition level is a contributing factor in susceptibility to eating disorders, level of self-esteem, and satisfaction with body image.

METHODS

For this study, we modeled the methods that Johnson et al[5] used to assess disordered eating in male and female Division I athletes. Upon receiving institutional review board approval, we e-mailed health professionals, such as athletic trainers and nutritionists, at Division I, II, and III institutions to explain the purpose of the study and to request participation. Once an institution agreed to participate in the study and a contact person was identified, we sent an e-mail that was forwarded to the female student–athletes at the institution. The e-mail explained the purpose of the research and contained a hyperlink to the questionnaire. At no time did we have access to the participants' e-mail addresses or identities. Seventeen institutions agreed to participate in the study: 5 in Division I and 6 each in Divisions II and III. There were 439 valid responses.

We used a questionnaire that assessed demographics, nature and extent of athletic involvement, eating-related behaviors, and attitudes toward body image and self-esteem. The questionnaire was administered online and comprised 4 parts: (1) 3 subscales of the Eating Disorder Inventory-2 (EDI-2), (2) Rosenberg Self-Esteem Scale, (3) Body Cathexis Scale, and (4) demographic items.

Eating Disorder Inventory-2

The EDI-2 is used to assess many behavioral and psychological traits common in people with anorexia nervosa or bulimia nervosa.[20] To look at an athlete's susceptibility to developing an eating disorder, we used 3 subscales of the EDI-2: Drive for Thinness, Body Dissatisfaction, and Bulimia. Our goal in using the EDI-2 was to specifically look at the susceptibility of student–athletes to eating disorders and not to determine the prevalence of eating disorders among athletes. The EDI-2 does not diagnose eating disorders. Instead, it is a screening tool to assess symptoms associated with anorexia and bulimia and to identify problematic eating behavior. An eating disorder requires a medical diagnosis.

The portion of this investigation derived from the EDI-2 consisted of 7 questions for each subscale that could be answered with *always*, *very often*, *often*, *sometimes*, *rarely*, or *never*. The responses were graded as follows: always = 3; very often = 2; often = 1; and sometimes, rarely, or never = 0. All items for each individual subscale were summed.

Respondents were identified as at risk for susceptibility to developing eating disorders if they scored at elevated levels on any of the subscales. Respondents were at risk for susceptibility to anorexia if they scored 10 points or more on the Drive for Thinness subscale or 12 points or more on the Body Dissatisfaction subscale. Similarly, respondents were susceptible to bulimia if they scored 10 points or more on the Drive for Thinness subscale or 12 or more points on the Bulimia subscale.[5]

Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale is one of the most widely used measures of self-esteem in social science research.[21] *Self-esteem* is a positive or negative orientation toward oneself and the overall evaluation of one's worth or value. Self-esteem, along with self-efficacy and self-identities, comprise the *self-concept*, which is how a person's thoughts and feelings relate to himself or herself as an object.[21]

The Rosenberg Self-Esteem Scale consists of 10 items that are answered on a 4-point Likert scale. For items 1, 3, 4, 7, and 10, *strongly agree* = 3, *agree* = 2, *disagree* = 1, and *strongly disagree* = 0. For items 2, 5, 6, 8, and 9, *strongly agree* = 0, *agree* = 1, *disagree* = 2, and *strongly disagree* = 3. The total possible score ranges from 0 to 30. Each participant's responses are summed across all 10 questions.[22,23] Scores between 15 and 25 are within the normal range. Scores below 15 suggest low self-esteem, and scores above 25 suggest high self-esteem.

Body Cathexis Scale

The Body Cathexis Scale examines how people view their bodies.[18] Body cathexis is closely related to body image but specifically focuses on body satisfaction. *Body*

satisfaction is the evaluative dimension of body image and is defined as positive and negative feelings toward one's body.[18] The Body Cathexis Scale measures the degree of satisfaction with several body parts and features, including facial features, complexion, hair, hips, thighs, buttocks, waist, stomach, bust, shoulders, arms, muscle tone, weight, height, and overall appearance. Participants respond on a scale for each body part and feature listed with 5 possible responses: *strong feelings and wish change could somehow be made* (1 point), *don't like, but can put up with* (2 points), *have no particular feelings one way or the other* (3 points), *am satisfied* (4 points), or *consider myself fortunate* (5 points).

The responses for *am satisfied* and *consider myself fortunate* were combined to determine satisfaction, and the responses for *don't like, but can put up with* and *have strong feelings and wish change could somehow be made* were combined to determine dissatisfaction.[24] The average Body Cathexis score was calculated by summing the answers for the 46 items and dividing the sum by 46, resulting in a number between 1 and 5.

Demographic Information

This instrument was used to identify each participant's age, year of athletic eligibility, ethnicity, collegiate division level, sport, and scholarship category, with additional questions about eating-disorder prevention and treatment resources available through the athletic department.

RESULTS

A total of 439 female student–athletes participated, representing 17 institutions. The institutions were categorized by division level (Division I = 5, Division II = 6, Division III = 6) and geographic region as defined by the US Census Bureau (Northeast = 2, Midwest = 6, South = 6, West = 3).

Respondent Profile

The sample was primarily underclass students (61.8%) who were white (83.1%) and were on either partial or no scholarship (84.3%; Table 1). Division I respondents accounted for 38.5%, Division II for 24.1%, and Division III for 37.4%. Ethnicity percentages were closely aligned with recent data from the National Collegiate Athletic Association: the overall percentage for white female student–athletes in 2009–2010 was 77.2%.[25] Respondents by competition level were also consistent with the overall participation rate. More than 186 460 females competed in the National Collegiate Athletic Association in 2009–2010, with 41.3% being from Division I, 20.6% from Division II, and 38.1% from Division III.[26] Of the total respondents, 42.6% did not receive a scholarship, 41.7% received a partial scholarship, and 15.7% received a full scholarship. Approximately 25% of the respondents said that their athletic departments offered eating-disorder prevention classes; however, only 3.9% of respondents said their athletic departments required them to take these classes. A total of 67.9% of respondents said their athletic departments offered eating-disorder treatment resources for their athletes.

Table 1. Respondent Profile

Characteristic	No. (%)
Athletic eligibility	
Freshman	153 (34.9)
Sophomore	118 (26.9)
Junior	87 (19.8)
Senior	81 (18.5)
Ethnicity	
African American	23 (5.2)
Multiethnicity	14 (3.2)
White	365 (83.1)
Other	37 (8.4)
National Collegiate Athletic Association division	
I	169 (38.5)
II	106 (24.1)
III	164 (37.4)
Scholarship category	
Full	69 (15.7)
Partial	183 (41.7)
None	187 (42.6)

Attitudinal Profile

The attitudinal profile of the respondents was generally positive (Table 2). Only 6.8% were susceptible to anorexia and only 1.8% were susceptible to bulimia. Body satisfaction was high, with 87.5% being satisfied or very satisfied with their body. Approximately 9.6% of the sample had low self-esteem.

Competition Level

We conducted χ^2 tests to determine if differences in the 4 attitudinal variables existed among divisions. No differences were evident (Table 3).

DISCUSSION

The purposes of our study were to examine the relationship among susceptibility to developing an eating disorder, self-esteem, and body image in female student–athletes and to determine if competition level was a factor. Most student–athletes at all competition levels fell within

Table 2. Attitudinal Profile

Factor	No. (%)
Susceptible to anorexia?	
Yes	30 (6.8)
No	409 (93.2)
Susceptible to bulimia?	
Yes	8 (1.8)
No	431 (98.2)
Body image satisfaction	
Very dissatisfied	1 (0.2)
Dissatisfied	54 (12.3)
Satisfied	283 (64.5)
Very satisfied	101 (23.0)
Self-esteem level	
Low	42 (9.6)
Normal	268 (61.0)
High	129 (29.4)

Table 3. Comparisons by Competition Level

Factor	χ^2	Degrees of Freedom	*P* Value ≤
Susceptible to anorexia	0.344	2	.842
Susceptible to bulimia	0.005	2	.998
Body image satisfaction	4.812	6	.568
Self-esteem level	6.864	4	.144

the normal to high range for self-esteem level and defined themselves as satisfied with their body image. These findings are consistent with other research[7,17] that showed female athletes have high levels of self-esteem. Few female athletes were defined as susceptible to eating disorders, which may be explained by the relationship between body image satisfaction and self-esteem. The low number of female athletes who were susceptible to anorexia or bulimia may reflect the normal to high self-esteem levels and body image satisfaction demonstrated by the majority of respondents. These findings suggest that self-esteem and body image concerns may not be a problem for most female athletes; however, coaches and athletic trainers should be vigilant about identifying athletes who may benefit from extra support. The female athletes in this sample, which represents a variety of sports, competition levels, and geographic regions, were fairly comfortable with their physical selves; more than 90% had normal or high self-esteem and approximately 88% were satisfied or very satisfied with their body.

This sample had a larger percentage of freshman and sophomore respondents than juniors and seniors, which was likely due to data collection occurring in the spring, when seniors in fall and winter sports had already finished their athletic commitments. The small number of responses that indicated low self-esteem and low susceptibility to eating disorders may be due to the younger respondents' not having as much exposure to the pressures of competition. In addition, these athletes may simply not have developed disruptive eating patterns at the time of the inquiry. It is also important to note that those who were susceptible to eating disorders may have chosen to not participate in this study.

Our results were generally positive, with the number of athletes susceptible to eating disorders or low self-esteem (or both) being extremely low. However, even 1 athlete at risk demands recognition of the situation and appropriate follow-up resources to prevent or treat an eating disorder and thus avoid the detrimental health sequelae that may result from such practices. One way to address this ongoing threat is to screen athletes on a regular basis and have programs and resources in place that can be used quickly. For example, the majority of athletes in this sample were not required or given the opportunity to take eating-disorder treatment or prevention classes, but approximately 68% had eating-disorder treatment resources available to them. These programs may include medical, nutritional, and psychological support from a team of experts, along with the general support of coaches, athletic trainers, and teammates. As more of these programs are developed, universities can continue to care for their student-athletes by promoting general self-esteem, a positive body image, and healthful habits and offering strategies for avoiding eating disorders.

Health refers to the complete state of physical, social, and mental well-being and not merely the absence of disease or infirmity.[27] This definition from the World Health Organization has not been modified since its official adoption in 1948. Thus, good health is more than just being injury or disease free but also means having a sense of serenity and emotional well-being. Many times, health is focused solely on the physical aspect. For student–athletes, the most visible providers of health care are athletic trainers and strength and conditioning coaches. Athletic trainers are often on the sidelines during competition, providing medical services to student–athletes, and may be on the field after an injury occurs. The efforts of strength and conditioning coaches can be seen as student–athletes' bodies are transformed from the high school physique to that of an elite athlete participating at a higher level of competition. Student–athletes must invest time and energy in physically developing their bodies to achieve performance excellence.[28] However, health care involves more than just physical care; emotional and spiritual well-being must also be taken into consideration. The symptoms of emotional distress and low self-esteem that may be related to an eating disorder may not be as visible as a sprained ankle, but they are still important aspects of the overall health of female student–athletes.

Female student–athletes face the same emotional issues as other students (depression, anxiety, addiction, and self-doubt), but they also experience concerns about body image.[29] It is important to have trained professionals in place to identify these concerns and provide appropriate counseling and support services.[9] Although few female student-athletes will be diagnosed with a clinical eating disorder, health care professionals who work with them must be properly trained to recognize the signs and symptoms that may lead to an eating disorder.[1] Athletic trainers are a unique group of professionals who have the opportunity to identify such behaviors, but previous research[30] suggests that only 33% believe they can identify a student–athlete with an eating disorder and only 50% believe they can offer effective support. Thus, screening for the susceptibility to develop an eating disorder is vital, so that prevention strategies can be implemented.[1] It is also important to assess susceptibility to eating disorders, which are associated with mood and anxiety disorders, including depression and suicidal thoughts. An eating disorder may be just one of many psychological or emotional concerns a student–athlete may be facing.

To date, few authors have addressed the role of competition level in the susceptibility to eating disorders. Future investigators may want to examine the relationship of specific sports with susceptibility to eating disorders. More research also needs to be performed on eating-disorder prevention programs and treatment resources. It is important to find out about the effectiveness of the programs currently in place and whether that differs at each competition level's schools. It is also important to find out student–athletes' awareness of education and counseling programs and the resources offered by schools at each competition level. We looked specifically at female collegiate athletes, but it is also necessary to study the relationship among self-esteem, body image, and competition level in male collegiate athletes to identify the appropriate prevention programs for these athletes that will

help protect them from developing an eating disorder. This knowledge will help build our awareness of the needs of all athletes, which in turn will help protect the physical and emotional health of this group. Even though we found a low susceptibility to eating disorders among female collegiate athletes, early screening tools, education, and referral networks are critical to safeguarding the health and well-being of student–athletes.

REFERENCES

1. Bonci CM, Bonci LJ, Granger LR, et al. National Athletic Trainers' Association position statement: preventing, detecting, and managing disordered eating in athletes. *J Athl Train*. 2008;43(1):80–108.
2. Sherman R, Thompson R, Dehass D, Wilfert M. NCAA coaches survey: the role of the coach in identifying and managing athletes with disordered eating. *Eat Disord*. 2005;13(5):447–466.
3. Thompson A, Yingling F, Boardley D, Rocks J. Collegiate athletic trainers' knowledge and perceptions of disordered eating behaviors in athletes. *Psychol Rep*. 2007;101(3 pt 2):1173–1178.
4. Quatromoni PA. Clinical observations from nutrition services in college athletics. *J Am Diet Assoc*. 2008;108(4):689–694.
5. Johnson C, Powers PS, Dick R. Athletes and eating disorders: the National Collegiate Athletic Association study. *Int J Eat Disord*. 1999;26(2):179–188.
6. Berry TR, Howe BL. Risk factors for disordered eating in female university athletes. *J Sport Behav*. 2000;23(3):207–218.
7. Reinking MF, Alexander LE. Prevalence of disordered-eating behaviors in undergraduate female collegiate athletes and nonathletes. *J Athl Train*. 2005;40(1):47–51.
8. Beals KA, Manore MM. The prevalence and consequences of subclinical eating disorders in female athletes. *Int J Sport Nutr*. 2002; 4(2):175–195.
9. Greenleaf C, Petrie TA, Carter J, Reel JJ. Female collegiate athletes: prevalence of eating disorders and disordered eating behaviors. *J Am Coll Health*. 2009;57(5):489–495.
10. Holm-Denoma JM, Scaringi V, Gordon KH, Van Orden KA, Joiner TE Jr. Eating disorder symptoms among undergraduate varsity athletes, club athletes, independent exercisers, and nonexercisers. *Int J Eat Disord*. 2009;42(1):47–53.
11. Jankauskiene R, Pajaujiene S. Disordered eating attitudes and body shame among athletes, exercisers and sedentary female college students. *J Sports Med Phys Fitness*. 2012;52(1):92–101.
12. Anderson C, Petrie TA. Prevalence of disordered eating and pathogenic weight control behaviors among NCAA Division I female collegiate gymnasts and swimmers. *Res Q Exerc Sport*. 2012; 83(1):120–124.
13. Torres-McGehee TM, Monsma EV, Gay JL, Minton DM, Mady-Foster AN. Prevalence of eating disorder risk and body image distortion among National Collegiate Athletic Association Division I varsity equestrian athletes. *J Athl Train*. 2011;46(4):431–437.
14. Gibbs JC, Williams NI, Scheid JL, Toombs RJ, De Souza MJ. The association of a high drive for thinness with energy deficiency and severe menstrual disturbances: confirmation in a large population of exercising women. *Int J Sport Nutr Exerc Metab*. 2011;21(4):280–290.
15. Bissell K. Sports model/sports mind: the relationship between entertainment and sports media exposure, sports participation, and body image distortion in Division I female athletes. *Mass Commun Soc*. 2004;7(4):453–473.
16. White S, Reynolds-Malear JB, Cordero E. Disordered eating and the use of unhealthy weight control methods in college students: 1995, 2002, and 2008. *Eat Disord*. 2011;19(4):323–334.
17. Petrie TA, Greenleaf C, Reel J, Carter J. Personality and psychological factors as predictors of disordered eating among female collegiate athletes. *Eat Disord*. 2009;17(4):302–321.
18. Jourard SM, Secord PF. Body-cathexis and the ideal female figure. *J Abnorm Psychol*. 1955;50(2):243–246.
19. Gill D, Kamphoff C. Gender and cultural considerations. In: Williams JM, ed. *Applied Sport Psychology: Personal Growth to Peak Performance*. New York, NY: McGraw-Hill; 2010:417–439.
20. Garner D. *Eating Disorder Inventory-2: Professional Manual*. Odessa, FL: Psychological Assessment Resources Inc; 1991.
21. Rosenberg M. *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton University Press; 1965.
22. Hagborg WJ. The Rosenberg Self-Esteem Scale and Harter's Self-Perception Profile for adolescents: a concurrent validity study. *Psychol Sch*. 1993;30(2):132–136.
23. Shahani C, Dipboye R, Phillips A. Global self-esteem as a correlate of work-related attitudes: a question of dimensionality. *J Pers Assess*. 1990;54(1/2):276–288.
24. Robinson T. *Clothing Behavior, Body Cathexis, and Appearance Management of Women Enrolled in a Commercial Weight Loss Program* [PhD dissertation]. Blacksburg, VA: Clothing and Textiles, Virginia Polytechnic Institute and State University; 2003.
25. Zgonc E. *2008–09 NCAA Student-Athlete Race/Ethnicity Report*. Indianapolis, IN: National Collegiate Athletic Association; 2010.
26. Zgonc E. *NCAA Sports Sponsorship and Participation Rates Report: 1981–82–2009–10*. Indianapolis, IN: National Collegiate Athletic Association; 2010.
27. World Health Organization. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference. Paper presented at: International Health Conference; 1946; New York, NY.
28. Weinberg RS, Gould D. Motivation. In: *Foundations of Sport and Exercise Psychology*. 5th ed. Champaign, IL: Human Kinetics; 2011: 51–76.
29. Keyes CL, Eisenberg D, Perry GS, Dube SR, Kroenke K, Dhingra SS. The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *J Am Coll Health*. 2012;60(2):126–133.
30. Vaughan J, King K, Cottrell R. Collegiate athletic trainers' confidence in helping female athletes with eating disorders. *J Athl Train*. 2004;39(1):71–76.

Address correspondence to Cherilyn N. McLester, PhD, Department of Exercise Science and Sport Management, Kennesaw State University, 1000 Chastain Road, MD 4104, Kennesaw, GA 30144. Address e-mail to cmclest1@kennesaw.edu.