



Eating Disorder Behaviors and Psychological Characteristics: A Comparison Between Athletes and Nonathletes in a Partial Hospitalization Program

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Although athletes and nonathletes have been compared across different measures of disordered eating and psychological characteristics, such comparisons are very limited when both groups are seeking higher levels of care. Thus, we compared collegiate athletes ($n = 18$) to a matched group of nonathletes ($n = 18$), all of whom were patients in a partial hospitalization program (PHP) for eating disorders (EDs). At admission, all patients completed the Temperament and Character Inventory (TCI) and Eating Disorder Inventory-3, and comparisons were made across subscales from these measures. Through a series of t -tests, we found that athletes and nonathletes did not differ on the three behavioral subscales from the EDI; however, they did differ significantly on six subscales assessing temperament or psychological characteristics (e.g., harm avoidance, perfectionism). Across all subscales, athletes scored in the healthier direction, with effect sizes being large. Our findings suggest that, although athletes are similar to nonathletes at admission in terms of behavioral ED indicators, they are healthier on a number of other characteristics that may assist them in successfully completing treatment. Future research should evaluate the impact that demographic differences, cultural standards of sport, and athletic and gender identity have on the expression of ED pathology in athletes.

Keywords: assessment, athlete, behavior, eating disorder, sport, temperament.

Due to their generally prolonged duration and severity of symptoms, eating disorders (EDs) can have profound negative effects on individuals' lives, including their physical health and psychological well-being (American Psychiatric Association [APA], 2013). Of all psychiatric disorders, EDs have the second-highest mortality rates (APA, 2013). Further, although not as prevalent as depression or anxiety, EDs occur with some regularity, particularly among young adult women (American Psychiatric Association [APA], 2016). In fact, girls and women represent the majority of patients in residential/ partial residential ED treatment centers (Pedram et al., 2021).

Among young adult women, athletes have been identified as a subpopulation who may be at increased risk for EDs (Petrie, 2020). Indeed, across multiple studies with female collegiate athletes, the prevalence of clinical ED classification can range up to 6% (e.g., Anderson & Petrie, 2011); subclinical classification rates are even higher. The sport environment/culture, and its related expectations and pressures, has been central to understanding athletes' risk for body image concerns and ED symptoms. For example, one study suggests that athletes are at greater risk for EDs and related psychopathology due to the unique stressors of their performance domains, such as pressures to perform, maintain a certain weight, wear revealing uniforms, etc. (Goodwin et al., 2016), whereas another study suggests that the culture and expectations of organized sport may lead athletes to underreport ED symptoms and body image concerns (Fewell et al., 2018). For example, athletes are expected to engage in high-intensity exercise and maintain a high level of dietary control to increase their chances of achieving optimal performance in their sport (Chapa et al., 2018). These behaviors would be considered abnormal and likely associated with an ED diagnosis if engaged in with the same intensity and frequency outside of sport.

The effects of the sport environment/culture may be particularly problematic in relation to athletes being diagnosed and treated for EDs. Athletes often underreport their symptoms if they or their coaches believe that their food restriction and excessive exercise are perceived to be increasing their performance in sport (Fewell et al., 2018; Thompson & Sherman, 2010). Additionally, compulsive exercise and dietary restriction are ED risk factors that, in sport culture, may be viewed as signs of athletes' dedication or commitment, and are often reinforced or encouraged in competitive settings (De Bruin et al., 2007; Thompson & Sherman, 2010). Thus, athletes may have different perceptions of, and relationships with, thought patterns and behaviors commonly associated with ED psychopathology.

Across two studies, Fewell et al. (2018) compared young adult athletes and nonathletes who were patients entering either residential, or partial hospitalization (PHP), ED treatment programs. Across both groups, patients were primarily female (> 85%) and had a diagnosis of Anorexia Nervosa at time of admission (> 65%). In Study 1, they compared the two groups on their ED symptomatology and impairment, depression, worry, and BMI after controlling for the differences that existed on several variables at time of admission (e.g., diagnosis, age, gender). They found that although the athletes scored lower than the nonathletes on ED symptomatology and level of depression (which the authors attributed to the positive aspects of sport involvement), there was a strong association between the two for the athletes. In Study 2, they expanded their outcomes to include other measures of eating-related pathology (e.g., body dissatisfaction, purging, restricting), OCD symptoms, and compulsive exercise. Across all outcomes, there were no significant differences between the athletes and nonathletes. The authors concluded that, even though the two groups differed on their levels of ED symptomatology at time of admission, they were experiencing similar levels of impairment and

pathology across all other psychological and behavioral outcomes assessed. As the first study to compare athletes and nonathletes who were in ED treatment, Fewell et al. (2018) suggested that additional research was needed to examine a broader set of ED correlates. They argued that doing so would provide a more complete picture of athletes' psychological profiles when they enter ED treatment, which could guide clinicians as they develop treatments to address the unique needs and experiences of athletes.

Thus, the purpose of our study was to compare athletes and nonathletes at time of admission to an ED partial-hospitalization program (PHP). We extended research done by Fewell et al. (2018) by considering other standard measures of personality and ED pathology that often are part of PHP admission protocols. Specifically, we used the Eating Disorder Inventory-3 (EDI-3; Garner, 2004) and the Temperament and Character Inventory (TCI; Cloninger et al., 1993). The EDI-3 assesses eating disorder symptoms (e.g., Drive for Thinness, Bulimia) and psychological characteristics that are associated with an ED (e.g., Low Self-Esteem, Perfectionism). The EDI-3 consistently distinguishes between ED and nonED adult women (Claussen et al., 2011) and is considered a gold-standard measure of ED and related pathology. The TCI has been widely used to isolate character profiles that predict individuals who are at-risk for ED psychopathology and how they may respond to treatment (Fassino et al., 2004). For example, across all ED diagnostic categories (e.g., Anorexia Nervosa, Bulimia Nervosa), patients tend to score higher on the TCI's harm avoidance (HA) and lower on self-directedness (SD) than controls (Fassino et al., 2004; Fassino et al., 2013; Miettunen & Raevouri, 2012). The TCI may be particularly useful in understanding athletes' ED profiles at time of admission because athletes, in general, report lower levels of harm avoidance and higher levels of self-directedness than do nonathletes (Bauger et al., 2013).

Method

Participants

Participants were collegiate athletes ($n = 18$) and non-athlete adults ($n = 18$) who had received treatment in a PHP eating disorder facility that had a specialized program for athletes. All participants were women and did not differ significantly in their age at time of admission (Athletes: $M = 21.94$ years, $SD = 3.29$; Non-athletes: $M = 23.00$ years, $SD = 3.16$; $t[34] = -0.98$, $p = .334$). Diagnoses at time of admission included Anorexia Nervosa (Athletes = 12; Nonathletes = 5), Bulimia Nervosa (Athletes = 2; Nonathletes = 4), Binge Eating Disorder (Athletes = 1; Nonathletes = 2), and Other Specified Feeding Disorder (Athletes = 3; Nonathletes = 7); no significant between group differences emerged in the frequency of diagnosis, $\chi^2(3) = 5.48$, $p = .140$. In terms of educational level at time of admission, patients were in high school (Athletes = 0; Nonathletes = 5), in college (Athletes = 13; Nonathletes = 11), had their bachelor's degree (Athletes = 4; Nonathletes = 1), or had their master's degree (Athletes = 1; Nonathletes = 1); again, there were no significant between group differences, $\chi^2(3) = 6.97$, $p = .073$.

Measures

Eating disorder symptoms. The 91-item Eating Disorder Inventory-3 (EDI-3; Garner, 2004) assesses eating disorder symptoms (i.e., drive for thinness (DT), bulimia (B), and body dissatisfaction) and associated psychological characteristics (i.e., low self-esteem (LSE),

personal alienation (PA), interpersonal insecurity (II), interpersonal alienation (IA), interoceptive deficits (ID), emotional dysregulation (ED), perfectionism (P), ascetism, and maturity fears (MF)). For this study, raw scores were converted to T-scores for each subscale. Although Garner (2004) provided extensive data concerning the EDI-3's psychometric properties, recent research has confirmed the subscales' strong internal consistency reliabilities, factor structure, discriminant validity, and sensitive and specificity for women (Claussen et al., 2011).

Temperament and character. The 240-item Temperament and Character Inventory (TCI; Cloninger et al., 1993) assesses seven components of personality that have been found to differ extensively in the population – temperament (i.e., novelty seeking, harm avoidance, reward dependence, and persistence) and character (i.e., self-directedness, cooperativeness, and self-transcendence). Participants respond true or false to each item to indicate whether the item applies to them. Although this measure was not intended for purely clinical populations it is considered to be reliable and valid within clinical environments (Cloninger, 2004). For the purposes of this study, and consistent with past research (e.g., Frank et al., 2011), we used only the harm avoidance, novelty seeking, and self-directedness dimensions.

Procedure

On the first day of admission into the PHP program at EDCare in Denver, CO, as part of the treatment center's onboarding protocol, each patient completed the EDI-3 and TCI on the computer. Patients also were given the assessments in paper form by the admissions clinicians to assist them in completing the assessments. Patients were instructed to ask staff for assistance in reading or understanding the questions. Once completed, their assessments were entered into their electronic charts to aid in treatment planning and intervention selection. As part of the admissions process patients were given information on, and consented to, the way their data would be used (i.e., treatment planning, intervention planning, and research).

Data Analyses

The raw scores for each subscale from each measure were converted to T-scores based on each scale's normative data. Given the exploratory nature of this study, we ran a series of independent samples *t*-tests across the variables from the EDI-3 and TCI and calculated Cohen's *d* value for each significant test; we set alpha at .01 for each analysis.

Results

TCI Subscales

Significant group differences emerged for Harm Avoidance, $t [34] = -3.78$, $p = .001$, and Self-Directedness, $t [34] = 3.03$, $p = .005$, but not for Novelty Seeking, $t [34] = -1.87$, $p = .071$. Athletes reported lower scores on Harm Avoidance (Cohen's $d = -1.24$), but higher scores on Self-Directedness (Cohen's $d = 1.01$) compared to the athletes. See Table 1 for means and standard deviations.

EDI Eating Disorder Symptoms

There were no significant differences between the athletes and nonathletes on Drive for Thinness, $t [34] = -0.98$, $p = .334$, Bulimia, $t [34] = -0.98$, $p = .334$, and Body Dissatisfaction, $t [34] = -0.98$, $p = .334$. See Table 1 for means and standard deviations.

EDI Psychological Characteristics

The athletes and nonathletes differed significantly on Personal Alienation, $t [34] = -0.98$, $p = .334$, Interpersonal Alienation, $t [34] = -0.98$, $p = .334$, Emotion Dysregulation, $t [34] = -0.98$, $p = .334$, and Perfectionism, $t [34] = -0.98$, $p = .334$. There were no significant differences across the remaining five subscales. The athletes reported feeling less personally, (Cohen's $d = -1.02$) and interpersonally (Cohen's $d = -1.25$), alienated, less dysregulated in their affect (Cohen's $d = -1.11$), and less perfectionistic (Cohen's $d = -1.02$) than the nonathletes. See Table 1 for means and standard deviations.

Table 1

Athletes' (n = 18) and Nonathletes' (n = 18) Means and Standard Deviations on the EDI-3 and TCI Subscales

Subscales	Athletes <i>M</i> (SD)	Nonathletes <i>M</i> (SD)	<i>t</i> -values
TCI- Novelty Seeking	49.33 (8.81)	55.94 (12.18)	-1.87
TCI- Harm Avoidance	58.00 (12.54)	73.06 (11.82)	-3.71*
TCI- Self Directedness	43.89 (12.89)	30.67 (13.27)	3.03*
EDI-3 Drive for Thinness	45.67 (9.54)	52.72 (8.64)	-2.33
EDI- 3 Bulimia	47.83 (9.01)	50.94 (11.51)	-.90
EDI-3 Body Dissatisfaction	47.00 (10.18)	51.89 (7.77)	-1.62
EDI-3 Low Self-esteem	47.39 (9.44)	54.78 (10.46)	2.23
EDI-3 Personal Alienation	44.89 (8.81)	55.00 (11.05)	-3.04*
EDI-3 Interpersonal Insecurity	47.56 (7.83)	53.33 (10.48)	-1.87
EDI-3 Interpersonal Alienation	44.33 (7.04)	57.00 (13.20)	-3.59*
EDI-3 Interoceptive Deficits	47.17 (7.69)	54.00 (9.20)	-2.42
EDI-3 Emotional Dysregulation	43.88 (6.09)	56.78 (15.25)	-3.25*
EDI-3 Perfectionism	50.94 (9.23)	58.89 (7.43)	-2.84*
EDI-3 Asceticism	47.06 (8.75)	53.28 (9.99)	-1.99
EDI-3 Maturity Fears	46.17 (11.56)	52.72 (9.58)	-1.85

Note: Means for all subscales are expressed as T-scores.

* $p < .01$ for each t-test.

Discussion

Across the subscales of the EDI-3 and TCI, athletes and nonathletes differed, though primarily on the personality and psychological characteristics and not the behavioral measures of EDs. Specifically, at time of admission into the PHP program, the athletes and nonathletes scored similarly on their drive to reduce caloric intake and pursue a thin body, the extent to which they were dissatisfied with their bodies, and their endorsement of bulimic symptomatology. Although Fewell et al. (2018) found slight differences between their ED

inpatient athletes and nonathletes on ED symptomatology, the two groups were similar in terms of ED impairment, body dissatisfaction, binge eating, restricting, cognitive restraint, and purging. Similarly, our findings indicate that athletes are more similar to, than different from, nonathletes at time of admission on the traditional behavioral markers of ED diagnosis. Despite engaging in a culture that can encourage problematic behaviors, such as restricting caloric intake or engaging in excessively high levels of exercise, athletes actually may not require specialized treatment within PHP ED programs for the behavioral aspects of ED pathology being so similar to nonathletes in these areas.

The athletes and nonathletes, however, differed on a number of the subscales that measured the personality and psychological characteristics associated with EDs. On the TCI, the athletes scored lower on harm avoidance and higher on self-directedness; effect sizes were large on both. Thus, the athletes were presenting themselves as more responsible, hopeful, and self-accepting and as being more optimistic and having more energy than the nonathletes. These differences in harm avoidance and self-directedness between athletes and nonathletes appear to transcend ED status, existing among athletes and nonathletes who are free from any ED diagnosis (Bauger et al., 2013). That athletes have this level of temperament and character may bode well for them in treatment given that low self-directedness and high harm avoidance are strongly associated with ED pathologies and complicate the process of recovery (Abbate-Dega et al., 2013; Fassino et al., 2009; Miettunen & Raevuori, 2012). Recovery from ED's is often measured by changes in these personality traits, with decreased harm avoidance and increased self-directedness predicting treatment success (Segura-Garcia et al., 2013). Our findings suggest that athletes enter treatment programs with scores on harm avoidance and self-directedness that are similar to those found among healthy controls (Atiye et al., 2012). Such a profile across these two TCI subscales could predict greater success in treatment, but could also reflect that these factors are less salient in the treatment outcomes of athletes. Additional research is needed to determine how athletes' scores on harm avoidance and self-directedness predict progress through PHP ED programs as has been done with nonathlete patients

The athletes and the nonathletes also differed significantly on four of the nine EDI-3 subscales that assessed the different psychological characteristics associated with EDs. Similar to the differences that emerged on the TCI subscales, the athletes' scores on these four characteristics suggested a healthier profile than found among the nonathletes; again, the effect sizes were large. Overall, the athletes reported feeling more emotionally full, less alone, more trusting and connected in relationships, more stable, less angry, less impulsive, less self-destructive, and less perfectionistic. Although athletes generally report higher levels of perfectionism than non-athletes (Hopkinson & Lock, 2004; Krane et al., 2001; Schwarz et al., 2005), which is likely driven by demands within the sport environment, at the time of admission to an ED treatment program such differences appear to have flipped. That the nonathletes now scored significantly higher than athletes speaks to the centrality of perfectionism in their ED risk (Shanmugam & Davies, 2015). That the athletes scored lower than the nonathletes on personal and interpersonal alienation and on emotion dysregulation aligns with research that suggest sport participation fosters positive development within those traits (Hawley et al., 2014; Prentice et al., 1994). Thus, although impaired at levels similar to nonathletes in terms of their engagement in ED specific behaviors (e.g., bulimia), athletes appear to enter treatment with lower levels of pathology across a range of psychological characteristics; this healthier profile may have been developed through their sport participation. The association between certain personality traits, athletic success, and the development of healthy, appropriate coping strategies suggest that

athletes may be better equipped to manage the psychological demands associated with ED recovery and may have more favorable outcomes.

Athletic identity may be an important factor to consider when evaluating athletes for EDs. The cultural pressures in athletics previously mentioned in the study could be compounded by reliance on the external validation of athletic identity, which is also associated with ED pathology (Palermo & Rancourt, 2019). Given that high levels of athletic identity can manifest at any level of sport participation (Lamont-Mills & Christensen, 2006; Palermo & Rancourt, 2019), athletes at every level of competition should be included in future research to determine how athletic identity influences ED development. Additionally, social support and perceived control may serve as preventative factors against EDs for athletes (Buckley et al., 2021), and thus should be considered when designing and altering treatment plans in clinical settings for individuals who strongly identify as athletes. For example, more generalized treatment could distance athletes from established support networks and lead to diminished feelings of autonomy, especially when athletes are pulled from their sport life to enter treatment at a higher level of care (HLOC) (Buckley et al., 2019). Stephan & Bilard (2003) also found that athletes experiencing transition out of sport reported greater sensitivity to weight gain and bodily deterioration, perceptions that intensified in the months following their transition. This, coupled with findings that involuntary retirement or separation from sport may impede the process of developing a sense of self outside of sport, demonstrate the significance of athletic identity not only in the diagnosis of EDs, but also the effectiveness of treatment (Esopenko et al., 2020). Treatment approaches that restrict athletic training, body awareness, and access to athletic environments, which are common in PHP programs, may require adjustment for athletic populations (Esopenko et al., 2020).

Future studies should consider the interaction of gender and athletic identity as a potential factor that differentiates athletes from nonathletes. Despite the growth of women's sports since the passage of Title IX in 1972, athletics are still viewed as a masculine domain (Fallon & Jome, 2007; Sorbe et al., 2021). Research suggests that women's participation and success in traditionally masculine domains may not only have social consequences, but can also lead to gender-role conflict and greater identification with stereotypes related to chosen gender identity, all of which have roles in the development of EDs (Heilman, 2004; Rudman & Phelan, 2010; Veldman et al., 2017). Female athletes have also reported awareness of expectations related to their gender-role behavior that conflict directly with their role as an athlete, particularly those related to body shape and weight (Fallon & Jome, 2007; Krane et al., 2004). These findings could indicate an unconscious conflict between the athletic and gender identity of certain athletes, which could contribute to the development and maintenance of EDs. A study similar to ours that evaluates differences between male and female athletes on intake assessments might offer insight into how gender (as well as roles and conflicts) may be related to the development of EDs and how athletes respond to specialized ED care.

Despite the strengths of our study, which included matched samples of female athletes and female nonathletes and our use of measures with established psychometric properties, there were several limitations that warrant discussion. First, our overall sample was small ($N = 36$), which would be associated with lower levels of power in our statistical tests. However, we did find significant differences across six of the subscales and, in each case, the effect size was large. The limited number of participants was due to the small sample of athletes admitted to the program in the time frame observed in this study. As the athlete-specific treatment program continues, future studies will have larger samples of athletes and thus be more robust and

generalizable. Second, although similar to Fewell et al.'s (2018) methodology, we used only self-report measures, which could lead to inaccurate reporting. Also, certain patient treatment data (e.g., race/ethnicity) was not usable in this study due to subjects opting out of sharing that information during intake. In future studies, considering broader, more diverse groups of athletes is needed to better understand the nuances of their psychological profiles upon admission.

In this study, we compared athletes and nonathletes who were patients in an ED treatment facility that had a specialized PHP program for athletes. Both groups provided information on their ED behaviors and psychological characteristics at time of admission, which allowed us to determine how similar the athletes and nonathletes were. Interestingly, the two groups did not differ on any of the ED behavioral indicators suggesting that, in terms of these symptoms, athletes and nonathletes were alike. However, the athletes demonstrated a healthier profile than the nonathletes across six of the temperament and psychological characteristics. This healthier profile, which included being more self-directed and better able to manage their emotions, may have developed through their long involvement in sport. Thus, the sport environment may at once increase their behavioral risk of ED, but also provide them with opportunities to develop psychological characteristics that may benefit them in treatment. Longitudinal research that tracks athletes' progress in ED treatment programs is needed to determine if such benefits exist.

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