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Prevalence and Prevention of the Female Athlete Triad

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HONORS PROJECT

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Just as women obtain the right to compete in athletics and prove themselves worthy of the resources previously explicitly given to men, they find themselves unable to complete a career in its entirety. No longer is this lack of completion due to the inability to find somewhere to play, but is instead due to the recent plague of a medical disorder. This disorder is invading thousands of teams and cutting the seasons of which women have worked so hard to earn the right to have, short. Recent studies estimate that women in collegiate athletics are up to six times more likely to develop any two of the three components of this disorder (Black). The growing commonality of this disorder deserves attention. This obstacle, the female athlete triad, clinically addresses three inter-related disorders: disordered eating, amenorrhea, and osteoporosis. Each of the three components exists within a spectrum and acts as a channel for the instigation for the other. In order to develop a plan as to how to suppress the expansion of the female athlete triad among collegiate athletics, one must first develop a thorough understanding of the three components and how they interact with one another. She must then decide which of the three components is the most responsible for the escalation and perpetuation of the disorder and then must hypothesize as to why a specific type of female athlete is most commonly plagued with the triad. Once a target group is identified, a prevention plan can be implemented in order to decrease the prevalence of the female athlete triad on all campuses. Identifying and understanding the three pillars of the triad, disordered eating, amenorrhea, and osteoporosis, is essential in its eventual prevention.

Disordered eating is the most diverse identifying pillar of the female athlete triad and is predominately considered to be the most dangerous component due to the intense psychological involvement of dietary habits. The reported surge of power and or loss of control a person battling an eating disorder feels when manipulating her diet is the perpetuating force of disordered eating, thus making the implementation of successful therapy fairly difficult (Seid). Many studies have unanimously concluded, via different theories, that there is a higher prevalence of disordered eating among women that have actively participated in athletics than in women that have not. In one study, over one third of the female athletes surveyed reported using an extreme diet method within the past six months and only 9% of non-athletes reported exhibiting these same methods (Montenegro). Dietary behaviors referenced in this study include, but were not limited to, anorexia nervosa and bulimia nervosa. Both of these disordered eating habits are rooted in the same goal of reducing weight in an extreme fashion, regardless of severe bodily ramifications. Women with disordered eating habits like bulimia and anorexia usually find themselves relying on the control, or lack thereof, of their diets due to body-image distortion (Montenegro). According to the Diagnostic and Statistical Manual of Mental Disorders, or DSM, as published by the American Psychiatric Association, a person must display certain criteria of behaviors for at least three months in order to be diagnosed with a mental health disorder (Munson). In order to be clinically diagnosed, a person must first exhibit recurrent episodes of binge eating. These binge episodes may include eating "in a discrete period of time, an amount of food that is larger than most people would eat" or express a complete lack of control during a meal and exhibit feelings of disgust or embarrassment after or during the

episode. A person with bulimia exhibits either purging behaviors, such as self-induced vomiting and misuse of laxatives, or non-purging behaviors, like fasting or excessive exercise (Munson). Those diagnosed with anorexia exhibit an intentional refusal to maintain normal body weight and have an intense fear of weight gain or obesity in general. This refusal to put on weight as found in anorexia is done usually through the severe restriction of a diet (Munson). The clinical diagnosis of an eating disorder has implications greater than just weight loss. Disordered eating patterns cause the disruption of the endocrine, metabolic, and skeletal systems (Beals). The complications within these delicately balanced systems cause dehydration, anemia, electrolyte imbalances, gastrointestinal disorders, gland enlargements, decreases in bone density, and radical drops in body mass (Seid). The disruption of these processes is a mechanism for the disordering of other regulatory processes of the body and therefore disordered eating pertains to more than just the loss of body fat. These two patterns of disordered eating contribute to being the primary indicators in diagnosing the female athlete triad; however, additional components are also taken into consideration in measuring a woman's risk and or diagnosis of the disorder.

The second of the three components of the female athlete triad is amenorrhea. This medical condition is the prolonged cessation of the menstrual cycles in a woman and is largely caused by the core factors that contribute to an improper and/or drastic diet. The condition exists in two forms, primary and secondary. Primary amenorrhea is the complete absence of menstruation by the age of sixteen whereas secondary amenorrhea is the inability of a woman to produce three consecutive menstruation cycles after she has had her first (Vinci). With reference to the female athlete triad,

primary amenorrhea is nonexistent in discussion due to the nature of when the condition is acquired and the circumstances of how the condition is developed. The secondary form of amenorrhea can be rooted in many instances of body imbalances. Medications such as antipsychotics, antidepressants, and blood pressure drugs have been known to cause the cessation of menstruation cycles as well as stressful lifestyle factors and structural problems (Mayo Clinic). Secondary amenorrhea relative to women in athletics is most commonly attributed to the radical depletion of a body fat percentage (Vinci). The core contributors and more specific causes of the condition in relation to athletes include abnormally low body fat composition and radical weight loss as the result of the significant increase in exercise frequency and intensity. This secondary form of the condition that plagues athletes specifically has recently been referred to as hypothalamic amenorrhea or exercise-induced amenorrhea (The Clearing House). The characteristics found in this subset of amenorrhea focus primarily on the reduction of the secretion rates of hypothalamic gonadotropin releasing hormone or GnRH. GnRH stimulates the portion of the pituitary gland that signals and stimulates the ovaries to produce estrogen and progesterone. (The Clearing House). Without appropriate pituitary hormone production, ovulation does not occur and amenorrhea can be diagnosed (Lebrun). The production of estrogen is also essential for the development of bone density, a matter which is directly related to another branch of the female athlete triad.

Osteoporosis, the final portion of the female athlete triad, is related to the density and mass of bones. Those clinically considered to be living with osteoporosis have a bone-mineral density more than two and a half standard deviations below the nation's

average (The Clearing House). This premature bone loss among young females has life-long effects, as it can alter the shape of the spinal frame and vastly increase skeletal fragility. A female athlete that is diagnosed with osteoporosis often falls victim to serious stress fractures at a rate that is exponentially greater than that of her teammates, thus impeding her ability to perform or even develop adequate bone strength (Beals). This inability to heal properly is especially true for women that compete in athletics that require a constant pounding such as gymnastics or distance running. The average non-athlete with a healthy diet finds themselves at risk for osteoporosis if they are above the age of 65, are female, have a slender build, have a family history, and partake in harmful habits such as smoking and drinking (National Institute of Arthritis...). Female athletes experience osteoporosis as part of the female athlete triad due to the inadequate amount of estrogen in the body from amenorrhea (Otis). Without the adequate amount of estrogen, as a result of the hypothalamic amenorrhea defined previously, bone density is severely compromised. If a female finds herself with an abnormally low bone density, the cycle of calcium deposition and restoration no longer exists in balance. Just as this balance is lost when an athlete becomes osteoporotic, the balance between eating correctly and maintaining regular menstrual cycles becomes compromised as well.

The cyclic nature of the female athlete triad is what makes it such a dangerous opponent for women in athletics to compete with. The onset of one of the three components is essentially a catalyst for the onset and perpetuation of the other two. This physiological imbalance can be traced in a cyclical pattern, and one must decide which of the three pieces is the most influential. Diagnosis of the triad is rooted most

predominately in the advancement of disordered eating. When an athlete experiences a decrease in caloric intake beyond her reasonable diet for any psychological reason, her energy levels and body fat percentages crash, causing the inevitable onset of hypothalamic amenorrhea if untreated (Birch). This development of amenorrhea then attributes through decline in estrogen production to the advancement of osteoporosis, thus completing the triad. Not only is the development of disordered eating the most pivotal piece of the triad, it is also the most common among female athletes (Lebrun). There are many theories surrounding the prevalence rates of disordered eating among different styles of women's sports teams.

Many hypotheses have been developed to analyze which style of teams in women's collegiate sports area at greatest risk for the female athlete triad, specifically the disordered eating component due to its marked severity. The most common theories state that women in aesthetic sports are at the greatest risk for disordered eating closely followed by those that participate in endurance sports (Dossil). One study confirms specifically this at-risk ranking based on the prevalence of disordered eating was conducted by Sundgot-Borgen and Torsveit in 2004. The purpose of Torsveit's study was to characterize which athletes with eating disorders belonged to which sports and to compare the level of importance of the "need to be lean" in order to find success among these sports (Torstveit). Aesthetic sports, such as gymnastics, figure skating, and ballet dancing, were found to have the greatest percentage of athletes with anorexia nervosa and or bulimia nervosa, which, as discussed previously, is the key contributor to the development and diagnosis of the female athlete triad. Similar studies done by Smolack and De la Torre also confirmed this theory by demonstrating the

greatest prevalence in sports that required a low body mass to be aesthetically pleasing existed at both the collegiate and junior level due to the nature of the sport (De le Torre) (Smolack). Additionally, the prevalence of disordered eating patterns in “endurance sports” like swimming, distance running, and jockeying, existed at a high level. This style of sport is among the highest in prevalence due to the performance enhancing qualities of living at a “lean body shape” has in competition (Dossil). Although these studies are very convincing, one must wonder why the female athlete triad is also found in other sports that don’t require a thin frame for success. Women that don’t participate in athletics are generally driven to an eating disorder in order to obtain a body more favorable by the media, so one must question if this favorable body image also plays a role in an athlete’s eating disorder. The “taught, lean, muscled body” of a female athlete is considered much more masculine than it is feminine, so perhaps the root of eating disorders is found in the need to overcompensate to obtain a “fit” build (Seid). If the perception of an athlete that competes in a “masculine” sport is plagued with the stereotype of a manly body, would that cause body-image disorders? Women in athletics often experience role conflict regarding this problem. Should a thrower lessen the weight she can squat in order to fit the societal expectation of her body and jeopardize her potential athletic success or should she face ridicule among her peers for living and competing in a “manly” body? (Black) In order to test whether women who compete in a “masculine” sport are also at a high risk for disordered eating (and the female athlete triad) due to their attempts to overcompensate for the lack of perceived femininity, a simple survey was conducted among Bowling Green State University students.

In order to obtain such data, 130 men participated in an observational study that analyzed a male's perception of the relative masculinity and femininity of BGSU women's sports. Students were chosen to participate through convenience sampling and completed a survey asking them to rank a list of women's sports offered at BGSU in terms of most masculine and most feminine. Of the 130 surveys, 110 were correctly completed and were able to be used in the survey. The two most "masculine" sports identified in the survey were soccer and gymnastics and the sports considered most feminine were volleyball and swimming. Since these data pertaining to the masculine sports was slightly skewed from one's intuitive responses, a few of the students that took the survey were asked to briefly explain why they determined the scale the way they did. The majority of men indicated the same results as the average, having soccer and gymnastics as the leading masculine sports, commented on the uniform and body shape of the athletes when making their decisions.

Once a scale of a male's perspective of masculinity levels in women's sports was determined, four of the women's sports teams were given a survey to determine the prevalence of disordered eating and levels of comfort in their uniforms. Gymnastics, swimming, volleyball, and soccer accounted for a total of 70 correctly completed surveys total. Of the tabulated surveys, approximately 27% of the gymnasts and swimmers, oddly enough aesthetic and endurance sports, reported experiencing sporadic eating habits either through restricting caloric intake or binging and purging. Of these athletes, 82% reported feeling confident in their uniforms which all denoted as "revealing" in the survey. Because of this, one can consider these pressures of disordered eating not as a result of a skewed body-image, but of attempted

performance enhancement. Women's soccer, who unanimously reported having a "modest" uniform in the survey, had a 33% prevalence rate of sporadic eating and exercise habits on the team, confirming a portion of the sought out theory. Volleyball, deemed the most feminine team by the male survey, had a disordered eating prevalence rate of less than 10% on the team and reported feeling "confident" in their "moderately revealing" uniform. Of the respondents that confirmed sporadic eating habits, more than 63% allied with a response associative with restriction dieting whereas the remainder of the respondents allied with a response vindictive with binge eating. From this brief survey, one can conclude that women's sports that are considered more masculine by the male population have a significant if not higher prevalence rate of disordered eating on their teams than those that are considered feminine and exhibit a level of confidence in their uniforms. One cannot, however, refute the theory proposed by previous studies that endurance and aesthetic sports have a great rate of disordered eating within teams and are therefore a risk group for the female athlete triad. Due to the small sample size of the survey and the absence of diversity among those surveyed from the concept of convenience sampling, these data cannot be identified as entirely representative of the population. The study also was done at one university and therefore the theories of masculinity and femininity of sport could easily differ from campus to campus. The results can aid in the further research of the common perception of a sport and its relative prevalence of disordered eating and eventual risk factor for the female athlete triad. In additional possible research concerning this theory, the idea of implementing disordered eating preventative tactics must be addressed.

The first priority in decreasing the prevalence of the female athlete triad is the involvement of coaches. Health educators and coaches must be entirely committed to adequate evaluation techniques for the women in sports if a positive change is to be made. Developing a greater sensitivity to risk factors, both internal and external to a team setting, learning about each component of the disorder and how it effects a player physically and emotionally, and learning how to address a potentially at risk player are all informative processes that should be instituted upon hiring a coach (Black). Additionally, both male and female athletes should be given ample opportunities to learn about the disorder, especially teams which are considered high risk. The simple increase in athlete and coach awareness and sensitivity could make huge strides in decreasing the number of female athletes that are unable to physically finish a season due to a compromised self body-image. To live in athletics is a gift, and protecting that gift is something for which all involved are responsible.

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