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Cost-Effectiveness of Treating Oppositional Defiant Disorder: A Comparison by
Treatment Modality and Mental Health Provider Type

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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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July 2014

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ABSTRACT

Cost-Effectiveness of Treating Oppositional Defiant Disorder: A Comparison by Treatment Modality and Mental Health Provider Type

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Master of Science

This study examined the treatment outcomes for Oppositional Defiant Disorder by provider license type and therapy modality. Administrative data from Cigna Insurance Company for 9,904 ODD cases were analyzed to determine the cost, number of sessions, dropout rates, and recidivism rates for treatment of ODD. Descriptive statistics indicate that the mean cost of treatment for ODD across all professions is \$389.83. Analyses revealed significant differences in total cost by profession, as well as cost per session for different license types with counselors providing therapy for the lowest average total cost, followed by MFTs, MSWs, Psychologists and then MDs. Chi square analyses revealed that in the treatment of Oppositional Defiant Disorder, MFTs have the lowest drop-out rate, followed by MSWs, then Counselors and Psychologists together, with MDs having the highest proportion of client drop-out. Results on re-admission rates rank MFTs with the lowest proportion of clients returning to care, followed by MDs, Counselors, MSWs, with Psychologists having the highest re-admission rate. When comparing outcomes by therapy modality, results of ANOVA tests indicate that family therapy is most cost-effective followed by individual, then mixed therapy modalities. Family therapy also had significantly fewer sessions than the other modalities.

Keywords: oppositional defiant disorder, cost-effectiveness, family therapy, mental health

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to my advisor, Dr. D. Russell Crane. I recognize the privilege it is to work with a distinguished professor with such extensive knowledge and experience in the field. Your encouragement these past two years has helped me see my own capabilities and to know I can achieve whatever I set my mind to. I am grateful for the opportunity to learn from you teaching, researching and writing skills as well as gain an abundance of real world experience. Thank you for the care and concern you have shown my family these last several months. It demonstrates to me who you are and what truly matters in your eyes. Thank you.

I am grateful to my wonderful husband Kevin who lends support in all I do. I love being married to you. Thanks for your patience with me as I seek to apply the principles I needed to learn throughout this program, areas you have already mastered.

Lastly, I am blessed with a truly loving and compassionate mother. You are an amazing example of the kind of wife and mom I hope to be. Your devotion to our family sustains and motivates me in my desire to bless the lives of others and become the person you believe me to be. I love you.

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Introduction

Childhood behavioral disorders place considerable strain on the individual, family, and society (Charles, 2011). These childhood disorders are becoming increasingly recognized as areas of major public health concern, with numerous studies reporting their alarmingly high prevalence in the child population (Maughan, 2004; Loeber, 2000). One of the most common of these childhood psychiatric disorders is Oppositional Defiant Disorder (ODD). The Diagnostic and Statistical Manual of Mental Disorders (The American Psychiatric Association, 2000) defines ODD as a pattern of negativistic, hostile and deviant behavior that is severe enough to impair the child's functioning for at least six months and does not occur solely during an episode of psychotic or mood disorder. These symptoms regularly bring about significant impairment in social, family, or academic functioning (Loeber, 2000).

Studies on the prevalence of this disorder estimate the occurrence to be between 2% and 16% depending on the population, ascertainment methods, and diagnostic measures used (Loeber, Burke, Lahey, Winters, & Zera, 2000). Lifetime prevalence of ODD is estimated to be 10.2% (males 11.2%; females 9.2%) (Nock, 2007). Studies demonstrate that the presence of ODD represents lifelong mental health disorders in 50% of children affected by the disorder (Boylan, 2007). This childhood illness is of great interest to the mental health professions not only because of the disruptions it causes in families, schools, and communities, but also because it is highly predictive of later delinquency, criminality, and substance abuse in later adolescence and adulthood (Cohen, 1998).

Behavior problems among children and youths are associated with substantial emotional and financial burdens to individuals, families, schools, agencies, and society at large (Farris, 2011). The greatest expenses fall on the families themselves, with yet additional costs on the health, social services, and welfare systems. One study by Foster (2005) found that public costs

for youth with ODD or CD were 10 times those without conduct problems. Those costs stem from the youths' involvement in a variety of child-serving sectors, such as juvenile justice, child welfare, special education, and mental health services (Foster, 2005). Another area of interest is determining the future risk profile of this disorder. One estimate (Cohen, 1998) is that 1.7–2.3 million dollars can be saved for successful intervention for each high-risk youth, evading a lifetime of negative impacts from disordered behavior.

Despite the increasing prevalence and significant costs of behavioral disorders, very little research has assessed cost effectiveness of family interventions for this population. To date, little research has been done on recidivism or dropout rates for children and adolescents with oppositional defiant disorder. There is a need for additional research to help understand variables that may influence a client returning for additional treatment. Effective treatments are critical to help minimize these costs and to help provide adequate support to all who are impacted by the disorder. The purpose of this study will be to evaluate the cost effectiveness and treatment outcomes by professional license type as well as a family therapy modality in comparison to individual therapy. It looks specifically at marriage and family therapists in their providing cost-effective treatment.

Review of Literature

Diagnosis by Age

ODD is described in the DSM-IV (APA, 2000) as having an onset typically before eight years of age. The non-diagnosed child likewise starts to display oppositional behavior at an early age, however this tends to diminish as they mature (Mireault, 2008). It is not unusual to view young children in public or at home engaging in misbehavior such as whining or not complying with a parent's command. While some children might demonstrate a typical development through tantrums and disobedience to authority figures, other children display a more severe presentation

of oppositional and defiant symptoms. When these behavior problems persist over time they can ultimately become severe enough to warrant clinical attention (Borrego, 2010).

Some young children with ODD “grow out of it,” yet a substantial proportion do not. Many children continue to have ODD as a solo diagnosis, others later develop anxiety or depression as a comorbid disorder (Lavigne, 2001). Preschool children with ODD are likely to continue to exhibit the disorder, with increasing comorbidity with attention deficit hyperactivity disorder, anxiety, or mood disorders (Lavigne, 2001). ODD in early childhood particularly predicts early-onset conduct disorder (Burke, 2010) and with that it is noted that youth showing the childhood-onset subtype of CD may have had ODD during early childhood (Rowe, 2010). This is important because early-onset antisocial behavior is linked to more serious maladaptive social and health functioning than later-onset antisocial behavior (Moffitt, 2006; Odgers et al., 2007). As such, the onset of ODD represents an important window of opportunity for prevention efforts (Greene, 1999). Add to that the fact that externalizing behavior has been found to show considerable stability throughout childhood and adolescence (Webster-Stratton & Taylor, 2001; Farris, 2011) and it becomes even more important that cost-effective treatment methods be ascertained.

Developmental Sequence of Psychopathology

Children with oppositional and conduct problems comprise a diverse group who engage in a broad array of problem behaviors ranging from relatively minor defiance and temper tantrums to more serious violations such as physical aggression, destructiveness, and stealing (Cunningham, 2010). ODD is generally considered a milder disorder than other more severe behavior disorders such as CD or Adult Personality Disorder (APD), but it is far from benign (Frick, 2012). It has been argued that ODD forms an early stage in CD development and constitutes a developmental antecedent to CD in “a significant proportion of cases” (American Psychiatric Association, 2013).

Studies suggest that ODD and CD are different disorders but are developmentally related (Greene, 1999). Although longitudinal studies have consistently found that ODD symptoms are associated with increases in CD symptoms over time, it is clear that not all children with ODD will go on to develop CD (Loeber, Burke, & Pardini, 2009). However, according to researchers, if left untreated, about 52% of children with ODD will continue to meet the diagnostic criteria up to three years later and about half of those will progress into CD.

Quality of Life for the Family and Impact on Society

By definition, childhood ODD is a function of relationships of children and adult figures (American Psychiatric Association, 2000). Various studies report that ODD poses a significant impediment to adaptive adult-child and child-peer interactions (Greene, 1999). Children with these externalizing behavior problems place considerable stress on the parent-child relationship (Buschbacher, Fox, & Clarke, 2004). It is not surprising, therefore, that ODD is significantly associated with parent-child relationship conflict (Kashdan, 2004). With this it is easy to recognize the potential distress this behavior disorder has on families as well as society.

Consistent with previous literature, one study by Evans (2009) affirms that defiance and delinquency are very wearing on parents. Child oppositional and defiant behavior also makes one of the greatest contributions to parent stress (Angold et al., 1998; Evans, 2009; Barkley et al., 1992; Pfiffner et al., 2005; Seipp & Johnston, 2005). It has been shown to not only have an effect on parenting behaviors and perceived family environment, but the results of this research indicate that oppositional, defiant, and delinquent behaviors are some of the most salient stressors for parents of youth with ODD (Evans, 2009).

This diagnosis is particularly detrimental to parental wellbeing (Burke, Pardini, & Loeber, in press). In one study (Bussing, 2003), a diagnosis of ODD emerged as the most significant predictor of caregiver strain. Several other studies have established that parents of children with

externalizing disorders show significantly elevated levels of caregiver distress related to their child's disorder (Kashdan, 2004). Parental depression also has been linked to disruptive behavior in children, perhaps via common familial vulnerabilities or due to the difficulty of raising children with a disruptive behavior disorder (Pffiffer, 2005; Burke, 2000). A common theme for oppositional children is a lack of parental positive emotions (Fraire, 2013). This suggests that ODD disrupts parents' lives in many ways. Although a correlation does not imply direct causation, these results are consistent with emerging awareness of the negative relationship of child problem behaviors and parental mental health. Due to the negative effects on children who exhibit these symptoms early in life and the impact it has on relationships in the family, it is important to address these symptoms to prevent future behavioral and social problems (Borrego, 2010).

Therapeutic Interventions

Over the last several years, interest in the economic analysis of interventions and services to prevent or treat behavioral problems among children has grown (Foster, 2011; Fawcett, 2012). Treatment for ODD and CD is most often not specific to either disorder, but to conduct problems or antisocial behavior in general. There are various empirically supported treatments (ESTs) that can help to reduce symptoms of childhood behavioral disorders. Most methods of treatment for these problems fall under either an individual or family modality and both forms have had successful treatment outcomes (Crane & Payne, 2011; Rudi, 2013). The treatment strategies that have been found to be most effective employ cognitive behavioral strategies while targeting multiple levels, most commonly child and parent, but also including family, peers, and school (Loeber, 2009).

Psychological interventions specifically for the family such as parenting skills training and behavioral therapy for the child and the family have been found to reduce conflict behaviors in children with ODD (Kelsberg, 2006). Therapy can provide a treatment or preventative intervention

for children with behavioral problems by supporting parents in the acquisition of strategies to reduce negative behaviors and promote positive behaviors (Charles, 2010). There is evidence from randomized trials that suggests that parent management training (PMT) strategies are also effective in the treatment of disruptive behavior disorders (Burke 2002).

Individual Therapy

The *Incredible Years* (Webster-Stratton, 2000) is one specific treatment program that is designed to reduce children's aggression and behavior problems as well as increase social competence at home and at school (Eyberg, 2008). Parent-child interaction therapy is another promising intervention for conduct problems in children, with the main focus on improving child-parent relationships and providing parents with skills to manage disruptive behavior (Nixon, 2003). A critical element of behavioral parent training, which derives from Patterson's (1976) seminal work, is helping parents develop skills for increasing the frequency of children's prosocial behavior (through attending, reinforcement and engaging in child-directed interactions) and reducing the frequency of antisocial behavior (through ignoring, time-out, contingency contracts, and engaging in parent-directed interactions).

Family Therapy

A few well-studied family therapy related treatment approaches have been found to be effective (Henggeler & Sheidow, 2012) Much of the conflict and strain that occurs within families is concentrated within a parent-child interaction (Evans, 2009), meaning that targeting this relationship can help the reduction of symptoms of behavioral problems. Three family-based intervention models with the greatest research evidence from meta-analytic, qualitative, and individual clinical studies are Positive Parenting Program (Triple P), Functional Family Therapy (FFT) and Multisystemic Therapy (Eyberg, 2008; Timmons-Mitchell, 2006).

Triple P is a parent-training program for disruptive behavior and is a behavioral family intervention delivered by mental health providers that targets family stressors such as parent depression or marital problems as well as disruptive child behavior. In order to target underlying processes, the treatment includes components that focus on emotion dysregulation, information processing deficits and specific parenting behaviors that influence the parent/child interaction.

Functional family therapy is a method of family therapy for adolescent conduct problems (Sexton & Alexander, 2000). It involves distinct stages of engagement, where the emphasis is on forming a therapeutic alliance with family members; behavior change, where the focus is on facilitating competent family problem solving; and generalization, where families learn to use new skills in a range of situations and to deal with setbacks. The phases are designed not only to meet immediate, externally imposed outcome criteria but also to help recalibrate family interaction patterns so that more positive family relations will continue beyond treatment.

Multi-systemic therapy is an approach to the treatment of adolescent behavior disorders which combines intensive family therapy with individual skills training for the adolescent, and intervention in the wider school and interagency network (Henggeler & Lee, 2003). Multi-systemic therapy involves helping adolescents, families and involved professionals understand how adolescent conduct problems are maintained by recursive sequences of interaction within the youth's family and social network. This is done by highlighting individual and family strengths in order to develop and implement action plans and new skills to disrupt these problem-maintaining patterns. Goals also include supporting families to follow through on action plans, helping families use new insights and skills to handle new problem situations, and monitoring progress in a systematic way.

In a meta-analysis of eight family-based treatment studies of adolescent behavioral disorders, Woolfenden, et al. (2002) found that family-based treatments including functional

family therapy, and multisystemic therapy were more effective than other types of treatment.

Family-based treatments significantly reduced time spent in institutions, the risk of re-arrest, and recidivism one to three years following treatment (Carr, 2009).

Inclusion of Family Component

Considering the family's important role in the initiation and escalation of adolescent problem behaviors, family-based interventions have been of great interest to treatment researchers and community practitioners (Sexton, 2011). Several reviews have found family-based systemic treatments to be model approaches for youth with conduct problems (Henggeler & Sheidow, 2002). Family-focused therapy addresses several aspects of adolescents' environments including individual internal processes, family relations, caregiver functioning, peer relations, and the school environment among others (Crane, 2005).

Previous studies have shown that family therapy is effective at reducing symptoms of ODD (Rudi, 2013; Carr, 2009). Unfortunately, little research has been done on treatment outcomes and cost-effectiveness of treating this behavioral disorder, to reduce health care costs for ODD patients and providers. With research demonstrating the significant amount of child's noncompliant, inappropriate behavior being shaped and maintained through maladaptive patterns of family interaction (Carr, 2009), treating the problem as a family modality is likely to be more effective than other forms of treatment. Oppositional and defiant behaviors are a family problem giving credence to argument that a family solution is required (Fulkerson, 2005).

Risk Factors Influencing Treatment

Issues in Family Process. According to the DSM-IV, a diagnosis should only be applied if the symptoms are the result of an underlying dysfunction within the individual and not a reaction to the immediate social context or a problematic environment (2000). The purpose is then to include contextual factors into the definition of disorders as it is often difficult to distinguish

between behaviors caused by negative environments that do not involve internal dysfunction and those that originate from negative environments but do involve internal dysfunction. What is known is that there are protective factors related to a positive family environment that may lower the prevalence of disruptive disorders (Canino, 2010).

In order to understand children, it is important to understand the environment in which they are embedded. While there is still a great deal to be understood about the role of the family in treatment, research must aim to understand the specific links to family involvement, risk factors influencing treatment. There is considerable evidence showing that disruptive disorders are more common among dysfunctional families and in environments with high levels of chronic adversity (Rey, 2000). Similarly, childhood conduct problems are most often correlated with certain family process variables such as family conflict and punitive or ineffective parenting (Fraire, 2013). Families exemplified by either overly rigid or overly loose boundaries are also associated with maladaptive child behavior (Lindahl, 1998). Disconnection and inconsistency within family relationships likewise appear to be strongly associated with conduct problems in children (Rey, 2000).

To make the disorder even more difficult to treat, children with externalizing problems often exhibit poor social skills frequently leading to conflicted peer relationships (Burke, 2000). Children with ODD tend to have more pervasive social problems with parents and peers in comparison to children with other psychiatric diagnoses, including ADHD and CD (Borrego, 2010). Similarly, longitudinal research suggests that these behaviors may also lead to a deterioration of the parent–child relationship over time, which in turn escalates the child’s problem behavior (Pardini, 2010).

A poor family environment is specifically associated with conduct disorder, oppositional defiant disorder and lower functioning (Rey, 2000). Affected adolescents often have a difficult

home life, with parents who may have very poor social support and coping skills. Significant financial barriers to counseling and other resources are also common in many of these families. The findings lend support to the view that interventions that target parenting in the early years of life and support families at risk may prevent the development of oppositional defiant disorder and improve psychosocial functioning (Rey, 1999).

Diagnostic Conundrum

ODD is often considered in conjunction with Conduct Disorder (August et al., 1999), which limits conclusions that can be drawn about "pure" ODD (Drabick, 2007). Because DSM-IV precludes a diagnosis of ODD in children who meet criteria for CD, the figures of prevalence inevitably underestimate levels of clinically significant oppositional behaviors in the population (Maughan, 2004). Since the introduction of the separate diagnosis of ODD in DSM III there have been continuing debates over the nature of the associations between the negativistic, disobedient and hostile behavior patterns indexed by ODD and the rule violations and physical aggression more characteristic of CD (Maughan, 2004). Some of the debate has centered around whether ODD is a developmental precursor to CD, a milder version of essentially the same disorder, or if it can be identified as a somewhat different clinical construct.

The overlap between the two diagnoses is a significant risk factor influencing effective treatment outcomes, often preventing youth from receiving the appropriate treatment. The oppositional and argumentative behaviors that form the criteria for this disorder are commonly displayed in normally developing children, especially at certain developmental periods, such as early in preschool years (i.e., the terrible twos) and in adolescence (Frick, 2012). Because ODD and the behaviors that form the criteria for this disorder are frequently comorbid with a host of other disorders (Rowe et al. 2002), it is not clear if ODD is simply a nonspecific marker for problems in adjustment or if it is an indicator of a meaningful and unique clinical construct.

Cost of Treatment

There are numerous studies that give evidence to individual and family interventions that can reduce ODD symptoms, but economic evaluations of their cost-effectiveness are rarely undertaken (Charles, 2011). Perhaps because of the tendency for other disorders to appear later in development, or perhaps because many studies have combined ODD and CD (Loeber, Burke, 2000), few studies provide cost-effectiveness evaluations on ODD specific treatment outcomes. One specific issue concerns the extent to which symptoms of ODD predict future developmental outcomes, including crime, mental health disorders, substance use, relationship and parenthood difficulties, and educational achievement and related outcomes (Fergusson, 2010). The high costs of behavior problems, and the fact that a small proportion of children and youth account for a disproportionate share of crime and delinquency, suggest that society should consider devoting considerable resources to targeted prevention (Foster, 2011). Given that evidence of the cost-effectiveness of treatment of ODD is essential for decision makers and a paucity of research in this field (Charles, 2010), it is important to consider the financial and relational costs associated with this disorder.

Research Questions

There is a need for additional research to help understand variables influencing treatment outcomes such as recidivism and dropout rates for adolescents diagnosed with oppositional defiant disorder. Effective treatments are critical to help minimize treatment costs and to help provide adequate support to all who are impacted by the disorder. The following research questions will help to fill this gap in the literature:

1. What are the total number of sessions and total cost in the first Episode of Care for oppositional defiant disorder by treatment provider?

2. Which professions (counselors, medical doctors, marriage family therapists, social workers, nurses, psychologists) have the lowest dropout and re-admission rates for treating oppositional defiant disorder?
3. What are the differences in cost and number of sessions between individual, family, and mixed (including both individual and family) therapy modalities for oppositional defiant disorder treatment?
4. What are the differences in total cost of treatment by age and gender of child for oppositional defiant disorder?

Method

Design

The current study is a retrospective study using administrative data from Cigna, a leading health care insurance manager in the United States. The use of administrative data for retrospective statistical analysis is allowed by the Health Insurance Portability and Accountability Act of 1996 (HIPAA). No unique subscriber or provider information is available. The data set used in the current study is a subset drawn from a larger data set. To create the data set for the present study, the sample included males and females in the age appropriate range. The data set was filtered further to include only participants diagnosed with oppositional defiant disorder as a primary diagnosis. For a full explanation of the original data set and data cleaning procedures, see Crane and Payne (2011).

Sample

Participants ($n = 9,904$) included individuals who had been given the sole diagnosis of ODD (DSM IV 313.81) and who received treatment with individual and/or family therapy from Cigna during 2001-2006. Participants were seen in outpatient settings and were aged ranging from 3 to 16 ($M = 11.1$, $SD = 3.7$). Current literature as well as the DSM V indicate that ODD is a

childhood disorder. Out of the 10,956 claims of ODD as a primary diagnosis, 1,052 were for clients who fell outside the appropriate age range of 3-16 to meet diagnostic criteria. The dataset was filtered to reflect this definition and those outside it were dropped from further analysis. There were only 47 reported cases of ODD treated by nurses (less than one percent) so they were not considered in further analyses. Children (ages 3-11) made up 48.4% of participants, with adolescents (ages 12-16) comprising 51.6%. Sixty-five percent (n=6,449) of participants diagnosed with ODD were male and 35% (n=3449) were female. Participants represented all regions of the United States except Hawaii. No additional demographic data were available for consideration.

Providers

This study includes the following five providers: Marriage and Family Therapists (MFTs), Medical Doctors (MD), Professional Counselors (LPC), Psychologists, and Social Workers (MSWs). These providers were studied because they are nationally recognized as independently licensed health care practitioners (Crane & Payne, 2011). When a provider had multiple licenses, provider type was determined by the first license identified as “primary.” Unlike other studies, nurses were not included in the present analyses since they provided care in only forty-seven cases.

Definitions and Procedure

Episode of care. Episodes of Care (EoC) were defined by Cigna as a series of services for the same patient. An EoC ended after an individual had no psychotherapy claims for 90 days. The number of sessions in the first EoC per patient in the data set ranged from 1 to 119 (M = 7.59, SD = 8.47), and more than 76% of all patients completed therapy in a single EoC. Therefore, the first EoC is the focus of this study.

Recidivism. For the purposes of this study, recidivism is defined as a patient returning to therapy (after at least a 90 day break) for an additional episode of care with the same provider type (Crane & Payne, 2011).

Cost Effectiveness. Cost effectiveness is defined as the per-session cost of treatment and the number of units required for successful treatment. The formula for cost-effectiveness is: Estimated cost effectiveness = 1st EoC average cost + (1st EoC average cost * readmission rate) (Crane, 2008; Crane & Payne, 2011). This formula was developed to compare different types of therapy treatments and professions based on treatment cost and readmission rate. Participants who dropped out of treatment were eliminated from cost-effectiveness analysis to prevent artificially low costs and readmission rate. A cost-effective treatment is not necessarily the least expensive, but the one that may provide the most value for the money (Crane, 2012).

Total cost. Total cost is defined as the total dollar amount paid by Cigna for all psychotherapy, individual and family services during the first EoC, for the same patient.

Drop out. Drop out is defined as a participant attending only one session of therapy (Johansson & Eklund, 2006).

Family therapy. Family therapy is identified in this study by Current Procedural Terminology (CPT) code 90847, “Family psychotherapy (conjoint psychotherapy) (with patient present)” (American Medical Association, 2006, p. 278).

Individual therapy. Individual therapy in this study is identified by CPT code 90806, “an insight oriented, behavior modifying, and/or supportive treatment in an office or outpatient facility, approximately 25 to 50 minutes face-to-face with the patient” (American Medical Association, 2006, p. 277).

Mixed therapy. Mixed therapy is defined as an episode of care including sessions of both family therapy and individual therapy. This definition does not address the range of possible

individual to family therapy ratios. For example, an episode of care could be classified as “mixed” if it consisted of 20 individual sessions and one family therapy session, or if it consisted of 20 family therapy sessions and one individual session. Though not an ideal definition, this modality is included to represent those treatments that are not exclusively family therapy or exclusively individual therapy.

Results

The first research questions asked, “What are the total number of sessions and total cost in the first Episode of Care for oppositional defiant disorder by treatment provider?” Descriptive statistics indicate that the mean cost of treatment for ODD across all sessions for all professions is \$389.83 ($SD = \488.08). Total number of sessions for ODD treatment across all professions ranged from 1 to 119 ($M = 7.59, SD = 8.47$).

Insert Table 1 about here

The next part of the question looks at cost and number of sessions by treatment provider type. Table 1 lists the results of this statistical analysis and ranks providers from lowest cost per session to highest as follows: Counselors, MFTs, MSWs, Psychologists and MD. Log transformation indicated a session mean of 1.51 ($SD=0.98$). Table 1 also contains a summary of number of sessions and cost in the first Episode of Care by profession for ODD.

Counselors had a mean cost of treatment of 332.87 ($SD=356.99$) and average total sessions of 7.32 ($SD=7.65$).

MFTs had a mean cost of treatment of \$339.53 ($SD= 385.38$). Average total session for MFTs who treated ODD was 7.49 with a standard deviation of 7.93. The mean cost of treatment for MSWs was \$354.72 with a standard deviation of \$422.25. Number of sessions for MSWs who treated ODD averaged 7.58 with a standard deviation of 8.05). Psychologists mean cost of treatment was \$424.31 ($SD= \522.36). Session mean for psychologists treating ODD was 7.62

($SD=8.91$). The average cost for MDs was \$450.25 with a standard deviation of \$627.92. Sessions for MDs treating ODD averaged 6.22 ($SD= 7.69$). As the results reveal, ranking of cost by profession type from lowest cost per session to highest is as follows: Counselors, MFTs, MSWs, Psychologists and MDs.

Insert Table 2 about here

Research question number two asked, "Which professions (Counselors, MDs, MFTs, MSWs, Nurses, Psychologists) have the lowest drop-out and re-admission rates for oppositional defiant disorder?" In order to determine if differences exist Chi square analyses were used. The results from these tests in Table 2 demonstrate that overall, in the treatment of Oppositional Defiant Disorder, MFTs have the lowest drop-out rate, followed by MSWs, then Counselors and Psychologists together, with MDs having the highest proportion of client drop-out. Results on re-admission rates rank MFTs with the lowest proportion of clients returning to care, followed by MDs, Counselors, MSWs, with Psychologists having the highest re-admission rate.

Insert Table 3 about here

Research question number three asked, "What are the differences in cost and number of sessions between individual, family, and mixed (including both individual and family) therapy modalities for oppositional defiant disorder treatment?" As can be seen in Table 3, the differences are statistically significant for both variables of cost and number of sessions by modality. Results of ANOVA tests indicate that family therapy is most cost-effective followed by individual, then mixed [$F(1, 9901) = 455.05, p < 0.001$]. Differences in number of sessions by modality were likewise significant and indicated individual sessions to be most prevalent, followed by mixed, then family modality [$F(1, 9901) = 989.81, p < 0.001$].

The fourth research question asked, "What are the differences in total cost of treatment by age and gender?" A linear regression was conducted to determine differences in the dependent

variable of total cost by the 2-group independent variable of age group (children 3-11, adolescents 12-16) Results indicated no statistical difference by age, either as a continuous variable or grouped as child and adolescent $p = 0.062$ and $p = 0.085$ respectively. Total average cost of treatment for children (ages 3-11) was \$398.56 (*SD* \$504.65) while the cost average for adolescents (ages 12-16) was \$381.65 (*SD* \$471.92). Analysis cost by gender also revealed no significant difference, $p = 0.57$. Treatment for males was \$391.89 (*SD* \$491.49) and for females \$386.03 (*SD* \$481.95), roughly \$5 more costly in the treatment of boys as compared to girls, but again, not statistically significantly different.

Discussion

The first research question assessed the differences in number of sessions and total cost in the first EoC for ODD across all professions and by treatment provider. Differences in treatment length between license types were all significant, with MDs displaying the fewest number of sessions, followed by Counselors, MFTs, MSWs, and Psychologists.

Comparing the professions on the average total cost of treatment in the first EoC demonstrates that they are significantly different. The results suggest that professional counselors and marriage and family therapists provided therapy for the lowest average cost and that medical doctors have the highest average cost in the treatment of ODD in children and adolescents. These results display similarities with previous studies exploring treatment outcomes by professional license type (Fawcett, 2012; Crane & Payne, 2011), demonstrating that on average, professional counselors, marriage and family therapists, social workers and psychologists are more cost effective when treating ODD than medical doctors. This suggests that the treatment with these practitioners costs less when considering the total length of treatment and the likelihood of returning for additional episodes of care.

The second research questions assessed which professions have the lowest dropout and re-admission rates for oppositional defiant disorder. There was a significant difference in dropout rates, with dropout rates of 12.4% for MFTs, 14.8% for MSWs, 16.6% for both Professional Counselors and Psychologists, and 23% for MDs. It is interesting to note that while MDs have the highest dropout rates, they have one of the lowest re-admission rates. With such few number of cases, this could mean that clients seeking help in the treatment of ODD are likely referred to other helping professions, which would explain the low re-admission rate. It is also important to note the distinction between biomedical care (the type provided by MDs with medication, etc.) and talk therapy (given by counselors, MFTs, MSWs, and Psychologists). One explanation of the higher dropout rate of medical doctors could be related to their inclination toward a medical model treatment approach that views mental illness as a disturbance of the brain which focuses on identifying the diagnosis and then prescribing a treatment to fix the problem (McCulloch, Rylie, Williamson, & St. John, 2005; Beecher, 2009). It is likely that this approach would result in fewer overall sessions and more cases where the client only presents for one single consultation session. It could also be explained by the fact that persons seeking treatment often visit their primary care provider first, not being aware of the required treatment and resources available so they are quickly referred out.

MFTs are listed with the lowest dropout rate along with the lowest re-admission rate, demonstrating that in comparison to the other four helping professions, clients seeing MFTs for the treatment of ODD more often tend to stay in treatment and complete treatment without returning to care. One possible explanation is that cases with a diagnosis of ODD, requiring a significant number of sessions, benefit from the treatment given by MFTs seeing the family as a system.

The third research question assessed differences in cost and number of sessions by therapy modality, including individual, family and mixed therapy. Differences in treatment length between modality were all significant. Family therapy had significantly fewer sessions than individual therapy, which in turn had fewer sessions than did mixed therapy. Mixed therapy had significantly more sessions and was demonstrated to be less cost-effective than either individual or family therapy. It is not known what leads to these differences. It is possible that cases that required mixed therapy were more severe, therefore requiring more treatment sessions. Mixed therapy is also associated with greater overall treatment costs, however, these costs are mostly associated with number of sessions. It is likely there is additional benefits for clients staying in treatment longer in order to receive an adequate dose of therapy and obtain successful treatment outcomes (Baldwin, Berkeljon, Atkins, Olsen, Nielson, 2009).

Individual mode therapy had the highest average number of sessions. Clients stayed in treatment longer than when using family mode and mixed mode approach combined. There is research which demonstrates that as the number of sessions increase, there is measurable decrease in negative behaviors (Cotton-Cornelius, 2004). The argument could be made that individual therapy is more convenient than other modes which is why it is likely why the quantity of individual therapy sessions outnumbered both family and mixed mode treatment approaches, but what is important to remember is the significantly more cost-effective approach consists of family therapy treatment.

The results suggest that family therapy on average costs less than individual or mixed mode therapy because clients tend to use fewer therapy sessions. This is likely due to the difficulty of getting the whole family to therapy at the same time. At the same time, it is possible that in a family setting, they were able to make progress more quickly and thus required a fewer number of sessions to improve the presenting problem. When practitioners use a family therapy modality

when working with children and adolescents with ODD, they may be capitalizing on the impact given the resources. Findings from previous studies similarly suggest that family therapy is more cost effective than individual therapy (Tucker & Oei, 2007). These results suggest that family based interventions are more cost effective than individual approaches across license types.

The last research question sought to evaluate differences in total cost of treatment by age and gender. While linear regressions indicate that there are no statistically significant differences of cost by treatment age or gender, these results are still meaningful in demonstrating cost differences and could provide preliminary direction for future studies.

Family-based interventions are effective for a significant proportion of cases of childhood behavior problems. Results of meta-analyses suggest that for many child mental health problems, particularly ODD, family therapy is an effective treatment of choice (Carr, 2009). These difficulties are of concern because they may lead to co-morbid academic, emotional and relationship problems, and in the long term to adult adjustment difficulties (Burke et al., 2002; Loeber et al., 2000).

Limitations

The current study utilized a retrospective analysis of administrative data. Future studies would benefit from utilizing an experimental design. Such a design would allow for random assignment to each profession (professional counselor, MD, Master's nurse, MSW, MFT, psychologist). In the existing data, clients may not have had equal access to each provider type or they may have self selected in any number of ways.

This study measured treatment success using drop out and recidivism. It is possible that successful treatment could occur in one session. Based on the definitions of success used in this study, these cases would not be included as successful outcomes. Future studies would benefit by

expanding the definition of success to include client and therapist self-report and clinical significance.

While we know the modality of therapy provided, it is unknown what models or types of therapy were utilized. In the future, it would be beneficial to know if it was Cognitive Behavioral, Experiential, Gestalt, Narrative, or a combination, etc.

Directions for Future Research

Further research is required in order to answer questions related to the costs associated with treatment, and the need to include the benefits associated with decreased symptoms, such as improving family process and/or quality of life for significant others. A complete cost-benefit analysis could assist in creating a clearer picture of the impact of treatment.

Additionally, further research is needed to assess potential differences in cost by age at the time of treatment initiation as we know from the literature that if not diagnosed and treated early, it can often turn into conduct disorder and other more severe diagnoses (Loeber & Burke, 2000). It would also be valuable to understand differences in outcome by gender.

Conclusion

The argument that economic analysis is a critical component of research on the treatment of behavioral problems is a strong one. The purpose of this study was to determine the impact of including family therapy on the overall costs of health care treatment for oppositional defiant children and adolescents in the examination of actual treatment costs and outcomes for patients treated for ODD in the Cigna network. This study demonstrates that family therapy (as a modality) is cost-effective for individuals with ODD. Policymakers and third-party payers may use such cost-effectiveness data to make decisions regarding treatment of ODD and funding allocation. Even though the results of the present study are only able to speak on cost effectiveness, dropout, and readmission, previous studies support the suggestion that children and adolescents with ODD

could benefit from family therapy (Rowe & Liddle, 2003, Sexton, 2011). Family involvement provides both the individual and their family the opportunity to learn to new skills and ways of minimizing symptoms associated with this disorder. Likewise, it allows family members to be involved as ongoing treatment providers in maintaining treatment outcomes. This study lends support to the inclusion of family therapy in the treatment of ODD by demonstrating that family therapy is a cost-effective option.

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Table 1

Log Average Sessions, Log Cost, Real Sessions, and Real Cost by License in first EoC

	N	Ln <i>M</i> (SD) Sessions	Ln <i>M</i> Cost (SD)	<i>M</i> Sessions (SD)	<i>M</i> Cost \$ (SD)
Counselors	1624	1.51 (0.98)	5.26 (1.06)	7.18 (7.69)*	327.95 (388.36)*
MDs	123	1.31 (0.99)	5.56 (1.02)	6.22 (7.68)*	450.25 (627.92)*
MFTs	769	1.58 (0.94)	5.34 (0.99)	7.49 (7.93)*	339.53 (385.38)*
MSWs	2888	1.57 (0.97)	5.34 (1.04)	7.58 (8.05)*	354.72 (422.25)*
Psychologists	3890	1.54 (1.0)	5.52 (1.04)	7.62 (8.91)*	424.31 (522.36)*
Industry Average	1859	1.50 (0.98)	5.40 (1.03)	7.22 (8.05)*	379.35 (469.25)*

Note. * $p < 0.05$

Table 2
 Recidivism and Drop-out Rates by Profession

	N	% Success	N Success	% Recidivism	N Recidivism	% Drop- out	N Drop- out
Counselors	1624	78.5	1275	21.5*	349	16.6	270
MDs	123	79.3	98	20.7*	25	23*	28
MFTs	769	80.3	618	19.7*	151	12.4*	95
MSWs	2888	76.9	2220	23.1*	667	14.8*	427
Psychologists	3890	76.2	2964	23.8*	926	16.6*	646
Industry Average	1859	78.2	1435	21.8	424	16.7	293

Table 3
Average Sessions and Cost by Treatment Modality

	N	M Sessions (SD)	M Cost \$ (SD)
Individual	5238	6.49 (7.39)*	334.37 (441.49)*
Family	1957	4.77 (5.86)*	243.49 (319.48)*
Mixed	2709	11.76 (10.32)*	602.77 (594.73)*

Note. * $p < 0.05$ [$F(1, 9901) = 989.81, p < 0.001$]