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Eating Disorders and Their Relevance to the Health Professional

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EATING DISORDERS AND THEIR RELEVANCE TO THE HEALTH
PROFESSIONAL

by

Tammy L. Surdez
Bachelor of Science in Physical Therapy
University of North Dakota, 1996



An Independent Study

Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine

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in partial fulfillment of the requirements

for the degree of

Master of Physical Therapy

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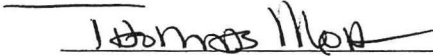
This Independent Study, submitted by Tammy L. Surdez in partial fulfillment of the requirements for the degree of Master of Physical Therapy from the University of North Dakota, has been read by the Faculty Preceptor, Advisor, and Chairperson of Physical Therapy under whom the work has been done and hereby approved.



(Faculty Preceptor)



(Graduate School Advisor)



(Chairperson, Physical Therapy)

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“Trust in the Lord with all your heart and lean not on your own understanding; in all your ways acknowledge him, and he will make your paths straight.” Proverbs 3: 5-6

ABSTRACT

Eating disorders such as anorexia nervosa and bulimia nervosa have become more prevalent among young people in our society. This rising pursuit of thinness can be attributed, in part, to our society's idealistic view of beauty and appeal, in addition to several other causal factors. Adolescents and young adults struggle to meet the unrealistic demands of society, often resorting to potentially fatal behaviors such as starvation, bingeing, and purging. These disorders often present with identifiable signs and symptoms. As health professionals, we must be prepared to identify these characteristic signs and symptoms in order to identify patients who are at risk for developing serious medical complications as a result of these extreme behaviors. As physical therapists, we must also be able to adjust exercise programs for these patients who have compromised medical states. Literature in the area of treatment adaptation is limited, which presents itself as a need for future research and reinforces the need for this study. Finally, we must be adequately informed to provide appropriate community resources to our patients.

The purpose of this study is to examine the clinical picture associated with eating disorders, causal factors involved in the onset of anorexia nervosa and bulimia nervosa, treatment of eating disorders and the associated prognosis, and the relevance of eating disorders to the health professional, with

an emphasis on adapting exercise programs for patients with eating disorders. The procedure to be used for this study is a review of the literature. The expected result of this study is to provide health care professionals with information about anorexia and bulimia, specifically regarding treatment adaptation.

CHAPTER I.

INTRODUCTION

Over the past two decades, dieting has become a word common to most households.¹ Children have grown up watching their mothers try new diets and count calories to maintain or improve their figures. As a result of this role modeling and other societal influences, some adolescents and young adults have become obsessed with thinness in an effort to avoid becoming “too fat.”¹ Today’s media reinforces this obsession by selling an illusion of beauty, “a body image that is slim, sexy and attractive.”¹ In an effort to attain perfection, young people conform to this image, paving the way for the onset of abnormal eating behaviors.

Societal and familial expectations and perceptions regarding body image and eating behavior exemplify the reality that eating is closely linked to emotional experiences.² Cultures have consistently applied values, beliefs, and status systems to food.² Some cultures believe being overweight demonstrates elevated social status, while other cultures value and respect the ability to refuse food. Because food is so closely tied to emotions and is influenced by family background, it is not difficult to see that eating behavior can easily be influenced based upon one’s family system and cultural expectations.²

In order to identify what types of behavior are disordered and differentiate among them, one must first understand what is considered normal eating behavior. Ellyn Satter³ defined "normal eating" as "being able to eat when you are hungry and continue eating until you are satisfied... Normal eating takes up some of your time and attention, but keeps its place as only one important area of your life." She concluded that "normal eating is flexible," differentiating it from the obsessive-compulsive eating behavior of patients with eating disorders.

When referring to eating disorders, the two that come to mind most readily and that are most prevalent in the literature are anorexia nervosa and bulimia nervosa. Anorexia nervosa is simply defined as "loss of appetite leading to emaciation."² It is characterized by "deliberate, self-induced starvation, and a body image disturbance."⁴ Bulimia is defined as "excessive eating followed by purging."² Bulimia is characterized by "recurrent, secretive episodes of binge eating which are followed by fasting, self-induced vomiting, or the misuse of laxatives and diuretics."⁴

The prevalence of eating disorders such as anorexia and bulimia appears to be on the rise.⁵ Whether this reflects actual growth or simply increased awareness is not clear. Statistics regarding prevalence varies among researchers, depending on the ages of the sample members. Anorexia nervosa affects about .5-1.0% of women ages 15-30.⁵ This number may increase to as high as 12% in middle class women ages 10-40.² Anorexia is predominantly a disease of developed countries with 97% of cases being white.² The incidence of

bulimia nervosa is thought to be 6 times higher than anorexia.² It is estimated that 4.5-19% of women between puberty and age 30 engage in some form of bulimic behavior.⁶⁻⁸ About 3-5% engage in binge/purge behaviors at least twice per week.^{4,6,7} The incidence of clinical normal weight bulimia is 1-2% among adolescents and college aged women; however, that figure does not include older women or cases of bulimia in which the patient is overweight or underweight.⁵ It is estimated that 20-30% of college aged women demonstrate bulimic behaviors.¹ Eating disorders predominantly occur in women, however it is estimated that 5-10% of anorexia cases and 10-15% of bulimia cases are male.^{1,5} Recent studies suggest a rise in bulimia among young men.^{4,6,7} The increasing prevalence of these disorders demonstrates the need for continued research in this area.

As health care professionals, we must be informed about these life threatening disorders in order to intervene and provide appropriate treatment. Physical therapists in particular may be expected to play a crucial role in adapting exercise programs for patients with eating disorders. Anorexia and bulimia can have severe medical implications, including electrolyte imbalances, amenorrhea leading to osteopenia, cardiac abnormalities, and metabolic abnormalities.^{4,9,10} Clinically, physical therapists must be able to recognize signs of menstrual dysfunction in eating disordered patients which can lead to osteopenia and ultimately osteoporosis.¹⁰ It is crucial that the therapist be able to provide the appropriate patient education and sources of referral. Physical therapists can also be instrumental in prescribing and

adapting exercise programs for inpatient treatment programs to facilitate weight gain that will be more desirable for the patients (i.e. increase in lean body mass rather than the typical weight gain in the form of fat).¹¹ Research in the area of treatment adaptation is limited, thereby reinforcing the need for this study and future research.

The purpose of this study is to examine:

- 1) the clinical picture associated with anorexia and bulimia,
- 2) the causal factors involved in the onset of anorexia and bulimia,
- 3) the treatment and associated prognosis of anorexia and bulimia, and
- 4) the relevance of eating disorders to the health professional (with an emphasis on adapting exercise programs for these patients).

The procedure to be used for this study is a review of the literature. The expected result of this study is to provide health care professionals (specifically physical therapists) with critical information about anorexia nervosa and bulimia nervosa, specifically regarding treatment adaptation.

CHAPTER II.

CLINICAL PICTURE

Eating disorders such as anorexia and bulimia are not only diseases of modern society.¹² Their existence has been evident for centuries. However, it has only been in the last few decades that these disorders have been given recognition as diagnosable psychological disorders. Since the acceptance of bulimia nervosa as an official diagnosis in the *Diagnostic and Statistical Manual--3rd edition* (DSM-III) in 1980, the criteria for diagnosis of bulimia and anorexia have been modified.¹

The most current set of diagnostic criteria are outlined in the fourth edition of the DSM.^{5,13,14} See Table 1 and 2 for DSM-IV diagnostic criteria (summarized) for anorexia nervosa and bulimia nervosa. (These tables were adapted from tables and information presented by Halmi et al^{5,13,14}.)

Table 1--Diagnostic Criteria for Anorexia Nervosa^{5,13,14}

- 1) Refusal to maintain body weight at a level expected for age and height (more specifically, a body weight 15% below that expected)
- 2) Intense fear of gaining weight, even when extremely underweight
- 3) Disturbance of body image in which there is "undue influence of body weight or shape on self-evaluation," or "denial of the seriousness of the current low body weight"
- 4) Absence of at least three menstrual cycles (amenorrhea). (Amenorrhea also includes women who only have their period with estrogen administration.)

Table 2--Diagnostic Criteria for Bulimia Nervosa^{5,13,14}

- 1) Repeated episodes of binge eating, characterized by eating an extreme amount of food in a "discrete period of time" (e.g., 2 hours) and a feeling of lack of control over eating.
- 2) Compulsive behavior in order to prevent weight gain following binges (e.g., vomiting, fasting, excessive exercise, and laxative/diuretic abuse).
- 3) The binge/purge behavior occurs at least twice per week for three months.
- 4) "Self-evaluation is unduly influenced by body shape and weight."
- 5) The binge/purge episodes do not occur "exclusively during episodes of anorexia nervosa."

The criteria in the DSM-IV differs slightly as compared to the DSM-III and the DSM-III-R (revised edition).^{1,5,6,12-16} The DSM-IV recognizes the "undue influence of body weight or shape on self-evaluation," thereby reflecting the psychological state of the patient with anorexia or bulimia.^{5,14} The DSM-IV also expands on the definition of binge-eating, clarifying and quantifying the disordered behavior. One critical difference between the DSM-III and the DSM-IV is the percentage of weight loss criteria. According to the DSM-III, to be diagnosed with anorexia, a patient must demonstrate a body weight 25% less than that expected for age, height, and build.¹⁵ The DSM-IV and the DSM-III-R specify that a patient must have a body weight that is 15% below that expected for age, height, build.^{5,6,12-14,16}

In addition to expanding on and revising the diagnostic criteria for anorexia and bulimia, the DSM-IV also outlines different subtypes of anorexia and bulimia, which was not previously done in the DSM-III and DSM-III-R.^{5,13,14} Anorexia nervosa is divided into two subtypes: “restricting type” and “binge-eating/purging type.”^{5,13,14} The restricting type of anorectic does not binge eat or purge during the episode of anorexia. The binge-eating/purging type of person with anorexia regularly engages in binge eating and/or purging behavior. Bulimia nervosa has also been divided into subtypes. These are the “purging” and “nonpurging” types.^{5,13,14} The purging type of person with bulimia regularly purges by way of vomiting or misuse of laxatives, diuretics, or enemas. The nonpurging type uses other “compensatory behaviors” following binges, such as fasting or excessive exercising, but does not regularly vomit or misuse medications.^{5,13,14} Since the incorporation of these subtypes into the diagnostic criteria, clinicians classify patients according to one of these subtypes.

As a member of the medical community, one must be aware of other signs and symptoms in addition to those presented in the diagnostic criteria. Recognizing signs and symptoms will aid in the detection of these life threatening illnesses. Signs and symptoms of anorexia nervosa are included in the following table:^{1,4-6,17,18}

Table 3--Signs and Symptoms of Anorexia^{1,4-6,17,18}

Unexplainable dramatic weight loss	Peculiar food handling	Muscle wasting
Excessive exercising	Hyperactivity (early stages of the disorder)	Hair loss
Sleep disturbances	Yellow skin (excess B-carotene in meager diet)	Lanugo (downy-like hair on face and trunk)
Amenorrhea		Constipation
Depressed Mood	Blue hands and feet	Ketotic breath (from eating insufficient carbohydrates)
Fatigue	Brittle nails	
Weakness	Intolerance to cold	Bloating
Avoidance of family meals	Diminished sex drive	Dry skin

In addition to these visible physical signs, there are also several behavioral and psychological symptoms.¹⁹ These include: preoccupation with appearance, distorted body image, poor academic performance, denial, and an intense fear of eating. Symptoms of bulimia are somewhat different than those of anorexia. There are three hallmark signs of bulimia, including: erosion of tooth enamel, "Russell's sign" (tooth marks or calluses on dorsum of hand due to repeated induced vomiting), and enlargement of the parotid glands.^{5,18} Other signs are listed in the following table:^{4,6,17,19}

Table 4--Signs and Symptoms of Bulimia^{4,6,17,19}

Bowel dysfunction	Redness of the eyes	Weight fluctuations
Diuretic/Laxative abuse	Frequent sore throat	Abdominal distension
Depressed mood	Frequent headaches	
Swollen gums	Blood in sputum	

Behavioral risk factors associated with bulimia also include perfectionism, low frustration threshold, and alcohol or drug abuse.⁸ As a clinician, it is important to identify these signs and risk factors in order to prevent unnecessary suffering.

All people have basic low level needs (such as nourishment) that must be met prior to fulfillment of higher level needs such as love, acceptance, and self-fulfillment (Maslow, 1970).¹⁷ Individuals with eating disorders have trouble realizing that they must meet these basic needs, such as nourishment.¹⁷ Instead they bypass these basic needs and attempt to satisfy their need for love, acceptance, and approval that they cannot give to themselves. They fail to realize that their distorted thinking impairs their ability to achieve these goals. Without proper nutrition, it is impossible to improve their mode of thinking, so these dreams of love, approval, and fulfillment are often left unfulfilled.

CHAPTER III.

CAUSAL FACTORS

Today's society differs significantly from the society of the past decades. We have an ever changing set of values and societal expectations. Among these expectations exists our society's view of beauty and attractiveness. The media influences our standards of beauty and repeatedly emphasizes our society's quest for thinness.^{15,17,20} These high expectations may be perceived by young people as additional stressors in their chaotic lives. They feel they must be thin and attractive to have fun with their peers and be popular.²¹ If they have not met these rigid guidelines, they begin to feel guilty and shameful and begin to seek a way to control these external influences.¹⁷ This need to somehow take control can be manifested as an eating disorder. In addition to sociocultural influences, there are several other proposed causal factors that influence the onset of eating disorders such as anorexia (a disorder in which loss of appetite and self-starvation lead to potentially fatal weight loss) and bulimia (a disorder characterized by binge overeating and self induced vomiting, compulsive exercising, and laxative abuse).²² These additional factors include psychological, familial characteristics, and biological factors. More specifically, there seems to be an interaction between these four major factors (sociocultural, psychological, familial, and biological) associated with the onset of eating disorders.

Sociocultural Factors

Eating disorders are seen primarily in Western, industrialized countries.⁵ They are rarely found in countries where food is relatively unavailable and extreme thinness is not viewed as a sign of attractiveness. The exception to this is among the upper class in third world countries, who have had more exposure to Western culture. Among many third world countries, higher value is often placed on women who exhibit fatness (above average expected weight for their height and age).²⁰ Fatness is a state sought after because it is a sign of wealth, security, and contentment. Once increased wealth has become more common, fatness is no longer sought after because anyone can achieve it. Thinness becomes equated with self discipline and society's ideal. This phenomenon demonstrates the increased prevalence of eating disorders among the upper class, which is seen in our society as well. Upper class women, as a group, tend to be more diet and figure conscious, which sends a message to members of their family that thinness is desired and fatness is despised.²⁰ This can influence the development of abnormal eating behaviors among their children.

Psychological Factors

In addition to societal factors, psychology of the individual and her/his family also seems to play a role in the onset of anorexia and bulimia. There appear to be four types of psychological illness that commonly coexist with anorexia and bulimia: mood disorders, anxiety disorders, personality disorders, and substance abuse.⁵ In fact, major depression or dysthymia (a milder form of depression) has been reported in 50-75% of anorectics.

Obsessive compulsive disorder exists among 10-13%. A majority of patients with bulimia meet criteria for at least one personality disorder.

Certain personality types appear to be evident among individuals with eating disorders. Anorectics tend to be late developers socially and psychosexually.²⁰ They often have difficulty making friends and are more introverted.^{9,20} According to Cousins⁹, they tend to be “overly sensitive, perfectionistic, stubborn, willful, and defiant.” They also tend to “define themselves according to others’ expectations.”⁹ The behavior that is manifested is related to an abnormal sense of autonomy, identity, and body image.¹⁷ Strict control of food intake acts as a method of easing feelings of anxiety and lack of control over life events. The resulting decrease in anxiety reinforces these learned maladaptive behaviors.⁹

Individuals with bulimia tend to be more outgoing and can maintain interpersonal relationships more consistently than individuals with anorexia.⁹ However, bulimics tend to be out of touch with their emotions.¹⁵ They have difficulty experiencing and expressing emotion. Feelings are often misinterpreted as a need to eat, which leads to the compulsive eating behaviors. Binging and purging are used to mask unwanted feelings by creating temporary “anesthesia.”¹⁵ Bulimics have also been seen as having more hostile relationships with their families.²² Common to both anorexia and bulimia is the presence of a profound loss or crisis that often precipitates onset or aggravation of these disorders.¹⁷ This fact, again, points to the role of psychological factors in the onset of eating disorders.

Familial Factors

A third possible causal factor that also ties into the psychological aspect of these disorders is the influence of the family system. Eating and meal time is the center of the family's interactions.²⁰ This is the time when expectations and feelings are expressed because it is the time when the family is together as a unit. Failure to meet these set expectations brings about feelings of shame and guilt that may become associated with eating behavior because of the link to family meal time.

There appear to be some common family traits associated with having a family member with anorexia.²² Typically, at least one other member deviates from the norm in weight or eating behavior.^{6,22} There is an unusually high prevalence of physical and mental illness among families who have a member who has anorexia.²² It is not uncommon to have a parent suffering from phobic avoidance and obsessive compulsive behaviors. These families tend to be unusually close, loyal, and interdependent. Minuchin²³ was the first theorist to examine characteristics of families who have a member with an eating disorder. He held the belief that family traits such as enmeshment, overprotection, rigidity, and poor conflict resolution can lead to anorexia.^{5,22,24} The parents reinforce the child's fear of growing up by being overprotective and fostering dependence.⁶ These family traits have not been tested in controlled studies, so their prevalence among families with a member who has anorexia or bulimia are not completely known.⁵

A history of sexual abuse is not uncommon.⁵ However, this increases the risk for many forms of psychiatric illness. Other experiences in the family that often precipitate the development of an eating disorder are the death of a parent, divorce, constant discord, removal of the mother from the home, as in working outside of the home, and substance abuse by a parent.^{6,9,20} A patient with bulimia is often said to have a controlling mother and a distant or passive father.²² Patients with bulimia also commonly have a family history of mood disorders and alcoholism.⁹ In families of persons with bulimia, there tends to be a high level of conflict and mental dissatisfaction, and the environment tends to be restrictive and controlling.²²

One must realize that eating disorders can occur in “healthy” families as well. It is difficult to determine, at times, if the family dysfunction led to the eating disorder, or if the eating disorder led to dysfunction.⁵ We do know that negative experiences in the home lead to insecurities, anxiety, and resulting stunted emotional development, which play a significant role in the development of eating disorders.

Biological Factors

A final factor that plays a role in the development of eating disorders is biology. Biological factors involved in the etiology of eating disorders include genetics, age, neurotransmitter systems, and neuroendocrine systems.^{5,17,21} The role that biology plays in causing eating disorders involves a combination of these factors and does not exist separately from the other causal factors previously mentioned.

According to family and twin studies, genetics seem to play a moderate role in the etiology of eating disorders.^{5,21} Eating disorders appear to travel in families. A girl has a 10-20 times greater risk of developing anorexia nervosa, for example, if she has a sibling who has the disease. It is important to note that environmental factors may also play a role in this concordance among siblings, so biology may not be the only factor involved.

Age also appears to play a role in the onset of eating disorders.⁵ The median age of onset for anorexia nervosa is 16-17 years of age. The median age of onset for bulimia nervosa is 18 years of age. Perhaps this is reflective of the hormonal influences associated with adolescence. It could also represent the vast number of changes that teenagers go through when completing the journey toward adulthood, as life changes are a strong predictor of onset of eating disorders.¹⁷ Clearly, these disorders tend to be diseases of adolescence.

Neurotransmitters appear to play a role in eating disorders.¹⁷ There is a neurobiological relationship between mood disorders and eating disorders, especially major depression. Major depression often occurs long before the onset of the disorder or following a long remission. These disorders have been associated with altered levels of serotonin and norepinephrine.¹⁷ Originally, serotonin was viewed as the primary culprit. Irwin¹⁷ noted that these disorders now appear to involve multiple relationships between neurotransmitters, specifically serotonin and norepinephrine. One example of this relationship is the beneficial effects antidepressant medication has had on eating disorders.¹⁷ There appears to be a similar pattern of depression and eating behavior among

cases of carbohydrate-craving bulimics as compared to cases of Seasonal Affective Disorder Syndrome (SADS). These disorders also have a similar response to serotonergic drugs. This relationship is supported by the fact that carbohydrates increase brain serotonin levels, thereby relieving the depression associated with a depletion of serotonin.

Laboratory testing of patients with eating disorders has detected evidence of neuroendocrine dysfunction that is common to patients suffering from depression as well as eating disorders.¹⁷ Dysregulation of circulating cortisol levels, which is found in eating disorders and depression, provides evidence that the hypothalamus-pituitary-adrenal system is affected by depression as well as eating disorders. Irwin¹⁷ noted that it is difficult to determine whether the endocrine dysfunction was a predisposing factor or a result of the eating disorder. There are several other neuroendocrine systems affected, but details regarding these systems are out of the scope of this study.

The causal factors presented simply begin to answer the question of how eating disorders are developed. As Irwin¹⁷ noted, isolating only one of the several causal factors as the sole etiological basis for anorexia or bulimia is a profound error. Limiting one's understanding of the causal factors of anorexia and bulimia would likely prevent effective intervention, which is critical in these cases.

CHAPTER IV.

TREATMENT AND PROGNOSIS

Treatment of eating disorders varies somewhat from patient to patient. The method of treatment chosen depends on a variety of factors including: 1) diagnosis (i.e. anorexia vs. bulimia), 2) severity of the illness, 3) age of the patient, and 4) the family situation of the patient.⁵ The consensus among most researchers is that bulimia nervosa is easier to treat as compared to anorexia nervosa, and patients with anorexia generally require multiple types of intervention. Researchers have also found that an eating disorder of more recent onset typically responds to treatment more readily and is more likely to be reversible.⁶ The treatment options available to individuals suffering from an eating disorder include outpatient and inpatient treatment. Within these major classifications of treatment are components of treatment that include: medical care, nutritional counseling, drug therapy, individual psychotherapy, family therapy, and group therapy.²⁵ These treatment methods as well as the prognosis for patients with eating disorders will be discussed in further detail.

Outpatient Treatment

Outpatient treatment consists of weekly visits with a physician, counselor, or dietitian, depending on the patient's needs, to evaluate physical status, participate in psychotherapy, and receive nutritional counseling.²⁴ A target weight is established for each patient, which is usually 90% of the

average weight for the patient's height and age. The clinician and the patient then formulate a weight and diet maintenance contract that outlines the expectations of the patient's recovery. A breach of contract often can indicate hospitalization of the patient due to noncompliance. During the course of treatment, the patient typically undergoes individual psychotherapy, group therapy, and family therapy in addition to receiving medical care and nutritional counseling.

Medical care consists of a supportive clinician who sees the patient regularly to monitor medical concerns and complications.²⁵ Medical care is important because serious medical complications as a result of the eating disorder may precipitate hospitalization.¹⁸ Nutritional counseling is carried out by a registered dietitian.²⁵ A patient with anorexia must consume an adequate number of calories in order to achieve weight gain. This increase in caloric intake must be gradual and realistic. The patient with bulimia must learn how to eat regularly and in a structured manner in order to break the binge/purge cycle associated with the disorder.

Psychotherapy should typically be offered to every patient, but it should be symptom oriented.²⁵ Individual psychotherapy focuses on relieving the symptoms associated with the disorder; facing underlying problems that aren't related to food (insight oriented therapy); alleviating feelings of guilt, anxiety, and depression; developing a realistic body image; and gaining confidence in controlling life events.^{26,27} Cognitive-behavioral therapy is an approach that is

extremely effective for patients with bulimia.²⁷ This approach focuses on encouraging normal eating habits and changing negative attitudes toward eating.²⁶ Clinicians educate patients about regular, balanced meals, encourage patients to keep diaries of their eating habits, teach self-control techniques, and teach patients how to identify emotions and situations that trigger abnormal eating patterns.²⁷ Many clinicians will also implement a reward system to provide the patient with positive feedback for progress. Clinicians may also utilize exposure and response prevention.²⁷ This approach is used to treat the obsessive-compulsive behaviors of patients with bulimia. The patient eats until she is nauseated, focuses on the discomfort she feels due to the binge, writes down her thoughts and feelings regarding her discomfort, and then is placed in a situation where she must tolerate the resultant anxiety in a manner other than purging.

Group therapy is also important for people with eating disorders.²⁴ Group therapy reduces the shame and secrecy associated with the illness, it fosters communication among group members and with others outside of the group, and it decreases the isolation that typically accompanies eating disorders. This type of therapy is specifically appropriate for college age and young adult women.⁵

Family therapy is utilized to facilitate understanding of the eating disorder.^{5,26} Family members come to understand why losing weight is so important to the patient. Family therapy teaches families appropriate coping

strategies and effective communication.²⁴ The goal of family therapy is to create a supportive home environment for the recovering patient.^{5,26} Family therapy is most typically utilized when the patient is living at home (i.e. a teenager living with her parents).⁵ Family therapy can be helpful in the treatment of anorexia and is almost always helpful in the treatment of bulimia.⁶ Families are typically told not to discuss food and weight at home, but rather to facilitate communication about other issues.

Outpatient therapy may suffice in treating many patients with eating disorders. A patient who demonstrates only occasional bingeing and purging may benefit simply from nutritional counseling and group therapy.⁶ Group therapy combined with individual therapy is superior in treating patients with bulimia.²⁷ Someone who has mild anorexia with recent onset may simply require realistic short-term goals for eating and weight gain with weekly monitoring of her condition. However, patients with anorexia are typically treated best by inpatient hospitalization.⁵

Inpatient Treatment

Inpatient hospitalization is necessary when the patient with an eating disorder is unable to function on a daily basis due to the symptoms of the disorder.¹⁸ Other reasons for hospitalization include: 1) medical complication, 2) resistance to other treatments, 3) very low body weight (loss of 25% of total body weight), 4) rapidly decreasing weight (greater than 25-30% in less than 3 months), 5) symptoms of inadequate brain perfusion, or 6) suicidal ideation or

severe depression.^{5,25} There are basically four stages of an inpatient program for patients with eating disorders.²⁸ The stages are as follows:

Stage 1: Nutritional Rehabilitation Stage

Stage 2: Intensive Psychotherapy Stage

Stage 3: Maintenance Stage

Stage 4: Follow-up Program

The goal of stage one is to restore normal body weight and eating patterns so the patient can progress to working on issues that are not related to food.²⁸

Stage two begins when clients are nutritionally stable.²⁸ Issues of fear of losing control, needing to be perfect, and difficulty expressing feelings are addressed in this stage. Family therapy is often indicated and may begin in this stage. Group therapy allows clients to share feelings and experiences.

Assertiveness training in this stage offers the patient strategies for dealing with conflict. Recreational therapy is utilized for patients who used exercise excessively. This form of therapy assists patients in moderating activity so that it becomes a way of enjoying life, rather than a means to punish oneself.

Stage three is characterized by a decrease in assistance from clinicians.²⁸ Patients begin to take control over their eating. For example, they may begin by planning menus. They then progress to shopping for groceries and preparing their meals with staff support.

Stage four may last several years.²⁸ This follow-up program often includes individual, group, and family therapy, as well as nutritional

counseling. This stage carries on when the patient has been discharged from the inpatient program.

During early stages of treatment for bulimia, patients may not be allowed to enter the kitchen or cafeteria alone or have food on the unit when it is not meal time.²⁸ These efforts are invoked in order to interrupt the binge-purge cycle of bulimia. Inpatient treatment of bulimia typically takes at least six weeks, while treatment for an emaciated patient with anorexia may take at least 3 to 4 months.²⁵ Patients with anorexia are best treated by long initial hospitalization in order to return the patient to a normal weight and provide resocialization and psychotherapy to prepare her for the pressures of the outside world.⁵

Typical inpatient protocol requires that the patient gains 1 to 2 pounds per week until goal weight is reached.^{21,24} Once the patient's weight is stable, psychotherapy begins, as stated earlier. Patients are supervised during meals and one hour after meals.²⁴ Feeding is started slowly with small frequent meals. If the patient refuses to eat on her own, a nasogastric tube may be put in to provide nutrition. This is seen as a form of punishment.

Drug Therapy

Drug therapy in the treatment of eating disorders has focused on stimulating the patient's appetite to encourage weight gain and eliminating depression.²¹ Drug therapy has been found to be most effective when used in combination with other forms of therapy. Research has shown that depression

is a common feature in patients with anorexia and bulimia and up to 50% of patients with eating disorders have received treatment in the form of psychotherapy on previous occasions.²⁵ Antidepressant medication is utilized in the treatment of patients with eating disorders to promote feelings of well-being in order to facilitate positive changes in the patients mental processing.¹⁷

Imipramine and desipramine are antidepressants that are used most widely in the treatment of anorexia and bulimia.¹⁷ The one major problem with these drugs is that there is associated weight gain, so patients are often noncompliant.

Bulimia

Tricyclic antidepressants have established benefits in the treatment of bulimia.⁶ They are typically used as an adjunct to cognitive-behavioral therapy.⁵ Monoamine oxidase inhibitors are effective in treating bulimia but are used less frequently.⁶ Fluoxetine (Prozac), sertraline, and paroxetine may be the recent drugs of choice for the treatment of bulimia.¹⁷ Fluoxetine is a serotonin reuptake inhibitor and has been found to have an antiobsessional effect, which is very important for treatment of bulimia in order to eliminate the obsessive-compulsive component.

Anorexia

For the treatment of anorexia nervosa, antidepressants are used mainly to help recovering anorectics maintain their weight gain.⁵ Many patients with anorexia benefit from short-acting antianxiety medication to conquer their fear

of eating.⁶ Amitriptyline and cyproheptadine have been used as appetite stimulators in the treatment of anorexia.²¹ Cyproheptadine, a histamine antagonist, has been found to decrease a patient's preoccupation with food in addition to stimulating the appetite. A benefit of this type of drug is its lack of serious side effects. This is in contrast to major tranquilizers, which were used in the 1980's. Their effectiveness was not well documented and they posed serious side effects, such as Parkinsonian-like symptoms and tardive dyskinesia.

Neurotransmitter Changes

The major neurotransmitters involved in the disease process of anorexia and bulimia are norepinephrine, serotonin, and dopamine.¹⁴ Drugs have an effect on the central nervous system to alter the levels of these chemicals, and ultimately influence the disease process.

Depression is very common in patients with eating disorders, as stated earlier. With depression, there is a characteristic depletion of norepinephrine in the central nervous system.¹⁴ Cerebral spinal fluid (CSF) levels of norepinephrine were also found to be low in patients with bulimia and weight restored patients with anorexia (decreased norepinephrine may be a trait in anorexia nervosa). Norepinephrine acts to stimulate one's appetite, with a preference for carbohydrates. Tricyclic antidepressants activate norepinephrine to regulate appetite and reduce depression in patients with bulimia, with a resultant decrease in bulimic binges.

Serotonin acts in the central nervous system to increase satiation and decrease food intake.¹⁴ It also modulates impulsive and obsessive-compulsive behavior. Fluoxetine, a serotonin agonist, decreases bulimic binges. Cyproheptadine, a serotonin antagonist, increases weight gain in patients with restricting anorexia.

Dopamine also has an influence on eating behavior.¹⁴ Phenothiazines, dopamine antagonists, increase eating. These drugs are major tranquilizers, so they may pose serious side effects. Patients who binge frequently have low CSF- homovanillic acid (CSF-HVA) levels compared with patients who binge less frequently.¹⁴ This demonstrates a dysfunction in the dopamine system.

Corticotropin releasing factor (CRF) has been found to inhibit feeding in rats.¹⁴ Continuous infusion produces weight loss. Patients who have anorexia and are emaciated have increased CRF levels, which may contribute to the maintenance of abnormal eating habits for prolonged periods, thereby leading to further weight loss.

Prognosis

The mortality rate for bulimia is less than that for anorexia.²¹ Death from bulimia can occur from gastric rupture or cardiac complications. One author cited the mortality rate for bulimia to be 3.1%.¹⁸ The mortality rate for anorexia is 9-12%.^{4,6,7} Other sources said it may range from 3.3%¹⁸ to 13%.² Cardiac arrest is the most common cause of death for anorexia.¹¹ One-third of the deaths among patients with anorexia are from suicide.^{4,6,7} Long term

studies have found morality at 10 years to be 10% and at 20 years to be 20% (50% from suicide; 50% from starvation).

Treatment of anorexia has modest success.²¹ Approximately 75% have improvements in body weight, but they suffer from other problems. Thirteen to fifty percent continue to have amenorrhea, 2/3 continue to have distorted views of weight and body shape, and 50% continue to have family problems. The longer the duration of the illness and the more severe the weight loss, the worse the outcome. Late age of onset and increased number of hospitalizations also contribute to a poor outcome. One-third to one-half develop bulimic behaviors, which provides a worse prognosis.²¹ Two-thirds relapse in six months, and some struggle with the illness for ten years or more. The best outcomes are for those who have received treatment prior to losing 15% of normal body weight. Patients with normal-weight bulimia have a better prognosis than those with anorexia.²¹ Approximately 60-80% of patients with bulimia can be in remission after three months of treatment if there is a good cognitive-behavioral therapy program. Of these, 20-30% will relapse in six months. Although there is no magic formula for determining which treatment will be effective, the treatment must be adapted to each individual patient in order to encourage success.

CHAPTER V.

ROLE OF THE HEALTH PROFESSIONAL

Medical Complications

Anorexia and bulimia can lead to serious medical complications that can be life threatening.²¹ Prolonged starvation leads to catabolism of brain tissue, causing serious mental dysfunction and possibly coma. Other detrimental effects include impaired resistance to infection, circulatory failure, electrolyte imbalance, and hypothermia, all of which can lead to death. Medical emergencies related to bulimia include severe hypokalemia (extreme potassium depletion) and Mallory-Weiss Syndrome (bleeding of upper gastrointestinal tract due to a tear in the esophagus).²⁵ Hypokalemia can lead to serious heart problems and kidney failure.⁹ Metabolic acidosis and ketosis (results from incomplete metabolism of fatty acids, generally from inadequate carbohydrate consumption) can cause coma or death in the patient with severe anorexia.¹ Other medical complications of anorexia and bulimia are listed in the following tables. These tables are a compilation of several different sources.^{1,2,4,5,8,9,18,21,29}

Table 5--Medical Complications of Anorexia^{1,2,4,5,8,9,18,21,29}**Cardiovascular:**

- * Bradycardia (< 60 bpm)
- * Cardiac arrhythmias (may cause sudden death)
- * Cardiac muscle atrophy
- * Hypotension (systolic < 90 mmHg)
- * ECG changes
- * Mitral valve prolapse
- * Systolic murmur
- * Decreased heart rate
- * Acrocyanosis (blue fingers and toes)
- * Hypothermia
- * Impaired oxygen utilization

Endocrine:

- * Amenorrhea with anovulation
- * Estrogen deficiency (women)
- * Hypogonadism (men)
- * Elevated cortisol
- * Reduced metabolic rate (hypothyroidism)
- * Cold intolerance

Gastrointestinal:

- * Delayed gastric emptying
- * Reduced intestinal motility
- * Constipation

Hematologic:

- * Leukopenia (increased risk for infection)
- * Bone marrow depression
- * Hypocellularity
- * Anemia

Electrolytes:

- * Hypochloridemia
- * Hypokalemia
- * Dehydration
- * Phosphorus deficiency

Metabolic:

- * Low blood glucose
- * Low insulin levels

Skeletal:

- * Osteoporosis
- * Increased fracture risk

Table 6--Medical Complications of Bulimia^{1,2,4,5,8,9,18,21,29}**Cardiovascular:**

- * Heart failure
- * Mitral valve prolapse
- * Cardiomyopathy (abuse of ipecac)
- * Peripheral edema
- * Cardiac arrhythmias

Endocrine:

- * Irregular menses
- * High cortisol levels
- * Low levels of estrogen
- * Low levels of progesterone
- * Hair loss

Gastrointestinal:

- * Constipation
- * Delayed gastric emptying
- * GI bleeding
- * Peptic ulcers
- * Malabsorption
- * Gastroesophageal reflux
- * Esophageal tearing (Mallory-Weiss)
- * Pancreatitis
- * Hiatal hernia
- * Rectal bleeding
- * Abdominal cramps

*** Esophagitis****Hematologic:**

- * Anemia
- * Subconjunctival hematoma

Electrolytes:

- * Hypokalemia
- * Hypovolemia
- * Hypochloridemia
- * Calcium depletion
- * Magnesium depletion
- * Dehydration

Metabolic:

- * Low serum glucose
- * Decreased insulin secretion
and clearance

Skeletal:

- * Muscle wasting/fatigue

Visceral:

- * Renal failure
- * Liver dysfunction

Exercise Adaptation

At the present time, physical therapy is not always specifically included in the treatment program for patients with anorexia and bulimia. However, there are some medical complications previously mentioned that may be addressed by physical therapists.

Decreased Bone Mass Density/Osteoporosis

There is a decline in ovarian function associated with eating disorders.³⁰ Resulting lower estrogen levels affect strength and density of bones. Torrance and Milligan³⁰ cited a study done at Massachusetts General Hospital in Boston assessed skeletal changes in patients with anorexia. The results of this study revealed that osteoporosis is common in women with anorexia. As compared to the control group, patients with anorexia had a decreased bone density, and there was the presence of multiple compression fractures in the vertebrae and a subsequent loss of height. The results suggested that estrogen loss may not be the only contributing factor, as there was no specific correlation between the remaining estrogen levels and bone density. High cortisol levels, typically found in patients with anorexia, may suppress bone formation and stimulate bone resorption, which could contribute to the decrease in bone density.

Calcium intake may have also been a factor, as persons with anorexia tended to consume less than 25% of the recommended daily allowance of calcium. Level of activity could also have been a contributing factor. Excessive activity (which is not uncommon among patients with anorexia) associated with low estrogen and amenorrhea may reduce vertebral bone density in particular. Exercise,

however, did have a profound protective effect against loss of bone material among subjects.

Research has shown that athletic girls tend to have more eating disorders as compared to their non-athletic counterparts (especially ballet dancers and long distance runners).¹¹ Athletic amenorrhea has been found to cause decreased bone mineral density (BMD), especially in areas of high trabecular content.¹⁰ According to Fruth and Worrell¹⁰, there are numerous variables involved in level of BMD. These variables include: training intensity, time spent training, diet, body weight, body composition, age of menarche, type of sport, and psychological stress. The American College of Sports Medicine (ACSM) has recognized the "female athlete triad": "a pattern of eating disorders, coupled with amenorrhea and bone loss, which potentially threatens many young female athletes."¹⁰

The hypothalamus is influenced by exercise, diet, and stress.¹⁰ Changes in its function results in decreased production of estrogen and progesterone, leading to irregular menses or amenorrhea. Estradiol is the form of estrogen that is in the blood plasma. It acts to prevent bone resorption and decreases bone remodeling peripherally. Progesterone promotes bone formation and accelerates bone remodeling. A decrease in these hormones leads to decreased bone mass. Adipose tissue is an important site for conversion of estrogen to estradiol. If there is decreased adipose tissue, the hypothalamic-pituitary-ovarian axis is interrupted. Controversy exists over whether body weight or

adipose tissue has a greater influence on menstrual function.¹⁰ When menstrual dysfunction occurs, there is compromised skeletal integrity.

Cortical Bone vs. Trabecular Bone

The skeleton is composed of 80% cortical bone and 20% trabecular bone.¹⁰ Cortical bone is found in the shafts of the long bones. Trabecular bone is found in the flat bones, ends of long bones, pelvis, and vertebral bodies. Trabecular bone is more metabolically active and is most sensitive to hormone fluctuation. Trabecular spicules maintain the "long term integrity of the skeleton."¹⁰ Once they atrophy and break, they are not replaced; however, cortical bone and remaining spicules may hypertrophy. Women are at a serious risk for fractures if bone mass is reduced 20-30%. A value of 80% of peak bone mass is considered osteopenia, which is a precursor for osteoporosis. It is not uncommon for patients with anorexia to have a bone mass value of 69% of peak bone mass.

Amenorrhea significantly impacts BMD in the spine.¹⁰ The lumbar vertebrae are most affected by amenorrhea due to their high concentration of trabecular bone. According to Fruth and Worrell¹⁰, athletes with eating disorders had lower vertebral BMD's as compared with normal values, but had higher values than non-athletes with eating disorders. Weight bearing activity slows and may reverse bone loss and decrease the likelihood of osteoporosis. Exercise appears to have an important impact on protecting BMD regardless of menstrual function. However, as stated by Fruth and Worrell¹⁰, several authors "have linked a long duration or high frequency of exercise to menstrual

irregularity," which ultimately affects BMD. There has been no research to show that lost BMD can be fully regained.

Exercise Prescription

Exercise is a part of daily life for many patients with anorexia, and is often excessive.¹¹ For this reason, exercise is not typically prescribed for patients with anorexia who are in an inpatient program. Short walks may be recommended once body weight has stabilized, but intense aerobic activity is prohibited. "Weight gain can be accelerated and hospitalization can be shortened by restricting exercise in persons with anorexia during refeeding."¹¹ One must realize that the weight that is gained while the patient is in treatment is typically in the form of fat. This may ultimately contribute to a high rate of regression because being "fat" is the patient's greatest fear. Weight gain in the patient with anorexia is desired, but the type of weight gain is important. Perhaps there would be a lower instance of regression if the weight gained were in the form of lean body mass.

Intensive aerobic training requires large energy expenditure, which is not desired for the patient with anorexia.¹¹ This form of training also produces less gain in lean body mass as compared to resistive training. Resistive training (weight lifting) would increase lean body mass while requiring less caloric expenditure. Resistive training may also increase bone density, which will protect against osteoporosis. Because the patient would gain weight in the form of lean body mass rather than fat, she would have a more appealing appearance, which would possibly minimize the rate of relapse. Even if the

patient over-exercised, the caloric expenditure would be much lower than for aerobic activity. "Vigorous circuit training (the most calorically expensive type of weight lifting) with free weights requires only 4.3 kcal. per minute for a 50 kg. woman, as opposed to 12.2 kcal per minute for jogging at a moderate speed."¹¹ Also, circuit training fatigues a person faster than jogging or aerobics.

There has been little research in the area of exercise adaptation for patients with eating disorders. To date, there have been no studies documenting the effectiveness of resistive training in patients with anorexia.¹¹ Research in this area may prove physical therapy to be an appropriate intervention for these patients. This is an area of research needs to be explored further in the future in order to ensure the best treatment of patients with eating disorders.

Resources

In addition to monitoring the medical complications of eating disorders and adapting exercise programs, it is the clinician's obligation to provide appropriate referral and resource information to patients who demonstrate signs of anorexia or bulimia. The following tables list possible resources for further information^{13,31}:

Table 7--Local Resources¹³	
* Campus Health Center	* Mental Health Centers
* Community Health Centers	* Local Clinics (specializing in
* Community Hospitals	eating disorders)

Table 8--National Resources³¹**National Associations of Anorexia Nervosa and Associated Disorders**

P.O. Box 7

Highland Park, IL 60035

(708) 831-3438

National Eating Disorders Organization

6655 South Yale Avenue

Tulsa, OK 74136-3329

(918) 481-4044

American Anorexia/Bulimia Association of Philadelphia

34th Street and Civic Center Boulevard

Philadelphia, PA 19104

(215) 221-1864

Anorexia Nervosa and Related Disorders, Inc.

P.O. Box 5102

Eugene, OR 97405

(541) 344-1144

Center for the Study of Anorexia and Bulimia

1 West 91st Street

New York, NY 10024

(212) 595-3449

CHAPTER VI.

CONCLUSION

The prevalence of eating disorders is on the rise in our country.⁵ This rise reflects the attitude our society holds regarding an unrealistic illusion of beauty that places value on being thin.¹ In addition to sociocultural influences on the onset and persistence of eating disorders, other factors have been presented in the previous chapters. These factors include familial, psychological, and biological factors.²² An interaction among these factors seems to be the most likely explanation for the complex onset of anorexia nervosa and bulimia nervosa. Clinicians must be aware of these causal factors associated with eating disorders in order to accurately assess a patient's risk of developing an eating disorder and be able to provide the most appropriate treatment for each patient.

In addition to recognizing causal factors associated with the onset of eating disorders, clinicians must also be knowledgeable about signs and symptoms of anorexia and bulimia and the associated medical complications. The list of signs and symptoms and associated medical complications seems to be nearly endless; however, physical therapists should be especially concerned with their role in addressing osteoporosis in patients with eating disorders, as well as serving to provide exercise adaptation that will facilitate return to normal weight while improving psychological well-being to decrease

recidivism among recovering patients.¹¹ Knowledge of associated signs and symptoms can lead to appropriate intervention and treatment of these potentially fatal disorders.

Anorexia and bulimia are complex disorders that require individualized treatment. The method of treatment chosen depends upon several factors, such as: 1) diagnosis, 2) severity of the illness, 3) age of the patient, and 4) the family situation of the patient.⁵ Based on these factors, a patient may be treated as an inpatient or an outpatient. A variety of treatments have been outlined in previous chapters, including medical care, nutritional counseling, drug therapy, individual psychotherapy, family therapy, and group therapy.²⁵ At the present time, physical therapists have not typically been team members in the treatment of eating disorders. However, there is a small, but growing, area of research that proposes the need for physical therapy intervention, most specifically in Stage One of inpatient treatment through exercise prescription.

Altered hormone levels secondary to the disease process associated with eating disorders, most specifically anorexia, can have a profound effect on the skeletal system of a patient in addition to the numerous other medical complications associated with the disease.³⁰ Patients with anorexia are at a high risk of developing osteoporosis and associated fractures. At the present time, exercise has not been used as a component of treatment for patients with eating disorders.¹¹ The reason behind this is that exercise is typically used at an excessive level by these patients to prevent weight gain. Excessive exercise is not beneficial for patients, but moderated exercise could play an important role

in preventing osteoporosis in these patients, in addition to decreasing relapse as a result of improved psychological well-being. Exercise has a preventative effect against osteoporosis due to the fact that bone responds according to the stresses placed upon it, thereby being laid down in areas of stress and removed from areas lacking natural stresses. The mode of exercise recommended in the literature was resistive training. Resistive training is relatively inexpensive in terms of caloric expenditure and encourages gain in lean body mass.¹¹ This form of exercise would be appropriate for a patient with anorexia, in contrast to aerobic activity, which is calorically expensive and produces little gain in lean body mass. In addition to preventing complications associated with osteoporosis, resistive training would also be beneficial in improving psychological well-being. Typically, a patient with anorexia gains back weight in the form of fat when going through treatment, due to lack of exercise and a reduced amount of lean body mass. By using resistive training, patients will gain weight in a more cosmetically acceptable manner, as weight will be more evenly distributed in the form of lean body mass. This will most likely be more acceptable to patients, thereby potentially decreasing the rate of relapse. Research in this area is extremely limited, and no controlled studies have been done to date.

A final role of the clinician is an obligation to provide appropriate referral and resource information to patients who may have an eating disorder. A list of resources has been provided in this document and can become an important reference guide.

Based on the limited research in the area of physical therapy intervention in the treatment of eating disorders, I would strongly recommend that further studies be performed in order to evaluate the significance of this intervention. Because anorexia and bulimia are such serious and complex disorders, clinicians must recognize the importance of searching for the most effective treatment options available for these patients.

I would also invoke society to recognize the impact of the messages it sends to young people in this country. An unrealistic and impossible image of beauty and perfection is being imposed upon extremely impressionable individuals who are searching for acceptance and guidance. Perhaps we will someday see the error of our ways and fight to uphold a standard of beauty that is based on one's inner spirit rather than one's outer shell.

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