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Eating disorders and weight control behaviors change over a collegiate sport season

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ABSTRACT

Objectives: Determine whether the prevalence of eating disorder classifications (i.e., clinical eating disorder, subclinical eating disorder, and asymptomatic) and pathogenic weight control behaviors (e.g., bingeing, vomiting) change over a five-month sport season.
Design: Longitudinal study.
Methods: Female collegiate gymnasts and swimmers ($N = 325$) completed the Questionnaire for Eating Disorder Diagnoses as well as six items from the Bulimia Test-Revised at Time 1 (two weeks into the beginning of their athletic season) and Time 2 (final two weeks of the athletic season); data collections were separated by five months.
Results: Over the course of the season, 90% of the athletes (18 out of 20) retained a clinical eating disorder diagnosis or moved to the subclinical classification. Of the 83 subclinical athletes at Time 1, 37.3% persisted with that classification and 10.8% developed a clinical eating disorder; the remainder became asymptomatic/healthy eaters by Time 2. The majority of Time 1 asymptomatic athletes (92.3%) remained so at Time 2. Exercise and dieting/fasting were the most frequent forms of weight control behaviors, though each was used less frequently at Time 2 (exercise = 35.4%; dieting = 9.2%) than at Time 1 (exercise = 42.5%; dieting = 12.3%).
Conclusions: Eating disorder classifications, particularly clinical and subclinical, remain stable across a competitive season, supporting the need for early detection and purposeful intervention. Athletes engage in weight control behaviors that may be reinforced in the sport environment (e.g., supplemental exercise), making identification more challenging for sports medicine professionals.

1. Introduction

Eating disorders (ED) are pathological disturbances in eating behavior that include acute misperceptions and concerns about body shape and weight.[5] Female athletes are considered at-risk because of sport environment pressures regarding weight, appearance, body size/shape, and performance.[14] For clinical EDs, which include the diagnostic category Eating Disorders-Not Otherwise Specified (ED-NOS), prevalence rates have ranged from 5.6% to 5.9% among aesthetic sport athletes (e.g., gymnasts[3]), and 1.6% to 5.9% for endurance and non-lean sport athletes (e.g., soccer[16]). Athletes also meet criteria for subclinical EDs (i.e., disturbances in eating and body image concerns that are below threshold for a clinical disorder in both intensity and frequency, including ED-NOS) at rates much higher than those associated with full diagnostic criteria.[4,20] Among female collegiate athletes, prevalence rates of subclinical eating disorders were 14.5% to 25.5%.[8,17] The use of weight control measures (e.g., extreme dieting, excessive exercising) also is high.[1,3,4] In a mixed-sport sample,[8] female collegiate athletes have reported dieting 2+ times in the last year (15.7%), binge eating at least once per week (18.6%), exercising 2+ hours per day to burn calories (25.5%), vomiting at least 2–3 times per month (2.9%), and using diuretics 2–3 times per month (1.5%) or laxatives 1–2 times per week (1.0%). Female athletes in aesthetic sports (e.g., gymnastics) report the highest prevalence of clinical and subclinical EDs and the most frequent use of weight control behaviors.[3,4]

Extant prevalence studies[1,3,8] have documented female athletes' frequency of ED behaviors. Their cross-sectional methodologies, however, cannot address the stability of ED classification or behaviors over time. Thus, longitudinal designs are needed to examine the progression of pathology and determine if EDs develop, abate, and/or intensify over time. To date, only one study has examined

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athletes using a longitudinal methodology,[12] finding an increase in EDs from first to third year of high school for female elite athletes; prevalence increased from % to 21.8%. Among female nonathletes (age range from 12 to 23 years), Stice, Marti, Shaw, et al.[18] found that, over an eight year period, 26.7% of the women who initially were classified as subclinical developed a clinical ED. The majority of the women (91%–96%), however, who had a subclinical or clinical ED recovered within a year of being diagnosed in the study (i.e., classified as asymptomatic or normal in their eating behaviors). Data from these studies indicate that ED classifications change over time and recovery may occur within a relatively short timeframe, even without treatment.

Thus, our purpose of this field-based study was to investigate the longitudinal prevalence of ED classification (i.e., clinical ED, subclinical ED, and asymptomatic) and pathogenic weight control behaviors (i.e., bingeing, vomiting, laxatives, diuretics, dieting, and exercising) in female collegiate gymnasts and swimmers, two sports with an increased risk for EDs.[26] First, within each athlete, we examined how ED classifications and use of weight control behaviors changed from the beginning to end of the athletic season. In terms of prevalence, we determined rates at each data collection time as well as the season-long rate, which represented the total number of athletes classified in a specific category at any point during the season. Second, at the group level, we tested whether changes that occurred in ED classifications and weight control behaviors across the season represented significant overall shifts in prevalence and, if so, in what directions such changes occurred (e.g., from subclinical to asymptomatic).

2. Methods

Participants were 219 female collegiate gymnasts and 106 female swimmers drawn from 26 different athletic programs in the U.S.; mean age was 19.24 years (*SD* = 1.14); 103 (31.7%) were freshman, 97 (29.8%) sophomores, 75 (23.1%) juniors, and 50 (15.4%) seniors. Majority were White/Non-Hispanic (*n* = 276; 84.9%) and had an athletic scholarship (*n* = 214; 64.8%). Mean body mass index (BMI) was 22.55 kg/m^2 (*SD* = 2.04; Time 1) and 22.64 kg/m^2 (*SD* = 2.04; Time 2). The study was approved by the Institutional Review Board for Human Subjects Research at the University of North Texas.

Athletes completed the study's measures twice during their sport seasons: (a) Time 1—during two weeks in September at the beginning of the athletic seasons, and (b) Time 2—at the end of February which was two weeks prior to conference championships. At each data collection, athletes received an unsealed envelope containing the consent form and survey questionnaire. Team contacts, who primarily were certified athletic trainers, read the instructions and then the athletes signed consents. Participation was voluntary, though no athlete refused to complete the questionnaires. Survey packets were completed anonymously, though each one was coded by number so it could be matched across Time 1 and Time 2. Due to the anonymity of responses, athletes who exhibited disordered eating behaviors were not referred for treatment, though team contacts (i.e., athletic trainers) were provided with information on recommendations and resources for athletes with dysfunctional eating behaviors. Team contacts were not present when athletes completed the surveys. When finished, athletes sealed the surveys in the envelopes; they wrote an "X" over the seal and returned them to the contacts who subsequently mailed them to the researchers. No envelope had been tampered with or opened.

Athletes completed the 50-item Questionnaire for Eating Disorder Diagnoses (QEDD[13]), which we used to classify them based on criteria from the *DSM-IV*[6] (i.e., which are the criteria on which the QEDD's scoring is based) as: (a) clinical eating disorder (i.e., anorexia nervosa, bulimia nervosa, or eating disorder not otherwise specified [EDNOS], which included menstruating anorexia, subthreshold bulimia, nonbingeing bulimia, and binge-eating disorder), (b) subclinical eating disorder (i.e., presence of symptoms of disordered eating that do not meet clinical criteria for a diagnosis), and (c) asymptomatic (i.e., healthy eating behaviors). The QEDD is a reliable and valid tool for accurately classifying female athletes[4,8] and nonathletes.[13] Given the geographic breadth of the data collection sites across all regions of the United States and the anonymity of the data collection, it was not feasible for the authors to conduct semi-structured interviews with all of the participants. Thus, we chose the QEDD for its high levels of criterion validity, ability to correctly differentiate among diagnostic classifications, and extensive use as an ED classification tool with athletes.[4,8]

Athletes also completed the 36-item Bulimia Test-Revised (BULIT-R[22]), though only six questions were used because they provided specific information regarding frequency of binge eating, laxative use, exercising to lose weight, vomiting, dieting/fasting, and diuretic use. For each item, athletes responded on a 5-point scale that ranged from 1, *least frequent use*, to 5, *most frequent use* (the scale for each item varied slightly but provided actual quantifiable levels of frequency for the behavior, such as 2–3 times per week). These items have been used with female collegiate athletes to assess frequency of weight control behaviors.[8] Athletes also provided demographic information, such as age, race/ethnicity, year in school, height and weight.

Although 414 athletes provided complete Time 1 data, 89 did not participate at Time 2 due to either no longer being on their teams or not being available for the second data collection; 5.6% (*n* = 5) and 34.8% (*n* = 31) of these athletes were categorized as clinical and subclinical, respectively, at Time 1. This group of athletes were less likely to have a clinical eating disorder, but slightly more likely to report subclinical symptoms than those who provided data at Time 1 and Time 2. Analyses are based on the 325 athletes who provided data at both collection times. The athletes' QEDD classifications, as well as their BULIT-R responses, from Time 1 were examined in relation to their Time 2 scores to determine the extent to which movement occurred between classifications and with respect to their frequency of pathogenic weight control behaviors. To address our first purpose, we matched athletes' Time 1 and Time 2 data and tracked the changes in ED classifications and weight control behaviors that occurred. In addition to Time 1 and Time 2 prevalence rates, we provide the season-long prevalence rate (i.e., the total number of athletes classified in a specific category at any point during the season; given this definition, the n's [and %'s] will exceed the overall *N* of the study and 100%) for all outcomes. Consistent with past prevalence research,[1] we reported these frequency data as group percentages. For our second purpose, we performed Chi-square tests to determine whether group level changes in ED classifications and weight control behaviors from Time 1 to Time 2 were significant.

3. Results

At Time 2, 24 athletes were classified with a clinical ED (7.4%); of these, the majority fell into the ED-NOS category, which were primarily bulimia-related disorders. The season-long prevalence was 9.5% (*n* = 31) for a clinical ED. See Table 1 for all prevalence rates.

Crossovers of individual athletes' ED classifications (e.g., Time 1 asymptomatic to Time 2 subclinical ED) are presented in Fig. 1. Of the 20 athletes who had a Time 1 clinical ED, 13 (65%) maintained their clinical classification at Time 2. Overall, 90% (*n* = 18) of the athletes who met criteria for a clinical ED at Time 1 continued to exhibit subclinical or clinical ED symptoms at Time 2.