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ScienceDirect

Journal of Sport and Health Science 4 (2015) 211–221

www.jshs.org.cn

Review

Validity and reliability of eating disorder assessments used with athletes: A review

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Received 11 October 2013; revised 1 February 2014; accepted 12 May 2014
Available online 20 September 2014

Abstract

Background: Prevalence of eating disorders (EDs) among college-aged athletes has risen in recent years. Although measures exist for assessing EDs, these measures have not been thoroughly reviewed in athletes. This study reviewed the validity and reliability evidence of the commonly used measures for assessing EDs in athlete populations aged 18–26 years.
Methods: Databases were searched for studies of regarding ED on male and/or female athletes. Inclusion criteria stated the study (a) assessed EDs in an athlete population 18–26 years of age and (b) investigated EDs using a psychometric measure found valid and/or reliable in a non-athlete population and/or athlete population.
Results: Fifty studies met the inclusion criteria. Seven and 22 articles, respectively, studied EDs behaviors in male and female athletes whereas 21 articles studied EDs in combined-gender samples. The five most commonly used measures were the Eating Attitudes Test (EAT), Eating Disorder Inventory (EDI), Bulimia Test-Revised (BULIT-R), Questionnaire for Eating Disorder Diagnosis (QEDD), and the Eating Disorder Examination Questionnaire (EDE-Q).
Conclusion: Only seven studies calculated validity coefficients within the study whereas 47 cited the validity coefficient. Twenty-six calculated a reliability coefficient whereas 47 cited the reliability of the ED measures. Four studies found validity evidence for the EAT, EDI, BULIT-R, QEDD, and EDE-Q in an athlete population. Few studies reviewed calculated validity and reliability coefficients of ED measures. Cross-validation of these measures in athlete populations is clearly needed.

Keywords: Athletes; Eating disorders; Psychometrics; Reliability; Validity

1. Introduction

Eating disorders (EDs) encompass abnormal eating and weight control patterns, such as caloric restriction, excessive exercise, binging and/or purging, and abnormal body dissatisfaction, over a prolonged period of time.[1] According to the *Diagnostic and Statistical Manual of Mental Disorders: Fifth Edition* (DSM-5), common EDs include anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED), and other specified feeding or eating disorders (OSFEDs). Anorexia nervosa is characterized by a severe limitation in caloric intake despite being severely underweight whereas BN features periods of abnormally high caloric intake in a short, distinct period of time (i.e., 2 h) during which the individual feels they have no control over their feeding behaviors followed by extreme purging measures (i.e., laxative use, vomiting, high amounts of exercise).[1] Individuals with BED experience the same period of abnormally high caloric intake and lack of control over their feeding behaviors as seen in BN but do not engage in extreme purging measures following the binge episode.[1] OSFEDs refers to an ED category wherein the individual meets a portion of the criteria for AN, BN, and/or BED but does not meet enough of these criteria to qualify as a clinical ED.[1] EDs occur among females and males in non-athlete populations and are

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Peer review under responsibility of Shanghai University of Sport.

2095-2546/$ - see front matter
http://dx.doi.org/10.1016/j.jshs.2014.05.001

concerning because of their negative effect on physical and mental health.[1] Given the danger EDs pose to a person's physical and mental health, assessing an individual's risk for EDs is vital for non-athletes as well as athlete populations.

EDs have been observed among female athletes and, more recently, some male athletes.[2–6] Sanford-Martens et al.[7] found 21.2% of a male athlete sample and 14.5% of female athletes possessed ED behaviors. In the seminal study of EDs in a large sample of Division-I athletes (n = 1445; 562 females, 883 males), Johnson et al.[3] found 13.02% of males and 10.85% of females engaged in binge eating at least once per week. Additionally, 5.52% and 2.04% of the female and male athletes, respectively, carried out some type of purging behavior on a weekly basis (i.e., use of laxatives, excessive exercise, vomiting). Two landmark studies on EDs in male athletes from a wide array of sports found 16.6%−19.2% to display ED behaviors.[4,6] The preceding findings indicate EDs occur in athlete populations and that both male and female athletes are affected.

Male and female athletes engaging in ED behaviors such as binging/purging, laxative use, or excessive exercise are putting both their athletic performance and health in serious jeopardy. For example, Sundgot-Borgen and Torstveit[8] state prolonged periods of caloric restriction cannot only degrade physical/psychological performance (e.g., strength production, fatigue levels, concentration, mental acuity) but also put the athlete in danger of serious health problems. Endocrine, cardiovascular, reproductive, and central nervous systems maladaptations, as well as gastrointestinal and renal problems, are all potential complications.[8] Thus, a need exists to properly assess EDs in male and female athletes to minimize any negative athletic performance or health consequences.

Gender is an essential consideration when one examines why male and female athletes engage in ED behaviors. Society's body ideals for each gender, and how these ideals affect athletes, may determine whether or not an athlete engages in ED behaviors. The "thin ideal" society projects upon female athletes may predispose them to engagement in weight control practices (e.g., excessive exercise, vomiting, use of laxatives) to lose weight—even if the loss in weight does not aid performance. In the hopes of achieving this thin, athletic body, some female athletes put themselves at risk for the female athlete triad (i.e., disordered eating, amenorrhea, and low bone mineral density)—a dangerous health condition.[9] In fact, 29.4%−57.1% of female athletes (varied based on the classification of the sport as aesthetic, endurance, team, and anaerobic) reported a bone injury during their collegiate career. Over 30% displayed ED behaviors and 31% report an irregular menstrual cycle without the use of oral contraceptives during this same time period.[9]

Conversely, some male athletes strive to reduce body fat while increasing muscle mass—producing the muscular, lean figure society deems most attractive.[10] This desire for a lean, muscular figure can predispose male athletes to ED behaviors such as binge eating, excessive exercise, and laxative use to build muscle but reduce body fat which may or may not be advantageous to the athlete's sport.[10,11] Not only are male and female athletes trying to conform to society's "ideal" body type, these individuals are also striving to achieve the body type which enhances sport performance.[10,12]

Male and female athletes are predisposed to engage in ED behaviors because of the sport context.[13] There can be sport-specific weight restrictions[14,15] and negative comments by coaches and teammates[16,17] that make athletes susceptible to the development of EDs. Furthermore, research suggests that EDs may be reinforced as coaches, teammates, and spectators comment upon changes in body type and performance that more closely align with how an athlete in said sport should appear or perform, respectively.[8]

Age and competitive level can also play a role in the onset of EDs. Woodside and Garfinkel[18] report individuals between the age of 18 and 26 years are more susceptible to ED (see also, Wright et al.[19]). This increased susceptibility to engagement in ED behaviors can arise due to the stress associated with a lack of structure and boundaries, moving away from home, and becoming more independent when young adults attend a college or university.[19] The preceding age range also corresponds to a time when athletes are often at higher levels of sport competition (e.g., collegiate, national, or international competitions). Athletes at higher levels of competition are exposed to even greater sport pressures (e.g., weight restrictions imposed by sport or coach, the need to conform to the "ideal" body type for a specific sport, belief weight reduction will enhance performance), which further predispose them to the development of EDs.[20,21] Given that athletes are under significant societal and sport pressures (e.g., sport-specific weight restrictions, pressure from coaches/teammates, conforming to both the male/female body ideal of society and sport), it is important for sports psychologists to have the tools necessary to assess EDs in this population.

EDs can be assessed via various psychometric measures. Through the use of these measures, psychologists can assess the severity of ED behaviors an athlete might engage in such as caloric restriction, binging/purging, and excessive exercise. Some examples of measures used for assessment of EDs include the Eating Attitudes Test (EAT),[22] the Eating Disorder Inventory (EDI),[23] the Bulimia Test-Revised (BULIT-R),[24] Questionnaire for Eating Disorder Diagnoses (QEDD),[25] and the Eating Disorder Examination Questionnaire (EDE-Q).[26] The EAT and EDI have multiple versions. The EAT has been shortened from its original 40-item version to a 26-item version, the EAT-26.[27] The EDI has two subsequent versions, the EDI-2[28] and EDI-3,[29] which have been modified to reflect the most current definitions of EDs.

These five measures are similar in that the questionnaires use dichotomous (i.e., yes/no) and/or Likert-type formatting to assess EDs (e.g., anorexic and bulimic behaviors, dangerous weight control behaviors) present in the individual being evaluated. The QEDD, EAT, EDI, and BULIT-R were developed from pre-existing definitions of EDs in the DSM.[18–20,25,26] The EDE-Q was also based upon the definitions of EDs from the DSM but was developed first into a structured interview format and then converted to a questionnaire.[26] Each EDs measure aims to assess specific types of