Eating Disorders in Athletes:
The Role of Coaches in Prevention, Intervention, and Recovery

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Abstract

Athletes are particularly vulnerable to the development of eating disorders, a dangerous category of mental illness. The primary focus of this paper is to explore the prevalence and causes of eating disorders among athletes through a thorough review of scholarly literature. Additionally, this paper includes analyses of data gathered from surveys sent to Division 1 (D1) coaches at the University of Colorado Boulder. The survey assessed coaches' knowledge of eating disorders as a problem in athletics, their ability to identify eating disorder behaviors and warning signs, and their efforts to actively prevent these disorders. Results of the analysis will inform discussion of preventive treatment approaches that coaches, parents, and fellow athletes can implement.

Keywords: mental health, eating disorders, mental illness, athletes, coaches, survey data

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Introduction

In the United States, official statistics from the National Eating Disorders Association (NEDA) report that 20 million women and 10 million men currently suffer from a clinically significant eating disorder (NEDA, 2016). The exact numbers are likely higher, as many symptoms and behaviors go unreported. There are four types of eating disorders: anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified (EDNOS), and binge eating disorder (NEDA, 2016). Anorexia nervosa is characterized by excessive weight loss, irrational fear of gaining weight or becoming fat, avoidance of meals, withdrawal from social situations involving food, fatigue, and among women, loss of menstrual periods (NEDA, 2016). Primary symptoms of bulimia nervosa include preoccupation with body image and weight and consumption of large amounts of food followed by purging behaviors such as self-inflicted vomiting, laxative use, or prolonged fasting (NEDA, 2016). EDNOS is when an individual exhibits symptoms of both anorexia and bulimia, but does not fit all of the criteria for one or the other as outlined by the Diagnostic and Statistical Manual for Mental Disorders (DSM) (NEDA, 2016). While these three types of eating disorders are characterized by purging or excessive starvation after meals, binge eating disorder entails the consumption of large amounts of food without any subsequent expulsion or restriction following ingestion. Individuals with binge eating disorder are usually significantly overweight and exhibit behaviors such as eating when not hungry and eating in secret (NEDA, 2016).

The research presented here focuses on anorexia, bulimia, and EDNOS, and specifically the susceptibility of competitive athletes and perceptions of coaching staff regarding these

disorders. Since coaches have regular interaction with their athletes, it is important to understand their knowledge of the sport-specific risk factors, warning signs, and symptoms. This study reports on a survey undertaken with CU-Boulder Division I coaches to ascertain their knowledge of, and experience with eating disorder signs and symptoms within their athletes. Below, I provide an overview of eating disorders and research examining their prevalence and determinants specifically within athletes. I then discuss my survey, present results, and conclude with implications.

Background

Athletes are particularly at risk for eating disorders because they experience societal pressures broadly combined with additional stressors and pressures due to their participation in competitive sports (DiPasquale and Petrie, 2013). Eating disorders are most prevalent among athletes who participate in sports that require strength and endurance, but where performance success is also correlated with being lean and having a low body weight. Some of these sports include gymnastics, figure skating, ballet, and cross-country running. Additionally, sports that divide athletes into weight classes or conduct frequent weigh-ins such as wrestling, horse racing, and crew, also increase the potential for eating disorders and intensified self-criticism.

Multiple studies have shown that male and female athletes have higher instances of disordered eating compared to their nonathlete counterparts (DiPasquale and Petrie, 2013). There are limited eating disorder studies where a large group of athletes across a range of sports disciplines and an equally large control group answer questionnaires, which are then corroborated by clinical interviews (Currie and Morse, 2005). The largest study to meet these criteria was a collaborative effort by professors Dr. Jorunn Sundgot-Borgen of the Norwegian

School of Sport Sciences and Monica Klungland Torstveit, of the University of Adger in Norway. A summary of their findings can be found in Appendix 1, Figure 1.

In this study, 1,620 male and female Norwegian elite athletes and 1,696 male and female nonathletes answered questionnaires regarding dietary intake and habits. Clinical interviewers followed up with both groups to authenticate what was reported in the questionnaires. The questionnaire and interview results showed that 7.7% of male and 20.1% of female athletes had eating disorders compared to 0.5% and 9% of male and female non-athletes, respectively. The methodology did not distinguish athletes by sport type, but solely by gender. These results parallel those of smaller scale studies, corroborating the correlation between sport participation and eating disorder prevalence (Sundgot-Borgen, and Torstveit, 2004).

Another study, published in the *Journal of Clinical Sport Psychology* in 2013, compared 146 male and 156 female NCAA Division I athletes to 170 male and 353 female nonathletes from the same university to gauge differences in behaviors associated with eating disorders (DiPasquale and Petrie, 2013). The study controlled for age and ethnicity. While more nonathletes reported feeling that parts of their body were "too fat," an astonishing 30% of female and 14% of male athletes reported their dissatisfaction with particular parts of their bodies and the perception that certain parts of their bodies were unappealing (DiPasquale and Petrie, 2013). Unlike the nonathlete group, responses among athletes were not anonymous. It's possible that the athletes' behaviors associated with eating disorder symptoms were actually underreported for fear of negative repercussions. Interestingly, the two athlete groups demonstrated more instances of extreme dieting and weight controlling behaviors, implying that these behaviors are possibly viewed as normal among athletes, and thus, have less negative stigma associated with them.

These results are concerning because they suggest that behaviors associated with eating disorders in the nonathlete population are regarded as normal habits to athletes.

Genetic Factors

There are factors outside of the socio-cultural milieu that shape vulnerability to eating disorders. It was not until recently that studies were performed to test for predisposing genetic factors, as these types of studies are quite expensive and difficult to conduct. Researchers must gather a group of diagnosed individuals to compare to a control group and examine genotype frequencies in search for disparities in genes hypothesized to contribute to development of disorders. These studies also require long periods of time over which subjects in the disordered group will have their symptoms monitored and tracked for changes. Additionally, there are many variables to consider and possibly control for such as race and ethnicity as well as whether one gene, or a series of genes, should be explored (Pinheiro et al., 2006).

Genetic studies conducted thus far have focused on genes that encode proteins related to hunger regulation, body composition, and neurotransmitter function. A particular neurotransmitter studied is serotonin, as it participates in appetite and mood regulation (Pinheiro et al., 2006). While several serotonin-related studies produced results linking certain serotonin transporters to eating disorder traits, similar, larger scale studies have failed to replicate these findings. Other studies focusing on estrogen pathways suggested a correlation between an estrogen beta-receptor and diagnosis of bulimia nervosa. Despite researchers' strong suspicion that eating disorders manifest from both environmental *and* genetic factors, studies associating certain genes expressed in people with eating disorder behaviors have not been successfully replicated to suggest direct causation, much less, a strong correlation. Thus, eating disorder

treatment should still be approached with the notion that socio-cultural influences are the primary factors at play.

Risk Factors

Athletes are particularly at risk for developing eating disorders because they are not only susceptible to the same socio-cultural influences as the general population, but they are also exposed to what researchers have determined as "sport-specific factors" (Giel, et. al, 2016). One potential factor is early sport-specific training--when an athlete begins engaging in one sport competitively from a very young age (Currie and Morse, 2005). The danger herein lies with predetermined genetic factors related to body-type that could ultimately manifest in the sport being inappropriate for a particular individual. This distinction is especially apparent during and post puberty when body fat begins depositing in specific areas, completely dependent on the individual's gender and hormone levels. For example, female gymnasts and figure skaters undergoing puberty often experience difficulty executing proper height and speed for certain skills due to growth spurts and weight gain. Viewing their altered body composition as a hindrance to performance, these athletes will be more likely to implement stricter diet regimes to account for such factors, thus becoming highly conscious of calorie intake (Joy and Nattiv, 2016).

Another important sport-specific factor is the occurrence of a traumatic event, such as an injury, that displaces the athlete for a significant amount of time (Currie and Morse, 2005). Being displaced from an activity that is an integral part of one's daily life will understandably cause some amount of stress or depression. Additionally, or perhaps as a result of such depression, the athlete may exhibit compensatory behaviors regarding food consumption to account for his or her decreased activity level. Unfortunately, these behaviors can often become addicting so that

they continue even after the individual returns to normal athletic activity, causing them to become susceptible to injuries due to malnourishment, thus a vicious cycle can ensue (Beals and Manore, 2000).

Consideration of the etiological factors of eating disorders is crucial for understanding the serious implications posed for this susceptible group, as many of the characteristics that promote positive athletic performance actually often also overlap with characteristics of disordered eating (Currie and Morse, 2005). Personality traits associated with athletic success include goal-oriented mentalities, blocking out distractions, performance anxiety, monitored dieting, perfectionism, and compulsiveness. According to the *European Journal of Sport Science,* there are three categories of risk factors for the development of eating disorders in athletes: predisposing, trigger, and perpetuating (Bratland-Sanda and Sundgot-Borgen, 2013). These risks are classified as follows:

Predisposing factors include genetics and personality traits such as perfectionism, over-compliance, willingness to please, and competitiveness. Theses are all traits that coaches find appealing, yet can also predispose an athlete to develop eating disorder habits. Additionally, self-esteem issues, body dissatisfaction, media influence, and past traumatic life events like sexual abuse or bullying are also predisposing elements (Bratland-Sanda and Sundgot-Borgen 2013).

Trigger factors include negative comments from coaches or teammates and distressing events like injuries. These factors are often unpredictable and the effects can vary depending on the individual (Bratland-Sanda and Sundgot-Borgen, 2013). For example, if a coach comments that an athlete has a slow day in practice, the presence or absence of a predisposing factor can influence how the athlete interprets the comment. If the athlete already struggles with self-esteem issues or body dissatisfaction, this type of comment may convince the athlete that dieting or

other forms of calorie restriction will fix the "problem." On the other hand, an athlete who does not possess the predisposing qualities may view their slow day as a sign that a better night's rest is necessary.

Lastly, perpetuating factors are those that encourage someone to continue his or her eating disorder behaviors once already commenced. For example, praise from coaches or teammates due to performance improvement or noticeable, appealing changes in figure are examples of perpetuating factors. Positive feedback may inadvertently encourage an athlete to continue the eating disorder practices, thinking that losing more weight will lead to even further success (Bratland-Sanda and Sundgot-Borgen, 2013).

Eating disorder prevalence rates in male and female athletes vary depending on sport. Differences between male and female athletes with eating disorders will be discussed in the next two sections.

Female Athletes

For female athletes, endurance and aesthetic sports, such as cross country and gymnastics demonstrate the highest prevalence of eating disorders. Female athletes, more so than male athletes, are at risk because they frequently participate in sports where form fitting clothing is required. Female bodies are already highly sexualized and objectified, and the uniforms female athletes compete in often further highlight the aspects under the societal microscope (Arthur-Cameselle and Baltzell, 2012). The societal expectations can understandably cause female athletes to be highly self-conscious of their appearance when competing, putting them at risk for developing an eating disorder, as they may feel the need to fit a bodily ideal for their sport (Joy and Nattiv, 2016). If one's body does not fit the norm set for that sport, this could cause the

athlete to think dieting or stricter weight-loss strategies will aid in achieving this body type, consequently enhancing their performance (Arthur-Cameselle and Baltzell, 2012).

Eating disorders in female athletes often result in the diagnosis of the Female Athlete Triad. Female Athlete Triad comprises disordered eating habits, like those of someone with anorexia nervosa, as well as amenorrhea, or loss of menstrual periods, and osteoporosis, loss of bone density. Weight fluctuations paired with hormonal imbalances can have serious effects not only on the individual's athletic performance but also on their long-term well being (Currie and Morse, 2005).

Male Athletes

Weight-class sports, like crew and wrestling have the highest occurrence of eating disorders among male athletes (Bratland-Sanda, 2013). Eating disorders in male athletes, like those in females, often emerge from a fear of becoming overweight. However, male athletes more frequently develop the disorder from apprehension of becoming less muscular. For this reason, there is a higher prevalence of EDNOS among male athletes as compared to anorexia or bulimia. In order to ensure their muscle mass is maintained or improved, male athletes with bodily insecurities sometimes resort to steroid use to accomplish their desire for enhanced muscularity (Parssinen and Seppala, 2002). Not only does the athlete risk jeopardizing their athletic career due to legality concerns, but also long-term steroid use can have hazardous health ramifications such as increased risk of cancer, cardiovascular difficulties, and mental health problems (Parssinen and Seppala, 2002). A Male Athlete Triad can also be considered as a type of eating disorder, as nutrition deficiency is associated with decreased testosterone levels, leading to decreased bone density. (Bratland-Sanda and Sundgot-Borgen, 2013).

An additional risk factor for males, regardless of sport participation, is sexual orientation. For reasons still not well understood, the prevalence of eating disorders is higher among homosexual males than their heterosexual counterparts (Bratland-Sanda and Sundgot-Borgen, 2013). However, since the prevalence of bullying is statistically higher among homosexual teenagers, and bullying is a definite risk factor for developing an eating disorder, this correlation serves as a potential explanation for why homosexual males are more susceptible.

The Roles of Coaches

As mentioned previously, much research has been done to demonstrate that athletes are particularly susceptible to the development of eating disorders. Additionally, qualitative research has been conducted, mostly in the form of interviews, to assess treatment strategies for athletes. There have not been, however, extensive studies to assess coaches' levels of awareness and knowledge of eating disorders. Since coaches spend numerous hours each week with their athletes, it is imperative to gauge their knowledge of the sport-specific risk factors their athletes encounter as well as their knowledge of warning signs and symptoms. Since few studies exist in this area of eating disorder research, I conducted my own research in order to assess coaches' knowledge of eating disorders, their awareness of risk factors for their respective sports, evaluate the roles coaches play in the prevention of eating disorders, and examine how they facilitate treatment. My primary research questions and hypothesis are as follows:

Research Question 1: To what extent are collegiate coaches aware of the factors particular to their respective sports that can contribute to the development of an eating disorder?

Hypothesis 1: Coaches are most likely not aware that certain aspects of their sport, such as uniforms or ideal body type, could increase the likelihood of their athlete developing an eating disorder.

Research Question 2: Are coaches educated about the warning signs and symptoms of disordered eating?

Hypothesis 2: Most collegiate coaches will have general knowledge of eating disorders, but may not be able to recognize the difference between the behaviors of a dedicated athlete and those of someone with an eating disorder.

Research question 3: Do the majority of coaches know the percentage of male and female athletes diagnosed with eating disorders in the United States?

Hypothesis 3: The majority of coaches will not know the occurrence of male and female athletes diagnosed with eating disorders.

Methods

Data for this study were collected through a survey of 32 Division 1 coaches at the University of Colorado Boulder. The surveyed individuals are all over the age of 25, and they coach either varsity or club sports, and have been coaching at the collegiate level for a minimum of five years. Coaches with less than five years of experience were not sampled because of their limited coaching experience at the Division 1 level. The study did not include an upper-age limit. Twenty of the surveyed coaches are male, and 12 are female. Additionally, the vast majority of those surveyed are Caucasian. Of the 32 surveys, 9 were returned, yielding a response rate of 28.1 percent. Though 8 of the 9 respondents were male, there was a relatively even distribution of respondents who coached males only, females only, and both males and females. A description of the respondents is provided in Appendix 1, Table 2.

Participation in the study was completely voluntary and subjects who participated were not compensated. The survey was devised using Qualtrics software provided by CU Boulder's Office of Information Technology, and the coaches were sent emails with a link to the survey.

The coaches' email addresses were acquired through the CU Athletic Department's public website. The survey consisted of 15 required multiple-choice questions and two optional fill-in-the-blank questions. The survey was completely anonymous and each of the multiple-choice questions provided a "prefer not to answer" option, so to further ensure and protect the coaches' privacy. The first five questions inquired about the coaches' genders as well as the gender of their athletes, the nature of their sports (team, individual, or combined) and characteristics of their athletes' personalities. Questions 6-7 asked about pre-season health screenings (if their athletes complete a pre-season health screening and if it assesses eating habits). Question 8 asked the coaches to subjectively rate the occurrence of various eating disorder habits observed in their athletes (such as intentional restriction of calories, comparing weights and clothes sizes, or refusal to eat certain foods). Questions 9-15 inquired about the coaches' opinion regarding eating disorders as a problem in athletics, what percentage of male and female athletes do they believe have eating disorders, and whether or not they had previously coached someone they knew or suspected had an eating disorder and what measures they took to intervene, if any. Finally, questions 16-17 were optional fill-in-the-blank questions asking if there is an ideal body type for the coach's respective sport and also how nutrition is discussed with their athletes. This study was approved by the Institutional Review Board at the University of Colorado Boulder.

Given the relatively low number of respondents, I provide a qualitative examination of response patterns in lieu of undertaking statistical analyses.

Descriptive Analysis and Discussion

Early detection is key when it comes to eating disorder interventions. For athletes, pre-season health screenings are key mechanisms through which the presence of eating disorder behaviors can be detected accurately and early (Sleight et. al, 2015). These screenings typically involve

questions assessing the frequency of certain behaviors such as calorie counting, weighing oneself, and laxative use, which, if done often, can be indicative of a potential eating disorder. At CU Boulder, less than half (44%) of the coaches reported their athletes undergo a pre-season health screening. Of those that do implement a screening, only 2 coaches reported that the screening assesses eating behaviors and habits. These data imply that pre-season health screenings aren't routine or required by CU Boulder's athletic department as a whole. Additionally, there is no indication on the NCAA's website that pre-season physicals are required. This implies that this decision is left to the each university, and, as my data may suggest, each individual sport organization within a university.

In addition to screenings, coaches may become aware of eating disorders through regular contact with their athletes. When asked how often their athletes engage in behaviors typical of eating disorders, 5 of the 9 coaches reported "often" or "sometimes", and 6 reported noticing dieting behaviors as well as intentional restriction of calories. Several coaches (5) reported overhearing athletes negatively comment on their own appearance. Another indicator of unhealthy body image is training outside of practice, during the season. This behavior reflects that athletes may feel that structured team practices aren't enough to meet their performance and fitness goals. All but one coach reported their athletes train outside of practice "often" or "sometimes" during the season. It is important to note that some athletes may train on their own time, for example, to improve a certain skill that they otherwise couldn't during a team practice. However, if an athlete trains outside of practice for the purpose of losing weight, thinking this will make them faster or stronger, this is something that is considered "overtraining." This could be indicative of an eating disorder. This type of training outside of practice is dangerous because the excessive exercise may not allow the body enough time to recover, and thus lead to overuse

injuries such as stress fractures, representative of low bone density (Hilibrand et. al, 2015). Assessment of other behaviors including "comparing weights/clothes sizes," "saying something negative about another athlete's physical appearance," "making excuses for missing team events, dinners, etc.," "refusing to eat certain foods such as carbohydrates or fats," and "dizziness, fainting, or general fatigue" all received predominantly "rarely" and "never" responses. These data demonstrate that some but not all eating disorder behaviors may be commonplace in the athletic community, implying that for athletes and perhaps their respective coaching staffs, the line between dedication to one's sport and excessive training and dieting may be blurry.

It is important to determine if coaches are aware of the problem of eating disorders, as they can have a tremendous impact on prevention and recovery of this disease if they are properly educated about this issue. When asked explicitly if eating disorders are a problem in athletics, less than half were certain (4), with the remaining coaches either unsure or declined to answer. These responses however, are inconsistent with the responses of the previous question, inquiring about the frequency of certain eating disorder behaviors. A visual representation of this disparity can be found in Figure 1. This disparity serves as strong indication that these behaviors such as training outside of structured practice time, saying something negative about one's appearance, and engaging in dietary restrictions, among others may be overlooked or seen as commonplace in athletics. When asked the incidence of male athletes diagnosed with eating disorders, less than half the coaches (4), chose the correct statistic of "less than 10%." Similarly, when asked the same question regarding female athletes, only 1/3 of coaches answered correctly (3) choosing "greater than 20%" These results indicate that the majority of coaches are somewhat but not fully aware of the prevalence of eating disorders in athletics. Without a

complete understanding, this makes it difficult for coaches to promote healthy training and nutrition practices as well as serve as supportive resources for struggling athletes.

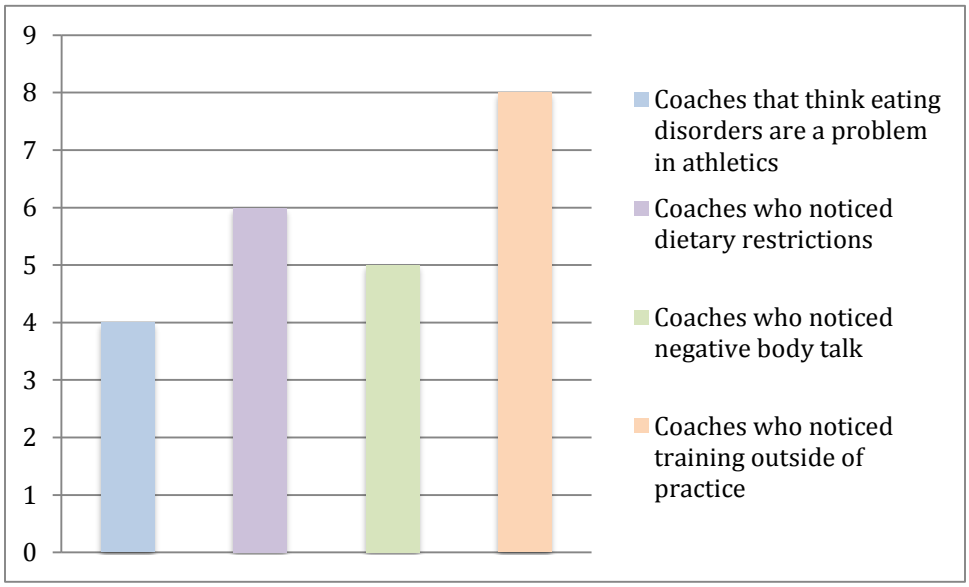

Figure 1: Coach perceptions of eating disorder prevalence in athletics (blue) compared to noted possible eating disorder behavior in their athletes (purple, green, and orange).

Next, coaches were asked about their own experiences with athletes previously diagnosed with an eating disorder, or suspected of having one. Less than half the coaches responded that eating disorders were definitely a problem in athletics, but, when asked if they had previously coached an athlete they *knew* had a diagnosed eating disorder, more than half (5) answered "yes- more than once." Additionally, when asked if they had previously coached an athlete they *suspected* had an eating disorder, again, more than half (6) answered "yes" with the majority of those instances being more than once.

These findings suggest that while coaches aren't fully knowledgeable about eating disorders in athletics, they aren't totally ignorant to the issue either – and many have had direct

connection within athletes of concern. This could imply that knowledge regarding athlete mental health and nutrition is left up to the discretion of universities or perhaps individual coaches to decide the appropriate amount of education necessary. While there are numerous resources on the NCAA's public website regarding athlete mental health, these are targeted towards athletes themselves, without any section of the website designated "for coaches." Furthermore, there is no evidence to suggest that coaches are required to undergo training or education programs regarding the mental health of athletes, including as related to eating disorders.

Lastly, the coaches were given two optional fill-in-the-blank questions. The first asked about an ideal body type for their respective sport, as striving for a specific body type to meet performance goals can lead to drastic measures, many of which are associated with eating disorder behaviors. Of the coaches that answered this optional question (8), the majority (5) identified "leanness" as an ideal quality with "strong" and "tall" also being common descriptions. This implies that sports do have somewhat of ideal body types that coaches are aware of. Since "leanness" was emphasized, this is certainly something that, if communicated to athletes, could be a contributing factor to the eating disorder habits that were reported. Additionally, previous research shows that eating disorder prevalence is higher in sports that emphasize and value leanness (Giel et. al, 2016).

The second fill-in-the-blank question asked about how nutrition is communicated to the athletes. More than half of the coaches that answered this question reported that nutrition was emphasized through group discussion and guest speakers, while one coach said this was the athletic department's job. These results suggest that educating athletes about nutrition is left to the individual discretion of the coaches and that there is no established educational program about nutrition that all athletes or coaches are required to attend.

Implications of Eating Disorders: Athletic Careers and Long-term Health

On average, athletes with eating disorders have shorter careers due to recurring injuries and inconsistencies in performance from malnutrition and fatigue (Currie and Morse, 2005). Malnourished athletes, having insufficient nutrient and low electrolyte levels at the start of competition or practice, are at an increased risk of having seizures, collapsing, or experiencing arrhythmias, a condition causing the heart to have irregularities in beat. Additionally, there are a number of co-morbidities that result from having an eating disorder. Calorie restriction paired with high physical activity have many health consequences such as compromised immune function, chronic fatigue, and hormone imbalances (Beals and Manore, 2000). Other psychological disorders such as anxiety disorder or depression may result from electrolyte and hormonal imbalances, causing mood fluctuations (Giel et. al, 2016). Body Dysmorphic Disorder (BDD) is also a common co-diagnosis resulting from an athlete over-critiquing their physical appearance. The individual will refer to certain body parts as "ugly" or "deformed" and may even consider cosmetic surgery or other extreme remedies to correct these "imperfections" (Currie and Morse, 2005).

Substance abuse whether from laxative use, diet pills, steroid use, or appetite suppressing drugs is another dangerous behavior common with eating disorder diagnoses. However, these behaviors become especially serious when the individual begins to have withdrawal symptoms, gains a higher tolerance, or obsesses over finding drugs, as these behaviors may persist even after recovery from the eating disorder (Hilibrand et. al, 2015). Overall, eating disorders have the highest mortality rate of any mental illness with 15% of all people diagnosed with anorexia nervosa dying as a result of health complications (NEDA, 2016).

Prevention Techniques and Support Resources

Eating disorders are rampant in the United States. There are approximately 30 million eating disorder diagnoses in the US, which is more than the prevalence of Alzheimer's, schizophrenia, and autism combined (NIH, 2016). In 2015 however, the National Institute of Health (NIH) supported an average of 346 million dollars in research funds for each of these other diseases, compared to 31 million dollars allocated to eating disorder research (NIH, 2016). This shocking statistic suggests that the severity of eating disorders is not well understood. Yet, there are several non-profit organizations working to improve understanding. The National Eating Disorders Association's website is replete with handouts, screening tools, resources for parents and coaches, as well as information regarding speakers in various cities and other events hosted by NEDA. Additionally, a peace movement named "Health at Every Size" which "acknowledges that good health can best be realized independent from considerations of size" and includes an online community that supports feeling healthy rather than focusing on numbers like pant size or weight (Bacon, 2014). Additionally, the National Collegiate Athletic Association's public website (NCAA.org) contains a multitude of sources regarding nutrition, information about athlete mental health, and tips for healthy weight-loss strategies. Lastly, sports nutrition textbooks for collegiate classes are becoming much more diligent about including sections on eating disorders and dispelling commonly believed food myths (Currie and Morse, 2005).

Advice from Recovered Current and Former Athletes

Testimonials or mentoring from a fellow athlete who has suffered and recovered from an eating disorder, combined with consulting a psychologist, doctor, or nutritionist, could be significantly impactful, as it would make the experience and implications of the disease more tangible. In a 2012 study Professor Jessyca Arthur-Cameselle of Manhattanville College and Dr.

Amy Baltzell of Boston University interviewed 16 current or former collegiate female athletes who were clinically diagnosed with anorexia, bulimia, or EDNOS and successfully recovered. The participants were asked about advice they would give coaches and parents on how to better prevent eating disorders and help facilitate recovery. The majority of participants emphasized the necessity of education and also that coaches should continually emphasize proper nutrition. After games and practices, in addition to advising a good night's rest and hydrating, the respondents said that coaches should also emphasize the importance of eating a good meal (Arthur-Cameselle and Baltzell, 2012). They also said that knowing how to talk to athletes about training habits and appropriate weight ranges is an essential skill.

The Aurthur-Cameselle and Baltzell (2012) study also revealed that parental education is key since it will improve communication and support. Many of the respondents advised that a parent helps best when providing emotional support and not trying to force the athlete into any kind of intensive recovery program. While it is certainly appropriate to offer the option of an outpatient recovery program, the respondents felt that more general parental support was particularly important (Arthur-Cameselle and Baltzell, 2012).

The respondents also provided advice for fellow athletes that are suffering. They suggested that those affected should examine their triggers and that they not shy away from seeking emotional support from close friends and family members. They also emphasized the importance of doing things that make one happy. An essential part of recovery is spending time with friends, loved ones, pets, or simply engaging in activities that minimize triggers and take the focus off the disordered thoughts. Lastly, the respondents advised that the key to recovery is believing recovery is possible. One misunderstood concept about eating disorders is the notion that forcing a person into therapy or recovery programs will solve the problem. However,

recovery is only achieved when the desire to be healthy comes from the athlete, as s/he ultimately decides whether or not recovery will happen. Focusing on the rewards of recovery, such as better athletic performance, more energy, and happiness, as well as improving one's relationship with food, can encourage the return of a healthy lifestyle.

Conclusion: Facilitating recovery and potential solutions

Diagnosing eating disorders in athletes is particularly tricky, as there is a fine line between being meticulous about dietary intake and intentionally depriving oneself of fuel. Athletes are particularly susceptible to eating disorders, and because of the stress already imposed on their bodies, the ramifications of an eating disordered athlete can be catastrophic not only for one's athletic career, but also for long-term physical and mental wellbeing. As indicated by the data gathered in my study, there is a disparity between the number of coaches who believe eating disorders are a problem in athletics and the number of coaches who noted experiencing their athletes engage in behaviors consistent with eating disorders. Additionally, my data suggest that coaches are not required to undergo nutritional education nor education regarding athlete mental health. Also, there does not seem to be a standard requirement for a pre-season health assessment of dietary intake and habits. For these reasons, there must be a greater emphasis on coaches and athletic programs to recognize the risk factors of their respective sports, become educated on prevention techniques, and understand how to facilitate and encourage recovery for a struggling athlete.

On recommendations, I would argue that conducting an eating disorder screening/questionnaire as part of pre-season or pre-competition evaluation should be required. Additionally, education regarding early detection of warning signs such as eating alone, visiting the bathroom right after meals, weighing oneself often, laxative use, and calorie counting will

help coaches and team physicians detect eating disorder behaviors. Awareness of these factors is important for coaches and other professionals working with athletes so that a more timely identification of the problem is possible, as there is a strong correlation between the severity of eating disorders and the duration of recovery. This means, the earlier an eating disorder is detected, the quicker the recovery process usually occurs (Beals and Manore, 2000). This early detection, assuming proper counseling and supportive measures follow, will hopefully prevent an athlete from missing out on competitions due to injuries or weakness. It can also impede the onset of conditions like amenorrhea and osteoporosis that, if were to persist over a long period of time, would otherwise have detrimental long-term effects.

There are also multiple actions coaches can take throughout the season as preventive measures. Most importantly, coaches should get to know their athletes outside the context of competition. This can be accomplished through team bonding activities or one-on-one check-in meetings throughout the season. These simple, yet impactful connections allow athletes to recognize that the coach does not just solely value them for their performance, but additionally, they see the athlete as a whole person. In the event that an individual has an off day during practice or a competition, he or she will be assured that the coach does not think any less of them. In addition, knowing that coaches value their mental wellbeing will reassure athletes that their coaches are fully invested in their success as it relates to each individual being satisfied with his or her performance.

If an eating disorder diagnosis is made, a physician should evaluate the athlete to ensure their health has not been compromised. If such a diagnosis is made and an athlete must abstain from strenuous physical activity, he or she should seek professional therapeutic support to aid with the emotional trauma often associated with missing competition. Athletes, regardless of

whether or not they are prohibited from competition, should also consult with a nutritionist to devise a plan for adequate nourishment. They should be educated about the nutritional role of certain foods, promoting a healthy relationship with food (Currie and Morse, 2005). Furthermore, therapy sessions where coaches and/or parents are present can be very beneficial, as this can improve understanding of not only the physical symptoms of an eating disorder, but also how these symptoms and their repercussions can affect the athlete emotionally.

People with eating disorders often struggle alone. Open communication with coaches and trusted teammates is critical in the creation and maintenance of a strong support system. However, this step should be taken with caution, as eating disorders are not well understood, and often, people do not know how to most effectively offer support. This is why all athletes should have, at the very least, a basic education about eating disorders as well as knowledge of ways in which they can support a struggling teammate (Joy and Nattiv, 2016). Ultimately, however, sports cannot be blamed for the development of eating disorders. There are also often underlying, pre-existing vulnerability factors, such as body insecurities, which are then manifested by sport-specific factors, like the requirement of tight clothing. This is why it is imperative that these potentially problematic aspects of the sporting environment are understood and properly managed by coaches and athletic organization more broadly.

Regrettably, there is no single solution or strategy that will raise awareness and help prevent the onset of eating disorders in athletes. Awareness and prevention requires many initiatives from various groups of people collaboratively making a difference over time. These efforts include perhaps a reform in the NCAA's health and education requirements, coaches and parents taking initiative to actively educate themselves, students being educated about eating disorders in health classes from an early age, and athletes promoting healthy training habits to

other athletes. Like all other social change, these shifts require time. Current athletes must actively begin to teach these new perspectives about bodies and healthy training behaviors to subsequent generations for these positive, healthier mindsets to eventually become mainstream in athletic culture.

Appendix A

Figures and Data Tables

Table 1
Prevalence of eating disorder by subtype

Athletes	n	Anorexia nervosa	Bulimia nervosa	EDNOS and AA	Total (%)
male	687	0	17	38	55 (7.7)
female	572	11	36	68	115 (20.1)
% of cases who are male	32.4				
% of cases who have anorexia	6.5				
Controls					
male	629	1	1	1	3 (0.5)
female	574	1	17	34	52 (9)
% of cases who are male	5.4				
% of cases who have anorexia	3.6				

Abbreviation: AA, anorexia athletica.
Data from Sundgot-Borgen J, Torstveit MK. Clin J Sport Med 2004;14(1):25–31.

Table 1: This is a summary of Sundgot-Borgen and Torstveit's data. For their study, 1,620 Norwegian male and female athletes and 1,696 control subjects took an initial eating disorder screening questionnaire. Of those initially surveyed, 74 percent completed the study by subsequently participating in a clinical interview. This interview served to validate the behaviors reported on the questionnaires. No statistical software was used to analyze the data. Their findings show that male and female athletes demonstrate a higher occurrence of eating disorders than nonathletes (Sundgot-Borgen, and Torstveit, 2004).

Table 2: Coach/athlete gender breakdown of respondents

Gender of coach	**Coach Males**	**Coach Females**	**Coach both**
Males:	3	2	3
Females:	-	1	-

Appendix B

D1 Coaches Survey

Q1 What is your gender?
- ❍ Male
- ❍ Female
- ❍ Transgender
- ❍ Other
- ❍ Prefer not to answer

Q2 What is/are the gender(s) of the athletes you coach?
- ❍ Male
- ❍ Female
- ❍ Both males and females
- ❍ Prefer not to answer

Q3 How long have you been a coach at the collegiate level?
- ❍ 0-5 years
- ❍ 6-10 years
- ❍ 11-20 years
- ❍ 20+ years
- ❍ Prefer not to answer

Q4 Which of the following best describe the nature of your sport (choose ALL that apply)
- ❑ Team sport
- ❑ Individual sport
- ❑ Both team and individual components
- ❑ Primarily sprint-related exertion
- ❑ Primarily endurance-related exertion
- ❑ Equal amounts of sprint and endurance-related exertion
- ❑ Prefer not to answer

Q5 What personality traits apply to your BEST athletes (choose 3)

- ❑ Dedicated
- ❑ Compliant
- ❑ Perfectionistic
- ❑ Detail-oriented
- ❑ Serious
- ❑ Motivated
- ❑ Perceptive
- ❑ Tough
- ❑ Prefer not to answer

Q6 Do your athletes complete a pre-season health screening

- ❍ Yes
- ❍ No
- ❍ Not sure
- ❍ Prefer not to answer

Q7 If applicable, does this pre-season health screening include an assessment of eating habits/behaviors

- ❍ Yes
- ❍ No
- ❍ Not sure
- ❍ N/A
- ❍ Prefer not to answer

Q8 During your coaching career, how often have you experienced/seen/heard of an athlete do the following?

	Never	Rarely	Sometimes	Often	Prefer not to answer	2-3 Times a Week	Daily
Intentional restriction of calories/dieting	❍	❍	❍	❍	❍	❍	❍
Compare weights/clothes sizes/strength	❍	❍	❍	❍	❍	❍	❍
Say something negative about another athlete's physical appearance	❍	❍	❍	❍	❍	❍	❍

Say something negative about one's own physical appearance	❍	❍	❍	❍	❍	❍	❍
Make excuses for not eating at team dinners, events, etc.	❍	❍	❍	❍	❍	❍	❍
Calorie counting	❍	❍	❍	❍	❍	❍	❍
Training outside of practice during the season	❍	❍	❍	❍	❍	❍	❍
Refusal to eat certain foods such as fats or carbohydrates	❍	❍	❍	❍	❍	❍	❍
Dizziness, fainting, or general fatigue	❍	❍	❍	❍	❍	❍	❍

Q9 To what extent do you believe eating disorders are a problem in athletics?

- ❍ Not at all
- ❍ Probably not
- ❍ Probably yes
- ❍ Definitely
- ❍ Prefer not to answer

Q10 What percentage of male athletes would you expect have eating disorders?
- ❍ None
- ❍ Less than 1%
- ❍ Less than 10%
- ❍ Less than 20%
- ❍ Greater than 20%
- ❍ Prefer not to answer

Q11 What percentage of female athletes would you expect have eating disorders?
- ❍ None
- ❍ Less than 1%
- ❍ Less than 10%
- ❍ Less than 20%
- ❍ Greater than 20%
- ❍ Prefer not to answer

Q12 Have you ever coached someone you knew had a diagnosed eating disorder?
- ❍ Yes-once
- ❍ Yes-more than once
- ❍ No
- ❍ Prefer not to answer

Q13 If "yes" to the previous question, please indicate any actions you took
- ❑ I answered "no"
- ❑ I did not take action because it's not my place/responsibility
- ❑ I did not take action because I didn't want to be nosy/intrusive
- ❑ I did not take action because I didn't feel as if I could help in any way
- ❑ I did not take action for other reasons
- ❑ I talked to the athlete to let them know I would try to help in any way I could
- ❑ I talked to the athlete's parents to let them know I would try to help in any way I could
- ❑ I did something not listed
- ❑ Prefer not to answer

Q14 Have you ever coached someone you suspected had an eating disorder?
- ❍ Yes-once
- ❍ Yes-more than once
- ❍ No
- ❍ Not sure/can't remember
- ❍ Prefer not to answer

Q15 If "yes" to the previous question, please indicate any actions you took
- ❑ I answered "no"

- ❑ I did not take action because it's not my place/responsibility
- ❑ I did not take action because I didn't want to be nosy/intrusive
- ❑ I did not take action because I didn't feel as if I could help in any way
- ❑ I did not take action for other reasons
- ❑ I talked to the athlete him/herself
- ❑ I consulted with a fellow staff member on what to do
- ❑ I consulted one of the athlete's friends/teammates
- ❑ I did something not listed
- ❑ Prefer not to answer

Q16 Is there an idea body-type for your sport (i.e. is a certain body type usually indicative of success in your sport) and how would you describe this body type?

Q17 How do you emphasize the importance of nutrition to your athletes?

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