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Cost Effectiveness of Outpatient Treatment for Anorexia Nervosa,
Bulimia Nervosa, and Eating Disorder
Not Otherwise Specified

Dwayne M. Horton

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Master of Science

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December 2012

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ABSTRACT

Cost Effectiveness of Outpatient Treatment for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorders Not Otherwise Specified

Dwayne M. Horton
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Master of Science

This study examined the cost effectiveness of treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder Not Otherwise Specified (NOS), as well as the effects that modality of therapy (i.e. individual, family, and mixed therapy), license of therapist, and secondary diagnosis had on recidivism and total cost of treatment in the care of these patients. One-thousand and thirty-eight patients (56 males, 982 females) diagnosed with Anorexia Nervosa, 1,674 patients (56 males, 1,618 females) diagnosed with Bulimia Nervosa, and 1,997 patients (197 males, 1,800 females) diagnosed with Eating Disorder NOS were included in this study. Results revealed that family therapy was the least expensive form of therapy in average total cost of therapy. Individuals who had family therapy were 3.3 times less likely to recidivate than those who had individual therapy and 7.5 times less likely to recidivate than those who had mixed therapy. Having a secondary diagnosis on average increased the total cost of treatment by \$437.34, irrespective of the type of secondary diagnosis (i.e. depression, anxiety, or substance-abuse). These findings suggest that modality of therapy should be considered in the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Future research should examine the effects of treatment for individuals with a secondary diagnosis.

Keywords: anorexia nervosa, bulimia nervosa, eating disorder nos, cost-effectiveness of treatment

ACKNOWLEDGMENTS

This Master's thesis would not have been completed without the love and support of family and friends. My dear wife has sacrificed much while I have completed this project. She has frequently had to take care of our dear little girl alone while I worked. I do not have words adequate enough to describe what her love, support, and comfort means to me, though I hope to be able to repay in like manner in the years to come.

I also owe a debt of gratitude to my committee who spent many hours helping me become a better researcher, writer, and individual. I appreciate the constant encouragement, especially when times were difficult. I will never forget their love and support of me.

Special thanks and gratitude is owed to Dr. Cynthia Berg, a former mentor from the University of Utah, who I turned to frequently seeking advice, help, and support. Dr. Berg was always willing to help me. She helped me through the most difficult times of this paper through her sage advice and love. She reminded me that I could do this work and that all I needed was to continue to work my hardest. The completion of this thesis was largely due to her help in editing, generating ideas, and her encouragement of me.

Finally, special thanks are necessary to Dr. Jeremy Yorgason from Brigham Young University, and Debbie Palmer from University of Wisconsin – Stevens Point. Dr. Yorgason and Dr. Palmer both helped with the editing of this thesis. Their help came at a very timely moment in the completion of this thesis.

Table of Contents

Abstract.....	ii
Acknowledgments	iii
Introduction	1
Literature Review	5
Diagnosis	5
Treatment	7
Cost Effectiveness of Treatments	10
Method	14
Participants	14
Variables	15
Results	17
Discussion	23
Limitations	28
Conclusion	29
References	31

Cost Effectiveness of Outpatient Treatment for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorders Not Otherwise Specified

The prevalence of eating disorders is a growing problem (DeLeel et al., 2009; Berg, Frazier, & Sherr, 2009). According to doctors' diagnoses and insurance claim reports, it is estimated that in the United States the prevalence rate for Anorexia Nervosa among adolescent girls is 0.3% and for Bulimia Nervosa is 0.9% (Hoek, 2006; Hoek & Van Hoeken, 2003; Swanson, et al., 2011), and among female adults is 0.9% and 1.5%, respectively (Hudson, et al., 2007). Berg, Frazier, and Sherr (2009) found that 49% of college-aged women surveyed showed symptoms of eating disorders persisted after years after completing college. In women's collegiate sports, up to 25% of female athletes have eating disturbances that could be classified as an eating disorder (Greenleaf, Petrie, Carter, & Reel, 2009). Perhaps of greater concern is the increasing prevalence of Anorexia Nervosa and Bulimia Nervosa in girls of younger ages (Rosen et al., 2010). Using data from the Pittsburgh Girls Study (Loeber et al., 2002), a community-wide longitudinal study, DeLeel et al. (2009) found that 11% of nine-year-old girls and 7% of ten-year-old girls qualified for an eating disorder diagnosis.

While females are more frequently diagnosed with Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS, males are also affected by these disorders. Lifetime prevalence rates for Anorexia Nervosa among men is 0.3% and for Bulimia Nervosa is 0.1% (Insel, 2012). Neumark-Sztainer, Eisenberg, Wall, and Loth (2011) found that young men (ages 23-years-old to 26-years-old) who do Pilates or Yoga are more likely to have disordered eating behaviors than those who do not. Homosexuality among men has also been found to be a risk factor for an eating disorder (Boisvert & Harrell, 2009). Men who have been diagnosed with a full or partial

eating disorder report less satisfaction in their work, family life, friends, and leisure activities, than men without an eating disorder (Woodside, et al., 2001).

Behaviors of males and females who have been diagnosed with Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS were similar (Núñez-Navarro, et al., 2012; Woodside, et al., 2001) in terms of age of onset as well as comorbidity with another mental health disorder (Woodside, et al., 2001). However, males and females differ on compensatory behaviors. Males were more likely to have a higher frequency of vomiting episodes and less laxative abuse than females (Núñez-Navarro, et al., 2012).

Similar prevalence rates for eating disorders are also being found in residents of European countries (Machado, Machado, Goncalves, & Hoek, 2007; Preti, et al., 2009; Tolgys & Nemessury, 2004). In Portugal, prevalence rates of eating disorders among young women were .39% for Anorexia Nervosa and .30% for Bulimia Nervosa, and 2.37% for young women diagnosed with Eating Disorder NOS (Machado, Machado, Goncalves, & Hoek, 2007). Preti et al. (2007) found the lifetime prevalence rate in six European countries for Anorexia Nervosa to be 0.48% and for Bulimia Nervosa 0.51%. In the Netherlands, there has been an increase in reports of Anorexia Nervosa among the natives in the remote island of Antilles as they may have received more exposure to the western philosophy of beauty (Van Hoeken, Veling, Smink, & Hoek, 2010).

Many of the health risks that Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS patients face are related to the methods used to establish and sustain weight loss. Compensatory behaviors such as self-induced vomiting, laxatives, diuretics, severe restriction on the intake of food, and excess exercise are the most common methods individuals use to maintain or reduce their body weight (Mehler, 2011, DSM-IV-TR, 2000). Side effects of compensatory

behaviors are associated with osteoporosis, cardiovascular problems, deterioration of teeth and gums, electrolyte imbalance and endocrine conditions (Birmingham, et al. 2005; Katzman, 2005; Mehler, 2010; Mehler, Crews, and Weiner, 2004; Mitchell, & Crow, 2006; Rome & Ammerman, 2003). Additionally, adolescent girls with Anorexia Nervosa have a higher suicide rate than adolescent girls without and higher than those with Bulimia Nervosa and Eating Disorder NOS (Preti et al., 2011). Over time, all of these weight loss methods damage and harm the body (Mitchell & Crow, 2006; Rome & Ammerman, 2003).

The use of a single compensatory weight control method is dangerous, but the dangers are amplified when multiple methods are used. Research suggests that it is not uncommon for individuals with eating disorders to use multiple compensatory methods (Ackard, Cronemeyer, Franzen, Richter, & Norstrom, 2011). In a study of college aged women, it was found that the use of more than one compensatory method was “associated with poorer quality of life in psychological, physical/cognitive, and financial domains and lower self-efficacy for normative eating and body image” (Ackard et al., 2011, p. 169). In addition, they found that individuals who used more than one compensatory method were also less likely to seek help with overcoming the disorder. Greenleaf et al. (2009) found that female college athletes with an eating disorder were less likely to seek help with treatment, which contribute to greater risk for the health of the athlete. Further, Mond et al. (2010) studied women who were at high risk for developing an eating disorder, or those who are already showing symptoms of eating disorders, and reported that they would not seek out help for their illness because of shame and fear of discrimination. These findings are concerning because they indicate that those who are in the early stages of an eating disorder may not get the help that they need to help prevent the illness from further spiraling out of control.

The treatment of eating disorders is costly. Crow and Nyman (2004) estimated that the cost of treating a single Anorexia Nervosa patient for two years was approximately \$119,200. The cost of use of family therapy for Anorexia Nervosa was estimated to cost a total of around \$83,736 (Lock, Couturier, & Argas, 2008). This cost is comparable to treatment costs of other severe mental illnesses such as schizophrenia (Crane, Chiang, Miller, & Feinauer, 2011; Striegel-Moore, Leslie, Petrill, Garvin, & Rosenheck, 2000). Estimated annual treatment costs for Bulimia Nervosa range between \$1,960 and \$22,170 (Pohjola et al., 2010). These estimates are also comparable to treatment costs for major depression (Pohjola et al., 2010). Cost of treatment of Anorexia Nervosa and Bulimia Nervosa is significantly increased when considering the high probability of relapse (Grilo et al., 2007; Kordy et al., 2002; McFarlane, Olmsted, & Trottier, 2008).

Research has found that the modality of treatment influences the cost of treatment and influences relapse rates (Carter et al., 2009). The treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS usually is accomplished by individual therapy (Robin, Siegel, & Moye, 1995). Cognitive-Behavioral Therapy has shown success in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS (Carter et al., 2009). Recently, family therapy has become the focus of effective treatment for eating disorders and has shown to reduce cost and recidivism rates (Lock et al., 2010).

This project examined multiple questions concerning the cost and treatment effectiveness of treating these disorders: What forms of psychotherapy (i.e. individual, family, mixed) are used in the outpatient treatment of eating disorders? Is there a difference in recidivism by modality of therapy? Is there a difference in recidivism by eating disorder diagnosis (i.e. Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS)? How does having a diagnosis of Anorexia

Nervosa, Bulimia Nervosa, or Eating Disorder NOS accompanied by one of the three categories of common comorbid diagnosis (anxiety, depression, and substance abuse disorder) affect the total cost of treatment? Is there a difference in the cost effectiveness of psychotherapy by provider type for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS? Is there a difference in the cost effectiveness of psychotherapy by modality for the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS? Is there a difference in the cost effectiveness of psychotherapy by degree of the therapist for the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS?

Literature Review

Diagnosis

Anorexia nervosa is defined by the *Diagnostic and Statistical Manual of Mental Disorders-IV-TR* (DSM-IV-TR) as a

refusal to maintain proper body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected. Intense fear of gaining weight or becoming fat, even though underweight. Disturbance in the way in which one's body weight or shape is experienced (i.e. thinking they are fat when they are really thin), undue influence of body weight or shape on self-evaluation (i.e. self-worth and self-esteem is dependent on being extremely thin), or denial of the seriousness of their current low body weight. In postmenarcheal females, amenorrhea, i.e., the absence of at least three consecutive menstrual cycles (American Psychiatric Association, 2000, p. 263).

Bulimia nervosa is defined by the DSM-IV-TR as

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 during a similar period of time and under similar circumstances and (2) a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how one is eating. [Bulimia Nervosa includes] recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting, misuse of laxatives, diuretics,

enemas, or other medications, fasting, or excessive exercise. The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months. Self-evaluation is unduly influenced by body shape and weight (American Psychiatric Association, 2000, p. 264).

One misconception about the differences between Anorexia Nervosa and Bulimia Nervosa is that individuals with Bulimia Nervosa binge and purge, whereas individuals with Anorexia Nervosa only restrict their diet. However, there are subtypes in the classification for Anorexia Nervosa and Bulimia Nervosa where both can be classified as the purging type. Monteleone et al. (2011) found that individuals whose initial diagnosis was Anorexia Nervosa binge-purging type crossed over to Bulimia Nervosa at a higher rate than those diagnosed with Anorexia Nervosa restrictive type. In addition, they found that individuals migrated more frequently from Anorexia Nervosa to Bulimia Nervosa than from Bulimia Nervosa to Anorexia Nervosa.

Eating Disorder NOS is defined by the DSM-IV-TR as

all of the criteria for Anorexia Nervosa met except that the individual has regular menses. All of the criteria for Anorexia Nervosa are met except that despite significant weight loss, the individual's current weight is in the normal range. All of the criteria for Bulimia Nervosa are met except that the binge eating and inappropriate compensatory mechanisms occur at a frequency of less than twice a week for a duration less than 3 months. The regular use of inappropriate compensatory behavior by an individual of normal body weight after eating small amounts of food (e.g. self-induced vomiting after consumption of two cookies). (American Psychiatric Association, 2000, p. 265).

Comorbidity is common among people diagnosed with eating disorders (D'Andrea et al., 2009). Substance use disorders commonly co-occur with Anorexia Nervosa and Bulimia Nervosa (Castro-Fornieles et al., 2009). In a twin study, Baker, Mitchell, Neale, and Kendeler (2010), found that women with Anorexia Nervosa were two times more likely to have an alcohol use disorder, and smoke regularly, than women without Anorexia Nervosa. They also found that women with Bulimia Nervosa were three times more likely than other women to use illicit drugs,

or alcohol, and be regular smokers. Mood disorders, such as anxiety, depression, and bipolar disorder, also commonly co-occur with Anorexia Nervosa and Bulimia Nervosa (McElroy et al., 2011; Touchette et al., 2011). McElroy et al. found that bipolar disorder paired with an eating disorder produced an earlier onset of mood symptoms, a greater number of episodes, and a higher rate of suicide. Touchette et al. found that adolescents dealing with Anorexia Nervosa or Bulimia Nervosa had a high comorbidity occurrence rate with mood and anxiety disorders. With the high comorbidity rate that Anorexia Nervosa and Bulimia Nervosa share with other psychological disorders, it is critical that clinicians and clients become aware of how their mood may exacerbate their symptoms.

Treatment

Individual therapy. Historically, eating disorders, like most mental health disorders, have been treated at the individual level. Cognitive Behavioral Therapy (CBT) has been the primary mode of therapy in treating Anorexia Nervosa and Bulimia Nervosa and has produced impressive results. CBT has been shown to help clients cope with the compulsions of Anorexia Nervosa and Bulimia Nervosa, as well as help clients return to healthy weights (Carter et al., 2009; Lock et al., 2010; Robin, Siegel, & Moye, 1995). Carter et al. (2009) found that clients who received CBT treatment for Anorexia Nervosa had a 35% relapse rate (65% recovery rate) at the 1-year follow-up compared to a 66% relapse rate (34% recovery rate) in the usual maintenance treatment group.

Family therapy. Family therapy treatments have become more popular and are proving to be highly effective, especially among adolescents (Lock et al., 2010; Robin et al., 1995). In one study, Family Behavioral Therapy was compared to Adolescent Focused Therapy on remission rates, eating disorder examination, and BMI with individuals with Anorexia Nervosa

(Lock et al.). Results from this study found that both Family Behavioral Therapy and Adolescent Focused Therapy led to significant improvements by the end of therapy. However, at the six- and 12-month follow ups, Family Behavioral Therapy had lower relapse (10% for Family Behavioral Therapy vs 40% for Adolescent Focused Therapy) and higher full remission rates than Adolescent Focus therapy. In addition, it was found that weight gain was faster initially for Family Behavioral Therapy than Adolescent Focused Therapy, but that difference disappeared by the six- and 12-month follow-up. In a different study, Robin et al. (1999) compared Behavioral Family Systems Therapy with Ego Oriented Individual therapy and found that both methods of treatment were effective in treating Anorexia Nervosa. However, Family Systems Therapy produced faster results, especially in weight gain and in the return of regular menses. Finally, Eisler, Simic, Russell, and Dare (2007) found that individuals with Anorexia Nervosa who underwent family therapy had a 75% chance of remission five years later. There are no known longitudinal studies which compared the remission rates of individual and family therapy for eating disorders.

Family therapy allows therapists to work with the family regarding how they communicate and work on the emotional involvement of the family. One study found that both individual and family therapy improved communication about eating habits (Robin et al., 1995). In addition, it was found that involving the mother in therapy helped decrease the mother's reaction to conversations about poor eating habits which helped strengthen the parent-adolescent relationship. The ability to help family members understand eating behaviors and help learn new methods of communication is a powerful tool of family therapy.

Family therapy also allows the therapist to work on family processes that may have contributed to the development of eating disorders and helped to maintain them. Female

adolescents with families with a greater number of constraining rules were more likely to develop an eating disorder (Gillett, Harper, Larson, Barrett, & Hardman, 2009). Family therapy is essential in helping families work through rules and communication problems that maintain eating disordered behaviors.

Involving family members in treatment may help individuals provide needed support for individuals dealing with an eating disorder. Cunha, Relvas, and Soares (2009) studied emotional connectedness of adolescents with and without eating disorders to their families. They found that those individuals dealing with Anorexia Nervosa were more detached from and less emotionally connected to their peers and mothers. The adolescents also reported that they felt their family was less emotionally connected and less able to manage problems with life. Finally, they found that individuals with Anorexia Nervosa and their families were less willing to seek out help for treatment. Helping families rebuild relationships helps individuals overcome Anorexia Nervosa (Cunha, Relvas, & Soares, 2009). Thus, evidence suggests that family therapy may be an important component in the treatment of eating disorders and that it warrants further study (Lock, 2011).

Recidivism. After treatment for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS is completed, the next major concern is whether individuals will relapse into old eating or compensatory patterns. Recidivism rates as measured by the Longitudinal Interval Follow-Up Evaluation (Grilo, et al., 2007; Kordy, et al., 2002; McFarlane, Olmsted, & Trottier, 2008) are quite high. Recidivism rate estimates for Anorexia Nervosa range from 36% (Keel et al., 2005) to 50% (McFarlane, Olmsted, & Trottier, 2008). Recidivism rates for Bulimia Nervosa range from 28% (McFarlane, Olmsted, & Trottier) to 47% (Grilo, et al., 2007), and for Eating Disorder NOS there is a 42% recidivism rate (Grilo et al.; McFarlane, Olmsted, & Trottier). Kordy

et al. (2002) found that in treating Anorexia Nervosa and Bulimia Nervosa, the ability for clients to reach full remission of the illness is difficult. This suggests that eating disorders are chronic health problems that are not easily “cured,” but rather treatment aims at helping the patient learn to manage the disorder. One influencing factor for the high recidivism rates is the ability of the clients to be able to focus exclusively on fighting the compensatory behaviors (McFarlane, Olmsted, & Trottier, 2008). Clients who work on their cognitive distortions, as well as their body-image issues, have found particular success in overcoming Anorexia Nervosa and Bulimia Nervosa (Keel et al., 2005). The nature of the illnesses and the behaviors associated with each influence the high recidivism rates.

Cost Effectiveness of Treatments

Although research suggests that both individual and family therapy are effective in treating eating disorders, an important issue is the cost of different modalities of treatment. Recent research has focused on comparing individual and family therapy as to which better prevents relapse and decreases the cost of treatment (Crow et al., 2009; Lock et al., 2008). Schmidt et al. (2007) compared family therapy with Cognitive Behavioral Therapy Guided Self-Care by randomly assigning individuals into each treatment. Results showed that Cognitive Behavioral Therapy was more cost effective and produced quicker results for reducing bingeing behaviors of those adolescents dealing with Bulimia Nervosa or Eating Disorder NOS. One major criticism of these findings is that the Cognitive Behavioral Therapy was a manualized and structured method, whereas the family therapy was not (Lock, 2011).

Family therapy has been not only efficacious but also cost effective in working with many mental health disorders (Crane & Payne, 2011; Crane & Morgan, 2007; Morgan & Crane 2010). Crane and Payne found that family therapy was the most cost effective method for

treating mental health disorders across the spectrum. In a study focusing on treating substance abuse, family therapy was found to be efficacious and more cost effective than individual therapy (Morgan & Crane). Law and Crane (2000) found that family therapy reduced the overall use of healthcare within the family.

Treating Anorexia Nervosa and Bulimia Nervosa is typically intensive and clients often opt for inpatient treatment, which allows therapists to closely monitor the health and eating behaviors of the clients. Striegel-Moore et al. (2000) found that 21% of Anorexia Nervosa patients required hospitalization in 1995 for an average length of stay of 26 days at an average cost of \$17,384 per patient. Lock et al. (2008) suggest that the average costs for treating adolescents with Anorexia Nervosa receiving inpatient medical stabilization (i.e. were hospitalized until stable), outpatient family therapy and medications for co-morbidity of mental illnesses to be \$23,836.

In a six-year longitudinal study, Mitchell et al. (2009) found that patients who were diagnosed with an eating disorder had an above average increase in healthcare utilization, even higher than those patients diagnosed with depression. In addition, they found that clients began to utilize healthcare more frequently during the time leading up to the diagnosis of an eating disorder. With the rising costs of treatment, many health insurance companies and HMO's will no longer cover hospitalizations for Anorexia Nervosa when it is the sole medical condition (Striegel-Moore, 2005). As number of cases of Anorexia Nervosa and Bulimia Nervosa increase each year (DeLeel et al., 2009; Berg, Frazier, & Sherr, 2009), and the costs of health care continue to rise, it is important to explore additional avenues for cost effective treatments.

With the growing concerns over medical costs, researchers have been investigating innovative methods to treat patients with Anorexia Nervosa and Bulimia Nervosa. One study

explored the cost effectiveness of treating Bulimia Nervosa in a face-to-face visit with clients compared with an intervention of doing Cognitive Behavioral Therapy via a television (Crow et al., 2009). The results showed that the outcomes were somewhat better for clients who received face-to-face contact with the therapists, but the costs were substantially cheaper for the CBT via television. The cost differences were mostly attributed to the travel expenses for the therapists. Another study in England compared the effectiveness of treating adolescents with Anorexia Nervosa in inpatient settings, general outpatient treatment, and specialist outpatient treatment. They found that there were no significant difference in outcomes between the three groups but the costs for treating Anorexia Nervosa were much less with the general out-patient treatment (Byford et al., 2007). With the exception of these two studies, there has been no other known research focusing on the cost effectiveness of treating Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder NOS.

Holes still remain in the literature regarding the treatment of eating disorders in outpatient treatment. This study seeks to fill in gaps in the literature regarding the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. The following questions were evaluated in regards to the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS:

Question 1. What forms of psychotherapy (i.e. individual, family, mixed) were used in the outpatient treatment of eating disorders?

Question 2: Is there a difference in recidivism by modality of therapy? It is predicted that family therapy will have the lowest recidivism rate similar to the findings found in Lock, et al. (2010).

Question 3: Is there a difference in recidivism by eating disorder diagnosis (i.e. Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS)? It is predicted that Eating Disorder NOS will have the lowest recidivism rate because it is the least severe diagnosis of the three categories.

Question 4: How does having a diagnosis of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder NOS accompanied by one of the three categories of common comorbid diagnosis (anxiety, depression, and substance abuse disorder) affect the total cost of treatment? It is predicted that having a secondary diagnosis will increase the cost of treatment. In addition, it is predicted that cost of treatment will be higher for those who have a secondary diagnosis of substance abuse disorder.

Question 5: Is there a difference in the total cost of psychotherapy by provider type for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS? No research known to the author has been done on this question or anything similar in nature. It is predicted that there will be a difference in cost of treatment due to insurance agencies reimbursing different professions at different rates.

Question 6: Is there a difference in the cost effectiveness of psychotherapy by modality for the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS? It is predicted that family therapy will be the most cost effective modality of therapy; similar to the findings that Lock et al. (2010) found that family therapy was cheaper than individual therapy in treating Anorexia Nervosa.

Question 7: Is there a difference in the cost effectiveness of psychotherapy by degree of the therapist for the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder

NOS? It is predicted that PhD providers will be more cost effective due to their additional training in an educational setting.

Method

The data used in this project came from the behavioral health division of Cigna, which is a large health insurance provider located in the U.S with several million participants. Data were available for 4,709 participants diagnosed with Anorexia Nervosa, Bulimia Nervosa or Eating Disorder NOS from 2001 to 2006. See Crane and Payne (2011) for the complete description of the data cleaning procedures that were conducted prior to the data were used in these analysis.

Participants

There were 1,038 patients diagnosed with Anorexia Nervosa with an age range from 8- to 54-years-old ($M = 22.7$, $SD = 10.4$), which included 56 males (5.4%) and 982 females (94.6%). Participants represented all regions of the United States with 163 (15.7%) from the Midwest, 359 (34.6%) from the Northeast, 120 (11.6%) from the Pacific region, 262 (25.2%) from the South, and 134 (12.9%) from the West.

There were 1,674 patients diagnosed with Bulimia Nervosa with an age range from 9- to 67-years-old ($M = 25.8$, $SD = 9.8$), including 56 males (3.3%) and 1,618 females (96.7%). Patients represented all regions of the United States with 223 (13.3%) from the Midwest, 538 (32.1%) from the Northeast, 202 (12.1%) from the Pacific region, 418 (25.0%) from the South, and 292 (17.4%) from the West.

There were 1,997 patients diagnosed with Eating Disorder NOS with an age range from 2- to 71-years-old ($M = 30.8$, $SD = 14.1$) of which there were 197 males (10.6%) and 1,800 females (89.3%). Patients represented all regions of the United States with 291 (11.9%) from the

Midwest, 914 (37.5%) from the Northeast, 177 (7.3%) from the Pacific region, 645 (26.4%) from the South, and 413 (16.9%) from the West.

Patients were included in the sample only if they had more than one claim for treatment and were only seen in outpatient clinics. Those clients who had only one session of treatment during an episode of care were dropped because with only one data point no patterns of treatment could be detected. In accordance with a research contract with Cigna, no identifying information was provided for any patients in the data set (Crane & Payne, 2011). The current study was a retrospective analysis of administrative data which is allowed by the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

Variables

Providers. Six provider types were compared in the current study. They were: medical doctors (MDs), nurses, marriage and family therapists (MFT's), professional counselors, social workers (MSW's), and psychologists. As per protocol, where there were multiple licenses reported; the first license to be reported was the identifying one for that case (Crane & Payne, 2011).

Episodes of Care (EoC). Episodes of care were defined by Cigna as a series of continuous services for the same patient. An episode of care began with the first psychotherapy session and ended 90 days after psychotherapy claims ended (Crane & Payne, 2011).

Recidivism. Recidivism was defined as a patient returning for a second episode of care 90 days after the end of the first EoC. Drop out was defined as those who Cigna had only one psychotherapy service for that individual for an EoC.

Modality of Therapy. Modality of therapy was the method of treatment that the therapist used to treat Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. There were three

categories of modality: individual, family, and mixed. Individual therapy was defined by therapy services provided by the therapist with only the identified patient with an eating disorder and no one else. Family therapy was defined by therapy services provided by the therapist with the identified patient with an eating disorder and someone else as well (i.e. parent, sibling, etc.). Mixed therapy was defined as therapy services provided by the therapist doing a combination of individual and family therapy.

Total Cost. Total cost of care was the total bill that Cigna paid for an individual for an episode of care.

Number of Sessions was defined as the total count of all the billings that Cigna received for an EOC.

Provider Type. Provider type reflected the profession of the therapist who billed Cigna for care provided to a patient. This variable was used as a control variable for cost because it determined the amount a therapist is paid.

Degree. Degree was the highest educational degree that the therapist received and that was reported to Cigna.

Diagnosis. Diagnoses that were given by the provider were available for each case. All participants in the current study had a primary diagnosis of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder NOS. Some participants also had a secondary diagnosis. The secondary diagnoses were sorted into three categories: depression, anxiety, and substance abuse.

Gender. Participant's gender was used to determine if there was a difference in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS by gender.

Results

Preliminary Analysis

Frequencies and descriptive statistics were run on the data prior to the study being completed. Results of the descriptive statistics revealed that there was missing data within each variable. It was decided to use as much of the data as possible. Consequently, the number of participants reported for each test will vary depending on how much useable data was available. Additional analyses were run with gender predicting total cost and recidivism rate. An independent t-test was run to test whether gender significantly predicted total cost. The analysis revealed that gender did indeed predict total cost $t(4709) = -2.45, p < .05$. On average, males were less expensive to treat than females. On average, it was found that females were in therapy longer than males. Chi-square analysis was performed with gender and recidivism $\chi^2(4709) = 8.16, p < .05$. Proportionally, 29.1% of females ($n = 1,471$) and 23.0% of males ($n = 89$) were treated for a second episode of care. These results indicate that there was a difference by gender with total cost, and gender with recidivism. Therefore, gender was used strictly as a control variable in the analysis. This study did not examine the gender differences in the cost of treatment or recidivism rates for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS because of severely unequal groups.

Question 1

What forms of psychotherapy (i.e. individual, family, mixed) were used in the outpatient treatment of eating disorders? Descriptive statistics were run to determine the proportions of professionals who were treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Results revealed that MSW's treated the most patients who were diagnosed with Anorexia Nervosa (40.3%) and Bulimia Nervosa (37.6%), and they treated 33.8% of patients with Eating

Disorder NOS. Psychologists treated the most patients in the Eating Disorder NOS (38.7%), and they treated 30.1% of patients with Anorexia Nervosa, and 30.7% of patients with Bulimia Nervosa. Counselors were in the mid range for treating patients with Anorexia Nervosa (19.0%), Bulimia Nervosa (20.1%), and Eating Disorder NOS (19.6%). Marriage and family therapists were on the low end for the treatment of patients with Anorexia Nervosa (6.8%), Bulimia Nervosa (8.8%), and Eating Disorder NOS (6.2%). Nurses and doctors were the lowest group of professionals treating Anorexia Nervosa (1.9% and 1.8% respectively), Bulimia Nervosa (1.8% and 1.0% respectively), and Eating Disorder NOS (1.0% and 0.8% respectively).

The type of modality of therapy used to treat Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS by professional groups are shown in Table 1. Results revealed that MSW's and psychologists used the greatest proportions of individual therapy (36.6% and 34.2% respectively), family therapy (39.6% and 30.0% respectively), and mixed therapy (35.6% and 33.4% respectively). MFT's were on the low end for using individual therapy (7.2%), family therapy (9.6%), and mixed therapy (7.4%). Nurses and doctors were the lowest group of professionals using individual therapy (1.6% and 1.0% respectively), family therapy (0.5% and 2.1% respectively), and mixed therapy (1.1% and 1.2% respectively).

Descriptive statistics were run to determine the percentage that each modality of therapy was used to treat Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Results revealed that individual therapy was used the most to treat Anorexia Nervosa (72.2%), Bulimia Nervosa (81.4%), and Eating Disorder NOS (79.3%). Mixed therapy was the next most frequently used model to treat Anorexia Nervosa (23.6%), Bulimia Nervosa (14.6%), and Eating Disorder NOS (16.4%). Family therapy was the least used modality of therapy in treating Anorexia Nervosa (4.2%) Bulimia Nervosa (4.3%), and Eating Disorder NOS (4.0%).

In summary, psychologists and MSW's were most likely to treat Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Psychologists and MSW's were also the most likely profession to use family therapy in the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. However, individual therapy was the most likely method of therapy in the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS.

Question 2

Is there a difference in recidivism by modality of therapy? A Logistic Regression analysis was used to determine if modality of therapy predicted recidivism. The results indicated that modality of therapy strongly predicted recidivism rate (see Table 2). Individuals who only had family therapy were 69.9% (*OR* 0.301; 95% *CI* 0.19 – 0.48) less likely to recidivate than those who only had individual therapy. Individuals who only had family therapy were 87.6% (*OR* 0.134; 95% *CI* 0.083-0.216) less likely to recidivate than those who had mixed therapy. Individuals who had only individual therapy were 55.4% (*OR* 0.446; 95% *CI* 0.379-0.526) less likely to recidivate than those who had mixed therapy. In short, individuals engaged in family therapy were least likely to recidivate.

Question 3

Is there a difference in recidivism by eating disorder diagnosis (i.e. Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS)? A chi-square test was used to determine if eating disorder diagnosis was related to recidivism. Results indicated that eating disorder diagnosis was not related to recidivism, $\chi^2(2) = 4.97, p = 0.08$. These results indicate that individuals with eating disorders did not recidivate more frequently depending on their eating disorder diagnosis.

Question 4

How does having a diagnosis of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder NOS accompanied by one of the three categories of common comorbid diagnoses (anxiety, depression, and substance abuse disorder) affect the total cost of treatment? A Chi-Square analysis was run to determine if there was a difference between those diagnosed with single diagnosis of Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder NOS and those dually diagnosed with a secondary diagnosis of anxiety, depression, or substance abuse disorder. Results revealed that there was no significant difference in those diagnosed with Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS and those with a secondary diagnosis, $\chi^2(2) = 5.01, p = 0.08$.

An ANOVA was run to determine if there was a difference in the total cost if the eating disorder was accompanied by a secondary diagnosis. The results indicated that there was a significant difference in cost with a secondary diagnosis, $F(1, 4230) = 84.75, p < .0001$. On average, those individuals with only one diagnosis (Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder NOS) spent \$637.91. Those individuals with a secondary diagnosis spent \$1,075.25 for treatment, for an average difference of \$437.34 more to treat clients with a secondary diagnosis than to treat than those with only a diagnosis of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS.

A second ANOVA was run to determine if there was a difference in total cost of treatment depending on whether the secondary diagnosis was depression, anxiety, or substance abuse. The results indicated that there was no significant difference in cost by type of secondary diagnosis, $F(2, 420) = 2.47, p = .09$.

Question 5

Is there a difference in the total cost of psychotherapy by provider type for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS? Descriptive statistics were run to analyze the percentage of recidivism by provider type (see Table 3). Marriage and Family therapists had the highest percentage of recidivism (34.2%) in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Medical Doctors had the lowest percentage of recidivism (26.1%) in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS.

An ANOVA was used to determine if provider type predicted total cost of therapy. The results revealed that provider type significantly predicted total cost of therapy, $F(5, 4231) = 4.94, p < .05$. A Tukey-Kramer post hoc test was used to determine specific differences between provider types. Results revealed that there were three significant differences in cost between professions. There was a significant difference between counselors ($M = \$534.66, SE = 47.4$) and medical doctors ($M = \$972.61, SE = 141.7$). Another difference was found between psychologists ($M = \$698.35, SE = 41.6$) and counselors ($M = \$534.66, SE = 47.4$). Finally, a significant difference was found between psychologists ($M = \$698.35, SE = 41.6$) and MSW's ($M = \$591.24, SE = 41.5$). No other significant differences were found.

Question 6

Is there a difference in the cost effectiveness of psychotherapy by modality for the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS? Descriptive statistics were run to determine the percentage of recidivism by modality of therapy. Mixed therapy had the highest percentage of recidivism (48.7%), followed by individual therapy (30.4%), with family therapy having the lowest recidivism (12.2%).

An ANOVA was run to determine if modality of therapy predicted total cost of therapy. The results indicated that modality of therapy did predicted total cost of therapy, $F(2, 4231) = 61.59, p < .0001$. A Tukey-Kramer post hoc test was used to determine specific differences between modalities of therapy. Results indicated that there was a significant difference between groups with family therapy as the least expensive ($M = 391.11, SE = 76.1$), followed by individual therapy ($M = 628.75, SE = 42.0$), and with mixed therapy as the most expensive ($M = 1019.42, SE = 51.6$).

Using the Crane and Payne (2011) model of cost effectiveness, cost effectiveness by modality of therapy was determined by using the equation: Cost-effectiveness = 1st EoC average cost + (1st EoC average cost * recidivism rate; see Table 4). Recidivism rates were calculated by using the parameter estimates of the Logistic Regression with modality of therapy predicting recidivism. (See Table 4 for complete breakdown of cost effectiveness for profession by gender, eating disorder diagnosis and modality of therapy.) Results indicated that counselors were the most cost effective in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS in males and females, using family therapy. Medical doctors were the least cost effective in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS, in both males and females, and across modality of therapy.

Question 7

Is there a difference in the cost effectiveness of psychotherapy by degree of the therapist for the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS? An ANOVA was used to determine if degree predicted the total cost of therapy. Results indicated that degree did not significantly predict total cost, $F(1,4063) = .6, p = .45$.

A Logistic Regression was used to determine if degree predicted recidivism. The results revealed that degree did significantly predicted recidivism. Therapists with a PhD were 28% less likely to have their clients recidivate following treatment than therapists with a Master's degree (*OR* .72; 95% *CI* 0.56-0.93).

Using the Crane and Payne (2011) method, cost effectiveness was calculated for therapists with a PhD and those with a Master's degree by using the equation: Cost-effectiveness = 1st EoC average cost + (1st EoC average cost * recidivism rate). Even though degree did not significantly predict the total cost of therapy, the results are informative. (See Table 5 for Master's degree cost effectiveness, and Table 6 for PhD cost effectiveness.) Family therapy was consistently the cheapest form of therapy, followed by individual therapy, then mixed therapy. Additionally, there is a consistent pattern revolving around the cost of therapy by gender, with males being cheaper to treat. Given that the results are not significant, future research should examine the patterns found in this study.

Discussion

Results revealed that in outpatient treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS, MSW's and psychologists treat the majority of cases, accounting for nearly 70% of all cases. Interestingly, among those MSW's and psychologists who treat Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS, the clinicians highly favor individual therapy over family therapy or mixed therapy.

Modality of therapy was a significant predictor of recidivism and total cost of therapy. Family therapy was found to be the least likely group to recidivate, and mixed therapy was the most likely group to recidivate. In addition, family therapy was the least expensive form of

therapy in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS, mixed therapy again was the most expensive form of treatment.

These findings are consistent with previous research, which also found that both family therapy and individual therapy are effective in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS (Robin et al., 1999; Aurther, Siegel, & Moye, 1995).

However, Lock et al. (2010) found that those individuals who received family therapy had lower rates of recidivism than those who had individual therapy. In addition, Lock et al. (2008) found that in treating Anorexia Nervosa, it was both less expensive to use family therapy over individual therapy, and family therapy had a lower recidivism rate than individual therapy.

The fact that the results of this study found that family therapy was the most effective method of treatment is interesting because family therapy was only used in this study 4.2% of the time in treating Anorexia Nervosa, 4.3% in treating Bulimia Nervosa, and 4.0% in treating Eating Disorder NOS. One potential reason that family therapy is not used is because family therapy may not be covered by insurance plans; thus, clinicians are not billing family therapy. It is also possible that clinicians are doing family therapy but only billing as individual therapy to receive compensation from the insurance agency. Additionally, clinicians may not feel comfortable providing family therapy and therefore solely provide individual therapy.

The recidivism rate difference between family therapy and mixed therapy is an important benefit to family therapy because the use of a combined regimen of individual and family therapy has been recommended for the treatment of Anorexia Nervosa (O'Halloran & Weimer, 2005). However, according to these findings a mixed model of therapy was not only a more expensive method to treat Anorexia Nervosa, but individuals were more likely to recidivate when receiving mixed therapy. Perhaps the strength of using family therapy is the ability to address

family rules and patterns that sustain the eating disordered behaviors (Gillett et al., 2009). The systems theory perspective suggests it is possible that eating disordered behaviors are methods that individuals use to deal with troubles that they are experiencing in family relationships. It is also possible that family therapy creates a platform for the family to discuss problems outside of the therapy office, and that by doing individual therapy it denies the family the opportunity to discuss problems. It is also possible that those who did receive mixed therapy were more severe cases, which caused the therapist to need extra sessions to help the patient.

This study found that there were no differences in recidivism by eating disorder diagnosis, which is consistent with previous research that also found that recidivism rates for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS are similar (McFarlane, et al. 2008; Grilo, et al., 2007; Keel, et al., 2005). These findings suggest that no one eating disorder (Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS) is easier to overcome.

This study found that there were no differences in cost of treatment by eating disorder diagnosis. However, this finding may be due to a limitation of the sample. This sample did not include any information regarding hospitalizations or inpatient treatment for Anorexia Nervosa, Bulimia Nervosa, or Eating Disorder NOS. Zhao and Encinosa (2009) found that in the United States, \$271 million was spent on hospitalization costs to treat Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS in 2005 and 2006. Zhao and Encinosa also found that Anorexia Nervosa had the highest hospitalization rate out of all eating disorders. Even though the cost of outpatient therapy was similar across Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS, it is possible that there might be a difference in total cost of treatment when more variables are considered (i.e. therapy, hospitalization, inpatient treatment, etc).

This study also found that cost of the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS was higher on an average of \$437.34 when a secondary diagnosis was present. Interestingly, the type of secondary diagnosis (i.e. depression, anxiety, substance abuse) did not influence the total cost of treatment. Instead, the presence of any psychological secondary diagnosis was enough to significantly influence the cost of treatment. These findings are significant due to the high comorbidity rates eating disorders have with mood, anxiety, and substance abuse disorders (Baker et al., 2011; Toucette et al., 2011). For example, Castro-Fornieles et al. (2009) found that 34.7% of their sample was either addicted to a substance or used substances regularly. Adolescent girls with Anorexia Nervosa, Bulimia Nervosa, or Eating disorder NOS were more likely to have major depression or dysthymia or PTSD or anxiety issues than other adolescents without an eating disorder (Mitchell et al., 2012; Touchette et al., 2011). The treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS is complex, but additional diagnosis tends to make the treatment of the disorders more difficult and more costly.

Marriage and family therapists were the most likely profession to have recidivism in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS with medical doctors as the least likely to have their clients relapse. Interestingly, the profession with the least amount of talk therapy training had the lowest recidivism rate. Perhaps doctors' knowledge regarding the medical consequences of eating disorders, and the ability to clearly explain them, may be more important than knowing how to deal with negative thought patterns. It is also possible that doctors are prescribing medications to their clients that help with a comorbid condition such as anxiety or depression. Further, MFT's, who define themselves by the ability to provide family and relationship therapy, only did family therapy 5.8% of the time. Sociocontextual factors might

also be responsible for the family therapy's lack of use. Insurance agencies and training programs may not be familiar with the efficacy of family therapy. Further research is needed on the efficacy of family therapy.

Provider type did predict the total cost of therapy with there being significant differences between doctors and counselors, counselors and psychologists, and psychologists and MSW's. Interestingly, while provider type did predict the total cost of therapy, the degree of the therapist did not. Both degree and provider type are influencing factors for reimbursement so it is intriguing that there is something about the profession that strongly influences cost. However, provider type did not predict recidivism, degree of the therapist did. Therapists with only a Master's degree were more likely to recidivate regardless of profession. It is assumed that the extra few years of training, from a Master's degree to a PhD, or equivalent, may help reduce the likelihood of their clients recidivating.

The cost effectiveness of treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS results were mixed in this study. Modality of therapy significantly predicted both recidivism and total cost. This finding is consistent with many research studies that have found family therapy to be more effective, in terms of lower cost and lower recidivism percentage, than individual therapy (Smith & Cook, 2011; Lock et al., 2010; Lock et al., 2008). However, provider type and degree did not predict either cost or recidivism rates. Even though the results of this study cannot imply that there is a significant difference in cost, there are practical implications of the results. Averaging across gender of patient, provider type, degree, and modality of therapy medical doctors were consistently more expensive than all other professions, and counselors were the most cost effective. The pattern of cost effectiveness was consistent

across degree. Future research with equal sized groups of profession is needed to fully answer this question.

The findings of this study reveal that family therapy is the most cost effective modality of therapy in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Despite the effectiveness of family therapy, the six providers in this study highly favored individual therapy in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. The findings of this study suggest that there needs to be a greater emphasis in the use of family therapy in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS in outpatient settings.

Limitations

The results of this study should be considered with several limitations. First, results concerning doctors, nurses, and MFT's should be considered in the context of these groups having small sample sizes. As a result the standard error for doctors, nurses, and MFT's was large. It is important to replicate the results with a larger sample of doctors, nurses, and MFTs.

Second, due to the manner of data collection by Cigna, it was not possible to control for therapist's level of experience of each in treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. The data set does not differentiate first year therapists from seasoned therapists. Also, it was impossible to differentiate therapists who may have received special training for the treatment of individuals with an eating disorder from those therapists who treat few eating disordered clients. Therefore, it is possible that there are some professionals who treated Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS that did not have much expertise in this area that may skewed the findings.

Third, due to the descriptive nature of the data set this study was unable to explore any effects that genetics have on the onset and course of eating disorders. There is a growing body of

literature linking gene-environment interactions to the onset and development of eating disorders (Campbell, Mill, Uher, & Schmidt, 2011). The exploration of biological causes was beyond the capability of this data set.

Finally, this study only focused on those individuals who received outpatient care for Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Traditionally, the treatment of Anorexia Nervosa and Bulimia Nervosa is done in inpatient care due to the severity of the illnesses. In addition, this study was not able to assess the severity of the diagnosis of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorders. It is possible that those individuals who were treated in outpatient care had a less severe diagnosis that was treatable in an outpatient setting. The results of this study should only be applied to those who receive outpatient care and not to the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS in general.

Conclusion

The findings in this study suggest that modality of therapy is a significant component of treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS. Specifically, in the treatment of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS, family therapy was found to be the most effective mode of therapy, both in terms of having the lowest total cost of therapy and the lowest recidivism rates. Future studies should research how to best implement family therapy as the standard for the treatment of eating disorders. Further, this study found that having a secondary diagnosis, regardless of the type of diagnosis, significantly increased the cost of therapy. Future research should continue to explore the effectiveness of treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS using family therapy. Understanding the process of family therapy, and what makes it effective in treating Anorexia Nervosa, Bulimia

Nervosa, and Eating Disorder NOS would be valuable in the quest to be more cost effective, and produce more effective therapists.

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Table 1

Proportions that each profession used each modality of therapy.

	Individual Therapy		Family Therapy		Mixed Therapy	
	N	Proportion	N	Proportion	N	Proportion
Counselor	645	19.4%	34	18.2%	154	21.1%
MFT	238	7.2%	18	9.6%	54	7.4%
MSW	1219	36.6%	74	39.6%	260	35.6%
Psychologist	1139	34.2%	56	30.0%	246	33.7%
Nurse	53	1.6%	1	0.5%	8	1.1%
MD	33	1.0%	4	2.1%	9	1.2%

Note 1. MFT = Marriage and Family Therapist, MSW = Social Worker, MD = Doctor

Note 2. The numbers in this table do not total to the 4709 diagnosed individuals because either profession or treatment modality was missing for 460 individuals.

Table 2

Percentage of recidivism for profession treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS by modality of therapy, gender and profession.

	Female Individual Therapy	Female Family Therapy	Female Mixed Therapy	Male Individual Therapy	Male Family Therapy	Male Mixed Therapy
Anorexia Nervosa						
Counselor	32.4%	12.6%	29.6%	29.8%	11.3%	27.1%
MD	25.9%	9.5%	23.5%	23.7%	8.5%	21.4%
MFT	34.3%	13.6%	31.4%	31.6%	12.2%	28.8%
MSW	32.0%	12.4%	29.2%	29.4%	11.1%	26.7%
Nurse	30.3%	11.6%	27.6%	27.8%	10.4%	25.2%
Psychologist	31.2%	12.0%	28.4%	28.6%	10.7%	26.0%
Bulimia Nervosa						
Counselor	31.0%	11.9%	28.3%	28.5%	10.7%	25.9%
MD	24.7%	9.0%	22.3%	22.5%	8.0%	20.3%
MFT	32.9%	12.8%	30.0%	30.2%	11.5%	27.5%
MSW	30.6%	11.7%	27.9%	28.1%	10.5%	25.5%
Nurse	29.0%	10.9%	26.3%	26.5%	9.8%	24.0%
Psychologist	29.8%	11.3%	27.1%	27.3%	10.1%	24.8%
Eating Disorder NOS						
Counselor	31.0%	11.9%	28.3%	28.5%	10.7%	25.9%
MD	24.7%	9.0%	22.3%	22.5%	8.0%	20.3%
MFT	32.9%	12.8%	30.0%	30.2%	11.5%	27.5%
MSW	30.6%	11.7%	27.9%	28.1%	10.5%	25.5%
Nurse	29.0%	10.9%	26.3%	26.5%	9.8%	24.0%
Psychologist	29.8%	11.3%	27.1%	27.3%	10.1%	24.8%

Note. MFT = Marriage and Family Therapist, MSW = Social Worker, MD = Doctor

Table 3

Percentage of recidivism by provider type, averaged across diagnosis, eating disorder diagnosis, and modality of therapy.

	Counselor	MD	MFT	MSW	Nurse	Psychologist
Did not recidivate	67.2%	73.9%	65.81%	68.1%	69.4%	67.8%
Did recidivate	32.8%	26.1%	34.2%	31.9%	30.7%	32.2%

Note. MFT = Marriage and Family Therapist, MSW = Social Worker, MD = Doctor

Table 4

Cost-effectiveness of treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder

NOS by modality of therapy, gender and profession.

	Female Individual Therapy	Female Family Therapy	Female Mixed Therapy	Male Individual Therapy	Male Family Therapy	Male Mixed Therapy
Anorexia Nervosa						
Counselor	857.97	450.63	1346.10	648.41	280.38	1131.67
MD	1367.43	917.94	1823.27	1159.21	748.58	1611.78
MFT	992.44	557.95	1484.30	777.25	384.81	1264.10
MSW	929.80	513.34	1414.85	719.53	342.75	1199.84
Nurse	976.24	559.43	1454.50	767.76	389.75	1241.59
Psychologist	1064.48	631.41	1543.82	852.89	460.21	1327.76
Bulimia Nervosa						
Counselor	734.80	350.44	1220.56	529.90	182.45	1010.85
MD	1245.54	818.53	1699.83	1041.77	651.16	1492.85
MFT	866.10	456.11	1355.52	655.74	285.44	1140.22
MSW	806.29	412.99	1289.04	600.68	244.66	1078.76
Nurse	853.84	459.65	1329.94	649.94	292.13	1121.68
Psychologist	940.34	530.77	1417.51	733.43	361.84	1206.20
Eating Disorder NOS						
Counselor	620.30	253.79	1107.08	418.25	87.16	900.15
MD	1135.24	723.85	1590.55	934.04	557.60	1386.06
MFT	749.61	358.47	1240.09	542.20	189.26	1027.68
MSW	691.96	316.42	1175.73	489.18	149.43	968.22
Nurse	740.80	363.71	1217.93	539.66	197.46	1012.34
Psychologist	826.32	434.36	1304.53	622.22	266.75	1095.97

Note. MFT = Marriage and Family Therapist, MSW = Social Worker, MD = Doctor

Table 5

Cost-effectiveness of Master's level clinicians treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS by modality of therapy, gender and profession.

	Female Individual Therapy	Female Family Therapy	Female Mixed Therapy	Male Individual Therapy	Male Family Therapy	Male Mixed Therapy
Anorexia Nervosa						
Counselor	809.63	436.20	1330.11	620.10	282.46	1134.66
MD	1326.67	908.43	1813.14	1137.35	755.09	1619.65
MFT	908.37	513.75	1433.80	714.21	357.63	1233.50
MSW	866.10	485.72	1383.72	676.09	331.75	1187.91
Nurse	961.23	573.00	1470.63	771.81	419.38	1275.81
Psychologist	988.56	593.12	1500.52	797.35	438.61	1303.79
Bulimia Nervosa						
Counselor	704.55	351.10	1221.94	519.12	199.37	1030.69
MD	1221.90	823.68	1706.20	1036.55	672.13	1516.78
MFT	800.76	427.33	1322.98	610.82	273.38	1127.04
MSW	760.78	400.51	1275.37	574.86	248.55	1083.78
Nurse	856.28	488.01	1362.86	670.91	336.32	1172.21
Psychologist	882.62	507.63	1391.70	695.52	355.12	1199.20
Eating Disorder NOS						
Counselor	582.66	248.06	1101.14	400.16	97.72	912.75
MD	1104.55	722.76	1589.91	921.83	572.37	1403.06
MFT	676.88	323.29	1200.23	489.98	170.84	1007.26
MSW	639.12	297.58	1154.81	456.12	147.00	966.06
Nurse	735.87	385.68	1243.54	553.35	235.31	1055.65
Psychologist	761.37	404.90	1271.54	577.16	253.74	1081.86

Note. MFT = Marriage and Family Therapist, MSW = Social Worker, MD = Doctor

Table 6

Cost-effectiveness of PhD level clinicians treating Anorexia Nervosa, Bulimia Nervosa, and Eating Disorder NOS by modality of therapy, gender and profession.

	Female Individual Therapy	Female Family Therapy	Female Mixed Therapy	Male Individual Therapy	Male Family Therapy	Male Mixed Therapy
Anorexia Nervosa						
Counselor	829.88	471.40	1334.64	647.09	320.57	1146.23
MD	1393.02	959.53	1887.49	1199.76	803.88	1689.21
MFT	925.95	547.56	1435.75	738.57	394.54	1242.51
MSW	876.71	517.67	1375.21	695.32	367.48	1188.52
Nurse	961.54	601.36	1450.38	782.26	452.12	1266.34
Psychologist	1012.82	629.10	1514.96	826.31	476.55	1322.99
Bulimia Nervosa						
Counselor	725.49	387.11	1225.39	547.37	238.39	1041.88
MD	1280.66	871.55	1770.72	1092.54	718.36	1577.83
MFT	818.54	461.81	1323.27	636.06	311.12	1135.17
MSW	773.01	433.70	1266.91	596.19	285.54	1085.03
Nurse	858.86	517.87	1343.55	683.99	370.52	1164.15
Psychologist	905.65	543.52	1403.05	723.98	393.21	1216.15
Eating Disorder NOS						
Counselor	608.95	286.27	1109.92	433.33	138.66	928.83
MD	1163.05	770.22	1654.24	977.49	618.19	1463.83
MFT	700.17	360.12	1206.02	520.30	210.63	1020.45
MSW	657.71	333.42	1152.65	483.31	186.31	973.10
Nurse	745.46	418.41	1231.14	572.86	272.02	1053.93
Psychologist	788.58	442.44	1287.08	609.44	293.26	1102.63

Note. MFT = Marriage and Family Therapist, MSW = Social Worker, MD = Doctor