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Comparison of disordered eating symptoms and emotion regulation difficulties between female college athletes and non-athletes

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ABSTRACT

The purpose of the study was to compare the prevalence of disordered eating between female college athletes and non-athletes and explore emotion regulation as a potential mediator of the link between participation in athletics and disordered eating symptoms. Data for this cross-sectional study came from 527 college students in a mid-western state of the USA in fall of 2013 (376 non-athletes and 151 athletes). Disordered eating symptoms and emotion regulation were assessed utilizing the Eating Attitudes Test and the Difficulties with Emotion Regulation Scale in a survey-based format. The prevalence of disordered eating was higher in non-athletes (16.5%, vs. 6.6%; $X^2 = 62.8$; $p < .05$). Non-athletes reported more signs and symptoms of disordered eating than athletes ($p < .01$). A linear regression approach indicated a statistically significant indirect effect (0.63, $CI_{95} = 0.18, 1.20$) of athletic-status on disordered eating via emotion regulation; however, this effect did not reach practical significance. Our findings show that female athletes in our sample were somewhat protected from disordered eating compared to non-athletes, but the mechanism of this relationship is unclear. A further in-depth examination of other factors, such as self-esteem and body satisfaction, that may have contributed to this finding is warranted utilizing a large sample of female college students and athletes representing a variety of sports.

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1. Introduction

Dieting, binge eating and preoccupation with food are examples of pathological eating behaviors and attitudes known as disordered eating (DE) (DePalma et al., 2002; Lowry et al., 2000; Torstveit, Rosenvinge, & Sundgot-Borgen, 2008). DE may in some, but not all, progress into an eating disorder over time (Anderson & Petrie, 2012; Neumark-Sztainer, Wall, Larson, Eisenberg, & Louth, 2011). Clinically diagnosed eating disorders are complex psychiatric conditions (i.e., anorexia and bulimia) that require a multidisciplinary and long-term treatment approach (American Psychiatric Association (APA), 2013). Because of the complex nature of eating disorders, efforts to promote healthy eating behaviors and attitudes are critical to optimize individuals' physical and psychological wellbeing before a clinical eating disorder develops (Ozier & Henry, 2011).

Young females are at a substantially higher risk for eating disturbances compared to males (Fortes, Kakeshita, Almeida, Gomes, & Ferreira, 2014; Martinsen, Brantland-Sandra, Eriksson, & Sundgot-Borgen, 2010; Sira & Pawlak, 2010). Previous studies have reported that between 11% and 56% of females in late adolescence and young adulthood engage in some type of dysregulated eating behaviors (Croll, Neumark-Sztainer, Story, & Ireland, 2002; Hoerr, Bokram, Lugo, Bivins, & Keast, 2002; Sira & Pawlak, 2010). Previous research has suggested several attributes and/or behaviors as DE risk factors, including a family history of eating disorders, low self-esteem, weigh/appearance concerns, certain personality traits (i.e., being a perfectionist or extroverted), negative body image, poor emotional well being, and high stress (Croll et al., 2002; Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Striegel-Moore & Bulik, 2007). The societal emphasis on thinness for females, strongly perpetrated through media, has been identified as an underlying contributor to weight concerns, poor body image and desire to lose weight that are strongly associated with DE behaviors among many girls and women (Bratland-Sanda & Sundgot-Borgen, 2013; Polivy & Herman, 2002). Overall, strong evidence suggests that eating disturbances are multifactorial, with unique interactions between personal, environmental and genetic factors (Ghaderi & Scott, 2001; Striegel-Moore & Bulik, 2007).

Female college students represent a particularly vulnerable population for engaging in unhealthy eating patterns (Fortes et al., 2014; Krahn, Kurth, Gomberg, & Drewnowski, 2005). The period between ages 18 and 21, a typical age of attending college, has been identified as the time of peak onset of clinical eating disorders (Berg, Frazier, & Sherr, 2009). Recent studies indicated that college females report engaging in dysregulated eating frequently and also report using a wide range of pathological behaviors coupled with negative attitudes related

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to either eating or weight (Bratland-Sanda & Sundgot-Borgen, 2013; Fitzsimmons-Craft, Harney, Brownstone, Higgins, & Bardone-Cone, 2012). These trends may be potentially explained by college students facing a variety of stressors as they transition from adolescence to adulthood, such as dealing with college-level academic expectations, creating new work and social relationships and being away from home (Cooley & Toray, 2001; Fitzsimmons-Craft et al., 2012; French & Jeffery, 1994).

Exercise offers multiple benefits to individuals across the age and gender groups, including young females (Costarelli, Demerzi, & Stamou, 2009; Hausenblas & Downs, 2001; Varnes et al., 2013). In addition to improved physical health and fitness, a recent systematic review by Varnes et al. (2013) indicated that girls and women involved in sports had higher body satisfaction and more positive body image than those who did not participate in athletics. The study, however, found that the benefit of being involved in athletics might be reduced in athletes based on their level of competition and/or type of sport (Varnes et al., 2013). In fact, some studies found that female athletes were at a greater risk of DE than general population of females and thus research in this area remains inconclusive (Sundgot-Borgen & Torstveit, 2004; Torstveit & Sundgot-Borgen, 2005). Excessive training, frequent food restriction and extreme dieting are examples of dysregulated behaviors that have been reported by female athletes in previous research (De Bruin, Oudejans, & Bakker, 2007; Monthuy-Blanc, Maiano, & Therme, 2010). Given the common belief within the athletic environment that low body weight and body fat enhance performance, athletes may engage in unhealthy patterns to achieve lower weight or body fat under pressures created by coaches, parents, and/or female athletes themselves (Barrack, Ackerman, & Gibbs, 2013; Holm-Denoma, Scaringi, Gordon, Van Orden, & Joiner, 2009).

In the area of dysregulated eating behaviors, emotion regulation represents an emerging construct (Costarelli et al., 2009; Han & Pistole, 2014). Sim and Zeman (2006) were among the first to publish data identifying emotional status as a potential predictor of DE in a sample of young females. Difficulties with emotion regulation have also been linked to DE, specifically to binge eating, in a study by Whiteside et al. (2007). In a sample of 695 college students (both females and males), those with poor access to emotion regulation strategies and greater difficulty identifying emotional states were more likely to engage in binge-eating behaviors (Whiteside et al., 2007). This association was stronger than the contributions of gender, food restriction and weight/shape concerns to the overall variance in the binge eating behaviors in this sample. A few studies have found similar associations between DE and emotion regulation among men. For instance, Lavender and Anderson (2010) indicated that DE behaviors and body dissatisfaction in college male students were predicted by difficulties with emotion regulation. In their sample, young men with lower ability to accept their emotions and those without adequate emotion regulation strategies, reported greater DE scores. All together, findings of these studies point to the potentially important influence of emotion regulation on DE patterns among young college-age individuals.

Despite the proposed associations between sports participation, emotion regulation, and DE patterns in previous studies, research examining these constructs has been limited in the at-risk population of female college students and none of the studies have assessed emotion regulation of athletes compared to non-athletes (Fortes & Ferreire, 2011; Haase, 2011; Holm-Denoma et al., 2009; Reinking & Alexander, 2005). The main purpose of this study was to examine athletic participation and emotion regulation as potential predictors of DE in a sample of female college students. First, we hypothesized that participation in athletics and greater emotion regulation difficulties will predict greater DE symptoms in our sample of young females. Second, we hypothesized that emotion regulation mediates the link between athletic status (athlete vs. non-athlete) and DE symptoms.

2. Materials and methods

2.1. Participants and recruitment procedures

Data for this study were collected from a sample of female college students in a NCAA Division I university in a mid-western state of the U.S. The university's Institutional Review Board approved the study protocol prior to any data collection. Additionally, official approval was obtained from the head sports physician who was responsible for the medical care of all athletes at the university. Non-athletes (students who were not members of any of the Division I athletic teams at the university) were recruited from six undergraduate classes across campus with the instructors' prior approval. The Primary Investigator (PI) informed interested students about the study during previously scheduled classroom visits. Written informed consents were collected from participants before data collection began. There was no penalty or incentive to participate in the study. The inclusion criteria for non-athletes included: 1) not being a member of an official university women's athletic team; 2) being recreationally active only (i.e., no training for a significant athletic event such as a marathon or half-marathon; and 3) being 18 or older.

Female athletes were recruited through certified and trained athletic trainers working with the individual teams. Participants were informed about the purpose, nature and details of the study by the athletic trainers during a team meeting, without the presence of the coaching staff to minimize potential perceived pressure for athletes to participate in the study. A written informed consent form was obtained from interested participants prior to any data collection. Participants were recruited from all women's athletic teams at the university and included the following sports: soccer, cross-country, track and field, basketball, cheer/pom/dance, equestrian, tennis, golf and softball. The inclusion criteria for this subsample included: 1) being a member of an official university women's athletic team; 2) being 18 or older; and 3) participating in regular team practices and activities at the time of the study (i.e., no recent injuries or illnesses).

2.2. Study procedures and research instruments

The data related to disordered eating behaviors and emotion regulation were collected in a survey format utilizing the Eating Attitudes Test (EAT-26) and the Difficulties in Emotion Regulation Scale (DERS). Participants also answered demographic questions and were asked to self-report their actual weight, height, and desired weight. Additional questions included topics about the participants' menstrual cycle, previous ED diagnosis, family history of ED, and exercise-related questions to determine whether participants met inclusion criteria for the study. The PI and/or athletic trainers provided an envelope containing the survey and participants were given approximately 30 min to complete it. No personal identifiers linking individual participants to their responses were included in the survey. Participants were instructed to place the completed survey in a sealed envelope and return it to the PI or the team athletic trainers. If the PI could not be present during data collection the sealed envelopes were collected by the athletic trainers or instructors and given to the PI within 24 h of data collection.

Disordered eating symptoms were assessed utilizing the EAT-26, which is one of the most commonly used instruments for examining disordered eating symptoms in college-aged populations (Fortes et al., 2014; Shriver, Betts, & Payton, 2009). The EAT-26 contains three subscales and yields a global score and three individual subscale scores: 1) Dieting; 2) Bulimia and Food Preoccupation, and 3) Oral Control (Garner & Garfinkel, 1979). This test contains 4 supplemental behavioral questions that refer to an individual's eating habits in the past 6 months. One of the 4 questions asks if the individual has ever been treated for an eating disorder. EAT-26 is scored using six answer options (0 = never, rarely, or sometimes, 1 = often, 2 = usually, and 3 = always). Item number 26 (i.e., “I enjoy trying new foods.”) was analyzed using reversed

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