Honors Thesis Proposal

for

Eating Disorders in Gymnastics: Pathogenic Progression and its Impact on Diagnosis

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Introduction to Eating Disorders

Eating disorders (ED) are psychological illnesses as described by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) and the International Statistical Classification of Disease and Related Health Problems, 10th edition (ICD-10).1,2 Both documents lay out precise, limiting specifications for the clinical diagnosis of eating disorders, such as anorexia nervosa (AN), bulimia nervosa (BN), and eating disorders not otherwise specified (EDNOS).1,2 In addition to these readily definable eating disorders, subclinical cases of disturbed eating are becoming increasingly prevalent.3,4 The increasing commonness of disordered eating has made it easier to recognize in earlier, more acute stages allowing for quicker treatment intervention before symptoms destructively potentiate.3,4

It is estimated that one in every two females will experience some type of eating disturbance during life with symptoms chiefly arising in their adolescent years.5 Approximately 50-60% of these cases will last between one to two years, with signs and symptoms fluctuating throughout this time.5 Research has shown that between 5-10% of these initial cases will last through adolescence into adulthood with specific markers indicating this predisposition.5 In the general public, the prevalence is estimated to be .8% for AN, 2% for BN, and 2.3% for EDNOS.3,4,6 AN accounts for 13%, BN for 10% and EDNOS for 77.4% of all diagnosed eating disorders; it is theorized that 33% of persons with AN and only 6% with BN actually receive clinical treatment secondary to the secrecy of the disorder and the difficulty in diagnosis.6 Anywhere between 5-10% of AN and 1% of BN patients will die as a result of disorder, most commonly due to severe cardiac complications or suicide.3,4 Furthermore, the severe metabolic debts created by starvation have a widespread physiologic effect and the potential to damage every major organ system.3
The diagnosis of eating disorders is performed through the use of questionnaires or interviews carried out by health care professionals. The most common tests are the Eating Disorder Inventory, Body Parts Satisfaction Scale, Eating Attitude Test, Eating Disorder Examination Questionnaire and the Composite International Diagnostic Interview. While the reliability and validity of these tools have been assessed for quality assurance in the general population and are used extensively in research, their reliability and validity within the more specific athletic population has not been established. After a diagnosis has been reached, depending on the severity of the disorder, treatment options include in- or out-patient psychotherapy and the use of medication to treat possible co-morbid conditions.

**Definitions**

*Eating Disorder*- Any clinically diagnosable eating disturbance as defined by the DSM-IV or the ICD-10.  
*Disordered Eating*- Any sub-clinical psychosis involving the consumption, or lack thereof, of food. Symptoms include, but are not limited to, excessive exercise, frequent episodes of the limitation or overindulgence of food, excessive usage of laxatives or diet pills, regular episodes of self induced vomiting, and/or a severe fixation on body weight, appearance, or size.  
*Anorexia Nervosa (AN)* - AN is characterized as the refusal to maintain an acceptable body weight, a severe concern with gaining weight, a distorted vision of self appearance, and the absence of three consecutive menstrual cycles (amenorrhea).  
*Bulimia Nervosa (BN)* - BN is characterized as repeated episodes of uncontrolled binge eating followed by severe, pathological weight loss mechanisms that occur in conjunction with self evaluation dependent on weight and an extreme anxiety of weight gain. Incidences of binging
and purging must occur at least twice a week for three consecutive months to receive a diagnosis of BN.\textsuperscript{1,2}

\textit{Eating Disorder Not Otherwise Specified (EDNOS)} - A diagnosis EDNOS is given to patients who do not display all of the signs and symptoms of AN or BN, but fall relatively close to the ascribed disorder. It includes patients who’s symptoms are similar to AN but present with consistent with menstruation or fall within their weight/ height percentiles, and patients who emulate BN but who’s episodes occur less than twice a week for three months, who engage in chewing, but not swallowing their food, or who use neurotic weight loss methods without the consumption significant amounts of food.\textsuperscript{1}

\textit{Anorexia Athletica} - Anorexia athletica is the excessive use of exercise to facilitate weight loss. Though it is not a clinically diagnosable disorder, other symptoms such as fear of weight gain and obsessions concerning food consumption are cornerstones of anorexia athletica.\textsuperscript{7}

\textit{Elite Athlete} - For the purpose of this study an elite athlete is anyone who participates in a Division I college setting or who competes on a national or international level.

\textit{Body Dissatisfaction} - Body dissatisfaction is a complex concept that develops based on the dynamic relationship between several different characteristics and is a core component to the development of eating disorders.\textsuperscript{1,2,8,9} There are two different ways of examining the effect that body dissatisfaction has on the patient: how the patient experiences body dissatisfaction or what measures the patient evaluates their body against.\textsuperscript{8,9} The patient may experience perceptual or attitudinal body dissatisfaction: perceptual is how a person sees their body, and attitudinal is how they feel about that perception.\textsuperscript{8} Additionally, a patient may develop their body dissatisfaction based on how their body type differs from their ideal body shape or by evaluating and scrutinizing how much body fat they perceive themselves to have.\textsuperscript{9}
Drive for Thinness- A drive for thinness is one of the foundational features that initiate an eating disorder. The outward portrayal of thinness is often related to the characteristics of health, power, self-control, and beauty by the media. The possession of these traits is often accompanied by attention, appraisal, and the feeling of achievement. Failure to achieve thinness, becoming fat, is associated with weakness, laziness, sloppiness, and stupidity. A drive for thinness represents the desire to adhere to the normative measures of beauty in order to achieve happiness with one's self and successfully assimilate with population.10

Perfectionism- Perfectionism is a multifaceted personality trait comprised of two subsets: ego or task oriented perfectionism.11 In ego orientation, patients perceive their success based on its relativity to the success of others, and it has been correlated with an unfavorable psychological framework.11 People who display task orientation focuses on personal achievement and doing ones best; it has been related to a more positive mental make up.11 Other factors such as unrealistic goals, preoccupation with mistakes, and self esteem based on success are related to perfectionism.11,12

Eating Disorders in the General Population

Anorexia Nervosa

AN is described by the DSM-IV and ICD-10 as the refusal to maintain an acceptable body weight, a severe concern with gaining weight, a distorted vision of self appearance, and amenorrhea.1,2 The DSM-IV has determined that a weight loss of at least 15% below the expected growth percentile is the standard by which AN can be diagnosed.3 For adult females this would be a BMI below 17.5 Kg/m2 and for children this would be at or below the 10th percentile.2 The physiologic consequences of AN affect every major organ system. Signs and symptoms include bradycardia, hypotension, hypothermia, hypokalemia, hyponatremia,
acrocyanosis, impaired left ventricular function signified by a prolonged QT segment, and decreased estrogen levels that lead to osteopenia and osteoporosis. Since the disease predominantly occurs in adolescence, and since affected individuals are typically reluctant or unable to recognize any problems, the primary care provider is typically the first to notice the medical materialization of AN and provide psychiatric referral to confirm the diagnosis. While the physiologic manifestations of AN play a role in the recognition and diagnosis of the disorder, the psychological constrains of these patients play a significant role in the development of the disease. A combination of genetic, developmental, and environmental factors play a role in the progression of AN. A predisposition towards anxiety, fixation, and perfectionism comprise the genetic baseline on which AN develops. When these personal attributes are combined with cultural and media influences that emphasize self worth relative to a lean physique, this notion becomes a core focus of the patients life. A negative association emerges concerning food in regard to weight, and a pathogenic perception relating to the ingestion of food surfaces. The patient becomes anxious about food consumption and obsessive about restricting it in order to regain self worth. Maladaptive diet practices develop that result in weight loss. Due to the destructive relationship between their personality traits and the environmental stimuli, the patient relates their self worth to their body shape, and they believe the weight loss outcome justifies any drastic measures taken. The learned correlation between weight loss and heightened self worth, and the practices carried out to achieve that goal, develop into a pathogenic cycle that defines AN.

**Bulimia Nervosa**

BN is a cyclic disorder that is comprised of two phases: binging and purging. Binging is described as repeated episodes of compulsive, uncontrollable eating during which a significant
amount of food is consumed over a short amount of time. Following these episodes, the patient experiences a pathological purging process through the use of vomiting, medication, and/or excessive starvation. These episodes must occur at least twice a week for three consecutive months for the patient to be clinically diagnosable as having BN. As with AN patients, people suffering from BN evaluate themselves based on physical appearance, which is the prediciating psychological factor to the physical manifestation.\textsuperscript{1,2} Medical symptoms of BN are swelling of the parotid gland, cavities or dental erosion, constipation or diarrhea, menstrual irregularities, chest pain, sore throat, and facial edema. Additionally, paraphernalia used to aid in vomiting may cause cuts on the mouth or throat.\textsuperscript{3}

Episodes of BN are triggered by situations that generate significant emotional distress in patients already overwhelmed with emotional stressors such as body dissatisfaction, low self-esteem, perfectionism or interpersonal distrust. Circumstances when the patient is insulted, alienated, or confronted with their own faults result in a heightened state emotional distress. Emotions such as anxiety, guilt or depression overwhelm the patient causing them to look for some form of comfort. In this enhanced stage of sensitivity, eating and focusing on food will both distract the patient from the initial incident and diminish overstimulation resulting in a positive correlation between food and emotion. After a binging episode the connotation of this relationship is reversed, and the patient becomes ashamed of their overindulgent actions and proceeds to purge. The purging process, while providing fleeting emotional relief from the failure binge, eventually poses itself as another failure propagating the cycle of BN.\textsuperscript{1,4}
Eating Disorder Not Otherwise Specified

Since the diagnosis EDNOS includes patients with a combination of AN and BN symptoms, its pathogenesis is an amalgamation of the two, and the medical signs and symptoms are the same.¹

General Eating Disorder Pathogenesis

Whether it be AN, BN, or EDNOS, body dissatisfaction, drive for thinness, perfectionism, maturity fears, self-esteem, and social insecurity are central components to the development of appearance fixation in the general population.³,¹⁵,¹⁶ For eating disorders in general, body satisfaction is the central characteristic around which self-esteem is determined.¹,².⁸ Once body dissatisfaction reaches a critical point and self-esteem is lowered, the patient develops a drive for thinness that occurs with decreased impulse regulation and social insecurities that result in the development of disordered eating.¹⁷ Other mediating factors such as perfectionism, maturity fears, and interpersonal distrust culminate in the patient’s psychological decline and worsen the disorder.³,¹¹,¹²,¹⁵,¹⁶ Because of the numerous and powerful psychological deficits evident in patients with eating disorders, often times other psychological disorders arise. These include anxiety disorders such as social phobia, simple phobia, and childhood overanxious disorder, with symptoms worsening secondary to the severe starvation.⁸ This relationship helps illuminate the poor psychological profile of those suffering from eating disorders.

Eating Disorders in Athletics

For the past two decades, substantial research has gone into determining both the prevalence of disordered eating in athletics as well as any additional components that may trigger the disease. In addition to the basic eating disorder triggers, researchers have examined how different factors may influence the pathway of disordered eating for athletes. They have
determined that in addition to general pressures placed on all women to attain the ideal body, there are pressures related to athletic participation that play a role in the development of disordered eating in athletes. Such factors include the desire for a lean physique for the purposes of generating power (greater ratio of fat to lean mass); pressures from coaches and teammates to improve performance or conform to the normative practices of the sport; desire to combat the natural progression of puberty (smaller bodies rotate faster and breasts may be a distraction to judges); an initial interest in the sport based on dormant, preexisting disordered eating symptoms; and/or a heightened competitive drive for perfection.\textsuperscript{12,17-20} Additionally, an elite athlete’s career fully revolves around their body’s capacity to function at an exceptional standard of physical performance. Their athletic participation sometimes supports their housing, education, and monetary requirements. The fact that their well being, and oftentimes that of their family, depends on their bodies’ ability to perform further increases any fixations on food, appearance and performance.

Because of the increased demands placed on athletes, many researchers have hypothesized that they are increasingly pre-disposed to eating disorders; however, research has not wholeheartedly supported this theory.\textsuperscript{21,22} While athletes do have increased pressure related to their body, the athletic population as a whole does not have a significantly higher prevalence of diagnosable eating disorders.\textsuperscript{21,22} The demographics of the athletic population are very broad and encompassing, including sports ranging from ballet and gymnastics to football and sumo wrestling. The variety of athletes and the diversity of the demands placed upon them make the group as a whole very diverse. This, in conjunction with an overall healthy psychological composition, makes the population of athletes no more at risk for ED than the general population.\textsuperscript{9,15,20,21} When investigating the prevalence of eating disorders in athletics, it is
important to focus on several succinct factors to determine which athletes are more predisposed to eating disorders.\textsuperscript{22} Variables such as gender, ethnicity, and sport type are the most significant when identifying at-risk athletes.\textsuperscript{22} Caucasian, female athletes participating in judged sports are most vulnerable and have habitually shown to have an increased eating disorder rate.\textsuperscript{9, 18, 22-24}

**Eating Disorders in Gymnastics**

Female gymnasts are a group at high risk for eating disorders.\textsuperscript{22, 18, 24-25} Research shows a significant increase in eating disorder prevalence in elite gymnasts.\textsuperscript{9, 18, 23-26} A combination of sociocultural, teammate, coach, judge, and internal pressures cumulate to comprise a psychologically stressful environment for aspiring gymnasts. Several theories regarding the development and progression of the disorder have been created to examine the effect of these pressures.

One of the biggest confounding factors evident in the eating disorder research pertaining to gymnasts is the prevalence and significance of body dissatisfaction. In the general population, body dissatisfaction is the central trait around which disordered eating develops; however, in gymnasts, the prevalence of body dissatisfaction, and therefore, epidemiology of disordered eating, is questionable.\textsuperscript{1-2, 8} In addition to the two classification categories of body dissatisfaction, gymnasts may compare their body against the general population or another gymnast, adding another variable. Since the gymnastics population is considerably leaner than the general population, this comparison can become even more pathogenic. When examining the development of body dissatisfaction in gymnasts it is also important to determine whether it stems from internalized, personal, psychological distress or from outside sources pressuring the gymnast to evoke weight loss.\textsuperscript{8, 16, 20, 18}
Another important factor to examine when evaluating eating disorders in gymnasts is drive for thinness. In contrast to body dissatisfaction, most research concludes that a drive for thinness is typically higher in gymnastics; however, as with body dissatisfaction, the significance of the drive for thinness in the progression of eating disorders is under researched.\textsuperscript{8, 16, 18, 19, 26} In gymnasts, a drive for thinness can either be seen as a pathogenic weight loss mechanism as with anorexia athletica or as a healthy dedication to the sport.\textsuperscript{8, 16, 18, 19, 26} A successful athlete will typically be driven, goal oriented, and extremely hard working; so drive for thinness could simply be the result of attempting to achieve the desired power ratio as opposed to a psychological disorder.\textsuperscript{5} It is also important to look at the source of the drive for thinness and how the athlete reconciles this drive.\textsuperscript{18, 20} There will be different psychological impacts on the athlete depending on if the drive for thinness stems from an internal drive for achievement or if it is result of outside influences.\textsuperscript{9, 11, 18, 19, 20, 25}

The relationship between body dissatisfaction and drive for thinness, as well as its impact on the pathway of psychological distress placed on a gymnast is complex and can have lasting, detrimental effects. But these two factors alone are not the only indications that a gymnast will develop an eating disorder.\textsuperscript{8, 11, 12, 26} Another crucial mediating factor between body dissatisfaction, drive for thinness, and eating disorders is perfectionism.\textsuperscript{8, 11, 19, 26} As opposed to drive for thinness and body dissatisfaction, perfectionism in and of itself is typically not enough of a reason to develop an eating disorder, but may play a role in mediating the other aspects.\textsuperscript{8, 11, 19, 26}
Purpose Statement

Research pertaining to eating disorders in the gymnastics population is still in the beginning stages. Through the use of diagnostic tools such as the EDI-II, Body Parts Satisfaction Scale, and the Composite International Diagnostic Interview, gymnasts around the world have been evaluated not just for the prevalence of eating disorders, but also for the characteristics that provoke them to invoke pathogenic weight loss mechanisms. While these tests may detect some of the triggering issues behind eating disorders, if eating pathology in gymnasts differs from that of the general population, these current diagnostic tools may be inadequate for proper detection of eating disorders. In order to properly detect this pathogenesis different theories and models have been proposed, but few have been substantially supported by data and may be formed from inaccurate information due to deficient diagnostic tools. Additionally, there have been few studies specific to gymnastics; many often include other related sports such as diving and ballet.

The purpose of this study is to explore past research for the prevalence of key eating disorder characteristics specifically in gymnasts in order to determine the pathogenic progression of eating disorders and disordered eating for that population. The outcomes of this research will have a significant impact on the athletic training community by changing the way eating disorders are identified, diagnosed, and ultimately treated in gymnasts. By understanding the impact and relationship between body dissatisfaction, drive for thinness and perfectionism, more specific diagnostic interviews and questionnaires may be developed to identify the core pathogenic nature of these disorders and provide sooner and more accurate diagnoses. Additionally, since more sub-clinical symptoms have been seen in gymnasts, it is important to identify and treat the differentiating factors between eating disorders and disordered eating to
prevent pathologic progression. Lastly, if the fundamental pathway of eating disorders is different in gymnasts, then there must be a different course of treatment for diagnosed patients.

**Methods**

A review and analysis of literature pertaining to eating disorders in gymnasts will be achieved through using the search engines MEDLINE, Cochrane Database of Systematic Reviews, CINAHL Plus, SPORTDiscus, PsycArticles, PsycBook, and Psychiatry Online. The following terms eating disorder, disordered eating, anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified, body dissatisfaction, drive for thinness, or perfectionism will be used in combination with variations of the word gymnast. Studies included will be published in the last fifteen years; include only female elite athletes; be peer reviewed and written in the English language; and be experimental, a systematic review or a meta analysis. Though studies must include gymnasts in their participant construct, they may include athletes from other lean sports as well.
Reference List


