# Eating Disorders in Male Athletes

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**Context:** Eating disorders (EDs) in male athletes are potentially debilitating disorders with significant medical, psychological, and athletic performance consequences.

**Evidence Acquisition:** Searches were performed across PubMed, EBSCOhost, and PSYCinfo from 1990 to 2019. Keywords searched were *eating disorder, male, athlete, anorexia nervosa, bulimia nervosa, muscularity, muscle dysmorphia*, and *sports*. Search results included articles written in the English language and encompassed reviews, empirical studies, and theoretical articles.

**Study Design:** Clinical review.

**Level of Evidence:** Level 3.

**Results:** EDs among male athletes may lead to serious negative outcomes, including increased susceptibility to injury, inconsistent performance, problematic recovery, muscle deficiencies, impairment of optimal athletic functioning, and medical, social, and emotional problems. Male athletes with EDs may be more difficult to identify and diagnose for a variety of reasons related to differential presentation of symptoms, secretiveness or shame around behaviors, and sex-related stigma.

**Conclusion:** Professionals working closely with athletes are uniquely positioned to identify and screen those who may require further evaluation and treatment.

**Keywords:** athletes; eating disorder; male

In February 2018, Olympic figure skater Adam Rippon disclosed his battle with a severe eating disorder (ED) in a *New York Times* interview. Although historically understood as occurring in Caucasian female adolescents, recent reports suggest that cisgender men may represent up to 25% of people with EDs.[2] EDs are not sex-exclusive and, over time, diagnostic criteria have been adapted to better fit male patients.[44] Among college-aged men, common behaviors include binge eating (7.9%), excessive/compulsive exercise (4.4%), fasting (4%), self-induced vomiting (2.7%), and laxative/diuretic abuse (1.6%).[16] A number of factors contribute to elevated ED risk among men, including psychological factors,[20] gender role expectations,[53] media portrayals of dieting and exercise,[53] conflation of muscularity and masculinity,[2] social media messages increasingly targeting body shape, and excessive changes in weight.[47]

Cisgender male athletes demonstrate a higher risk of developing EDs than the general male population.[52] In many historically male-dominated sports, the perception of the male athlete as unbreakable, stoic, and self-sacrificing may be part of the sport culture that is reinforced overtly and implicitly. This conformity to traditional male gender norms (eg, dominance, power, status) predicts greater muscle dissatisfaction and increased prevalence of muscularity-oriented ED behaviors.[23] Within this context of gender and athlete identity, ED behaviors may be unrecognized as problematic, or even encouraged. Seeking help may be deterred due to shame about symptom experience, general stigma around mental health treatment for athletes,[37] internal conflict around masculine gender norms and athlete identity, or the stereotyping of EDs as a female problem.[12,46]

The significant physical, psychological, and time investment of athletic training and competition may increase vulnerability to disordered eating behaviors and EDs. Athletes normally adhere to rigid diets and strenuous exercise regimens to optimize performance.[15,29] In this pursuit, athletes may become malnourished enough to enter a state of relative energy deficiency in sport or low energy availability (LEA) from consuming too few calories relative to expended exercise

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output for prolonged periods of time.[43] Both states can have detrimental effects, including damage to multiple organ systems, lower bone mineral density (BMD), reduced testosterone, fragile joints and muscles, increased risk of injury, and decreased athletic performance.[26,27,33,43,57] Comorbid "burnout" or overtraining syndrome can further predispose athletes to EDs; athletes may turn to disordered behaviors to increase performance, which can initiate a vicious cycle of maladaptive behavior. For instance, a male athlete pursuing muscularity and leanness may diet rigidly, excessively train beyond capacity, and even abuse anabolic steroids.[35] Furthermore, men are more likely to control their weight through excessive exercise, especially if they have been overweight in the past.[53]

Specifically, muscularity-oriented disordered eating may include "cheat" meals, substance misuse, and supplement abuse.[35,42,44,45] Recent reports have identified the lifetime prevalence of steroid abuse in male athletes to be 6%,[28] with some data suggesting steroid abuse rates among sexual minority (defined as those identifying as nonheterosexual or reporting sexual relations with a member of their own sex) men as high as 21%.[8] The appropriate screening (for steroids, serum or urine testing; ED screening options discussed later) can help delineate if one or both are suspected.

ED risk is also a function of sport type.[4,11,15,30,52,54] Endurance sports (ie, distance running[15] and cycling[21,49]) correlate leanness with increased performance.[59] Other sports such as gymnastics, figure skating, and bodybuilding have an esthetic component to the overall score.[15,54,59] Athletes competing in weight-based sports, such as wrestlers or jockeys,[65,66] are actually prohibited from competing if they are outside the range of their weight class.[15] These pressures fuel and normalize practices that many consider disordered eating (ie, "bulk and cut").[22,35,48,59] Those vulnerable to EDs experience significant distress when deviating from strict diet regimens or when dissatisfied with either muscular or esthetic results.[35,59]

These factors—coupled with the higher incidence of EDs among athletes—suggest that EDs among male athletes are multietiological and at risk of being overlooked (or inadvertently reinforced) by teammates and sports health professionals.[54]

## RECOMMENDATIONS FOR SCREENING AND ASSESSMENT

EDs are classified in the *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition, under "Feeding and Eating Disorders"; to meet clinical criteria, the conditions must impair physical health or psychosocial functioning.[3] Although a detailed review of diagnostic criteria is beyond the scope of this article, knowledge of the most common EDs can inform sports health professionals in supporting overall athlete health (see Appendix Table A1, available in the online version of this article). Additionally, many EDs are associated with co-occurring mental health concerns (mood disorders, anxiety problems, obsessive-compulsive disorders, substance use, posttraumatic stress disorder,[1,64] self-harm, and suicidal behaviors[13]) that may negatively affect the individual's well-being. Behavioral health challenges and suicide are significant risks for people with EDs, with rates affecting up to 20% of those with anorexia nervosa[5] and 23% of those with bulimia nervosa.[14]

Clinicians have recognized the vulnerability for EDs among cisgender female athletes. However, ED presentations among male athletes differ from those common in female athletes (eg, "the female athlete triad"—LEA, menstrual dysfunction, and low BMD) and thus are less easily recognized by those working with this cohort. Also, minimization of symptoms, underutilization of behavioral health intervention, and sex-related stigma contribute to underreporting and underdiagnosing.[54] Thus, it is imperative for professionals working with male athletes to accurately monitor and screen for EDs, as they may present differently. Sports health professionals are uniquely positioned to identify, guide, and refer male athletes with EDs to treatment.

### Risk Factors

Several general and sports-related factors have been identified that may increase the risk of a male athlete developing an ED. For instance, men with a history of obesity are at greater risk of ED behaviors.[53] Also, behaviors associated with negative body image are a risk factor, including body dissatisfaction,[16,18,20] preoccupation or obsession with specific body areas,[18] body checking,[18] and negative body talk, especially "fat talk."[2,61] Psychological and personality features such as an anxious attachment style,[18] low self-esteem,[16,17] fear of negative evaluation,[18] depression,[24,40,53] impulsivity,[34] and tendency for internalizing distress[40] increase the propensity for an ED. Early sports specialization and competing at an elite level can exacerbate these risks.[59] This intersectionality may increase vulnerability to developing an ED for a male athlete beyond the general risk faced by male nonathletes.[59]

### Sport Behavior

It is important to monitor specific behaviors related to sport. Mealtime isolation, changes in eating behavior, obsessions, food rituals, or excessively rigid eating behaviors can all be indicators of an ED. Changes in behavior or mood may be red flags. Deficits in physical or psychological performance—especially combined with changes in body shape or weight—should be carefully monitored. Undernourished athletes often struggle to concentrate or experience injuries related to overexercising, which also warrant monitoring. Finally, excessive exercise should be assessed to ensure the function is not to compensate for eating.

### Medical Markers

Several objective measures can also help determine whether eating behaviors have become problematic. Routine vital signs (eg, low pulse rate), marked unaccounted fluctuations in weight/body mass index, or hypotension (especially orthostatic) are markers of malnourishment.[1] Also, physical examination findings can be helpful (Table 1). Laboratory measures can offer more specific indicators of EDs; for instance, multiple low electrolyte

Table 1. Potential signs and symptoms of eating disorders (EDs) in male athletes[a]

| System | Signs and Symptoms of EDs in Male Athletes |
|---|---|
| General | Marked fluctuations in weight/body mass index |
| | Cold intolerance |
| | Weakness |
| | Fatigue or lethargy |
| | Presyncope (dizziness) |
| | Syncope (fainting) |
| | Hot flashes, sweating episodes |
| Oral and dental | Oral trauma/lacerations |
| | Perimyolysis (dental erosion on posterior tooth surfaces) and dental caries (cavities) |
| | Parotid (salivary) gland enlargement |
| Cardiorespiratory | Chest pain |
| | Heart palpitations |
| | Bradycardia |
| | Arrythmias/prolonged QTc |
| | Orthostatic tachycardia/hypotension |
| | Dyspnea (shortness of breath) |
| | Edema (swelling) |
| Gastrointestinal | Epigastric discomfort |
| | Abdominal bloating |
| | Early satiety (fullness) |
| | Gastroesophageal reflux (heartburn) |
| | Hematemesis (blood in vomit) |
| | Hemorrhoids and rectal prolapse |
| | Constipation |
| Endocrine | Low sex drive |
| | Hypoglycemia |
| | Stress fractures |
| | Low bone mineral density |
| | Infertility |
| Neuropsychiatric | Depressive/anxious/obsessive/compulsive symptoms and behaviors |
| | Confusion |
| | Irritability/aggression |

*(continued)*

Table 1. (continued)

| System | Signs and Symptoms of EDs in Male Athletes |
|---|---|
| | Memory loss |
| | Poor concentration |
| | Insomnia |
| | Self-harm |
| | Suicidal thoughts, plans, or attempts |
| | Seizures |
| Dermatologic | Lanugo hair (fine hair growth on the body and face) |
| | Hair loss |
| | Carotenoderma (yellowish discoloration of skin) |
| | Russell sign (calluses or scars on the back of the hand from self-induced vomiting) |
| | Poor wound healing |
| | Dry brittle hair and nails |

[a]Derived from the Academy for Eating Disorders' Medical Care Standards Committee guidelines.[1] QTc, corrected QT interval.

values are suggestive of an ED (Table 2). These changes in electrolytes can have adverse health effects, which include osteoporosis, impaired production of insulin, altered metabolism, fatigue, and seizures.[7,32] Cardiac arrhythmias (which can be fatal) are caused by the electrolyte abnormalities associated with self-induced vomiting, diuretic, or laxative abuse.

In contrast to female athletes, the male athlete triad consists of LEA, hypogonadotropic hypogonadism, and low BMD.[10,25,56,58,60] A recent study assessed the incidence of low BMD in adolescent male runners, along with risk factors, including low body weight, high weekly mileage, history of prior stress fracture, and low daily calcium intake.[6] These results provided further evidence that sports which equate leanness with improved performance also have a higher prevalence of athletes who exhibit low BMD and who are at greater risk of developing an ED.[6] Male athletes with LEA in this sport category have been found to have lower levels of testosterone as well; however, hypogonadism may not be as evident in male athletes as it is in female athletes.[56]

### Screening Tools and Methods

The SCOFF is a common and well-accepted 5-item screening instrument that may be used to screen for ED symptoms[41] (see Appendix Table A2, available online). More than 2 affirmative responses indicate the need for further assessment of an ED.[41] Preliminary evidence suggests that the SCOFF questionnaire may be more specific and sensitive for identifying men with EDs than women with EDs.[50] Another helpful tool to evaluate for unhealthy exercise behaviors in athletes is the 24-item Compulsive Exercise Test.[55]

While we recommend that all athletes be screened for EDs, there is some evidence to suggest that clinical interviews may yield more sensitive results for men, as athletes were more likely to underreport symptoms on some screening instruments.[38] Clinical studies have also obtained greater endorsement of ED symptoms and disordered eating behaviors among adult men when self-reporting the signs/symptoms verbally compared with women.[36] Thus, direct questions about ED symptoms and behaviors in clinical interview may yield more accurate self-disclosure, demonstrating the necessity for personal interviews by sports health professionals. For a list of screening questions, please see Appendix Table A3 (available online).

## RECOMMENDATIONS FOR CLINICAL TREATMENT

Once an athlete has been identified with an ED, it is vital to refer him to treatment as quickly as possible. Existing evidence about treatment outcome suggests that treatment response is similar to that of female athletes.[51,63,67] Still, a number of barriers are in place for male athletes to access treatment. Stigma remains significant and contributes to underreporting and delay of care for male athletes with EDs. Sports health professionals must assuage the shame many athletes carry about EDs, especially relating to masculine gender role conflict.[12] This shift can help men seek treatment not only for EDs but also for other

Table 2. Diagnostic tests indicated for persons with suspected eating disorder[a]

| Basic Tests | Potential Abnormal Findings and Causes (in Italics) |
|---|---|
| Complete blood count | Leukopenia, anemia, or thrombocytopenia |
| Comprehensive panel with liver function tests and other electrolytes | Glucose: ↓ (*poor nutrition*) |
| | Sodium: ↓ (*water loading or laxative misuse*) |
| | Potassium: ↓ (*vomiting, laxative or diuretic misuse*) |
| | Chloride: ↓ (*vomiting, laxative misuse*) |
| | Blood bicarbonate: ↑ (*vomiting*) or ↓ (*laxative misuse*) |
| | Blood urea nitrogen: ↑ (*dehydration*) |
| | Creatinine: ↑ (*dehydration, renal dysfunction, muscle wasting*) |
| | Calcium: ↓ (*poor nutrition at the expense of bone*) |
| | Phosphate: ↓ (*poor nutrition*) |
| | Magnesium: ↓ (*poor nutrition, laxative misuse*) |
| | Prealbumin: ↓ (*in protein-calorie malnutrition*) |
| | Aspartate aminotransaminase (AST): ↑ (*starvation*)<br>Alanine aminotransaminase (ALT): ↑ (*starvation*) |
| Electrocardiogram (ECG) | Bradycardia (low heart rate), prolonged QTc (>450 ms), other arrhythmias |

[a]Derived from the Academy for Eating Disorders' Medical Care Standards Committee guidelines.[1] QTc, corrected QT interval.

behavioral health conditions, such as substance use or depression.[9]

Though a comprehensive description of ED treatment is beyond the scope of this article, best practice treatment includes an interprofessional team (including registered dieticians and psychotherapy professionals), explicit focus on food as nourishment, close monitoring and management of all medical complications, interrupting all ED behaviors (food rituals, limited repertoire of foods, body checking, compensatory behaviors), and targeting underlying beliefs and attitudes toward weight, shape, and control over eating.[39,51,62,63,67] Depending on severity, athletes may need care ranging from intensive inpatient/residential treatment to outpatient treatment. Specialized treatment centers offer tracks for athletes and men with EDs.

Athletes with EDs who desire to return to sport should do so gradually and under close supervision. They should undergo stepwise progression from light physical activity to full sport participation (if appropriate).[19,31] During this process, if ED behaviors return or increase in frequency or severity, the steps should be regressed.[19,31,32] The decision of when/if an athlete can return to play is most commonly made by the sports medicine physician; this professional should consider both the psychological and the physical effects of the ED in consultation with treatment team recommendations.

## CONCLUSION

Though prevalence estimates vary across sport and context, EDs are likely underrecognized, underreported, and underdiagnosed among male athletes. Coaches, certified athletic trainers/staff, and sports medicine professionals are encouraged to monitor male athletes for signs/symptoms of EDs and refer to formal ED assessment and treatment services in a timely manner.

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