

ASSESSING THE EXTENT THAT HIGH SCHOOL WRESTLING
COACHES & ATHLETES UNDERSTAND DISORDERED EATING BEHAVIORS

A Thesis

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by

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by

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Abstract
of
ASSESSING THE EXTENT THAT HIGH SCHOOL WRESTLING
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by
Melissa Fehn-Tuavao

Statement of Problem

The purpose of this study was to study the level of knowledge that California wrestling coaches and athletes have about disordered eating behaviors. With the rapid growth of female high school athletes participating in the sport of wrestling, there may be a need for concern regarding eating disorders. Research has found the prevalence of eating disorders is higher in teenagers, athletes, women, and even in athletes participating in certain sports (Arthur-Cameselle & Baltzal, 2012; Jankowski, 2012; Prnjak, Jukic & Tufano, 2019). Research also suggests a lack of knowledge of eating disorders in collegiate coaches and athletes (Rosa-Caldwell et al., 2018). This study attempts to assess the knowledge of eating disorders by both coaches and athletes at the high school level.

Sources of Data

This explorative study collected primarily quantitative data. A 30 question Knowledge of Eating Disorders Questionnaire was given to all participants. Confidence in response correctness, demographic information and supplemental questions were

collected and analyzed. The knowledge of eating disorder questions were divided into five domains: etiology, identifying signs and symptoms, management and treatment, risk factors, and education and prevention of eating disorders. High school wrestlers were also given the Self-Loathing Subscale Questionnaire, comprised of four questions, to determine which athletes may be at a higher risk of an eating disorder.

Conclusions Reached

The study included a sample of 18 high school wrestling coaches and 16 high school wrestlers. A Pearson Correlation and t-test revealed that there is a significant difference in knowledge of eating disorders based on gender. The study found that 89%, (16/18) of high school coaches had never attended an educational program or training on disordered eating. Surprisingly, only 16.7% of coaches believe that they are responsible for teaching their athletes safe and healthy weight loss practice. The mean percent of correct answers on the Knowledge of Eating Disorders Questionnaire for coaches was 75.19%. Female wrestling coaches were found to have more knowledge of eating disorders with a mean score of 85.56% to 73.11%. High School wrestlers had a mean score of 57.08%, scoring the lowest in the management and treatment of eating disorders. There appears to be a slight difference in knowledge levels between genders in wrestlers. Female wrestlers knew slightly less about eating disorders in all domains except the signs and symptoms of eating disorders. However, females displayed a higher level of confidence across all domains, which may warrant a problem. The study found that 94% of wrestlers feel High School wrestling coaches need more support in educating themselves and their athletes

about eating disorders. When asked if they had any personal experience dealing with disordered eating behaviors and/or eating disorders, 57% of female athletes and 33% of male athletes responded that they have.

This study shows a need for further education in both high school wrestling coaches and athletes. It also suggests a need for more educational resources that are accessible to coaches and athletes. This study indicates that there may be a greater need for educating female wrestlers since they received the lowest overall scores.

_____, Committee Chair
Dr. Michael Wright

Date

DEDICATION

This Master's Thesis is dedicated to all the young women out there who have been brave enough to pave the way for our future. I wrestled in high school back when women's wrestling teams were essentially, non-existent. I did not do it to prove a point or to make some sort of a stand for women. I wrestled because I enjoyed being physically active and I was good at it. I honestly did it to stay in shape for water polo. I heard that wrestlers were amazingly fit. Being somewhat of a tomboy myself, I thought it would be fun. Being around boys was kind of the norm for me anyway. I never knew I would learn so much though competing with them.

I remember that first year was hard. I was 15 years old and raised by my parents to believe I could be anything I wanted. Which, I thank God for every day. I lived in my happy bubble not knowing anything about the sacrifice so many amazing people made long before me to even be able to sign up for a male dominated sport. Much, like the young girls today are surprised by my past experience, it is hard for me to imagine a world where I would be denied the opportunity to even participate. It really is amazing how far we have come.

When I wrestled in Lodi, Ca in the late 90's there were many people who told me to just quit. At times, I felt isolated and different. However, I sought those who supported me and I fell in love with wrestling. I fell for the challenge and the fight I was forced to find within me. I met so many amazing people who showed me such love and support. My wrestling coach, Rod Gaines, was like a second dad. He taught me so much about

what it meant to be a good athlete, but more about what it meant to be a good person. He supported me and treated me fairly. To this day, he is still the greatest coach I've ever known.

Years later, I remember Coach Gaines calling me and telling me I needed to come by the wrestling room because I would never believe how many girls signed up to wrestle that year. He said there were 43 girls. Eventually, Tokay High School put together a female team led by Coach George Bozovich. They have had an enormous amount of success and I could not be more proud. I am so thankful for the support that I received and for those who continue to support our young athletes today in reaching their goals. I have spoken to a lot of wrestling coaches, athletes and athletic directors about this topic. I have devoted my life to using my personal struggles to help others. The challenges we face always have a silver lining. It is my hope that this study brings awareness to this issue and reaches those that need it.

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Thank you to my parents, Brenda and John Fehn. I wouldn't be who I am today if not for. I would not have devoted my life to helping others. Whether it be teaching, firefighting or even just volunteering in the community, I would not have this desire to make some kind of difference in the world had I not learned to love and give to others from you. You both have devoted everything to our family, to your children. Thank you

for helping to watch my kids so that I was able to have the time to research and conduct this study. It gave me so much comfort to know that they were safe with you while I was away.

Thank you to my children, Kayleen and Cameron. This year has been a very busy one and I could not have accomplished all of this without you. If you learn anything from me, I pray it is how to develop and cultivate the gifts you have been given and use them to help others. Finding something or someone you love and are passionate about will provide you with a strength you never knew you had. Both of you have been my strength. Since the moment you were born I knew that the love I shared for you was endless. That love made me push through every obstacle and challenge and forced me to become a better woman. I hope that I have and will continue to provide a good example to you both. Being your mother is hands down my greatest joy in life. Never forget that!

I cannot forget my future husband, Mr. Matthew Berger. Talk about a crazy year. Your fire academy, getting engaged, blending our family, dealing with a family illness, and then let's just throw in a thesis project. It has been beyond crazy. But, I would not want anyone else by my side. My pride in you and your accomplishments this year is overflowing. I am so thankful to share my life with you and that you encourage me to chase after my dreams. I appreciate the sacrifices you have made so that I was able to return to school and work on this goal of mine. Wherever life leads us, I know as long as I have you, I will be smiling ear to ear. Thank you for your constant love, encouragement and your relentless dedication to our wonderful family.

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CHAPTER ONE: INTRODUCTION

THE PROBLEM

With the rapid growth of female high school athletes participating in the sport of wrestling, there may be a need for more education regarding eating disorders. Female high school wrestlers may be at a higher risk on many levels. It has been suggested that the prevalence of eating disorders is higher in teenagers, athletes, women, and in weight class sports. Research also suggests a lack in knowledge of eating disorders in collegiate coaches and athletes (Rosa-Caldwell et al., 2018).

According to the National Federation of State High School Associations (NFHS), there were 21,124 female high school students participating in wrestling in the 2018-19 season. In comparison to the prior season, with 16,562 female students participating, the sport of girls wrestling had a 21.5% increase. The number of girls participating in wrestling surpassed that of girls dance (14,875 participants) moving wrestling up to the 18th highest participation rate in high school sports for girls (NFHS, 2019). In 1990 there were only 112 girls who participated in high school wrestling. Over the last twenty-seven consecutive years girls' participation in high school wrestling has grown. In many of those years, the percentage of growth was 10% or more. In California the number of young women, competing in high school wrestling has nearly doubled in the last twenty-four years, growing from 804 in 1994 to 1,562, as of 2018 (NWCA, 2019). In addition, there are now sixty-three colleges which sponsor a varsity wrestling program for women (NWCA, 2019).

Research has shown that women and athletes have a higher prevalence of eating disorders. (Fortes et al., 2013b; Torstveit, Rosenvinge & Sundgot-Borgen, 2008). Over one-half of teenage girls and nearly one-third of teenage boys use unhealthy weight control behaviors such as skipping meals, fasting, smoking cigarettes, vomiting, and taking laxatives (Neumark-Sztainer, 2005).

Eating disorders include extreme emotions, attitudes, and behaviors surrounding weight and food issues. A person's disordered eating can lead to adverse effects on health and serious medical issues. There is also an increased likelihood that those with eating disorders will have other psychiatric disorders and even have a higher prevalence of substance abuse than the general population (Schreiber, Odlaug, & Grant, 2013). Eating disorders are very serious and can cause emotional and physical problems which can have life-threatening consequences for both females and males. In fact, eating disorders have the second highest mortality rate of all mental health disorders, surpassed only by opioid addiction (Chesney, Goodwin, & Fazel, 2014). Heart conditions and suicide are often the cause of premature death due to complications related to eating disorders. Anorexia has an estimated mortality rate of around 10% (Arcelus et al., 2011). There has been a rise in incidence of anorexia in young women ages fifteen to nineteen years each decade since 1930 (Hoek & van Hoeken, 2003).

Despite the prevalence of eating disorders in the United States, the problem continues to receive inadequate research funding. In 2011, the average amount of research dollars spent per individual affected with an eating disorder was just ninety-three

cents, compared to eighty-eight dollars per individual affected with Alzheimer's disease, eighty-one dollars per individual affected with Schizophrenia, and forty-four dollars per person affected with Autism (National Institutes of Health, 2011).

The prevalence of disordered eating among college athletes has been found to be as high as sixty-two percent among female athletes and thirty-three percent among male athletes (Bonci et al., 2008). One study found data indicating higher scores for female athletes with regard to the bulimia and preoccupation with food (Fortes et al., 2014). With the fierce demands on athletes today, it is no surprise that they are shown to be at a higher risk for developing distorted eating behaviors and at serious risk for developing eating disorders. However, patterns related to eating disorders might be difficult to detect among some athletes (Conviser, Schlitzer, & Nickols, 2018). This difficulty in detection could be because the same characteristics, which help athletes excel in their sports, such as perfectionism, competitiveness, and high-performance expectation, can often place these accomplished athletes at an even higher risk for disordered eating (Berner, 2012; Prnjak, Jukic, & Tufano, 2019). An athlete's physical performance in both sport and school may be dramatically affected if disordered eating behaviors are not detected and managed as soon as possible.

Disordered eating can hamper an athlete's performance and make the athlete more susceptible to injuries. Among female high school athletes in aesthetic sports, 41.5% reported disordered eating (Jankowski, 2012). These athletes were eight times more likely to incur an injury than athletes who did not report disordered eating (Jankowski,

2012). In general, participation in sports comes with a pressure to excel and a demand for an athlete to achieve peak physical performance. By participating in sports, many young athletes experience both external and internal pressures to win, a situation wherein disordered eating behaviors can easily occur. Several athletes have ruined their careers by failing to seek treatment for eating disorders or not following through with treatment.

An athlete's environment may inadvertently reinforce behaviors like excessive exercise or rigid dieting, both of which are characteristics of the development of an eating disorder (Thompson & Sherman, 1999b). In a large study of fourteen- and fifteen-year-olds, dieting was the most important predictor of a developing eating disorder. Those teens who dieted moderately were five times more likely to develop an eating disorder, and those teens who practiced extreme restriction were eighteen times more likely to develop an eating disorder than those who did not diet at all (Golden, Schneider, & Woods, 2016).

The symptoms of eating disorders are manifesting earlier in both males and females (Favaro et al., 2009). Coaches play a key role in the early recognition and detection of disordered eating behaviors in student athletes. However, those same coaches may avoid raising the issue with athletes, because the issue seems too overwhelming or because the athlete is performing well and they don't want to interfere with his or her success. The prevention, detection, and management of disordered eating behaviors are all vital components to investigate to ensure each athlete's success and wellbeing not just in high school but, throughout their lives (Bonci et al., 2008).

DEFINITIONS

The *Diagnostic & Statistical Manual of Mental Disorders, fifth edition*, (DSM-V) was published in 2013 by the American Psychiatric Association. It provides physicians and mental health professionals with standard criteria for diagnosis of specific mental disorders, including eating disorders (APA, 2013).

Feeding and Eating Disorders

Feeding and Eating Disorders are characterized by persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food that significantly impairs physical health or psychological functioning. Feeding and Eating Disorders categories include; Pica, Rumination Disorder, Avoidant/Restrictive Food Intake Disorder, Anorexia Nervosa, Bulimia Nervosa, Binge-Eating Disorder, Other Specified Feeding & Eating Disorders, and Unspecified Feeding or Eating Disorder (APA, 2013).

Disordered Eating

Disordered Eating is a term used to describe any atypical eating behavior. Disordered eating ranges in severity. It can be anywhere from mild, with occasional abnormal eating behaviors, to the much more severe cases of anorexia and bulimia. Distorted eating is an indication of a mental health issue that manifests in a variety of eating and weight related symptoms. Disordered eating can be a result of physiological, psychological, and social issues (APA, 2013).

Anorexia Nervosa (AN)

Anorexia Nervosa is a serious, potentially life-threatening eating disorder characterized by excessive weight loss and self-starvation. A person's resistance to maintaining body weight at or above a minimally normal weight is typical. Often there is an intense fear of weight gain or morphed sense of body weight or shape. Usually, there is a denial of the seriousness of low body weight and females may also have amenorrhea, a loss of menstrual periods (NEDA, 2019).

Diagnostic Criteria according to DSM-V

- A. Restriction of energy intake relative to requirements leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health. Significantly low body weight is defined as a weight that is less than minimally normal or, for children and adolescents, less than that minimally expected.
- B. Intense fear of gaining weight or becoming fat, or persistent behavior that interferes with weight gain, even though at a significantly low weight.
- C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight.

The DSM-V also allows professionals to specify subcategories of Anorexia Nervosa:

AN-Restricting Type: During the last 3 months, the individual has not engaged in recurrent episodes of binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas). This subtype describes presentations in which weight loss is accomplished primarily through dieting, fasting, and/or excessive exercise.

AN-Binge-Eating/Purging Type: During the last 3 months, the individual has engaged in recurrent episodes of binge eating or purging behavior.

In the event that all the DSM-V criteria for Anorexia Nervosa are not met, a serious eating disorder can still be present. Atypical Anorexia includes those individuals who meet the criteria for anorexia but who are not underweight despite significant weight loss. Research studies have not found a difference in the medical and psychological impacts of Anorexia and Atypical Anorexia.

Bulimia Nervosa (BN)

Bulimia Nervosa is characterized by a cycle of bingeing, or consuming an abnormally large amount of food, and compensatory behaviors to make up for the binge. To compensate for the effects of binge eating, when there is often a sense of loss of control over eating behavior, regular use of inappropriate compensatory behaviors such as self-induced vomiting, laxatives or diuretic abuse, fasting, and/or obsessive or compulsive exercise, and/or extreme concern with body weight and shape (NEDA, 2019).

Diagnostic Criteria according to DSM-V

- A. Recurrent episodes of binge eating characterized by BOTH of the following:
- Eating, in a discrete amount of time (within any 2-hour period) an amount of food that is definitely larger than what most individuals would eat in a similar period of time under similar circumstances.
 - A sense of lack of control over eating during the episode (i.e., a feeling that one cannot stop eating or control what or how much one is eating).
- B. Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting; or excessive exercise.
- C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least once a week for three months.
- D. Self-evaluation is unduly influenced by body shape and weight.
- E. The disturbance does not occur exclusively during episodes of anorexia nervosa.

Specify if in partial or full remission. Specify current severity based on episodes of inappropriate compensatory behaviors per week; 1-3 mild, 4-7 moderate, 8-13 severe, or 14 or more extreme.

Binge Eating Disorder (BED)

Binge Eating Disorder is characterized as recurring episodes of eating significantly more food in a short period of time than most people would eat under similar circumstances, with episodes marked by feelings of lack of control. This disorder is associated with marked distress and occurs, on average, at least once a week over three months (APA, 2013).

Diagnostic Criteria according to DSM-V

- A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
 - 1. Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat in a similar period of time under similar circumstances.
 - 2. A sense of lack of control over eating during the episode (i.e., a feeling that one cannot stop eating or control what or how much one is eating).

- B. The binge-eating episodes are associated with three (or more) of the following:
 - 1. Eating much more rapidly than normal.
 - 2. Eating until feeling uncomfortably full.

3. Eating large amounts of food when not feeling physically hungry.
 4. Eating alone because of feeling embarrassed by how much one is eating.
 5. Feeling disgusted with oneself, depressed, or very guilty afterward.
- C. Marked distress regarding binge eating is present.
- D. The binge eating occurs, on average, at least once a week for three months.
- E. The binge eating is not associated with the recurrent use of inappropriate compensatory behavior in in bulimia nervosa and does not occur exclusively during the course of bulimia or anorexia nervosa.

Specify if in partial or full remission. Specify current severity based on number of binge-eating episodes per week; 1-3 mild, 4-7 moderate, 8-13 severe, or 14 or more extreme.

Other Specified Feeding or Eating Disorder (OSFED)

According to the DSM-V criteria, to be diagnosed as having OSFED a person must present with feeding or eating behavior(s) that cause clinically significant distress and impairment in areas of functioning, but do not meet the full criteria for any of the other feeding and eating disorders (APA, 2013)

The following are further examples for OSFED:

- Atypical Anorexia Nervosa: All criteria are met, except despite significant weight loss, the individual's weight is within or above the normal range.
- Binge Eating Disorder (of low frequency and/or limited duration): All of the criteria for BED are met, except at a lower frequency and/or for less than three months.
- Bulimia Nervosa (of low frequency and/or limited duration): All of the criteria for Bulimia Nervosa are met, except that the binge eating and inappropriate compensatory behavior occurs at a lower frequency and/or for less than three months.
- Purging Disorder: Recurrent purging behavior to influence weight or shape in the absence of binge eating
- Night Eating Syndrome: Recurrent episodes of night eating. Eating after awakening from sleep, or by excessive food consumption after the evening meal. The behavior is not better explained by environmental influences or social norms. The behavior causes significant distress/impairment. The behavior is not better explained by another mental health disorder (e.g. BED).

Unspecified Feeding or Eating Disorder (UFED)

According to the DSM-V criteria this category applies to where behaviors cause clinically significant distress/impairment of functioning, but do not meet the full criteria of any of the Feeding or Eating Disorder criteria. This category may be used by clinicians

where a clinician chooses not to specify why criteria are not met, including presentations where there may be insufficient information to make a more specific diagnosis (e.g. in emergency room settings) (APA, 2013).

Pica

According to the DSM-V criteria, to be diagnosed with Pica a person must display:

- A. Persistent eating of non-nutritive substances for a period of at least one month.
- B. The eating of non-nutritive substances is inappropriate to the developmental level of the individual.
- C. The eating behavior is not part of a culturally supported or socially normative practice.
- D. If occurring in the presence of another mental disorder (e.g. Autistic Spectrum Disorder) or during a medical condition (e.g. pregnancy), it is severe enough to warrant independent clinical attention.

Rumination Disorder (APA, 2013)

According to the DSM-V criteria, to be diagnosed as having Rumination Disorder a person must display:

- A. Repeated regurgitation of food for a period of at least one month.
Regurgitated food may be re-chewed, re-swallowed, or spit out.

- B. The repeated regurgitation is not due to a medical condition (e.g. gastrointestinal condition).
- C. The behavior does not occur exclusively in the course of Anorexia Nervosa, Bulimia Nervosa, BED, or Avoidant/Restrictive Food Intake disorder.
- D. If occurring in the presence of another mental disorder (e.g. intellectual developmental disorder), it is severe enough to warrant independent clinical attention.

Avoidant/Restrictive Food Intake Disorder (ARFID) (APA, 2013)

According to the DSM-V criteria, to be diagnosed as having ARFID a person must display:

- A. An eating or feeding disturbance as manifested by persistent failure to meet appropriate nutritional and/or energy needs associated with one (or more) of the following:
 - 1. Significant loss of weight (or failure to achieve expected weight gain or faltering growth in children).
 - 2. Significant nutritional deficiency.
 - 3. Dependence on enteral feeding or oral nutritional supplements.
 - 4. Marked interference with psychosocial functioning.
- B. The behavior is not better explained by lack of available food or by an associated culturally sanctioned practice.

- C. The behavior does not occur exclusively during the course of Anorexia Nervosa or Bulimia Nervosa, and there is no evidence of a disturbance in the way one's body weight or shape is experienced.
- D. The eating disturbance is not attributed to a medical condition, or is better explained by another mental health disorder. When the eating disturbance does occur in the presence of another condition/disorder, the behavior exceeds what is usually associated and warrants additional clinical attention.

Body Dysmorphic Disorder (BDD)

BDD or Body Dysmorphic Disorder is a preoccupation or obsession with a defect in visual appearance, whether that be an actual slight imperfection or an imagined one. BDD goes beyond normal concern with one's appearance and may significantly impair normal, everyday functioning, as well as interpersonal relationships. Those suffering from BDD will often possess low self-esteem, have unreasonable fears of rejection from others due to perceived ugliness, and have some realization that one's perception of his/her "defect" is distorted, but an uncontrollable impulse to think about it (APA, 2013; Phillips et al., 2010).

Diagnostic Criteria according to DSM-V

- A. Preoccupation with an imagined defect in appearance. If a slight physical anomaly is present, the person's concern is markedly excessive.
- B. The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

- C. The preoccupation is not better accounted for by another mental disorder (e.g., dissatisfaction with body shape and size as in Anorexia Nervosa).

Orthorexia

Orthorexia is an eating disorder, coined in 1997 by Steven Bratman, M.D., which is defined as an obsession with "healthy or righteous eating". It often begins with someone's simple and genuine desire to live a healthy lifestyle. An individual dealing with Orthorexia fixates on defining the "right" foods, e.g. foods that can be safely eaten. The individual will spend as much time and energy thinking about food as someone with Bulimia or Anorexia. He or she may not think about calories, but may think about the overall "health benefits" and how the food was processed or prepared. Individuals with Orthorexia tend not to eat away from home as much because they do not trust the preparation of foods other than what they have prepared (APA, 2013).

The obsession for healthy foods could come from a number of sources such as family habits, society trends, economic problems, recent illness, or even just hearing something negative about a food type or group, which then leads them to ultimately eliminate the food or foods from their diet. The severe restrictive nature of Orthorexia has the potential to morph into Anorexia (APA, 2013).

Night Eating Syndrome (NES)

Night eating syndrome, or NES, is an eating disorder diagnosis that is primarily characterized by an ongoing, persistent pattern of late-night binge eating. The individual may not be aware at the time of what they are doing when they are eating. NES was

originally described by Dr. Albert Stunkard in 1955. NES affects between one and two percent of the general population (APA, 2013). Six percent of people seeking treatment for obesity have NES and twenty-eight percent of those seeking gastric bypass surgery suffer from NES (APA, 2013). Although this syndrome can affect both sexes of varying ages, it is more common in young women. Unlike binge eating, which is done in relatively short episodes, NES involves continual eating throughout evening hours.

Muscle Dysmorphia

Muscle Dysmorphia is a disorder which causes a person to constantly obsess and/or worry about being too small, underdeveloped and/or underweight. Typically, those who have Muscle Dysmorphia are not frail or underdeveloped at all and actually have large muscle mass. These individuals obsess about having the perfect physique and believe their muscles are inadequate.

This disorder is a form of Body Dysmorphic Disorder and is related to Obsessive Compulsive Disorder (OCD). Those with Muscle Dysmorphia constantly obsess over their imperfections, further distorting their self-perception. This can significantly impair the person's mood, often causing depression or other emotional distress. Feelings of inadequacy may also extend and affect many areas of their life.

Both men and women can be affected by this disorder, although men are most susceptible. It is estimated that approximately ten percent of the men who are obsessive gym-goers have this disorder (APA, 2013). Many people with Muscle Dysmorphia may compete in body building competitions and are addicted to lifting weights. One reason

Muscle Dysmorphia may be a common disorder in men is due to the common stereotype that men are supposed to be big and strong.

The Female Athlete Triad

The female athlete triad refers to a medical condition observed in physically active females. The condition has three components occurring simultaneously; an eating disorder, menstrual dysfunction, and low bone mineral density.

Aesthetic Sports

Aesthetic sports are those sports which tend to emphasize diet, appearance, size and weight. Examples of these sports include bodybuilding, gymnastics, swimming & diving, weight-class sports such as wrestling, rowing, and horse racing.

PURPOSE OF STUDY

The purpose of this research study is to assess the current knowledge of high school wrestling coaches and high school athletes (wrestlers) regarding Eating Disorders. The study serves to examine the differences in knowledge in Eating Disorders between male and female coaches, as well as their educational opportunities. I also hope to be able to assess the levels of confidence coaches and athletes have in their knowledge of Eating Disorders. The data collected will provide insight as to which methods are currently being used by high school coaches to prevent, detect and manage disordered eating behaviors. Specifically, I hope to identify how much high school coaches know about disordered eating and what resources they have available to them. In addition, I want to see how coaches apply their knowledge to assist in the prevention of the development of

eating disorders in their student athletes. This research study focuses on high school coaches and athletes involved in what has been considered a “high risk” sport for eating disorders, as wrestling typically requires lower body composition, aerodynamics, lean frames, and/or has weight classes for competition.

There has been an increase in the prevalence of eating disorders in the United States. Disordered eating behaviors are known to be very dangerous and may result in serious health consequences, both physically and psychologically (Grilo, White & Masheb, 2009; Keel & Forney, 2013). Typically, in the early stages, those people who have eating disorders are in denial about it. The characteristic rationalization is, “I’m just doing this to get myself in better shape to play.” Those individuals who fail to accept the problem and fail to do something about it will likely deal with bigger problems in the future. The earlier an eating disorder is treated, the more potential the individual has to make a full recovery. They may miss playing time, as their bodies need time to heal and their pattern of exercise may need to be disrupted, but failure to act quickly can end athletic careers and can even be fatal.

Various studies have indicated that collegiate coaches need more education on the topic of eating disorders (Arther-Cameselle & Baltzell, 2012; Bonci et al., 2008; Kroshus et al., 2014; Pantano, 2017; Drinkwater et al., 2005). There have been advances in providing support and resources at the collegiate coaching level, however there is still little being done at the high school level. The high school level is where more preventative measures can and should be taken. Athletes of certain sports have been

shown to have a higher prevalence of eating disorders and therefore more education should be emphasized and more preventative care ought to be offered to them. This is especially true in wrestling, a sport known for its disordered eating behaviors (Kiningham & Gorenflo, 2001; Kordi et al., 2012; Lakin, Steen & Opplinger, 1990; Opplinger, Steen & Scott, 2003).

Though most athletes with eating disorders are female, male athletes are also at risk, particularly those competing in sports which tend to emphasize diet, appearance, size and weight. In weight-class sports (wrestling, rowing, horseracing, etc.) and aesthetic sports (bodybuilding, gymnastics, swimming, diving, etc.) nearly 33% of male athletes are affected by eating disorders. The rates of disordered eating in female athletes, engaged in weight class and aesthetic sports, is estimated to occur at rates of up to 62% (Bonci et al., 2009; Sundot-Borgen et al., 2004).

Lastly, studies have shown females, as well as, female athletes to have a much higher prevalence of eating disorders (Neumark-Sztainer, 2005; Sundot-Borgen et al., 2004). In addition, there is a growing number of females participating in the sport of high school and collegiate wrestling. Therefore, it is imperative that we, as a society are sure the student athletes are being properly educated and appropriately led by their coaches. There is a need to ascertain what coaches know about eating disorders and what actions they are taking currently to help student athletes. Hopefully this information will lead to next steps in further education and support for coaches. By assessing the need for more education for high school wrestling coaches and high school athletes, further action may

be taken to help prevent disorder eating behaviors from potentially becoming life threatening mental illnesses.

HYPOTHESES

Due to the nature of the study the hypotheses were written in the null.

1. There will be no significant differences among the current knowledge level of Eating Disorders of California High School Wrestling Coaches.
2. There will be no significant differences among the current knowledge level of Eating Disorders of California High School Wrestlers.
3. There will be no significant difference in high school wrestlers risk for eating disorders based on gender.

SIGNIFICANCE OF STUDY

Many wrestlers engage in chronic diet practices and extreme weight cutting behaviors in order to compete at the lowest weight class possible (Lakin, Steen, & Opplinger, 1990). These young athletes have a very dangerous misconception that the lighter you are, the more successful you will be as a wrestler. However, as research has proven time and time again, an athlete's performance is comprised of much more than what the scale might say (Krentz & Warschburger, 2013). While maintaining a healthy weight is optimal for a wrestler's success, engaging in dangerous and destructive eating behaviors in order to achieve a specific weight can do more harm than these young athletes may realize. Disordered eating can lead to very serious mental and physical

issues such as an impaired metabolism, decreased bone health, cardiovascular and mental health issues (Mountjoy et. al., 2014).

Young athletes are still developing physically and many are easily influenced. The need exists for more education and proper guidance for them, with regards to healthful eating. Many athletes rely primarily on their coaches and fellow wrestlers for information on weight management. However, how much do their high school coaches really know? More often than not, coaches teach what they were taught. But, is that really safe or effective today? As a parent, I expect my child's coach to know the warning signs for eating disorders and the implications these disorders can cause psychologically, physically, and emotionally if left untreated. I expect the coaches to understand the physical risks, the effects on an athlete's performance and the long-term consequences of disordered eating. I expect coaches to feel comfortable when addressing a concern with my child if they suspect the possibility of disordered eating. I expect coaches to know about and teach healthy eating habits and proper nutrition or if they lack such knowledge, I expect schools to provide someone who can. I expect high school coaches to receive the support they need to properly educate their athletes and subsequently, their athletes' parents.

Furthermore, there are a growing number of female wrestlers in the high school setting and there may be specific concerns regarding this situation. Research has shown that females are more than twice as likely to develop an eating disorder (De Abreu Soares, 2014; Smolk & Murnen, 2000). For those females between the ages of fifteen and

twenty-four years who suffer from Anorexia Nervosa, the mortality rate associated with the illness is twelve times higher than the death rate of all other causes of death (Sullivan, 1995). This fact alone should raise a concern or, at least, be a small cause for alarm.

This high-risk population of high school wrestlers cannot be ignored. It is far easier to work to prevent an eating disorder, then it is to treat an eating disorder (Beals & Manore, 2000). This topic is extremely important and needs to be addressed. The solution begins with assessing the current situation. What is the knowledge base of high school coaches and athletes with regards to eating disorders and what resources does this population have available to them? Ultimately, high school wrestling coaches are in a good position to influence these young athletes. These coaches are there to support athletes' advancement of skills in their chosen sport but they also should be there to encourage and teach good healthy behaviors. For this reason, I believe an assessment of coaches' knowledge and practice is warranted. The data gathered from this study could lead to future work to improve coaches' knowledge about eating disorders, which they will ultimately pass onto their athletes.

A number of studies have been conducted at the collegiate level resulting in the creation of guidelines for those coaches to follow (Bonci et al., 2008). However, there is a lack of this same information at the high school level, where preventative measures could and should be taken. It is for this reason that I chose to look further into this high risk population.

CHAPTER TWO: LITERATURE REVIEW

INTRODUCTION

The literature on disordered eating is surely not in short supply. There are numerous studies on the prevalence of disordered eating behaviors and eating disorders. Research studies showing the various risks associated with eating disorders in various populations, including athletes, have been conducted. Women have been noted to have a much higher prevalence of anorexia. Athletes have also been shown to have a higher risk of disordered eating in numerous studies. Certain sports, classified as “high risk”, such as wrestling, have also been shown to have a high prevalence of eating disorders. Research has shown the need for more education to prevent, manage and treating eating disorders (Bonci et al. 2008).

PREVALENCE OF DISORDERED EATING

National surveys estimate that 20 million women and 10 million men in America will have an eating disorder at some point in their lives (NEDA, 2019). Over thirty million Americans experience a clinically significant eating disorder during their lifetime (AFED, 2019). The prevalence of disordered eating behaviors has been studied in some degree, however, the individual and group data over time is lacking in the athletic population (Sundgot-Borgen & Torstveit, 2010). It is actually quite common for athletes of weight class sports to diet or have abnormal eating behaviors, especially before competition. Research shows that up to 70% admit to dieting and have abnormal eating behaviors to reduce weight before a competition (Torstveit & Sundgot-Borgen, 2005).

Many studies also suggest that there is a high prevalence of disordered eating in athletes who compete in those sports that emphasize leanness (Sundgot-Borgen & Larsen, 1993; Hausenblas & Carron, 1999; Smolak & Murnen, 2000; Rosendahl et al., 2009; Holm-Denoma et al., 2009). A study in 2009 found that 59% of the young male athletes were dissatisfied with their body, 19% were dieting, and eleven percent had disordered eating. The prevalence of disordered eating for endurance, weight class, and anti-gravitations sports were 10%, 17%, and 42% respectively (Rosendahl et al., 2009).

The University of Miami's Athletic Department found that 89% of female athletes in thin-build sports and 58% in normal-build sports reported a desire to lose weight. Although there are many motives for their desires to lose weight, research suggests a simple diet can be all it takes to start the downward spiral of distorted eating. Thirty-one and a half percent of female collegiate athletes actually reported disordered eating (UOMAD, 2008).

Only about ten percent of those suffering from eating disorders are male. More often than not, we see men suffering from bulimia or binge eating disorders, rather than anorexia. Men may engage in unhealthy practices to manage their weight as well (Bauer, 2012). This may include skipping meals or self-induced vomiting. Their guilt or need to reconcile the binge may lead to "sweat runs", excessive use of saunas, and often excessive exercise (UOMAD, 2008).

In a review, Sundgot-Borgen & Torstveit (2010), concluded that the prevalence of eating disorders has increased gradually from the beginning of the 1990's to the 2000's in

both female athletes and non-athletes. Specifically, in athletes, the prevalence of eating disorders was shown to increase from twenty percent to twenty eight percent (Sundgo-Borgen & Torstveit, 2010).

RISK FACTORS FOR FEEDING & EATING DISORDERS

Many factors contribute to the risk of developing distorted eating and eventually eating disorders. Eating disorders are complex and can affect people of all genders, ethnicities, religions, and socioeconomic status. Risk factors for all eating disorders involve a range of biological, psychological, and sociocultural issues. These factors may interact differently in different people, so two people with the same eating disorder can have very diverse perspectives, experiences, and symptoms. Researchers have found broad similarities in understanding some of the major risks for developing eating disorders (NEDA, 2019).

Biological risk factors may include having a close relative with an eating disorder or mental health condition, having a history of dieting, a negative energy balance, and Type 1 (insulin-dependent) diabetes. Psychological Risk factors include perfectionism, body image dissatisfaction, personal history of an anxiety disorder, and behavioral inflexibility. Social risk factors include a weight stigma, teasing or bullying, appearance ideal internalization, acculturation, limited social networks, and a history of trauma (NEDA, 2019).

High Risk Populations

Although there are many risk factors we are going to take a closer look at female teenage athletes who participate in a weight-class sport. Personality factors, pressure to lose weight, restricted eating, frequent weight cycling, early start of sport-specific training, injuries, symptoms of overtraining, and the impact of coaching behavior can all put an athlete at a higher risk for developing eating disorders (Sundgot-Borgen, 1994; Smolak et al., 2000). Another risk factor in the athletic environment is the fact that in some sports, such as High Intensity Sports (HIS), a decrease in body fat or weight can enhance performance. Often, an initial loss of weight leads to a better performance and this initial success can force the athlete, and other athletes observing this, to continue efforts to lose weight and unknowingly slip into an eating disorder. This may be an explanation why athletes are at a higher risk for developing an eating disorder.

FEEDING & EATING DISORDERS IN HIGH SCHOOL

Nearly 13% of female high school students took diet pills, powders or liquids to control their weight without a doctor's advice (CASA, 2003). Teenage girls from low-income families are 153% more likely to be bulimic than girls from wealthy families (Goeree et al., 2011). In a large study of 14- and 15-year-olds, dieting was the most important predictor of developing an eating disorder. Those who dieted moderately were five times more likely to develop an eating disorder, and those who practiced extreme restriction were eighteen times more likely to develop an eating disorder than those who did not diet (Golden, Schneider & Wood, 2016).

Elite Adolescent Athletes

Some may think that professional athletes, who need to be in near-perfect shape to compete, would be the last people to have an eating disorder. However, the prevalence of eating disorders have shown to be higher in adolescent elite athletes and higher in female athletes compared to male athletes (Martinsen & Sundgot-Borgen, 2012).

There is a limited number of studies focused on elite adolescent athletes who are in a vulnerable developmental stage and are affected by general, as well as sport-specific risk factors. In 2016, Giel and colleagues administered a survey to 1,138 elite adolescent athletes. They assessed body weight, weight control behavior, body acceptance and screened overall for core symptoms of eating disorders, depression and anxiety. They found that athletes competing in weight dependent sports and female athletes were at a higher risk for eating disorders. Athletes competing in weight dependent disciplines reported widespread use of compensatory behaviors to influence body weight. Athletes reporting eating disorder pathology showed higher levels of depression and anxiety than athletes without eating disorder pathology (Giel et. al., 2016).

The same characteristics that make college athletes vulnerable to eating disorders may be even more prevalent in professional athletes. At the professional level, the stakes are higher, and the characteristics that help athletes at the highest levels to excel will be even more prevalent in professional athletes. Professional athletes typically begin training at an early age and are prone to over-exercise. Their parents are sometimes demanding and controlling. Depending on the sport, training may take place in near social isolation.

There have been few reports of professional athletes with eating disorders. For an athlete to admit that he or she has an eating disorder would be about as helpful to a career as admitting to taking anabolic steroids. However, there have been plenty of stories about Olympic athletes with eating disorders. Bahne Rabe, a male rower who won eight gold medals, and gymnasts Helga Brathen and Christy Henrich are among those who died from complications related to anorexia. Cathy Rigby, the first American woman to win a medal in World Gymnastics, and Nadia Comaneci, who won nine gold medals, both suffered from bulimia. Amanda Beard, wrote a book about her experience called “In the Water, They Can’t See You Cry.” She explains her experience competing in the 1996 Olympic Games in Atlanta at just 14-years-old. She was smart, talented and excelled athletically, however, behind the scenes her personal life spiraled out of control (Beard & Paley, 2013).

FEEDING & EATING DISORDER GENDER DIFFERENCES

Although, females primarily are diagnosed with anorexia nervosa (90-95%), and bulimia nervosa (80%), there are a significant number of men who suffer from binge eating disorder. Binge eating disorder affects women slightly more often than men. It is estimated that 60% of people struggling with binge eating disorder are female, 40% are male (NEDA, 2019).

Body Image and Female Athletes

Disordered eating is shown to have a higher prevalence among athletes than the general population, even reaching 45% in female athletes (Bratland-Sanda & Sundgot-

Borgen, 2013). Women are more likely to develop eating disorders than men, and athletes in sports where body aesthetics or weight are important are more likely to develop eating disorders than those in other sports (De Oliveira et. al., 2017). A study of college athletes, in 1999 by Craig Johnson of Laureate Psychiatric Clinic and Hospital in Tulsa found that at least one third of female college athletes have some type of disordered eating (Johnson et.al., 1999).

The most known contributor to the development of anorexia nervosa and bulimia nervosa is body dissatisfaction (Stice, 2002). By the age of six, girls especially start to express concerns about their own weight or shape. Forty to 60 percent of elementary girls, ages 6 to 12, are concerned about their weight or about becoming too fat. This concern continues through life (Smolak, 2011).

Research has shown that 42% of first to third grade girls want to be thinner (Collins, 1991). Over one-half of teenage girls and nearly one-third of teenage boys use unhealthy weight control behaviors such as skipping meals, fasting, smoking cigarettes, vomiting, and taking laxatives (Neumark-Sztainer, 2005). For females between the ages of fifteen and twenty-four years who suffer from anorexia nervosa, the mortality rate associated with the illness is 12 times higher than the death rate of all other causes of death (Sullivan, 1995).

A study surveyed 146 female high school athletes to determine which factors influence their body image. The found that body image related to several physical and psychological health variables. Coaches and parents need to emphasize healthy habits, as

well as effective coping strategies when dealing with female athletes (Pritchard & Wilson, 2005).

The Female Athlete Triad

The female athlete triad is a medical condition observed in physically active females. It has three components occurring simultaneously; an eating disorder, menstrual dysfunction, and low bone mineral density. Research suggests that 1-3% of female athletes at the high school or collegiate level meet all three criteria (Beals & Hill, 2006; Nicholas et al., 2006). A study in 2017, researched the knowledge High School Coaches had about the Female Athlete Triad. Only 14% were able to correctly name all three of its components and 24% reported “having heard of the Triad”. The Study showed that gaps in knowledge about the triad exist and that educating coaches about the condition could serve as an important means of prevention of the condition (Pantano, 2017).

Disordered eating has been shown to be as high as 25% in female endurance athletes and up to 42% in female athletes participating in aesthetic athletic events like gymnastics, figure skating, or dancing (Sundgot-Borgen & Torsteveit, 2004). However, that prevalence most likely is under reported due to the fact that most female athletes often try to hide their symptoms and behavior from coaches, health care providers, family, and friends (Sanborn et al, 2000).

Risks to Male Athletes

There are plenty of male athletes with eating disorders as well. The National Eating Disorders Association estimates that 33% of male athletes in aesthetic sports are affected by eating disorders (NEDA, 2019). Writing about eating disorders in male athletes in *Sports Medicine* in 2006, Antonia Baum, M.D., detailed the extremes that male athletes sometimes go to when weight is a factor in performance (Baum, 2006). Jockeys may sit in a heated car wearing a rubber suit, use hot-box saunas, self-induce vomiting, or take cocaine and amphetamines to suppress their appetite. Wrestlers abuse diuretics, binge and purge, and take laxatives to make their weight requirements before a match, then routinely binge right before or following a match. Crew athletes wear many layers of clothing during runs on hot days to lose weight (Baum, 2006). A study of 131 Cornell University lightweight football players found that 40% engaged in dysfunctional eating patterns, mostly bingeing or purging, with 10% classified as having outright eating disorders (Rogers, Seligmann & Annin, 1994).

Take for instance, male athletes in major sports like baseball, football and basketball, face challenges with disordered eating behaviors as well. Eating disorders and the use of anabolic steroids in football, baseball and bodybuilding are growing concerns (Björk, Skårberg & Engström, 2013). The use of steroids is a sign of “muscle dysmorphia,” where the athlete becomes preoccupied with increasing muscle mass to the exclusion of almost everything else. In addition, athletes who take steroids to improve

performance eat more as a result and then try to control their weight, which can often result in an eating disorder.

Both male and female athletes are at greater risk for disordered eating (Rosendahl et al., 2009; Prnjak, Jukin & Tufano). If preventative measures are not taken it is inevitable that these trends will continue. Even though the use of performance-enhancing drugs are being increasingly enforced in the world of professional sports, the personality traits that lead to their use will still be there. The risks our young athletes face increases the younger they start these unhealthy behaviors. These behaviors need to be addressed before they become an even bigger issue.

FEEDING & EATING DISORDERS IN ATHLETES

Factors that contributed to eating disorder onset were identified in both athletes and non-athletes. A recent study included interviews with 12 collegiate female athletes and 17 non-athletes. Inductive content analysis revealed that low self-worth, peer issues, and comorbid psychological disorders were common in both groups. However, athletes reported sport-specific factors including performance pressure, team weigh-ins, and injuries, whereas family dysfunction, bullying, and puberty were more commonly reported triggers for non-athletes. Findings support prevention and treatment programs customized for unique vulnerabilities for each subgroup (Arther-Cameselle, Sossin & Quatromoni, 2017).

Athletes possess certain personality characteristics that make them at a higher risk for distorted eating. A study comparing the psychological profiles of athletes with

anorexia found many common traits, including high self-expectations, perfectionism, competitiveness, hyperactivity, repetitive exercise routines, compulsiveness, drive, a distorted body image, preoccupation with weight and dieting, and a tendency toward depression. According to a study of 744 male college athletes, those who weighed themselves seven or more times per week reported the most pressure to lose weight and be lean and muscular, engaged in muscle-building behaviors most frequently, dieted most often, and had the highest level of bulimic symptomatology (Galli, Petrie & Chatterton, 2017).

In summary, there are various factors that may place an athlete at a higher risk for developing distorted eating. For example, sports that emphasize appearance or weight requirements have added pressures to maintain a certain weight or size. Sports that focus on the individual rather than the entire team can encompass more pressure on the individual to succeed. Endurance sports, specializing in a sport too early, a belief that lower body weight will improve performance and competing at an elite level can all increase an athlete's risk for eating disorders.

Although most athletes with eating disorders are female, male athletes are also at an increased risk (DeFeciani, 2016). Especially, those competing in sports that tend to emphasize diet, appearance, size and weight. In weight-class sports (wrestling, rowing, horseracing) and aesthetic sports (bodybuilding, gymnastics, swimming, diving) about 33% of male athletes are affected. In female athletes in weight class and aesthetic sports,

disordered eating occurs at estimates of up to 62% (Bonci, 2009; Sundot-Borgen & Torstveit, 2004).

There may also be influential coaches who focus only on success and performance rather than on the athlete as a whole person. Some other factors influencing ones risk of developing disordered eating behaviors include, low self-esteem, family dysfunction, families history of eating disorders, chronic dieting, history of physical or sexual abuse, peer, family and cultural pressures to be thin, and other traumatic life experiences (SSU, 2019).

It is not uncommon for athletes who have serious eating problems to continue to perform well athletically for long periods. However, disordered eating eventually will catch up to the athlete in a number of physical and psychological ways. Until performance is noticeably affected, it can be quite difficult to identify disordered eating. Many have suggested that some traits desired by coaches in their athletes are similar to traits found in individuals with eating disorders, such as excessive exercise, perfectionism, and over-compliance (Galli, Petrie & Chatterton, 2017; SSU, 2019).

Leon (1991) suggests that these athletes also may have evidence of psychological traits such as high achievement orientation and obsessive-compulsive tendencies commonly associated with clinical eating disorders, which is also essential for successful competitions. Therefore, such athletes with these traits, should be considered as an increased risk for eating disorders (Leon, 1991).

Such attitudes and behaviors are apt to be awarded in the sport environment. Thus, rather than identifying an individual who is in need of treatment, sport personal are, without knowing, apt to increase the frequency of eating disorders through their reinforcement of attitudes and behaviors (Drinkwater et al., 2005). Often athletes distorted eating behaviors may go unnoticed and as a result and therefore left untreated.

The Disordered Eating Continuum

There are various reasons an athlete may develop distorted eating behaviors. One of the most common reported cause is actually dieting (Sundgot-Borgen, 1994). Elite athletes begin dieting for three main reasons. First, they want to fulfill a perception of the paradigm of a certain body image in a specific sport. Secondly, an athlete may believe that dieting will enhance their athletic performance. Lastly, athletes may feel sociocultural pressures to lose weight and have the “ideal” body composition or body shape (Sundgot-Borgen, 1994; Defeciani, 2016).

A low body fat is desirable in many sports that aim to achieve maximal power while maintaining an optimally low weight. Excessive fat is often viewed as a disadvantage in sports requiring powerful horizontal or vertical movements (eg., running, gymnastics, ski jumping, high jump, and long jump). It makes sense that when athletes are carrying excess fat they will not perform as well as their leaner competitors. All of a sudden they can run faster and jump higher. However, sometimes this leads athletes to believe “more is better” and that is not always the case. There comes a point at which you

cross a line and more often than not, it can be quite difficult to correct (Sundgot-Borgen & Torstveit, 2010).

An athlete's body composition can play a very important role in their athletic performance depending on which sport they are participating in. Think of the aerodynamics and resistance one may experience in swimming or cycling when carrying a few extra pounds. This is probably why certain sports are at a high risk for developing eating disorders. Sports such as figure skating, diving, rhythmic gymnastics, bodybuilding, and dance all desire a lean body composition. In addition, the sports in which athletes are divided into weight categories are at higher risk for developing distorted eating behaviors. These include wrestling, judo, karate, and rowing. It is no surprise that athletes today are developing these distorted eating behaviors with the high expectations to excel at any cost (Sundgot-Borgen & Torstveit, 2010).

Sadly, for many athletes who struggle with disordered eating, excessive weight, dieting, and abnormal eating behaviors consume them and become a main focus of their athletic existence. This behavior may continue to worsen and athletes may eventually be diagnosed with a clinical eating disorder.

“High Risk” Sports

All student-athletes can be at risk for disordered eating. However, certain sports have a higher prevalence of disordered eating. These sports include aesthetic sports, such as gymnastics, dancing, and figure skating, and competitive body-building were increased preoccupation with weight and shape, along with body dissatisfaction has been

reported (Fortes et. al., 2013b; Goldfield, 2009). Due to the serious physical and mental health risks associated with distorted eating, athletes exhibiting such behaviors should receive treatment as early as possible. Without treatment, recovery is very unlikely (Sherman & Thompson, 2007).

High School Wrestlers

Lakin, Steen, and Oppliger (1990) conducted a survey of 716 high school wrestlers assessing eating behavior, weight loss methods and nutrition practices. Wrestlers were shown to use fasting, fluid restriction, dehydration methods, and laxatives significantly more often to promote weight loss. They also note that their subjects reported that they relied primarily on coaches and fellow wrestlers as a source of information for weight management (Lakin, Steen & Oppliger, 1990).

According to the National Center for Catastrophic Sport Injury Research' All Sport Report 1982/83-2017/18, there have been 28 deaths in high school wrestling since 1983 that were the result of injuries that were caused by systemic failure as a result of exertion while participating in a sport activity, or by a complication that was secondary to a non-fatal injury (NCCSIR, 2019). There have been seven deaths in college wrestling in the same category, including the three in 1997.

The issue of unsafe weight practices among elite wrestlers gained national attention in 1997, when three collegiate grapplers died within a 32-day period. Billy Saylor, Joe LaRosa and Jeff Reese were all attempting to lose weight for wrestling,

experienced cardiorespiratory arrest, and died. The NCAA acted quickly, within two months, by passing the following rule changes in January 1998.

1. The use of saunas and rubber or impermeable suits was banned
2. A change from a one pound to a seven pound allowance was added to each weight class.
3. The weight in time was changed from 24 hours to 2 hours before the match.

A study of 243 colleges sponsored wrestling programs showed 40% of the wrestlers were influenced by the new NCAA rules and curbed their weight loss practices (Oppliger, Steen & Scott, 2003). However, it was recommended that education was still needed, as some wrestlers were still engaging in dangerous weight loss methods.

A weight management program was also adopted by the National Federation of State High School Associations (NFHS) for the 2006/2007 season. This program was based on three principles:

1. Elimination of all weight-control practices that could potentially risk the health of the wrestler
2. Focus on competition, not weight control
3. Recommendations should be practical, enforceable, and scientifically based.

The National Wrestling Coaches Association implemented this a new weight-management program for high school wrestlers by establishing a healthy minimal wrestling body weight through body composition and hydration assessments. The program also called for sound, gradual and safe weight-loss plans that include nutritional

education if weight loss is desired that should be directed by the coach, individual wrestler, and parents. To my understanding, this is where we seem to have a problem. This is a great goal or guideline but how is it being carried out? How are we ensuring that coaches, athletes, and parents are receiving the education and resources to even achieve this? I personally spoke to two athletic directors in San Joaquin County and neither says that their school require wrestling coaches to have any education in weight loss/control or nutrition considerations.

HEALTH RISKS OF DISORDERED EATING

Physical Problems

Since anorexia nervosa involves self-starvation, essential nutrients needed to function normally can lead to various complications, as shown in Table 1. The body is forced to slow down all of its processes to conserve energy. This can cause an abnormally slow heart rate and low blood pressure, reduction of bone density (osteoporosis), muscle loss and weakness, and severe dehydration. Dehydration can cause kidney failure, fainting, fatigue, and overall weakness. Often dry hair and skin, hair loss, or growth of body hair, lanugo, can develop in an effort to keep the body warm (NEDA, 2019).

Bulimia nervosa can prove to be extremely harmful to the body. The recurrent binge-and-purge cycles can damage the entire digestive system and purging behaviors can lead to electrolyte and chemical imbalances in the body that affect not only the heart but many other major organ functions. Dehydration and electrolyte imbalances can lead to irregular heartbeats and possibly heart failure and death. Frequent vomiting can cause

the esophagus to become inflamed and even rupture. Tooth decay and staining is also common due to the stomach acids being released during purging episodes. Laxative abuse can lead to chronic irregular bowel movements and constipation. Binge eating can even cause gastric rupture (NEDA, 2019).

Binge Eating Disorder health risks are closely linked with those of obesity. Often health consequences include high blood pressure, high cholesterol levels, heart disease, diabetes mellitus, gallbladder disease, and/or musculoskeletal problems (NEDA, 2019).

Table 1

Health Complications of Common Eating Disorders According to the Alliance for Eating Disorders Awareness

Anorexia Nervosa	Bulimia Nervosa	Binge Eating Disorder
<ul style="list-style-type: none"> • Amenorrhea (cessation of menstrual cycle) • Abnormally slow and/or irregular heartbeat Low blood pressure • Anemia • Poor circulation in hands and feet • Muscle loss and weakness (including the heart) • Dehydration/kidney failure • Edema/swelling • Memory loss/disorientation • Chronic constipation • Growth of lanugo hair • Bone density loss/Osteoporosis 	<ul style="list-style-type: none"> • Amenorrhea (cessation of menstrual cycle) • Abnormally slow and/or irregular heartbeat Low blood pressure • Anemia • Poor circulation in hands and feet • Muscle loss and weakness (including the heart) • Dehydration/kidney failure • Edema/swelling • Memory loss/disorientation • Chronic constipation • Growth of lanugo hair • Bone density loss/Osteoporosis 	<ul style="list-style-type: none"> • Overweight or obese • Type II Diabetes • Osteoarthritis • Lipid abnormalities (Including increased cholesterol) • Increased blood pressure • Chronic kidney problems • Gastrointestinal problems • Heart disease • Gallbladder disease • Joint and muscle pain • Sleep apnea

Psychological Problems

Psychological problems associated with eating disorders include low self-esteem, depression, and anxiety disorders (Nattiv., 2007). Generally, women exhibit a higher risk for developing an eating disorder due to expectations from society and thin-idealization (Keel & Forney, 2013). For athletes, the stress of constantly denying hunger, obsessing about food, agonizing over body weight, and fearing high body weight is mentally exhausting. Moreover, this preoccupation interferes with the athlete's daily activities as well as his or her training and competition (Steen & Brownell, 1990).

Obesity from binge eating may just be a symptom for a much deeper issue. Many binge eaters often do not know how to cope with their feelings. They sometimes isolate themselves from the rest of the world and find difficulty in sustaining deep and meaningful relationships. Their constant obsession with food and their disorder becomes mentally draining and quite often exhausting. It becomes a dangerous cycle of training to drown out feelings with food. Professional help is often needed to correct this unhealthy coping mechanism of trying to drown out feelings with food. It is very similar to alcoholism or drug addiction. Food becomes their addiction and overshadows the rest of their life.

Binge Eating Disorder presents with an emotional compulsion to overeat. They often feel stress or tension that is only relieved by eating. Many feel embarrassment over how much they are eating and hide it. They may feel numb while bingeing, like they are not really there or they are on auto-pilot. They never feeling satisfied, no matter how

much they may eat and often feel guilty, disgusted, or depressed after overeating. There is an overwhelming sense of desperation to control weight and eating habits.

Body Dysmorphic Disorder can cause distress, excessive self-consciousness, and avoidance of social situations and intimacy, leading to depression, isolation, and possible suicidal thoughts. Some may use excessive behaviors to compensate for the perceived flaws, such as, narcissism regarding other personal qualities. People with BDD will undergo unneeded cosmetic surgery, dental procedures, or dermatological procedures to correct the perceived flaw but are typically not satisfied with the results, as this is an internal perceptual problem. Some clinicians and researchers believe BDD is a type of Obsessive Compulsive Disorder (OCD).

Mortality Rates

Not only do many young women and men die from starvation and metabolic collapse but, also suicide. It is actually more common in women with anorexia than other mental disorders (Insel, 2012). This is mostly due to the low self-esteem and depression issues seen in conjunction to eating disorders. It is estimated that between 5-20% of individuals struggling with anorexia nervosa will die (NEDA, 2019). Depending on the length of the condition, the probabilities of death increase. Those struggling with binge eating disorder often express distress, shame, and guilt over their eating behaviors and are reported to feel as if they have a lower quality of life than non-binge eating disorders (NEDA, 2019). Young people between the ages of 15 and 24 with anorexia have 10 times the risk of dying compared to their same-aged peers (Smink, Hoeken & Hoek, 2012;

Finchter & Quadflieg, 2016). Males represent 25% of individuals with anorexia nervosa, and they are at a higher risk of dying, in part because they are often diagnosed later since many people assume males do not have eating disorders (Mond, Mitchison & Hay, 2014).

Athletic Performance

A decrease in food intake frequently leads to lower energy availability among athletes, a state that causes hormonal alterations, menstrual irregularities and impaired bone health, which consequently has a negative impact on sport performance as well (Mountjoy et al., 2018). Along with the physical and psychological problems associated with disordered eating behaviors, athletes put themselves at greater risk by placing such extreme demands on their bodies. It is clear that the negative effects of quickly losing body weight and restricting caloric intake takes a toll on performance, growth, cognitive function, and overall health in athletes (O'Connor & Caterson, 2006).

Dieting athletes could easily slip into disordered eating, which can eventually lead to a serious eating disorder, abnormal menstrual cycle, and eventually an imbalance in bone remodeling leading to osteopenia or osteoporosis. When all three diseases are present it is often referred to as the female athlete triad (Nattiv et al., 2007). It is also believed that female athletes with menstrual dysfunction, a possible side effect of disordered eating, are at increased risk for developing injuries (Nattiv et al., 2007).

Low bone mineral density values have also been seen in male competitive and recreational cyclists and long-distance runners with a low percent body fat (Hetland,

Haarbo & Christiansen, 1993; Smathers et al., 2009; Rector et al., 2008) In one study, 63% of male cyclists were diagnosed with osteopenia (Rector et al., 2008).

One study found results indicating that disordered eating, oligomenorrhea/amenorrhea, and low bone mineral density were associated with musculoskeletal injuries in these female high school athletes. Programs designed to identify and prevent disordered eating and menstrual dysfunction and to increase bone mass in athletes may help to reduce musculoskeletal injuries (Rauh, Nichols & Barrack, 2010).

COACHES INFLUENCE

In 1999 a study of collegiate coaches suggested a need for coaches to achieve a greater knowledge of eating disorders in all domains. Evidence suggests that athletic departments do not provide educational programs about eating disorders to coaches or athletes. There seemed to be poor communication between athletic departments and coaches regarding the availability of eating disorder educational resources (Turk, 1999). In 2003, a Master's student from Sacramento State investigated High School Coaches' knowledge of eating disorders (Conway, 2003). They surveyed 41 high school coaches from northern California. The study concluded that only 32% of coaches had any education concerning eating disorders. Only 29% of coaches were aware of any educational resources available concerning eating disorders in their athletic departments. Interestingly, they found that the longer the coach was in their current position, the less the coach knew about the eating disorder education and prevention (Conway, 2003).

There is a lot of information out there now for athletes, as well as coaches. More and more colleges and athletic training departments have handbooks on the matter of eating disorders. National Training Associations have set up guidelines to follow in preventing, managing and detecting eating disorders. Coaches can take the initiative, educate themselves on the matter, and even gather information for their athletes or parents. However, this is yet another task on their long to-do lists and requires time that they may not have.

A 2005 study comprised of 2,894 NCAA coaches, representing 23 sports found that athletic trainers, teammates, and coaches are frequently involved in the identification of eating disorders in athletes (Trattner et al., 2005). Eating disorder symptoms were most often used to identify symptomatic athletes, and athletes from high-risk sports were more often identified. Coaches rated symptoms as being serious, both in terms of how they affect the athlete's health and her athletic performance (Trattner et al., 2005).

Special Considerations

In a study conducted by a doctoral student at Boston University, sixteen female collegiate athletes, who had experienced eating disorders, were interviewed (Arthur-Cameselle & Baltzal, 2012). They compiled advice for coaches, parents and other athletes with eating disorders. Their advice for coaches were divided into two categories. The first addressed general coaching behaviors to prevent eating disorders. They came up with four key points;

1. Become educated on eating disorders to increase awareness

2. Emphasize proper nutrition to athletes
3. Emphasize sport skill instead of body weight as a means of achieving performance goals
4. Avoid singling out athletes with regards to body weight or shape

The second category regarded specific behaviors for interacting with athletes who have eating disorders.

1. Address and Confront the Athlete with the eating disorder if it is noticed or suspected
2. Provide emotional support
3. Refer the athlete to professional care such as a physician, psychologist, and/or Nutritionist
4. Prohibit participation in sport if health risks are evident
5. Help to provide them with a peer or parent for more support

PROFESSIONAL ORGANIZATION POSITION STATEMENTS

National Collegiate Athletic Association (NCAA)

National Collegiate Athletic Association (NCAA) actually conducted a research study on athletes and eating disorders. There were 1,445 students from 11 Division I schools, who were surveyed to determine the prevalence of eating disorders (Johnson, Powers, & Dick, 1999). This research sparked others to take notice. The NCAA also provides helpful information in the “NCAA Coaches Handbook Managing the Female Triad” and their Nutrition and Performance guidelines (Sherman et al., 2007)

National Athletic Trainers Association (NATA)

Unsafe weight management practices can compromise athletic performance and negatively affect an athlete's health (Turocy et al., 2011). Many often attempt to lose weight by starvation or extremely limiting caloric intake, engaging in pathogenic weight control behaviors, and/or restricting fluids. Sadly, these people often respond to pressures of the sport, coaches, peers, or parents by adopting negative body images and unsafe practices to maintain an ideal body composition for the activity (Turocy et al., 2011).

Because athletes with disordered eating rarely self-report their symptoms and are often in denial of their condition it is recommended that screenings and interventions be led by knowledgeable professionals. National Athletic Trainers Association (NATA), states that certified athletic trainers have the ability and responsibility to be effective members of the health care team (Bonci et al., 2008).

The recommendations provided are intended mainly for athletic trainers and those individuals involved in the maintenance of health and the enhancement of performance in athletes. It provided specific knowledge and guidelines to prevent, detect, and manage disordered eating behaviors in athletes. NATA explains that 'the individual biological, psychological, sociocultural, and familial factors for each athlete with distorted eating result in widely different responses to intervention strategies, challenging the best that athletic programs have to offer in terms of resources and expertise' (Bonci et al., 2008).

Eating disorders are not minor issues that will just disappear if ignored, in fact they are known to only worsen and cause serious physical and psychological damage.

NATA recognizes the adverse effects that eating disorders can have on a student-athlete's health and physical performance. The Position Statement provides detailed information on detecting eating disorders and disordered eating giving specific signs and symptoms and physical complications ranging from clinical signs including heart rate, blood pressure, body temperature, female menstrual cycles and dietary intake. An extensive list of physical signs and symptoms are broken down into categories such as cardiovascular, endocrine, gastrointestinal, fluids and electrolytes, thermoregulation, hematologic, dermatologic, oral/facial, and others. Even more so these signs and symptoms are split into which eating disorder they are most likely to occur. Most importantly, the commonalities between male and female athlete characteristics in eating disorders are more than the differences so strategies to detect and treat both genders should be the same (Bonci et al., 2008).

Other Resources

There are many other resources available. Many of which, provided supplemental information. I have provided a list in Appendix A. The National Eating Disorders Association (NEDA), Academy for Eating Disorders (AED), American Dietetic Association (ADA), American College of Sports Medicine (ACSM), and Sports, Cardiovascular and Wellness Nutritionist (SCAN) all provided helpful information on disordered eating.

Many University websites also addressed disordered eating. For example, University of Arizona (UOA) created a page to provide questions, considerations,

warning signs, action steps and resources to tackle distorted eating issues and concerns. The University of Miami (UMI) actually provides some of the foundational information on implementing disordered eating guidelines for other athletic programs, such as California State University, Sacramento.

Sacramento State's Athletic Department has a Disordered Eating Handbook available entitled "Competing to the Extreme" (Roberts, 2007). They state that its contents are exclusive to the school's athletic department and strive to educate about the prevention, management, and treatment of student athletes with distorted eating. The handbook provides guidelines for coaches, administration, athletic trainers and sports medicine staff. Basic nutrition and hydration considerations are provided. The definitions, signs and symptoms of eating disorders are supplied to provide a foundation of knowledge and understanding. The health consequences and dangers to athletes with distorted eating are outlined. Sacramento State's Athletic department also conveys prevention, identification and treatment strategies as well. Last but not least the handbook provides a resource list to help in suspected disordered eating cases.

PREVENTING EATING DISORDERS

Previous researchers have recommended that coaches should receive education in the subject matter to help prevent eating disorders in their athletes (Martinsen et al., 2015). Some colleges make an effort to address or educate students and faculty about the dangers of disordered eating behaviors and the risks of developing eating disorders. NCAA, for example, provides literature on nutrition and proper eating habits to students.

However, there are no actual requirements for the coaching staff to take an educational course on preventative measures or how to even recognize the symptoms of eating disorders. There has been success in previous education implementation for football coaches and concussion prevention. With the rise of concussion rates and serious head injuries in football players, the NCAA decided to take preventative action. They mandated that all coaching staff were required to complete a safety course (Yang, 2017).

In 1997, at the University of Michigan Jeff Reese died from a wrestling-related incident. Jeff had been trying to rapidly shed 17 pounds to qualify to wrestle in the 150-pound weight class. He died of kidney failure and heart malfunction while wearing a rubber suit and working out in a room heated to 92 degrees. He was the third college wrestler to die in a six week span, all during strenuous weight-loss workouts.

The deaths triggered a national debate over training techniques and the risks involved in sudden, large-scale weight loss. The NCAA Wrestling Committee responded by implementing wide-spread changes to the rules and regulations concerning these unhealthy weight-loss practices (Oppliger et al., 2006). New rules and regulations regarding how quickly a wrestler can cut weight were implemented. Now, wrestlers must undergo body fat testing and take hydration tests to ensure their safety in this very demanding and high risk sport.

Wrestlers have been known for “cutting weight” and doing so with extreme measures at times. However these rules have been imposed for their safety. Before the 2017/2018 season, the NCAA created stiffer penalties for wrestlers who violate NCAA

weight certification protocols if they use prohibited weight-loss practices or commit a severe weigh-in or medical exam violation (NCAA. 2019).

A first offense would result in suspension for eight competitions, while a second offense would lead to suspension for the rest of the season. Additionally, the team's coach and the director of athletics will receive private reprimands for the first offense. If a second offense occurs, additional institutional penalties will be determined by the rules committee.

High School wrestling has seen some changes as well. However, addressing the lack of knowledge that coaches may have of the signs and symptoms of disordered eating can prove to help prevent even more issues in athletes. Evidence from a research study in 2012 indicated the need for guidelines for parents. Advice for coaches, parents and other athletes were compiled, as shown in Table 2. They looked to female collegiate athletes who achieved recovery from an eating disorder for advice (Arthur-Cameselle, 2012).

Table 2

Learning From Collegiate Athletes Who Have Recovered From Eating Disorders: Advice to Coaches, Parents, & Other Athletes with Eating Disorders (Arthur-Cameselle & Baltzell, 2012).

<p style="text-align: center;">How a Coach can Help to Prevent Eating Disorders</p> <ol style="list-style-type: none"> 1. Become educated on eating disorders to increase awareness 2. Emphasize proper nutrition to athletes 3. Emphasize sport skill instead of body weight as a means of achieving performance goals 4. Avoid singling out athletes with regard to body weight or shape <p style="text-align: center;">How a Coach can Help Manage Athletes with Eating Disorders</p> <ol style="list-style-type: none"> 1. Address and Confront the Athlete with the Eating Disorder if it is Noticed or Suspected 2. Provide Emotional Support 3. Refer the athlete to professional care, such as, physician, psychologist, and/or Nutritionist 4. Prohibit Participation in Sport if Health Risks are evident 	<p style="text-align: center;">Advice to Other Athletes with Eating Disorders</p> <ol style="list-style-type: none"> 1. Keep hope that recovery is possible 2. Determine the underlying cause of and triggers for the disorder 3. Seek professional treatment 4. Reach out to important other in your life for emotional support 5. Focus on the benefits of recovery Put your life and eating disorder behaviors into perspective <p style="text-align: center;">Advice to Parents</p> <ol style="list-style-type: none"> 1. Provide Emotional Support 2. Encourage the use of Professional treatment 3. Become educated about eating disorders
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Pre-Screening Physicals

The NATA Position Statement: Preventing, Detecting, and Managing Disordered Eating in Athletes (2008) discusses screening methods for “high risk sports”. Such methods include a questionnaire regarding disordered eating as part of an athlete’s participation exam. Samples of such questionnaire are even provided in the article. These can be a great resource to wrestling coaches (Bonci et. al., 2008).

Education

In August of 2010, a nationally recognized public opinion research company, American Viewpoint, conducted a telephone survey of American adults for the National Eating Disorders Association. The survey polled a nationwide sample of one thousand adults in the United States. They found that 86% of people favor schools providing information about eating disorders to students and parents. Eighty percent believed conducting more research on the causes and most effective treatments would reduce or prevent eating disorders (NEDA, 2019).

When a group of athletic trainers working with female collegiate athletes were surveyed, only 27% felt confident identifying an athlete with an eating disorder (Greenleaf, 2009). Despite this, 91% of the athletic trainers reported dealing with an athlete with an eating disorder. The survey also found that 93% of trainers felt that increased attention needs to be paid to preventing eating disorders among collegiate female athletes. About ¼ of the athletic trainers worked at an institution without any policy on managing eating disorders (Greenleaf, 2009).

The National Athletic Trainers' Association Position Statement on Disordered Eating in Athletes also suggest mandatory educational programs to be implemented annually for administration, athletes, coaches and certified athletic trainers. The statement is meant to provide strategies for anyone working with athletes that may struggle with disordered eating. Other sources also recommend providing parent education on disordered eating and healthy nutrition practices (Bonci et al., 2009). Increased knowledge may improve self-efficacy, which plays a critical role in parents' ability to adopt eating disorder treatments.

Summary

In order to prevent eating disorders in athletes educational programs should be mandatory for coaches and athletes. It is vital to educate athletes about disordered eating and the health and performance effects that result from engaging in unhealthy behaviors (Currie, 2010). Coaches, athletic trainers, and other athletic staff members must know how to respond to a student-athlete and de-emphasize weight, appearance, and body shape and body composition. By improving overall health practices, such as getting six hours of sleep a night, eating three meals a day, not skipping meals, eliminating substance use, and treating food as an energy source for sport training and performance, we will begin to see a positive turn (UOMAD, 2008).

DETECTING EATING DISORDERS

Coaches may notice a decline in athletic performance or fitness/stamina, abnormal muscular fatigue, weight loss, excessive tiredness, light headedness, feeling

cold and/or extreme mood changes (Hornak & Hornak, 1997). Although athletes have shown to have a higher risk for disordered eating, their knowledge about the topic remains an area of possible improvement. In fact, athletic organizations such as the National Association of Intercollegiate Athletics (NCIA) have been raising awareness about eating disorders at the College level. However, a study conducted by a team of American and Swedish researchers compared general knowledge of eating disorders and confidence in that knowledge among 51 female collegiate athletes. They found that despite the women's confidence in their knowledge of eating disorders, their actual understanding fell far short. Their knowledge of identifying signs and symptoms of eating disorders brought the lowest scores. Coaches should be aware of this lack of knowledge and work with clinical practitioners (dietitians, team physicians, & athletic trainers) to educate and monitor their athletes on eating disorders, specifically signs and symptoms (Rosa-Caldwell et al., 2018).

Research recommends prompt intensive treatment will significantly improve the chances of an athlete's recovery. Therefore, it is important to be aware of some of the warning signs of disordered eating. Different disorders show different signs or symptoms, as shown in Table 3. With anorexia nervosa we often see dramatic weight loss, a preoccupation with weight, food, calories, fat grams, and dieting, refusal to eat certain foods, progressing to restrictions against whole categories of food, frequent comments about feeling "fat" or overweight despite weight loss, anxiety about gaining weight, denial of hunger, development of food rituals, consistent excuses to avoid meal times or

situations involving food, an excessive exercise regimen indicating that weight loss, dieting, and control of food are becoming primary concerns (NEDA, 2019).

The chance for recovery increases the earlier bulimia nervosa is detected. Therefore, it is important to be aware of some of the warning signs of the condition. Evidence of binge eating, evidence of purging behaviors, use of laxatives or diuretics, or an excessive exercise regimen can all be indicators. There may be unusual swelling of the cheeks or jaw area, calluses on the back of the hands and knuckles from self-induced vomiting, discoloration or staining of the teeth, creation of lifestyle schedules or rituals to make time for binge-and-purge sessions, and a withdrawal from usual friends and activities (NEDA, 2019).

Identifying distorted eating behaviors requires some basic knowledge of disordered eating and the signs and symptoms to look for. California State University, Sacramento's handbook recommends that if you suspect that a student-athlete has disordered eating, continue to be supportive and caring and do not take responsibility for altering his or her eating behavior or any other problems. Concerns are to be presented to a Certified Athletic Trainer (ATC) in a private setting (UOMAD, 2008; SSU, 2019).

Early warning signs of disordered eating can be identified when athletes complete their pre-participation physical-exam forms. Athletic trainers are often the first to detect eating disorders in athletes and should become familiar with the signs, symptoms, and multiple diagnostic tools available (Montenego, 2006).

Table 3

The National Eating Disorders Association's List of Signs & Symptoms for Detecting Eating Disorders (NEDA, 2019).

Anorexia Nervosa	Bulimia Nervosa	Binge Eating Disorder
<ul style="list-style-type: none"> • Significant weight loss • Distorted body image • Intense fear/anxiety about gaining weight • Preoccupation with weight, calories, food, etc. • Feelings of guilt after eating • Denial of low weight • High levels of anxiety and/or depression • Low self-esteem • Self-injury • Withdrawal from friends and activities • Excuses for not eating/denial of hunger • Food rituals Intense, dramatic mood swings • Pale appearance/yellowish skin-tone • Thin, dull, and dry hair, skin, and nails • Cold intolerance/hypothermia • Fatigue/fainting • Abuse of laxatives, diet pills, or diuretics • Excessive and compulsive exercise 	<ul style="list-style-type: none"> • Bingeing and purging • Secretive eating and/or missing food • Visits to the bathroom after meals • Preoccupation with food • Weight fluctuations • Self-injury • Excessive and compulsive exercise regimes — despite fatigue, illness, or injury • Abuse of laxatives, diet pills, and/or diuretics • Swollen parotid glands in cheeks and neck • Discoloration and/or staining of the teeth • Broken blood vessels in eyes and/or face • Calluses on the back of the hands/knuckles from self-induced vomiting • Sore throat • Heartburn/reflux • Feelings of shame and guilt • Self-criticism and low self-esteem • High levels of anxiety and/or depression 	<ul style="list-style-type: none"> • Eating large quantities of food, without purging behaviors, when not hungry • Sense of lack of control over eating • Eating until uncomfortably/painfully full • Weight gain/fluctuations • Feelings of shame and guilt • Self-medicating with food • Eating alone/secretive eating • Hiding food • High levels of anxiety and/or depression • Low self-esteem
Body Dysmorphic Disorder	Muscle Dysmorphia	Night Eating Disorder
<ul style="list-style-type: none"> • Low self-esteem • Unreasonable fears of rejection from others due to perceived ugliness • Some realization that one's perception of his/her "defect" is distorted, but an uncontrollable impulse to think about it 	<ul style="list-style-type: none"> • Distorted self-image • Missing social events, skipping work, and cancelling plans in order to work out • Never being satisfied with one's muscle mass • Working out despite an injury • Maintaining extreme workout methods • Maintaining a strict, high-protein and low-fat diet • Using excessive amounts of food supplements, steroid abuse, unnecessary plastic surgery, and even suicide attempts 	<ul style="list-style-type: none"> • Skips breakfast and delays first meal for several hours after awakening • The individual will eat more than half of daily food intake during and after dinner. • Late-night binges almost always consist of consuming sugary foods and carbohydrates • Suffer from stress, depression or anxiety, often in connection with their eating habits • These night eating episodes typically bring guilt rather than hedonistic enjoyment • Trouble falling asleep or staying asleep • Are more likely than the general public to sleepwalk • Tense, anxious, upset or guilty while eating

Signs & Symptoms of Anorexia Nervosa (AN)

In anorexia nervosa the body is denied the essential nutrients it needs to function normally. By starving the body, it automatically slows down its metabolic processes to conserve energy. You may see an abnormally slow heart rate and low blood pressure, as this happens, the risk of heart failure rises. There is often a reduction of bone density which results in brittle dry bones or osteoporosis. There may be muscle loss and weakness. Dehydration can lead to kidney failure, as well as, dry hair or skin, even hair loss. Some may even begin to grow a downy layer of hair, called lanugo, all over the body in an effort to keep the body warm. A review of nearly fifty years of research confirms that anorexia nervosa has the highest mortality rate of any psychiatric disorder (Arcelus, Mitchell, Wales, & Nielsen, 2011).

Signs & Symptoms of Bulimia Nervosa (BN)

The recurrent binge-and-purge cycles of bulimia can affect the entire digestive system and can lead to electrolyte and chemical imbalances in the body. These affect the heart and other major organ functions and can have serious health consequences. For example, electrolyte imbalances can lead to an irregular heartbeat or possibly heart failure. It can also cause dehydration and loss of sodium and potassium. During binging there is a chance of gastric rupture. Frequent vomiting can cause inflammation and possible rupture of the esophagus. The stomach acid from vomiting can cause tooth decay. Chronic irregular bowel movements and constipation occur as a result of laxative abuse. Bulimia also puts you at risk for Peptic ulcers and pancreatitis.

Signs & Symptoms of Binge Eating Disorder (BED)

People with binge eating disorder are embarrassed and ashamed of their eating habits, so they often try to hide their symptoms and eat in secret. Many binge eaters are overweight or obese, but some are of normal weight. They are known to self-medicate with food often feeling a lack of control of their eating. Binge Eating is consuming a large amount of food without purging or other compensatory measures.

Signs & Symptoms of Eating Disorder Not Otherwise Specified (EDNOS)

Examples of presentations that can be specified using the "other specified" designation include the following:

1. Atypical anorexia nervosa: All of the criteria for anorexia nervosa are met, except that despite significant weight loss, the individual's weight is within or above the normal range.
2. Bulimia nervosa (of low frequency and/or limited duration): All of the criteria for bulimia nervosa are met, except that the binge eating and inappropriate compensatory behaviors occur, on average, less than once a week and/or for less than 3 months.
3. Binge-eating disorder (of low frequency and/or limited duration): All of the criteria for binge-eating disorder are met, except the binge eating occurs, on average, less than once a week and/or for less than 3 months.

4. Purging Disorder: Recurrent purging behavior to influence weight or shape (e.g., self-induced vomiting, misuse of laxatives, diuretics, or other medications) in the absence of binge eating.
5. Night eating syndrome: Recurrent episodes of night eating, as manifested by eating after awakening from sleep or by excessive food consumption after the evening meal. There is awareness and recall of the eating. The night eating is not better explained by external influences such as changes in the individual's sleep-wake cycle or by local social norms. The night eating causes significant distress and/or impairment in functioning. The disordered pattern of eating is not better explained by binge-eating disorder or another mental disorder, including substance use, and is not attributable to another medical disorder or to an effect of medication. (APA, 2013)

MANAGING EATING DISORDERS

Treatment

A study in 2017 used an open-ended survey to collect information about current eating practices and coping strategies among 218 retired female athletes (Plateau, Petrie, & Papathomas, 2017). Athletes described feeling liberated with regards to their eating following retirement from sport, and for some this included an alleviation of disordered eating practices. These changes, however, required an effortful process of recalibration, during which athletes had to relearn and reinterpret their body's physiological signals of hunger and satiety. Additional research is needed to understand just how this process

unfolds and how retired athletes can be supported in developing a healthier and more adaptive approach to eating (Plateau, Petrie, & Papathomas, 2017).

Only one in ten people with eating disorders receive treatment (SCDMH, 2014). This may be due to the fact that many who suffer from eating disorders are in denial or don't know how to get the help they so desperately need. Most likely due to the expensiveness of treatment of eating disorders, about 80% of the females who have accessed care for their eating disorders do not get the intensity of treatment they need to stay in recovery (SCDMH, 2014). Many times, they are often sent home weeks earlier than the recommended stay. It is estimated that individuals with eating disorders need anywhere from three to six months of inpatient care, in the US, this can cost about \$30,000 a month. It is uncommon that health insurance companies will typically cover the cost (SCDMH, 2014).

Learning more about eating disorders has also shown to help with treatment. A cross-sectional and prospective cohort study comparing the parents of children age 8 to 18 years seeking initial evaluation for an eating disorder at an adolescent medicine clinic (ED) to those attending appointments at a general pediatrics clinic (GP) was performed utilizing a 20-item questionnaire. There was no difference in mean scores at baseline, however, after two months, the mean score of the ED group was significantly higher. Parents' increased knowledge may improve self-efficacy, which plays a critical role in parents' ability to adopt eating disorder treatments (Bryson et al., 2018).

Summary

Early identification and treatment of disordered eating provide athletes with a much easier and shorter treatment process (Beals & Manore, 2000). It will also protect the student-athlete from more serious chronic health consequences. Research as stated that the most effective treatment is a multidimensional approach, which includes the student-athletes' family and friends, teammates, coaches, athletic trainers, physicians, nutritionists & mental health professionals (UOMAD, 2014). A 2011 study showed that female athlete triad patients recover best with a team approach to care (Warr & Woolf, 2011). Depending on the severity of the disease, there are various approaches to treatment. Often components of treatment may include: medical evaluation, psychological counseling, and nutritional management (UOMAD, 2014).

CHAPTER THREE: METHODOLOGY

RESEARCH DESIGN

Overview of Design

The purpose of this study was to assess the level of knowledge possessed by high school wrestlers and high school wrestling coaches about disordered eating behaviors. The study used an established survey to assess the participants' knowledge. In addition to investigating the knowledge of and confidence in response, demographic data about participants was gathered. The study included various supplemental questions about participants' experiences and opinions. Student athletes' responses to the Self-Loathing Subscale were also assessed.

Variables

Coaches

Independent Variables

The Independent variables are the demographic characteristics of the coaches.

- Age
- Gender
- Race/ethnicity
- Current coaching position, years in position
- Years of experience coaching wrestling
- Gender of athletes they have coached

Dependent Variables

- Knowledge of eating disorders
- Confidence level in coaches' responses

Student Athletes

Independent Variables

The Independent variables are the demographic characteristics of the athletes.

- Age
- Gender
- Grade level
- Height/weight
- Gender of their coach
- Level at which they compete in wrestling

Dependent Variables

- Knowledge of eating disorders
- Confidence level in athletes' responses
- Response to Self-Loathing Subscale

Hypotheses

Due to the nature of the study the hypotheses were written in the null.

1. There will be no significant differences among the current knowledge level of Eating Disorders of California High School Wrestling Coaches.

2. There will be no significant differences among the current knowledge level of Eating Disorders of California High School Wrestlers.
3. There will be no significant difference in high school wrestlers risk for eating disorders based on gender.

METHODS

Sample Population/Participants

Coaches. This survey was designed for high school wrestling coaches, assistant coaches, and volunteer coaches. The study required coaches to have been in the role of wrestling coach within the last five years. This study was specifically looking for coaches in the state of California.

Student Athletes. Participants involved were California high school wrestlers who participated in the 2019-2020 wrestling season.

Human Subject Assurance

The International Review Board (IRB) reviews human subjects research conducted by Sacramento State researchers to ensure participants are protected. The Student Research Committee from California State University, Sacramento evaluated the research proposal. All coaches receiving the questionnaire were presented with the consent form (Appendix C) which described the purpose of the study. Specific results from individuals completing the study has been kept confidential. All student athletes participating in the online survey were given an assent form (Appendix F) and expected to get parental

consent before taking part in the survey. No names or personal information was collected and all participants have remained anonymous.

Data Collection

Permission to conduct the study was received from the Kinesiology Department at California State University, Sacramento. Participation in the study was on a voluntary basis. Wrestling coaches were recruited from the California Interscholastic Federation (CIF) database. Permission was obtained from CIF prior to emailing the California high school coaches the information needed for them and their athletes to participate in the survey. The survey designed for coaches was conducted on Survey Monkey as was the survey designed for student athletes. This process was used to ensure privacy, to aid in obtaining parental consent and to guarantee participant identities would stay anonymous.

Data Collection Tools

Consent Form for Athletes. (Appendix B). This form described the purpose of the study, explained participant rights and provided participants my contact information if they had any questions. Student athletes under the age of 18 years were required to get parental consent before participating in the survey.

Consent Form for Coaches. (Appendix C). This form described the purpose of the study, explained participant rights and provided participants my contact information if they had any questions.

Demographic Questionnaire on Athletes. (Appendix D). This questionnaire was designed to garner information about each participant's age, gender, height, weight, race/ethnicity, grade level, level at which they competed and the gender of their coach.

Demographic Questionnaire on Coaches. (Appendix E). This questionnaire was designed to garner information about their age, gender, race/ethnicity, coaching position/title, gender of athletes coached, years in current position and years of experience coaching will all be noted in the demographic section.

Supplemental Questions for High School Wrestling Athletes (Appendix F). This series of questions was designed to garner a better understanding of each athlete's individual situation.

Supplemental Questions for High School Wrestling Coaches. (Appendix G). This series of questions was used to gain further understanding of their individual situations.

The Self-Loathing Subscale (Appendix H.) This Questionnaire included four items derived from the Exercise Orientation Questionnaire (EOQ; Yates et al., 1999). Each item was scored on a five-point scale ranging from five which equated to "strongly agree" to one point which stood for "strongly disagree".

The Self-Loathing Subscale has been used as a screening tool for persons who may be at risk of developing or having an eating disorder. Research has shown the Self-Loathing Subscale to positively detect the possible presence of an eating disorder. In this study, the Self-Loathing Subscale was chosen to be used to reduce the length of the survey and increase accuracy due to the fact that the questions are more about exercise

rather than disordered. This questionnaire has shown to be consistent with other Eating Disorder Assessments (Aruguete, Yate, & Edman, 2007). A score of sixteen was used as the cut-off point since a high proportion of individuals scoring at or above sixteen on the Self-Loathing Subscale showed a clinically diagnosable eating disorder (Edman, Yates, & Aruguete, 2005).

Knowledge of Disordered Eating Questionnaire. Participants' knowledge of disordered eating was measured by the Knowledge of Disordered Eating Questionnaire. This 30 question Questionnaire (Appendix I) was developed based on the Turk (1999) questionnaire. At the time of Turk's study there were no existing questionnaires on the topic. Upon development of the Knowledge of Eating Disorders Questionnaire, Turk had the instrument critiqued by eleven experts in various sports and medicine fields. No validity and reliability measures were conducted on the instrument. The range of the level of confidence was changed from a 1-4 scale to a 1-5 scale to assess the knowledge of disordered eating for both coaches and high school athletes (Torres et al., 2011).

Data Analysis

A Pearson correlation coefficient was utilized to assess the relationship between the demographic information gathered and knowledge of coaches and athletes. Correlations were used to compare gender, age, experience, coaching position, athletes primarily coached, and experience with eating disorders in relation to the knowledge of eating disorders in the sample of coaches. In the athletes, correlations were used to

compare gender, grade level, competition level, eating disorder experience, and body mass index to the knowledge of eating disorders.

In addition, an independent two-sample t-test with equal variances was utilized to determine if there was a difference between coaches' and student athletes' knowledge of eating disorders and if there was a significant difference in findings based on gender within either population. Demographic, supplemental, and knowledge base data was analyzed further using means and standard deviation of responses. The five domains listed on the Knowledge of Disordered Eating Questionnaire were separated and analyzed to determine if there was a difference in the overall mean in coaches or athletes. The Self-Loathing Subscale Questionnaire was calculated and gender was compared to the athlete's overall score. Using a Two-sample t-test assuming equal variances, a test for significance was administered. Graphs and Tables were then created to display results clearly.

CHAPTER FOUR: ANALYSIS OF DATA

COACH'S RESULTS

Demographic Information

The study included a total of eighteen High School Coaches who completed the entire survey, as shown in Table 4. There were 10 (55.56%) head coaches, 2 (11.11%) assistant coaches, and 5 (27.78%) volunteer coaches and 1 (5.56%) coach in the other category. Fifteen coaches were male and three were female. The mean age of coaches was 36.61 years. Ten coaches identified themselves as White and/or European American, 2 as Asian/Pacific Islander and/or Asian American, 2 as Latino and/or Mexican, 4 identified as Multi-racial. The majority of coaches reported to have experience coaching both male and female athletes, 77.8% overall. A review of all coaches in the study revealed a mean score of 4.9 years of experience in their current positions and a mean score of 9.8 total years of experience coaching wrestling.

Table 4

Demographic Information of High School Wrestling Coaches

Participant Categories	Male	% of Sample	Female	% of Sample	Total	% of Sample
Total Sample of Coaches	15	83.33%	3	16.67%	18	100%
Mean Age in Years	36.4	-	37.7	-	36.6	-
Coach Position						
Head Coaches	9	50.00%	1	5.56%	10	55.56%
Assistant Coaches	2	11.11%	0	0.00%	2	11.11%
Volunteer Coaches	3	16.67%	2	11.11%	5	27.78%
Other	1	5.56%	0	0.00%	1	5.56%
Total	15	83.33%	3	16.67%	18	100.00%
Years of Experience						
Mean in Current Position	5.50	-	2.00	-	4.88	-
Mean Total Coaching	10.47	-	6.33	-	9.78	-
Race/Ethnicity						
White/European American	8	44.44%	2	11.11%	10	55.56%
Black/African American	0	0%	0	0%	0	0%
Native American or Aleutian Islander/Eskimo	0	0%	0	0%	0	0%
Asian/Pacific Islander/Asian American	1	5.56%	1	5.56%	2	11.11%
Middle Eastern/Middle Eastern American	0	0%	0	0%	0	0%
Latino/Mexican	2	11.11%	0	0%	2	11.11%
Multi-racial	4	22.22%	0	0%	4	22.22%
Total	15	83.33%	3	16.67%	18	100.00%
Gender Coached						
Male	3	16.67%	0	0.00%	3	16.67%
Female	0	0.00%	1	5.56%	1	5.56%
Both	12	66.67%	2	11.11%	14	77.78%
Total	15	83.33%	3	16.67%	18	100.00%

Supplemental Questions

Out of the eighteen High School Coach participants, only 2 coaches (11.11%), claimed that they have ever attended an educational program or training on disordered eating behaviors. An alarming thirteen coaches (72.22%) reported that their school's athletic department does not sponsor an educational program about disordered eating behaviors and/or eating disorders. The remaining five coaches (27.78%) reported that they didn't know if their school sponsored an educational program, which is also a concern.

More than 83.3% of the coaches claimed that their respective athletic departments did not make educational resources centered on disordered eating behaviors and/or eating disorders available for coaches or teams. Only 16.67%, three of the eighteen coaches, believed that they were responsible for teaching their student athletes safe and healthy weight loss practices. In the past two years, none of the coaches surveyed had a team who attended an educational program about eating disorders.

Every coach involved in the study felt that High School Wrestling Coaches need more support in educating both themselves and their athletes about eating disorders. When coaches were asked to identify the areas of education they felt would be most valuable for them to focus, they responded as follows; 0/18 Etiology/Causes of Eating Disorders, 5/18 Sign/Symptoms of Eating Disorders, 2/18 Management/Treatment of Eating Disorders, 8/18 Risk Factors Contributing to Eating Disorders, 3/18 Education/Prevention of Eating Disorders. Over 72.22% of high school wrestling coaches

reported that they had a prior personal experience dealing with disordered eating behaviors/eating disorders in student athletes.

Knowledge of Eating Disorders

High School Wrestling Coaches had a mean score of 75.19% on the Knowledge of Eating Disorders Questionnaire. This score is consistent with previous studies (Conway, 2003; Turk; 1999). The Knowledge of Eating Disorders Questionnaire was divided into five domains: etiology of eating disorders, identifying signs and symptoms of eating disorders, management and treatment of eating disorders, risk factors of eating disorders, and education and prevention of eating disorders. Of these five domains, High School Wrestling Coaches scored the lowest in the etiology of eating disorders and the signs & symptoms of eating disorders.

The mean score of female coaches was higher than that of the male coaches in all five domains (see Table 5). As you can see in Table 6 there were no significant findings based on coaching position. Female coaches had a mean of 6.33 years of coaching experience, compared to a mean of 10.47 years of experience for male coaches. However, their knowledge of eating disorders it 12.44% higher than male coaches. Male wrestling coaches had a mean score of 73.11%, whereas, female coaches had a mean score of 85.56% (see Tables 7-8). A Pearson Correlation confirmed that there was a significant correlation between gender and coaches knowledge of eating disorders at the 0.05 level (2-tailed).

The mean level of confidence for high school wrestling coaches of overall correctness of answers was 3.95 and the mean level of confidence for incorrect answers was 3.50 (see Table 9). There was no significant difference found between total years of experience and overall scores in knowledge of eating disorders (see Table 10). High school wrestling coaches who reported to primarily coach females showed the highest overall mean score in their overall knowledge of eating disorders, 86.67%. Those who coached both genders had a mean score of 75.00% in their overall knowledge of eating disorders and those coaches who coached primarily males had a mean score of 72.23% in their overall knowledge of eating disorders (see Table 11).

When the high school wrestling coaches were asked to identify the area they believed would be most valuable to concentrate on in order to provide support in educating themselves and their athletes about eating disorders, 44.44% chose Risk Factors of Eating Disorders (see Figure 1). The other domains chosen by coaches were Signs and Symptoms of Eating Disorders (27.78%), Education & Prevention of Eating Disorders (16.67%), and Management and Treatment of Eating Disorders (11.11%). As shown in Figure 1, Etiology received the lowest overall score of eating disorders, Etiology (0%).

Table 5

Results of High School Wrestling Coaches' Knowledge of Eating Disorders by Domain

	MALE COACHES (MEAN SCORE)	FEMALE COACHES (MEAN SCORE)	OVERALL MEAN SCORE
ETIOLOGY	62.22%	72.22%	63.89%
SIGNS & SYMPTOMS	65.56%	88.89%	69.44%
MANAGEMENT/TREATMENT	73.33%	77.78%	74.07%
RISK FACTORS	76.67%	94.44%	79.63%
EDUCATION & PREVENTIONS	87.78%	94.44%	88.89%
TOTAL SCORE	73.11%	85.56%	75.19%

Table 6

Knowledge of Eating Disorders Results vs. Coaching Position

Coach Position	# of Participants	% of Sample	Mean Score	Standard Deviation
Head Coaches	10	55.56%	77.33%	.08
Assistant Coaches	2	11.11%	81.67%	.07
Volunteer Coaches	5	27.78%	69.33%	.13
Other	1	5.56%	70.00%	.00
Total	18	100%		

Table 7

Knowledge of Eating Disorders Results for Male High School Wrestling Coaches

<i>Scores Earned</i>	<i>Participants in Category</i>	<i>% of Male Participants</i>
<i>51-60%</i>	2	13.33%
<i>61-70%</i>	4	26.67%
<i>71-80%</i>	7	46.67%
<i>81-91%</i>	2	13.33%
<i>Total</i>	15	100%
<i>Mean Score</i>	15	73.10%
<i>Lowest Score</i>	15	56.67%
<i>Median Score</i>	15	73.33%
<i>Highest Score</i>	15	86.67%

Standard Deviation for the sample was 9%.

Table 8

Knowledge of Eating Disorders Results for Female High School Wrestling Coaches

<i>Scores Earned</i>	<i>Participants in Category</i>	<i>% of Female Participants</i>
<i>71-80%</i>	1	33.33%
<i>81-91%</i>	1	33.33%
<i>91-100%</i>	1	33.33%
<i>Total</i>	3	100%
<i>Mean Score</i>	3	85.56%
<i>Lowest Score</i>	3	76.67%
<i>Median Score</i>	3	86.67%
<i>Highest Score</i>	3	93.33%

Standard Deviation for the sample was 8%.

Table 9

Level of Confidence of Correct vs. Incorrect Answers per Questionnaire Item for High School Wrestling Coaches

Question Number	# Correct	# Answered	% Correct	Mean "Correct" Level Of Confidence	# In-Correct	% In-Correct	Mean "Incorrect" Level Of Confidence
1	13	18	72.22%	4.15	5	27.78%	3.60
2	13	18	72.22%	4.15	5	27.78%	3.40
3	18	18	100.00%	4.17	0	0%	0.00
4	18	18	100.00%	4.39	0	0%	0.00
5	9	18	50.00%	3.67	9	50.00%	3.22
6	5	18	27.78%	3.60	13	72.22%	3.23
7	8	18	44.44%	3.50	10	55.56%	3.90
8	13	18	72.22%	4.15	5	27.78%	3.60
9	16	18	88.89%	3.81	2	11.11%	4.50
10	15	18	83.33%	3.73	3	16.67%	3.00
11	13	18	72.22%	3.23	5	27.78%	3.60
12	12	18	66.67%	3.42	6	33.33%	3.50
13	4	18	22.22%	3.25	14	77.78%	3.21
14	13	18	72.22%	3.62	5	27.78%	3.80
15	13	18	72.22%	4.00	5	27.78%	3.60

Table 9, continued

Level of Confidence of Correct vs. Incorrect Answers per Questionnaire Item for High School Wrestling Coaches

Question Number	# Correct	# Answered	% Correct	Mean "Correct" Level Of Confidence	# In-Correct	% In-Correct	Mean "Incorrect" Level Of Confidence
16	18	18	100.00%	3.94	0	0.00%	0.00
17	18	18	100.00%	3.44	0	0.00%	0.00
18	14	18	77.78%	3.71	4	22.22%	3.25
19	17	18	94.44%	4.00	1	5.56%	2.00
20	17	18	94.44%	3.59	1	5.56%	3.00
21	13	18	72.22%	3.62	5	27.78%	4.00
22	18	18	100.00%	4.17	0	0.00%	0.00
23	18	18	100.00%	4.39	0	0.00%	0.00
24	16	18	88.89%	3.94	2	11.11%	3.0
25	18	18	100.00%	4.61	0	0.00%	0.00
26	15	18	83.33%	4.20	3	16.67%	3.33
27	18	18	100.00%	4.67	0	0.00%	0.00
28	2	18	11.11%	3.50	16	88.89%	3.63
29	10	18	55.56%	4.00	8	44.44%	3.88
30	11	18	61.11%	3.73	7	38.89%	3.43
TOTAL	406	540	75.19%	3.95	134	24.81%	3.50

Table 10

Years of Wrestling Coaching Experience vs. Knowledge of Eating Disorders in High School Wrestling Coaches

Years of Total Wrestling Coaching Experience	# of Coaches in Sample	% of Sample	Mean Score of Knowledge of EDs	% Mean Score of Knowledge of EDs
1	1	5.56%	26/30	86.67%
2	1	5.56%	23/30	76.67%
3	3	16.67%	21.33/30	71.10%
5	1	5.56%	21/30	70.0%
6	1	5.56%	23/30	76.67%
10	2	11.11%	25.50/30	85.00%
11	1	5.56%	24/30	80.00%
12	2	11.11%	24/30	80.00%
13	1	5.56%	20/30	66.67%
18	1	5.56%	23/30	76.67%
20	3	16.67%	20.33/30	67.77%
27	1	5.56%	22/30	73.33%
Total	18	100.00%		

Table 11

Knowledge of Eating Disorders Results vs. Athletes Coached in High School Wrestling Coaches

Group of Athletes Coached	# of Participants	% of Sample	Mean Score	Standard Deviation
Males	3	16.67%	72.23%	6%
Females	1	5.56%	86.67%	0%
Both	14	77.78%	75.00%	10%
Total	18	100.00%		

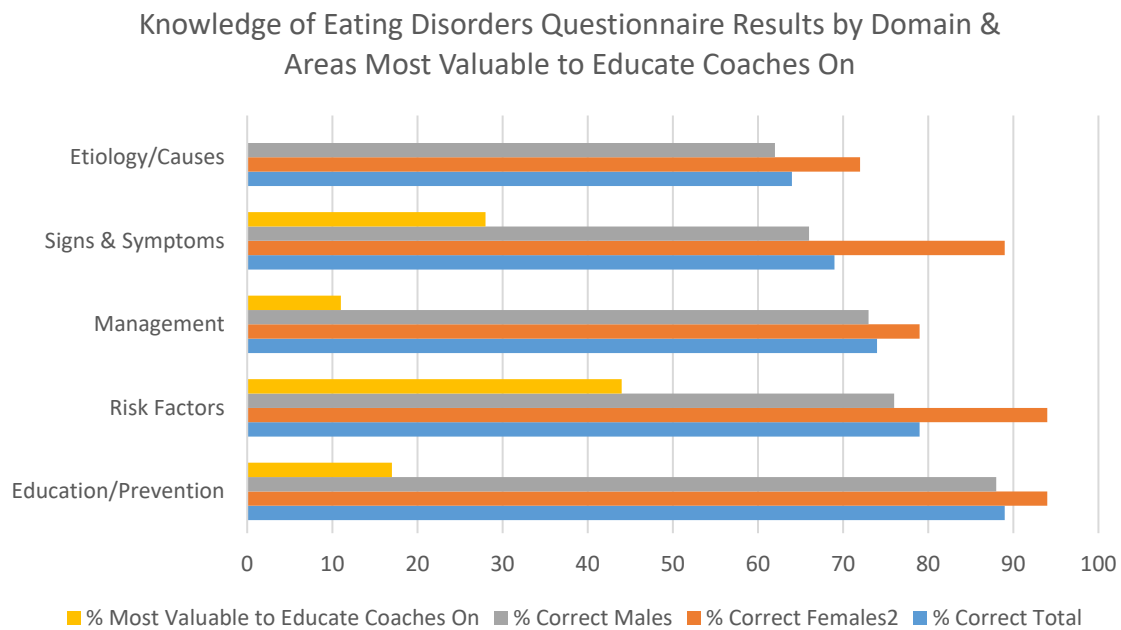


Figure 1: Knowledge of Eating Disorders Questionnaire Results by Domain & Recommended Area Most Valuable to Educate Coaches On

ATHLETE'S RESULTS

Demographic Information

This study included a total of 16 High School Wrestlers, 9 males and 7 females with a mean age of 15.81 years (see Table 12). Of the athletes who participated in the study, 25% were freshmen/9th grade, 37.50% were sophomores/10th grade, 6.25% were juniors/11th grade, 25.00% were seniors/12 grade, and 6.25% were considered “other”.

With regards to race/ethnicity demographics 50.00% of athletes identified as white and/or European American, 12.50% of athletes identified as Asian/Pacific Islander and/or Asian American, 18.75% athletes identified as Latino and/or Mexican, and 18.75% identified as multi-racial. The study participants wrestled at varying levels; 56.25% of participants competed at the varsity level, 31.25% of participants competed at the junior varsity level and 12.50% were reserve wrestlers. All of the high school wrestlers who participated in the study reported that they had a male coach.

Of the participants, 68.75% reported a “normal” Body Mass Index (BMI), 18.75% were classified as “overweight”, and 12.50% were considered “obese” (see Table 13).

Table 12

Demographic Information of High School Wrestlers

Participant Categories	Male	% of Sample	Female	% of Sample	Total	% of Sample
Total Sample of Wrestlers	9	56.25%	7	43.75%	16	100.00%
Mean Age in Years	15.56	-	16.14	-	15.81	-
Grade Level						
Freshman	3	18.75%	1	6.25%	4	25.00%
Sophomore	3	18.75%	3	18.75%	6	37.50%
Junior	1	6.25%	0	0.00%	1	6.25%
Senior	2	12.50%	2	12.50%	4	25.00%
Other	0	0.00%	1	6.25%	1	6.25%
Total	9	56.25%	7	43.75%	16	100%
Race/Ethnicity						
White and/or European American	4	25.00%	4	25.00%	8	50.00%
Black and/or African American	0	0.00%	0	0.00%	0	0.00%
Native American or Aleutian Islander/Eskimo	0	0.00%	0	0.00%	0	0.00%
Asian/Pacific Islander and/or Asian American	2	12.50%	0	0.00%	2	12.50%
Middle Eastern and/or Middle Eastern American	0	0.00%	0	0.00%	0	0.00%
Latino and/or Mexican	1	6.25%	2	12.50%	3	18.75%
Multi-racial	2	12.50%	1	6.25%	3	18.75%
Total	9	56.25%	7	43.75%	16	100.0%
Level of Competition						
Reserve	1	6.25%	1	6.25%	2	12.50%
Junior Varsity	2	12.50%	3	18.75%	5	31.25%
Varsity	6	37.50%	3	18.75%	9	56.25%
Total	9	56.25%	7	43.75%	16	100.0%

Table 13

High School Wrestling Participants BMI data by Category

BMI	MALES	%	FEMALES	%	TOTAL	%
<i>UNDERWEIGHT</i> <i>< 18.5</i>	0	0.00%	0	0.00%	0	0.00%
<i>NORMAL</i> <i>18.5 - 25</i>	6	37.50%	5	31.25%	11	68.75%
<i>OVERWEIGHT</i> <i>25 - 30</i>	2	12.50%	1	6.25%	3	18.75%
<i>OBESE</i> <i>>30</i>	1	6.25%	1	6.25%	2	12.50%
<i>TOTAL</i>	9	56.25%	7	43.75%	16	100%
<i>MEAN BMI</i>	23.80		24.07		23.92	
<i>BMI RANGE</i>	19.20 - 32.60		19.50 - 30.20		19.20 – 32.60	

Supplemental Questions

The study found that 94% of wrestlers feel High School wrestling coaches need more educational support for themselves and their athletes with regards to eating disorders. When asked if they had any personal experience dealing with disordered eating behaviors or eating disorders 57% of female athletes and 22% of male athletes responded affirmatively. The participants who said they had personal experience dealing with disordered eating behaviors or eating disorders had a mean score of 62% on the Knowledge of Eating Disorders Questionnaire. Whereas, the group who did not have any personal experience with disordered eating behaviors or eating disorders had a mean score of 54%.

The study revealed that none of the high school wrestlers had ever attended an educational program or training on disorder eating behaviors. Eighty-eight percent of athletes reported that their athletic department did not sponsor an educational program about disorder eating behaviors or eating disorders and the other 13% of athletes didn't know whether an educational program existed. A total of 81% of wrestlers claimed that their respective coaches had not held any type of lesson or workshop regarding safe and healthy weight loss practices or nutritional issues. When asked which area they believed would be most valuable for coaches to educate themselves on and subsequently educate their athletes, the following results were found, 19% identified signs & symptoms of eating disorders, 31% identified risk factors of eating disorders, and 50% said education about and prevention of eating disorders.

High School wrestlers were asked how confident they were in their abilities to recognize the signs and symptoms of an eating disorder. Ten percent of athletes reported that they were very confident, 31% of athletes reported they were somewhat confident, 30% of athletes said they were less confident, and 18% of athletes reported that they were not confident at all. When athletes were asked if they felt comfortable talking to their coach about disordered eating concerns or questions that they may have; 10% replied that they would be very comfortable, 31% said they would be somewhat comfortable, 30% said they would be less comfortable, and 18% said they would not be comfortable at all. Seventy-five percent of high school wrestlers said that they were somewhat confident in their coaches' ability to know how to prevent, detect and manage disordered eating behaviors in athletes; 6% were very confident and 19% were less confident. All of the high school wrestlers who participated in the study, believed that athletes should have an opportunity to take part in an annual educational workshop regarding safe and healthy nutritional practices.

Knowledge of Eating Disorders Questionnaire

The Knowledge of Eating Disorders Questionnaire measures the participant's knowledge in five different domains related to eating disorders. The student athletes had a mean score of 57.1%, scoring the lowest in the management and treatment of eating disorders domain (see Table 14). There appeared to be a difference in the knowledge levels between male and female high school wrestlers. Female wrestlers scored lower than male wrestlers across all domains, except in the knowledge of signs and symptoms

of eating disorders. Male wrestlers had a mean score of 59.6%, whereas, female wrestlers had a mean score of 53.8% (see Tables 15-16). Despite their low scores, the female wrestlers displayed a higher level of confidence across all domains (see Table 17).

As revealed in Figure 2, the high school wrestlers' mean percentage of knowledge of eating disorders fell short of their mean percentage of levels of confidence across all five domains of the Knowledge of Eating Disorders Questionnaire. The results of this study suggested that high school male wrestlers are slightly more knowledgeable with a mean score of 59.63% compared to the mean score of 53.81% for female wrestlers (see Table 18). The results also indicated that the higher the athlete's level of competition the higher an athlete's overall knowledge score is. Lastly, the study's results indicated that the higher the grade level of an athlete, the more they may know about eating disorders. The mean level of confidence for high school wrestlers overall correct answers was 4.00 and the mean level of confidence for incorrect answers was 3.37 (see Table 19).

Table 14

Results of High School Wrestlers' Knowledge of Eating Disorders by Domain

	MALE MEAN SCORE	FEMALE MEAN SCORE	OVERALL MEAN SCORE
ETIOLOGY	57.41%	45.24%	52.08%
SIGNS & SYMPTOMS	46.30%	61.90%	53.13%
MANAGEMENT/TREATMENT	46.30%	38.10%	42.71%
RISK FACTORS	68.52%	59.52%	64.58%
EDUCATION & PREVENTIONS	79.63%	64.29%	72.92%
TOTAL SCORE	59.63%	53.81%	57.08%

Table 15

Knowledge of Eating Disorders Results for Male Wrestlers

Scores Earned	Participants in Category	% of Male Participants
<i>41-50%</i>	3	33.33%
<i>51-60%</i>	1	11.11%
<i>61-70%</i>	4	44.44%
<i>71-80%</i>	1	11.11%
<i>Total</i>	9	100%
<i>Mean Score</i>	9	59.63%
<i>Lowest Score</i>	9	46.67%
<i>Median Score</i>	9	63.33%
<i>Highest Score</i>	9	76.67%

Standard Deviation for the sample was 10%.

Table 16

Knowledge of Eating Disorders Results for Female Wrestlers

Scores Earned	Participants in Category	% of Female Participants
<i>31-40%</i>	2	28.57%
<i>41-50%</i>	2	28.57%
<i>51-60%</i>	1	14.29%
<i>61-70%</i>	2	28.57%
<i>Total</i>	7	100%
<i>Mean Score</i>	7	53.81%
<i>Lowest Score</i>	7	40.00%
<i>Median Score</i>	7	53.33%
<i>Highest Score</i>	7	70.00%

Standard Deviation for the sample was 12%.

Table 17

Results of Confidence in Knowledge of Eating Disorders by Domain

Coaches				
	<i>Mean SCORE For Males</i>	<i>Mean Level of Confidence for Males</i>	<i>Mean SCORE for Females</i>	<i>Mean Level of Confidence for Females</i>
<i>Etiology</i>	62.22%	4.02	72.22%	3.08
<i>Signs & Symptoms</i>	65.56%	3.58	88.89%	4.00
<i>Management/Treatment</i>	73.33%	3.62	77.78%	4.14
<i>Risk Factors</i>	76.67%	3.96	94.44%	4.12
<i>Education & Preventions</i>	87.78%	4.15	94.44%	4.71
Total Score	73.11%	3.88	85.56%	4.05
Athletes				
	<i>Mean SCORE For Males</i>	<i>Mean Level of Confidence for Males</i>	<i>Mean SCORE for Females</i>	<i>Mean Level of Confidence for Females</i>
<i>Etiology</i>	57.41%	3.68	45.24%	3.89
<i>Signs & Symptoms</i>	46.30%	3.64	61.90%	4.00
<i>Management/Treatment</i>	46.30%	3.60	38.10%	3.94
<i>Risk Factors</i>	68.52%	3.65	59.52%	4.16
<i>Education & Preventions</i>	79.63%	3.86	64.29%	4.30
Total Score	59.63%	3.70	53.81%	4.08

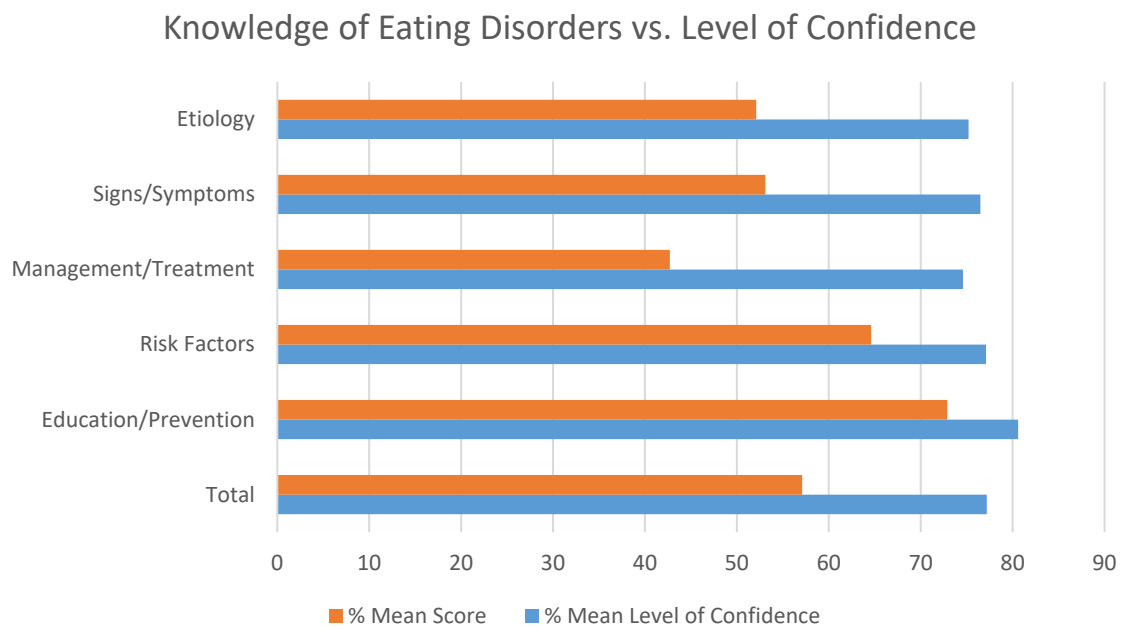


Figure 2: High School Wrestlers Percentage of Mean Knowledge of Eating Disorders with Percentage of Mean Levels of Confidence in Correctness of Answers Across Five Domains.

Table 18

High School Wrestlers' Knowledge of Eating Disorders Results by category

Category	# of Participants	% of Sample	Mean Score	Standard Deviation
Gender				
Males	9	56.25%	59.63%	10%
Females	7	43.75%	53.80%	12%
Total	16	100.00%	57.08%	11%
Level of Competition				
Reserve/Freshman	2	12.50%	48.33%	2%
Junior Varsity	5	31.25%	56.00%	10%
Varsity	9	56.25%	59.63%	12%
Total	16	100%		
Grade Level				
Freshmen (9 th)	4	25.00%	52.50%	10%
Sophomore (10 th)	6	37.50%	53.33%	8%
Junior (11 th)	1	6.25%	63.33%	0%
Senior (12 th)	4	25.00%	62.50%	16%
Other	1	6.25%	70.00%	0%
Total	16	100.00%		

Table 19

*Level of Confidence of Correct vs. Incorrect Answers per Questionnaire Item for
2019/2020 High School Wrestlers*

Question Number	# Correct	# Answered	% Correct	Mean "Correct" Level Of Confidence	# In-Correct	% In-Correct	Mean "Incorrect" Level Of Confidence
1	8	16	50.00%	3.88	8	50.00%	3.25
2	8	16	50.00%	4.38	8	50.00%	3.25
3	16	16	100.00%	3.88	0	0.00%	-
4	13	16	81.25%	3.62	3	18.75%	3.00
5	4	16	25.00%	3.75	12	75.00%	3.25
6	3	16	18.75%	3.33	13	81.25%	3.46
7	5	16	31.25%	4.00	11	68.75%	3.46
8	10	16	62.50%	3.50	6	37.50%	3.33
9	12	16	75.00%	4.00	4	25.00%	3.50
10	11	16	68.75%	3.82	5	31.25%	2.60
11	9	16	56.25%	3.67	7	43.75%	3.14
12	6	16	37.50%	3.83	10	62.50%	3.50
13	4	16	25.00%	3.50	12	75.00%	3.33
14	5	16	31.25%	4.00	11	68.75%	3.18
15	6	16	37.50%	4.00	10	62.50%	3.10

Table 19, continued

*Level of Confidence of Correct vs. Incorrect Answers per Questionnaire Item for
2019/2020 High School Wrestlers*

Question Number	# Correct	# Answered	% Correct	Mean "Correct" Level Of Confidence	# In-Correct	% In-Correct	Mean "Incorrect" Level Of Confidence
16	13	16	81.25%	3.62	3	18.75%	3.33
17	8	16	50.00%	3.88	8	50.00%	3.50
18	5	16	31.25%	3.40	11	68.75%	3.18
19	15	16	93.75%	3.80	1	6.25%	4.00
20	13	16	81.25%	3.62	3	18.75%	3.67
21	5	16	31.25%	4.00	11	68.75%	3.45
22	15	16	93.75%	3.80	1	6.25%	4.00
23	13	16	81.25%	4.00	3	18.75%	3.33
24	8	16	50.00%	3.75	8	50.00%	3.25
25	16	16	100.00%	4.13	0	0.00%	-
26	8	16	50.00%	4.63	8	50.00%	3.5
27	16	16	100.00%	4.13	0	0.00%	-
28	6	16	37.50%	3.83	10	62.50%	3.50
29	4	16	25.00%	4.00	12	75.00%	3.75
30	9	16	56.25%	3.56	7	43.75%	3.86
TOTAL	274	480	57.08%	4.00	206	42.92%	3.37

Self-Loathing Subscale (SLSS)

The Self-Loathing Subscale was used from the Exercise Orientation Questionnaire as a screening tool for possible eating disorders. The SLSS shows high internal consistency, concurrent validity, and convergent validity (Arugete et al., 2007). Since the SLSS is based on questions about exercise and is not easily identifiable as a screening tool for eating disorders, the scale may be particularly useful in identifying possible pathology among individuals who may try to suppress or deny obvious symptoms of eating disorders. A score of sixteen was used as the cut-off point since a high proportion of individuals scoring at or above sixteen on the Self-Loathing Subscale showed a clinically diagnosable eating disorder (Edman et al, 2005).

High School athletes competing in the sport of wrestling in the 2019/2020 season had a mean score of 12.94 on the Self-Loathing Subscale. Male wrestlers had a mean score of 11.33 and female wrestlers had a mean score of 15. (see Table 20). There were 4 wrestlers who met or exceeded a score of 16, suggesting they may be at an increased risk of having an eating disorder. The athletes, who had a Body Mass Index (BMI) in the “normal” category had a mean score of 15.91 on their knowledge of eating disorders, those in the “overweight” category had a mean score of 19.67, and those who had a BMI in the “obese” category had a mean score of 20. This indicates that there is a relationship between an athletes’ increased knowledge of eating disorders and their elevated BMI.

Table 20

Results of the Self-Loathing Subscale Questionnaire for High School Wrestlers

<i>Question</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>Total</i>	<i>Weighted Average</i>
<i>1. I disliked my body before I began to exercise.</i>	0.00% 0	12.50% 2	18.75% 3	25.00% 4	43.75% 7	16	4.00
<i>2. I am dissatisfied with my performance.</i>	18.75% 3	18.75% 3	37.50% 6	25.00% 4	0.00% 0	16	2.69
<i>3. I hate my body when it won't do what I want.</i>	12.50% 2	18.75% 3	37.50% 6	25.00% 4	6.25% 1	16	2.94
<i>4. If I don't reach my goals I feel like a failure.</i>	18.75% 3	12.50% 2	12.50% 2	31.25% 5	25.00% 4	16	3.31
						<i>Total Mean Score</i>	12.94
						<i>Mean Score for Males</i>	11.70
						<i>Mean Score for Females</i>	15.00
<i>Overall Scores</i>		<i># of participants</i>					
<i>7-9</i>		3					
<i>10-12</i>		5					
<i>13-15</i>		4					
<i>16-18</i>		4				<i>>16 at risk for an eating disorder</i>	
<i>Total</i>		16					

CHAPTER FIVE: CONCLUSIONS & INTERPRETATIONS

OVERVIEW OF THE STUDY

The purpose of this study was to determine the level of knowledge that high school wrestling coaches and athletes had about eating disorders. Both coaches' and athletes' knowledge of eating disorders were measured in five domains. The domains were etiology, identifying signs and symptoms, management and treatment, risk factors, and education and prevention of eating disorders. In addition, each group's level of confidence in answering each of the thirty knowledge-based questions was also measured. The Self-Loathing Subscale was given to assess High School wrestlers who may be at a higher risk of an eating disorder.

The study's research questions were:

1. What is the current knowledge level of California High School Wrestling Coaches regarding eating disorders?
2. What is the current knowledge level among high school athletes participating in the sport of wrestling in the 2019/2020 school year with regards to eating disorders?

Hypotheses were written in the null and stated as:

1. There will be no significant differences among the current knowledge level of Eating Disorders of California High School Wrestling Coaches.

2. There will be no significant differences among the current knowledge level of Eating Disorders of California High School Wrestlers.
3. There will be no significant difference in high school wrestlers' risk for eating disorders based on gender.

The research methodology centered on the implementation of anonymous, online surveys (one for each participant group) to ensure the collection of honest and accurate data. The surveys included the Knowledge of Eating Disorders Questionnaire, questions to ascertain demographic data and supplemental questions to ascertain participants' experience with eating disorders and prior educational opportunities. I also included the Self-Loathing Subscale Questionnaire for athletes. The surveys were constructed on Survey Monkey. After IRB approval, the research study flyer and links to the survey were emailed to California High School Wrestling Coaches. They were asked to distribute the information to parents. Eighteen coaches and sixteen athletes completed the Knowledge of Eating Disorders Questionnaire in its entirety.

IMPORTANT FINDINGS

Accept or Reject Hypotheses

I must reject my first null hypothesis as there were significant differences among the current knowledge levels of California High School Wrestling Coaches with regards to eating disorders. There were significant differences in knowledge levels found between male and female coaches. A two sample t-test of equal variances showed $t(16) = 2.26, p = .038$.

I must also reject my second hypothesis that there would be no significant differences among the current knowledge level of Eating Disorders of California High School Wrestlers. A two sample t-test of equal variances on gender showed $t(14) = 105$, $p > .05$. However, a Pearson Correlation did reveal there was a significant relationship between Knowledge and BMI at the 0.05 level (2-tailed). The test also revealed a relationship between knowledge of eating disorders and age at the 0.05 level (2-tailed).

Lastly, I must reject my third hypothesis, as there was a significant difference in high school wrestlers' risk for eating disorders based on gender. Data gathered from use of the Self-Loathing Subscale Questionnaire revealed male athletes had an average score of 11.7 and female athletes had an average of 15. A two-sample t-test assuming equal variances showed $t(14) = -2.52$, $p = 0.02$. This showed that females scored significantly higher on the SLSS and therefore have a higher risk of developing an eating disorder.

Summary of Findings

The study found that only 11% of high school coaches had any previous education on the topic of eating disorders. Only 16.7% of coaches were aware of any educational resources concerning eating disorders in their athletic departments. This is of great concern because of the high-risk population they are coaching. The mean percent correct on the Knowledge of Eating Disorders Questionnaire for coaches was 75.16% which leaves room for improvement. Female coaches were found to have more knowledge of eating disorders, 85.57% to male coaches at 73.10%. A Pearson Correlation test revealed

that there was significant difference in knowledge scores based on gender of coach at the 0.05 level (2-tailed).

High School students who participated in wrestling in the 2019/2020 season had a mean score of 57% on the Knowledge of Eating Disorders Questionnaire, scoring the lowest in the management and treatment of eating disorders. The scores between coaches and athletes were found to be significant by a two-tailed t-test revealing $t(32) = 5.9$ $p < .01$. Female wrestlers knew slightly less than male wrestlers about eating disorders in all domains in the Knowledge of Eating Disorders Questionnaire except the signs and symptoms of eating disorders. However, females displayed a higher level of confidence across all domains suggesting that female athletes may be over confident in their knowledge of eating disorders.

The study found that 94% of wrestlers reported High School wrestling coaches need more support in educating themselves and their athletes about eating disorders. When asked if they had any personal experience dealing with disordered eating behaviors and/or eating disorders, 57% of female athletes and 33% of male athletes responded that they had. These athletes showed a higher overall average mean score on the knowledge of eating disorders than those who had no experience at all with disordered eating behaviors/eating disorders. Those with personal experience with disordered eating behaviors scored a mean score of 63% on knowledge of eating disorders compared to those reporting no personal experience with disordered eating behaviors only scoring a mean of 52%.

As depicted in Figure 3, the mean score on the Knowledge of Eating Disorders Questionnaire varied for both coaches and athletes based on gender. Female athletes had the lowest overall average of 53.81%. Female coaches however, had the highest overall score with mean of 85.56%. Of the three female coaches, who completed the survey, all reported having worked with females or both males and females. This begs the question of why female coaches have such a greater knowledge of eating disorders than female athletes.

A previous study found that the longer the coach was in their current position, the less the coach knew about eating disorder education and prevention (Conway, 2003). In this current study, the female coaches had a higher overall mean score than the male coaches however the female coaches had a mean of 4.2 less years of experience coaching. The study participants identified two areas which would be most valuable for high school coaches to be educated, Risk Factors (38%) and Education and Prevention (32%) as depicted in Figure 4. However, the domain, Etiology/Causes of eating disorders was almost always designated as the lowest overall mean score for all subjects.

This study demonstrated the need for further education in eating disorders for both high school wrestling coaches and athletes. Study results suggested the need for more educational resources, which are easily accessible to coaches and athletes. The study also recognized a greater necessity to provide education to female wrestlers as they seemed overly confident in their knowledge base yet still needed up to date information.

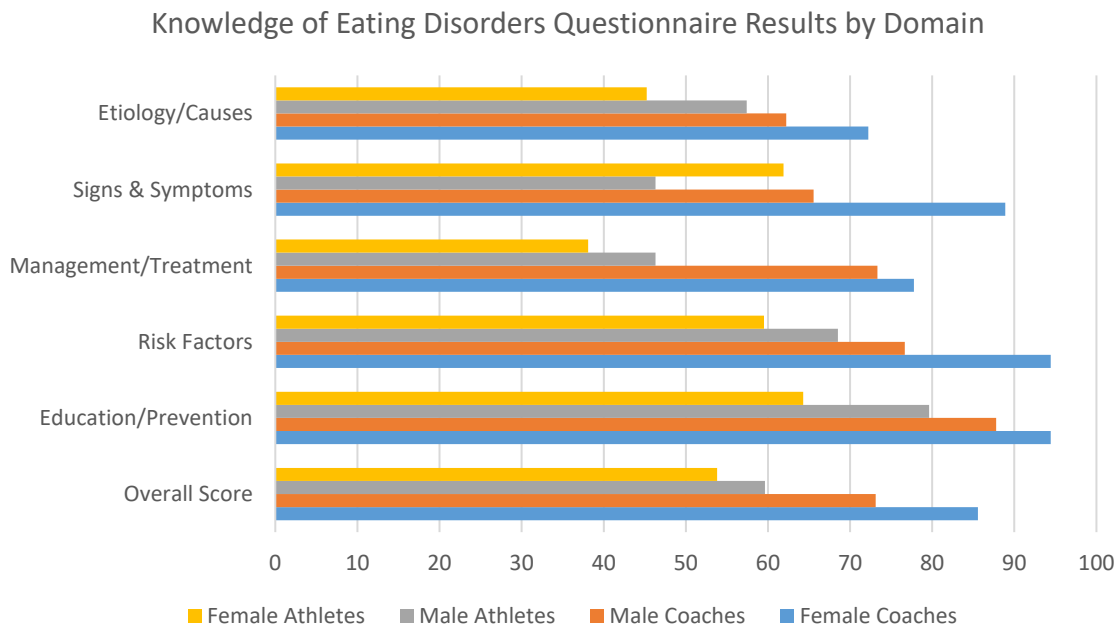


Figure 3: Knowledge of Eating Disorders Questionnaire Results for Coaches & Athletes by Domain Topic.

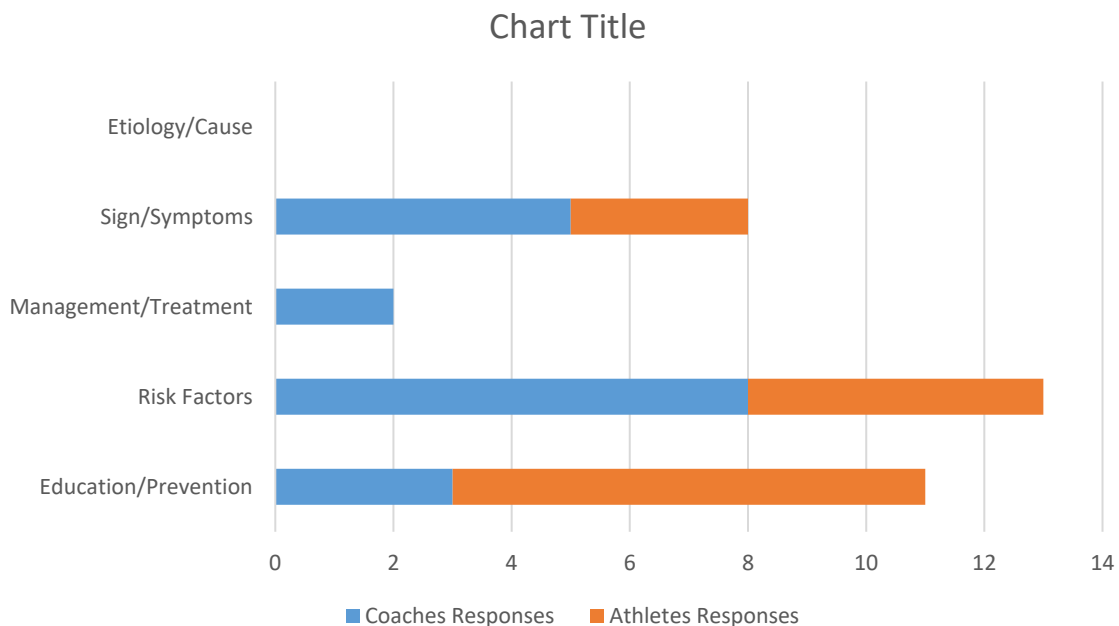


Figure 4: High School Wrestlers' & Coaches' Responses to Areas Most Valuable to Educate Coaches On

LIMITATIONS OF THE STUDY

The study limitations were as follows:

- Length of Data Collection- Increasing the length of data collection may have provided a larger sample size and more accurate results.
- Self-Loathing Subscale Questionnaire Past Practice- The Self-Loathing Subscale is not as researched as other eating disorder questionnaires, like the EAT 26, in predicting eating disorders. Using a different questionnaire may have increased validity but I felt the Self-Loathing Subscale Questionnaire was more suitable for the younger population I was studying.
- Advertising- Doing more hands-on advertising for the survey may have increased numbers of study participants.
- Research Design- This study mostly focused on quantitative data but it would have been interesting to gather more qualitative data. Perhaps a qualitative research study could have yielded answers to how this population can be best served.
- Limited Subjects- The study was open to coaches and athletes in California, however it could have been done nationally or globally.

IMPLICATIONS FOR RESEARCH

Previous studies on collegiate and high school coaches yielded a mean knowledge of eating disorders for coaches of 75% (Turk, 1995) and 73% (Conway, 2003). This

study yielded a mean knowledge of eating disorders of 75.19%. Conway (2003) found similar results, female coaches had a higher mean number correct than male coaches overall, and in all domains except risk factors. In an effort to keep everything anonymous I did not compare coaches to athletes from the same school. Further research which could compare athletes' knowledge to the knowledge of their actual coaches would be very interesting. It also would be worthwhile to gather information from coaches and students to see whether educational or interactional approaches with students vary based on gender.

In this study, female wrestling coaches had a higher mean number correct in all domains of the Knowledge of Eating Disorders Questionnaire. Female coaches had a mean score 13% greater than male coaches. This area of incongruity points to the need for a more focused research study. One explanation presented in this study may be that the mean age for female coaches was greater, implying that they may have had previous experience wrestling at a time when many rules regarding an athletes' body fat or hydration were not in effect. However, other studies suggest the older the coach the less they scored on the knowledge of eating disorders questionnaire. Further research should be done to see if older coaches need more support in the subject of eating disorders and if female coaches do in fact have more knowledge of eating disorders.

It would also be interesting to identify the level of education these coaches have. Since the education level for high school coaches is not regulated it would be interesting to know how many coaches have completed college coursework and to what level. It

would also be interesting to gather information about subject matter of college degrees. The coaches' knowledge level could be a factor in their overall knowledge of eating disorders.

This study could be expanded to include other states or narrowed to isolate certain counties to assess for similarities and differences. A qualitative research design could provide an enormous amount of knowledge to support quantitative information. Through interviews of high school coaches, athletes, or parents one could gain more insight as to the other factors, which might be contributing to female high school wrestlers' risk of eating disorders.

IMPLICATIONS FOR PRACTICE

The overall results from this study are consistent with previous research, implying that wrestling coaches have a similar amount of knowledge of eating disorders as coaches of other sports. The concern however, is that not all coaches deal with similar athletes. Consider, for instance, the sport of football and the prevalence of concussions. The education requirements for football coaches was changed due to the needs of athletes in a certain sport. Thus, why is there not a similar change in requirements for the sports whose athletes are at a higher risk for eating disorders?

The provision of a class or presentation for coaches, athletes, and parents about proper nutrition and the risks of eating disorders prior to participation in high risk sports doesn't seem like it would require much effort from the school districts. Districts must employ a qualified and educated professional, who is properly trained, to help prevent,

detect and manage eating disorders. As this study indicates, the knowledge that coaches have is not being conveyed to athletes. Female wrestlers, a high risk group on many levels are not getting the education or support they need. Although educating coaches and athletes about eating disorders is an important component, it is only a piece of the puzzle.

There is a lack of suitable statewide expectations for wrestling coaches, which should be addressed. One generalized course for all coaches doesn't adequately prepare all coaches for every sport. Surely, the education requirements could be changed at both the state and district levels. However, not all coaches are going to be comfortable addressing a disordered eating issue with their athletes. Is it reasonable to expect a male coach to confront a female high school athlete about her menstrual cycle and feel comfortable? The goal is to decrease the risk of eating disorders not create an uncomfortable situation for athletes and coaches and possibly parents. Trying to prevent disordered eating in athletes is complicated. There are many factors influencing athletes and coaches. Having trained professionals on hand who are both a male and female may help provide athletes with someone who may make them feel more comfortable. This could aid in the early detection of disordered eating behaviors and help to prevent.

The importance of attaining a good medical history is also a key component in detecting whether an athlete has an eating disorder or is at risk for developing an eating disorder. Simple screening questions could be integrated into routine assessments. Also, those who review these physical assessments must be aware of the issues, which should raise concern, such as finding a low or high body mass index, amenorrhea, bradycardia,

gastrointestinal disturbances, skin changes, and changes in dentition. Whoever is doing each athlete's annual exam should be aware of the signs and symptoms of eating disorders, especially if the athlete plans to take part in a sport known to be at a higher risk for participants to developing eating disorders.

SUMMARY

In conclusion, I found this study to be quite meaningful to conduct. The research raised many questions for me and hopefully for others. I hope to help educate and enlighten coaches, athletes and parents about healthy and safe nutrition and/or weight management. As a coach myself, I know the importance of continuously educating myself to provide the most accurate and up to date information to my athletes. Regardless of the state or district requirements, I do hope that this study helps to raise awareness of the possible risk of high school female wrestlers developing eating disorders. This issue goes far beyond just an assessment of the knowledge that coaches or athletes have of eating disorders. It will require a combination of efforts among various groups. However, if efforts to prevent eating disorders in high risk athletes are made, I am confident we will see a decline in the prevalence of eating disorders and a growth of strong, healthy, and independent female athletes.

APPENDIX A

EATING DISORDERS RESOURCES

National Eating Disorders Association Helpline: 1-800-931-2237

This helpline offers support Monday–Thursday from 9 a.m.–9 p.m. EST, and Friday from 9 a.m.–5 p.m. EST. You can expect to receive support, information, referrals, and guidance about treatment options for either you or your loved one. You can also contact this helpline through its online chat function.

Something Fishy: 1-866-418-1207

This eating disorders helpline offers treatment referrals nationwide. Its website also provides a wealth of information and resources about eating disorders and eating disorder treatment. Through its website, you can join an online chat group where you can speak to others in your shoes to gain support, advice, and hope.

Hopeline Network: 1-800-442-4673

This is a hotline dedicated to serving anyone in crisis. Sometimes, people with eating disorders might feel so full of shame or self-hatred that they contemplate hurting themselves. If this is true for you, this hotline offers nationwide assistance and support from volunteers specifically trained in crisis intervention. You can talk to someone day or night about anything that’s troubling you, even if it’s not related to an eating disorder. You can also call if you need referrals to eating disorder treatment centers.

National Association of Anorexia Nervosa and Associated Disorders: 1-630-577-1330

Currently serving people in the United States, the hotline operates Monday–Friday from 9 a.m.–5 p.m. CST, with plans for a 24/7 hotline coming soon. Trained hotline volunteers offer encouragement to those having problems around eating or bingeing, support for those who “need help getting through a meal,” and assistance to family members who have concerns that their loved one might have an eating disorder.

Overeaters Anonymous: 1-505-891-2664

This hotline is available to people worldwide who need a referral to an Overeaters Anonymous support meeting in their area. Contrary to popular belief, Overeaters Anonymous is not just for people who are concerned about eating too much; it is also intended for those who have anorexia, bulimia, food addiction, or any other type of eating disorder. If you are reluctant to attend an in-person meeting or are not geographically near one, its website offers you the option to participate in an online- or telephone-based support group.

The National Eating Disorders Association (NEDA)

NEDA is the largest nonprofit organization dedicated to supporting individuals and families affected by eating disorders. NEDA supports individuals and families affected by eating disorders, and serves as a catalyst for prevention, cures and access to quality care. <https://www.nationaleatingdisorders.org/>

Academy for Eating Disorders (AED)

AED helps physicians, psychiatrists, psychologists, nutritionists, academic researchers, students and experts through lived experience connect and collaborate with each other and keep abreast of recent developments in eating disorders research. <https://www.aedweb.org/home>

Help Guide.

While the symptoms of eating disorders revolve around eating, they are more about coping with feelings than they are about food. If you have an eating disorder, you may believe that being thin is the key to being happy, or that if you can control what you eat, you'll be able to control your life. But the truth is that happiness, confidence, and self-empowerment come from accepting yourself for who you truly are—and that's only possible with recovery. <https://www.helpguide.org/home-pages/eating-disorders.htm>

Sports, Cardiovascular and Wellness Nutritionist (SCAN)

Their mission is to optimize health and human performance through the integration of nutrition with sports, physical activity, cardiovascular health, and well-being. <https://www.scandpg.org/home>

APPENDIX B

CONSENT TO PARTICIPATE AS A RESEARCH SUBJECT FOR ATHLETES

**ASSESSING THE EXTENT THAT HIGH SCHOOL WRESTLING
COACHES & ATHLETES UNDERSTAND DISORDERED
EATING BEHAVIORS**

Your student is invited to participate in an IRB approved research study which will involve an online survey about disordered eating behaviors. My name is Melissa Fehn-Tuavao and I am a graduate student at California State University, Sacramento. I am currently completing my Masters of Science Degree in Kinesiology. As part of my Thesis I am conducting a research study to assess how much knowledge high school wrestling coaches and athletes have on disordered eating behaviors. I am doing this research in an effort to better help prevent, detect and manage disordered eating behaviors in younger athletes. You will NOT receive results directly related to your student's responses. Results will be aggregated and reported in my thesis.

Your child's participation in this project is voluntary. Even after you agree to participate, you or your student may decide to leave the study at any time without penalty or loss of benefits to which you may otherwise be entitled. This survey will require 30 minutes of your student's time. To withdraw from the study please contact researcher at melissatuavao@csus.edu. Any data collected may be utilized in study if withdraw procedures are not followed.

If you and your student agree to participate, they will be asked to complete a demographics questionnaire, answer a supplemental questionnaire, complete the Self-Loathing Subscale Questionnaire (comprised of 4 question), and lastly complete the 30 question Knowledge of Eating Disorders Questionnaire online.

There are minimal risks involved with this research study, but they are not anticipated to be greater than risks encountered in daily life. However, if for any reason you suspect you or your child of disordered eating behaviors please don't hesitate to use the reference list provided.

It is anticipated that study results will be shared with the public through presentations and/or publications. Any information that is obtained in connection with this study and that can be identified with your student will remain confidential and will be disclosed only with your permission, although I will not be collecting any direct identifiers like names. Data will be encrypted and password protected. Access will be limited to only the research team. Raw data will be destroyed after a period of 3 years after study completion. The data will be maintained in a safe, locked location and may be used for

future research studies or distributed to another investigator for future research studies without additional informed consent from you.

If you have any questions about this research study at any time, please contact me at melisstuavao@csus.edu , or my faculty advisor, Dr. Michael Wright, at wrightm@csus.edu. If you have any questions about your rights as a participant in a research project please call the Office of Research, Innovation, and Economic Development, California State University, Sacramento, (916) 278-5674, or email irb@csus.edu.

By allowing your student to complete this survey you indicate that you and your student have read and understand the information provided above, that you willingly agree to allow your student to participate, that you may withdraw your consent at any time and discontinue participation at any time without penalty or loss of benefits to which you and your student are otherwise entitled.

You can print out a copy of this form to keep.

APPENDIX C

CONSENT TO PARTICIPATE AS A RESEARCH SUBJECT FOR COACHES

**ASSESSING THE EXTENT THAT HIGH SCHOOL WRESTLING
COACHES & ATHLETES UNDERSTAND DISORDERED
EATING BEHAVIORS**

You are invited to participate in an IRB approved research study which will involve an online survey about disordered eating behaviors. My name is Melissa Fehn-Tuavao and I am a graduate student at California State University, Sacramento. I am currently completing my Masters of Science Degree in Kinesiology. As part of my Thesis I am conducting a research study to assess how much knowledge high school wrestling coaches and athletes have on disordered eating behaviors. I am doing this research in an effort to better help prevent, detect and manage disordered eating behaviors in younger athletes.

Your participation in this project is voluntary. Even after you agree to participate, you may decide to leave the study at any time without penalty or loss of benefits to which you may otherwise be entitled. To withdraw from the study please contact researcher at melissatuavao@csus.edu. Any data collected may be utilized in study if withdraw procedures are not followed.

If you decide to participate you will be asked to complete a demographics questionnaire, answer a supplemental questionnaire, and complete the 30 question Knowledge of Eating Disorders Questionnaire. Your participation in this study will last approximately 30 minutes.

There are minimal risks involved with this research study, but they are not anticipated to be greater than risks encountered in daily life. However, if for any reason you suspect you or your child of disordered eating behaviors please don't hesitate to use the reference list provided.

It is anticipated that study results will be shared with the public through presentations and/or publications. Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission, although I will not be collecting any direct identifiers like names. Data will be encrypted and password protected. Access will be limited to only the research team. Raw data will be destroyed after a period of 3 years after study completion. The data will be maintained in a safe, locked location and may be used for future research studies or distributed to another investigator for future research studies without additional informed consent from you.

If you have any questions about this research study at any time, please contact me at melisstuavao@csus.edu , or my faculty advisor, Dr. Michael Wright, at wrightm@csus.edu. If you have any questions about your rights as a participant in a research project please call the Office of Research, Innovation, and Economic Development, California State University, Sacramento, (916) 278-5674, or email irb@csus.edu.

By your participation in this survey you are giving your consent, indicating that you have read and understand the information provided above, that you willingly agree to participate, that you may withdraw your consent at any time and discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.

You can print out a copy of this form to keep.

APPENDIX D

DEMOGRAPHICS QUESTIONNAIRE FOR HIGH SCHOOL

WRESTLING ATHLETES

Please supply the following demographic data. If a question is not applicable, please indicate this by writing a N/A by the appropriate question. Your time and assistance are greatly appreciated.

1. What is your age?
2. What is your gender?
 - a. Male
 - b. Female
 - c. Other
3. What is your height?
4. What is your weight?
5. What Race or ethnicity do you consider yourself to be?
 - a. White and/or European American
 - b. Black and/or African American
 - c. Native American or Aleutian Islander/Eskimo
 - d. Asian/Pacific Islander and/or Asian American
 - e. Middle Eastern and/or Middle Eastern American
 - f. Mexican and/or Latino
 - g. Multi-racial
 - h. OtherIf Other or Multi-racial (Please Specify)
6. In which county do you attend school?
7. What is your current grade level?
 - a. Freshmen (9th grade)
 - b. Sophomore (10th grade)
 - c. Junior (11th grade)
 - d. Senior (12th grade)
 - e. Other:

8. What level do you compete at in wrestling?
 - a. Reserve
 - b. Junior Varsity
 - c. Varsity
 - d. Other:

9. What gender is your coach?
 - a. Male
 - b. Female
 - c. Other:

APPENDIX E

DEMOGRAPHICS QUESTIONNAIRE FOR HIGH SCHOOL

WRESTLING COACHES

Please supply the following demographic data. If a question is not applicable, please indicate this by writing a N/A by the appropriate question. Your time and assistance are greatly appreciated.

1. What is your age?
2. What is your gender?
 - a. Male
 - b. Female
 - c. Other
3. What race or ethnicity do you consider yourself to be?
 - a. White and/or European American
 - b. Black and/or African American
 - c. Native American or Aleutian Islander/Eskimo
 - d. Asian/Pacific Islander and/or Asian American
 - e. Middle Eastern and/or Middle Eastern American
 - f. Mexican and/or Latino
 - g. Multi-racial
 - h. OtherIf Other or Multi-racial (Please Specify)
4. What County do you coach in?
5. What is your current Coaching position?
 - a. Head Coach
 - b. Assistant Coach
 - c. Volunteer CoachOther (please specify)
6. What gender of Athletes have you had experience coaching?
 - a. Male
 - b. Female
 - c. BothOther Comments:

7. How many years have you been in your current coaching position?
8. How many total years have you been coaching wrestling?

APPENDIX F

SUPPLEMENTAL QUESTIONS FOR HIGH SCHOOL WRESTLING ATHLETES

Thank you so much for helping to provide honest and accurate responses for this research study. I can't tell you how much I appreciate your willingness to take the time out of your day to help. Here are a few supplemental questions for you to answer.

1. Have you ever attended an educational program or training on disorder eating behaviors?
 - a. Yes
 - b. NoIf yes, when did you last attend such a program and was attendance mandatory?
2. Does the athletic department sponsor an educational program about disorder eating behaviors or eating disorders?
 - a. Yes
 - b. No
 - c. I Don't KnowOther Comments:
3. Has your coach held any type of lesson/workshop regarding safe and healthy weight loss practices or nutritional issues?
 - a. Yes
 - b. No
 - c. I Don't KnowOther Comments:
4. Do you feel High School Wrestling Coaches need more support in educating themselves and their athletes about Eating Disorders?
 - a. Yes
 - b. No
 - c. Don't KnowOther Comments:
5. If so, which areas do you believe would be most valuable to concentrate on?
 - a. Etiology (the Causes)
 - b. Signs/Symptoms
 - c. Management/Treatment
 - d. Risk Factors
 - e. Education/PreventionHow do you feel this need should be met?

6. Have you had any personal experience dealing with disordered eating behaviors/eating disorders?

- a. Yes
- b. No
- c. Don't Know

Other Comments:

7. How confident are you that you could recognize the signs and symptoms of an eating disorder?

- a. Very confident
- b. Somewhat confident
- c. Less confident
- d. Not confident at all

Other Comments:

8. Do you feel comfortable talking to your coach about disordered eating concerns or questions that you might have?

- a. Very comfortable
- b. Somewhat comfortable
- c. Less Comfortable
- d. Not Comfortable at all

Other Comments:

9. How confident are you that your coach knows how to prevent, detect and manage disordered eating behaviors in athletes?

- a. Very confident
- b. Somewhat confident
- c. Less confident
- d. Not confident at all

Other Comments:

10. Do you believe athletes should have an opportunity to take part in an educational workshop regarding safe and healthy nutritional practices annually?

- a. Yes
- b. No
- c. Other (specify)

APPENDIX G

SUPPLEMENTAL QUESTIONS FOR HIGH SCHOOL WRESTLING COACHES

Thank you so much for helping to provide honest and accurate responses for this research study. I can't tell you how much I appreciate your willingness to take the time out of your day to help. Here are a few supplemental questions for you to answer.

1. Have you ever attended an educational program or training on disorder eating behaviors?
 - a. Yes
 - b. No

If yes, when did you last attend such a program and was attendance mandatory?

2. Does the athletic department sponsor an educational program about disorder eating behaviors or eating disorders?
 - a. Yes
 - b. No
 - c. I Don't Know

Other Comments:

3. Are you responsible for teaching your athletes safe and healthy weight loss practices?
 - a. Yes
 - b. No
 - c. I Don't Know

Other Comments:

4. In the past 2 years, has your team attended an educational program about eating disorders?
 - a. Yes
 - b. No
 - c. I Don't Know

If yes, was attendance mandatory?

5. What educational resources does the athletic department make available for coaches/teams regarding disorder eating behaviors and/or eating disorders?
 - a. None
 - b. Video
 - c. Literature
 - d. Sponsored Programs
 - e. Other (specify)

6. Do you feel High School Wrestling Coaches need more support in educating themselves and their athletes about Eating Disorders?
 - a. Yes
 - b. No
 - c. Don't Know

Other Comments:

7. If so, which areas do you believe would be most valuable to concentrate on?
 - a. Etiology (the Causes)
 - b. Signs/Symptoms
 - c. Management/Treatment
 - d. Risk Factors
 - e. Education/Prevention

How do you feel this need should be met?

8. Have you had any personal experience dealing with disordered eating behaviors/eating disorders in athletes?
 - a. Yes
 - b. No
 - c. Don't Know

Other Comments:

APPENDIX H

THE SELF-LOATHING SUBSCALE

The Self-Loathing Subscale (SLSS) includes 4 items derived from the Exercise Orientation Questionnaire (EOQ; Yates et al., 1999). It is scored on a five-point scale ranging from 5 = “strongly agree to 1= “Strongly disagree”.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neither Agree or Disagree
- 4 = Agree
- 5 = Strongly Agrees

Questions:

1. I disliked my body before I began to exercise.
1 2 3 4 5
2. I am dissatisfied with my performance.
1 2 3 4 5
3. I hate my body when I won't do what I want.
1 2 3 4 5
4. If I don't reach my goals I feel like a failure.
1 2 3 4 5

16 was used as the cut off since a high proportion of individuals scoring at or above 16 on the SLSS show a clinically diagnosable eating disorder. (Edman, Yates, & Aruguete, 2005).

APPENDIX I

KNOWLEDGE OF EATING DISORDERS QUESTIONNAIRE

For each question please indicate if the statement is true or false by choosing the appropriate response.

Below each true or false response please indicate your confidence in the correctness of your response by choosing the appropriate level of confidence. Please use the following scale to indicate your level of confidence:

- 1 = Not At All Confident
- 2 = Not Very Confident
- 3 = Somewhat Confident
- 4 = Confident
- 5 = Very Confident

EXAMPLE:

1. There are seven days in a week.

True/False 1 2 3 4 5

1. Psychological disturbances are the exclusive cause of eating disorders

True/False 1 2 3 4 5

2. Females not involved in athletics usually feel more social pressure to be thin than do female athletes.

True/False 1 2 3 4 5

3. Athletes with a negative self-image may resort to harmful eating practices in order to improve their performance.

True/False 1 2 3 4 5

4. Coaches can significantly contribute to the development of an eating disorder.

True/False 1 2 3 4 5

5. Individuals with anorexia nervosa usually do not concentrate on academics, however they often strive for excellence in athletics.

True/False 1 2 3 4 5

6. Simple dieting is the usual precipitant of an eating disorder.

True/False 1 2 3 4 5

7. Habitual, high intensity exercise in addition to daily team practice may be considered a behavior characteristic of an eating disorder.
True/False 1 2 3 4 5
8. Bulimia nervosa is often termed the “self-starvation” syndrome as individuals suffering from bulimia usually ingest less than 500 calories daily.
True/False 1 2 3 4 5
9. It is possible for an individual who is above average in weight to have an eating disorder.
True/False 1 2 3 4 5
10. The loss of menstruation should be considered a potential warning sign of an eating disorder in an athlete.
True/False 1 2 3 4 5
11. Hair loss and/or fine, soft body hair may be seen in those with an eating disorder.
True/False 1 2 3 4 5
12. An obvious decrement in performance will rapidly be seen in an athlete with an eating disorder.
True/False 1 2 3 4 5
13. Due to the psychological considerations involved, only the psychologist and physician should create the treatment plan for an athlete with an eating disorder.
True/False 1 2 3 4 5
14. The team physician or psychologist should always be the first to approach an athlete suspected of having an eating disorder.
True/False 1 2 3 4 5
15. Once approached about an eating disorder, the athlete will usually be relieved and agree to treatment.
True/False 1 2 3 4 5
16. Treatment of an eating disorder may take years before recovery is complete.
True/False 1 2 3 4 5
17. Athletes diagnosed with an eating disorder should never be allowed to participate in sports until recovery is complete.
True/False 1 2 3 4 5

18. The individual that initially approaches the athlete should concentrate on discussing the eating disorder symptoms identified.
True/False 1 2 3 4 5
19. Distance runners, swimmers, and body builders may have an increased risk for developing an eating disorder.
True/False 1 2 3 4 5
20. Weight monitoring by coaches may increase an athlete's risk for developing an eating disorder.
True/False 1 2 3 4 5
21. A proven, effective means to improve performance is to train at a higher weight then drop or cut weight prior to competition.
True/False 1 2 3 4 5
22. A joking comment regarding an individual's weight may actually trigger an eating disorder in a susceptible athlete.
True/False 1 2 3 4 5
23. Male athletes are not at risk for developing an eating disorder.
True/False 1 2 3 4 5
24. Body fat percentages of 10% or less for females is considered acceptable for athletes that participate in judged sports such as gymnastics, diving, or figure-skating.
True/False 1 2 3 4 5
25. Educating coaches about eating disorders is an important preventative strategy for minimizing the risk of such disorders.
True/False 1 2 3 4 5
26. If the athletic department does not offer education programs about eating disorders, then it is the coach's responsibility to educate him/herself on the topic.
True/False 1 2 3 4 5
27. Proper nutrition, body composition, weight maintenance are issues that should be included in educational programs for athletes.
True/False 1 2 3 4 5

28. The medical staff should be the only individual to conduct weigh-ins for athletes.
True/False 1 2 3 4 5
29. In order to improve individual performance, coaches should emphasize the importance of achieving an ideal body weight and body composition, in addition to proper training.
True/False 1 2 3 4 5
30. Dieting may be encouraged by coaches in cases where weight loss is needed in a short time period.
True/False 1 2 3 4 5

Answer Key:

- | | | |
|-------|-------|-------|
| 1. F | 11. T | 21. F |
| 2. F | 12. F | 22. T |
| 3. T | 13. F | 23. F |
| 4. T | 14. F | 24. F |
| 5. F | 15. F | 25. T |
| 6. T | 16. T | 26. T |
| 7. T | 17. F | 27. T |
| 8. F | 18. F | 28. T |
| 9. T | 19. T | 29. F |
| 10. T | 20. T | 30. F |

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