



Theses and Dissertations

2014-12-01

Cost Effectiveness of Treating Generalized Anxiety Disorder in Adolescence: A Comparison by Provider Type and Therapy Modality

Kathryn Evelyn Reynolds
Brigham Young University - Provo

Follow this and additional works at: <https://scholarsarchive.byu.edu/etd>



Part of the [Marriage and Family Therapy and Counseling Commons](#)

BYU ScholarsArchive Citation

Reynolds, Kathryn Evelyn, "Cost Effectiveness of Treating Generalized Anxiety Disorder in Adolescence: A Comparison by Provider Type and Therapy Modality" (2014). *Theses and Dissertations*. 5753.
<https://scholarsarchive.byu.edu/etd/5753>

This Thesis is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.

Cost Effectiveness of Treating Generalized Anxiety Disorder in Adolescence:
A Comparison by Provider Type and Therapy Modality

Kathryn Evelyn Irene Reynolds

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

D. Russell Crane, Chair
Jonathan G. Sandberg
Jeffry H. Larson

School of Family Life
Brigham Young University

December 2014

Copyright © 2014 Kathryn Evelyn Irene Reynolds

All Rights Reserved

ABSTRACT

Cost Effectiveness of Treating Generalized Anxiety Disorder in Adolescence: A Comparison by Provider Type and Therapy Modality

Kathryn Evelyn Irene Reynolds
School of Family Life, BYU
Master of Science

Generalized anxiety disorder (GAD) is frequently found in primary care settings and is highly prevalent among adolescents. The purpose of this study was to examine the cost effectiveness by provider type and therapy modality in treating adolescents (ages 13-17) with a GAD diagnosis (DSM-IV 300.02). A national insurance company in the United States provided outpatient and unidentifiable data for adolescent GAD cases ($n = 2,932$). These cases were used to analyze the cost effectiveness, total cost, treatment length, dropout, and readmission rates for the treatment of adolescents with GAD. Descriptive statistics signify that the mean cost of treatment for GAD in the first episode of care across all provider types is \$439.28. Results revealed significant differences in cost effectiveness, total cost, treatment length, and readmission rates by provider type and therapy modality. MFTs and counselors were most cost effective, had the lowest total cost and number of sessions, as well as the lowest readmission rate among the provider types. In contrast, MSWs and psychologists were the least cost effective, had the highest number of sessions and the highest readmission rate. Therapy modality comparisons indicated that family therapy is most cost effective followed by individual, then mixed therapy modalities. Significantly fewer sessions were found when conducting family therapy upon treating adolescents with GAD. There were no significant differences in dropout by provider type, therapy modality or age group. The results of total cost by gender were also insignificant. Professional and clinical implications and future directions for research will be discussed.

Keywords: generalized anxiety disorder, adolescence, mental health care, therapy modality, provider type, family therapy, dropout, readmission, diagnosis, mixed therapy, Cigna, cost, cost effectiveness, number of sessions, treatment length.

TABLE OF CONTENTS

ABSTRACT.....	ii
TABLE OF CONTENTS.....	iii
LIST OF TABLES.....	vi
Introduction.....	1
Literature Review.....	2
Definition, Prevalence, and Total Cost.....	2
Factors Influencing Treatment.....	5
Comorbidity.....	5
Age and age of onset.....	6
Therapeutic Interventions.....	7
Individual therapy.....	7
Family therapy.....	7
Dropout.....	9
Readmission Rate.....	9
Cost and Cost Effectiveness.....	10
Cost.....	10
Cost effectiveness.....	11
Research Questions.....	12
Method.....	13
Design.....	13
Sample.....	14

Providers	14
Definition of Terms.....	15
Episode of Care.....	15
Readmission.....	15
Total cost.....	15
Cost effectiveness.....	15
Drop out.....	15
Individual therapy.....	16
Mixed therapy.....	16
Preliminary Analyses	16
Results.....	17
Research Question One.....	17
Research Question Two.....	23
Research Question Three.....	23
Research Question Four.....	27
Research Question Five.....	27
Research Question Six.....	28
Discussion.....	28
Provider Type.....	28
Therapy Modality.....	29
Age and Gender.....	31
Age.....	31
Gender.....	31

Professional and Clinical Implications31

Limitations32

Directions for Future Research33

Conclusion34

References36

LIST OF TABLES

1	Real and Log Total Cost Effectiveness by Provider Type and Therapy Modality	19
2	Real and Log Total Cost by Provider Type, Therapy Modality and Gender	20
3	Real and Log Total Sessions by Provider Type and Therapy Modality	21
4	Cost per Session by Provider Type	22
5	Dropout and Readmission Rates by Provider Type, Therapy Modality and Age	25
6	Dropout by Provider Type and Therapy Modality	26

Introduction

In the United States, three percent of the population is affected by Generalized Anxiety Disorder (GAD) each year (ADAA, 2014). The most common mental disorders in the general population are anxiety disorders (Kessler et al., 2009). Among anxiety disorders, GAD is the most frequent disorder found in primary care (Ballenger et al., 2001). The prevalence of GAD in adolescents is reported to be as high as 10.8% (Albano, Chorpita, & Barlow, 2003). Adolescents with this disorder are at a higher risk for poor school performance, more likely to experience social isolation from their peers, and more prone to become involved with substance abuse (ADAA, 2014). Anxiety disorders commonly surface during childhood and adolescence, and early intervention and diagnosis can lead to better treatment outcomes (Lydiard, 2000). This study aims to emphasize the importance of effectively treating adolescents with GAD due to the potential impact this disorder may have upon entering adulthood which may result in greater costs to the individual and society over the course of a lifetime.

In addition to individual impairment, the societal cost of anxiety disorders is substantial. Individuals with this disorder have decreased productivity and increased health care costs (Revicki et al., 2012; Wittchen, 2002). It has been estimated that the annual economic burden of anxiety disorders in the United States is approximately \$42.3 billion (Greenberg et al., 1999). Interest in studying anxiety disorders in adolescents specifically has increased over the past 15 years, as researchers and clinicians have become more aware of the prevalence of the disorder in this age group (Schniering, Hudson, & Rapee, 2000). However, studies continue to be limited. One reason for these limitations is because the diagnosis of GAD has only been recently applied to adolescents in the DSM-IV (which was published in 1994). Prior to this diagnostic inclusion, youth presenting with excessive worries were given the diagnosis of Overanxious Disorder

(OAD). As a result, providing precise prevalence estimates of GAD in adolescents may be difficult (Beesdo, Knappe, & Pine, 2009). Research is particularly necessary on the costs and cost effectiveness of various forms of treatment for GAD in adolescence. For example, family treatments may provide better long-term treatment gains if the family becomes more stable (Bodden et al., 2008); however, no research to date has compared the costs of treatment by modality (i.e. individual, family, and mixed psychotherapy) with this demographic. The current study will examine cost and cost effectiveness of treatments for GAD in adolescence, comparing therapy modalities as well as treatment by various provider license types.

Literature Review

Definition, Prevalence, and Total Cost

The DSM-IV defines Generalized Anxiety Disorder (GAD) as characterized by “excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least six months, about a number of events or activities” (i.e. work or school performance; APA, 2000). When diagnosing adolescents, only one of the six symptoms is required for diagnosis; these symptoms include: restlessness, becoming fatigued easily, difficulty concentrating, irritability, muscle tension, and sleep disturbance (APA, 2000).

GAD in adolescence is more commonly diagnosed than it is studied. According to Masi and colleagues, epidemiology data is lacking on this disorder among adolescents as compared to adults. In a sample of child and adolescent GAD outpatients (n=157, ages 7-18 years old), anxiety symptoms were reported in more than 75% of the participants (Masi et al., 2004). In addition, Wagner (2001) found that the worries of GAD adolescents differ from adults and are most often connected to school performance and social situations. Over time, these concerns may develop into constant self-doubt, a need for reassurance, and a high sensitivity to criticism

(Wagner, 2001). Similarly, the DSM-IV describes that adolescents with GAD are often obsessively seeking approval and require extreme levels of reassurance. They may also be “overly conforming, perfectionist, and unsure of themselves and tend to redo tasks because of excessive dissatisfaction with less-than-perfect performance” (APA, 2000, p. 473).

Anxiety disorders have high prevalence rates among adolescents, affecting a wide segment of the population. In a recent nationally representative study of 10,123 adolescents aged 13 to 18 (Merikangas et al., 2010), anxiety disorders were listed as the “most common condition” at 31.9 percent. In this same study, GAD was twice as likely in girls than in boys, and the prevalence rate of a GAD diagnosis among these adolescents consistently increased with age (McLean, Asnaani, Litz, & Hofmann, 2011; Merikangas et al., 2010).

Considering the pervasiveness of anxiety disorders and their frequent comorbidity with physical symptoms and other general medical conditions (Marciniak et al., 2005), the costs to society, family, and individuals are significant. Furthermore, GAD is related to high levels of impairment in psychosocial and role functioning, decreased productivity in work settings, and poorer health-related quality of life (Revicki et al., 2012). Therefore, if GAD is treated properly during adolescence, it can be ultimately be managed or eliminated to avoid facing these issues later in adulthood (Rickels & Schweizer, 1990).

In the United States alone, it was estimated that the economic burden of anxiety disorders across all ages was around \$42.3 billion in 1990, or in other words approximately \$1500 annually per patient with an anxiety disorder (Greenberg et al., 1999). In 2014 dollars, the estimates would be about \$78.2 billion or \$2700 annually per patient. No known studies since that date have so extensively assessed cost of anxiety disorders in the United States. Of the total

cost, 54% was spent on nonpsychiatric medical treatment such as emergency room visits, while 31% involved some form of psychiatric treatment (i.e. counseling or hospitalization).

Another study found that in Dutch families, the annual societal cost of anxiety in children and adolescents ages 8-17 years was approximately \$6.9M to \$70.6M (Bodden, Dirksen, & Bögels, 2008). Costs for families with clinically anxious children are 20 times higher than families from the general population, including both direct and indirect costs such as health care, special education, absenteeism, “presenteeism”, day care, and transportation (Bodden et al., 2008).

GAD is associated with greater health care utilization and medical costs. Across patients of all ages, significantly higher median annual medical costs were connected to GAD primary care patients (US \$2,375) than those without GAD (US \$1,448) (Revicki et al., 2012). In addition, the mean annual medical cost of GAD at \$6,475 was \$2,138 higher when compared to other anxiety disorders.

Another pressing issue linked to the overall societal cost of those diagnosed with anxiety disorders includes absenteeism and “presenteeism” at either work or school. In one study of 1,522 employees, patients with anxiety had a higher likelihood of absenteeism and lower work performance as a result (Plaisier et al., 2012). For adolescents specifically, anxiety often leads to decreased school attendance. Many studies have shown that anxiety disorders are related to problematic school absenteeism. In a community sample of 162 youth, Richards and Hadwin (2011) found that increased anxiety traits were linked with decreased school attendance. Another study discovered that among the most common diagnoses of adolescents with problematic school absenteeism included GAD (Kearney & Albano, 2004).

In addition to societal cost and work or school impairment, relationships between parents and child are negatively impacted by anxiety disorders. According to a study examining adolescent attachment relationships, those with anxiety disorders experienced higher levels of distress and decreased behavioral organization in their interactions with their mothers (Brumariu, Obsuth, & Lyons-Ruth, 2013). Anxious adolescents also perceive having less autonomy in relation to their parents and vice versa from their parents' perspective (deAlbuquerque & Schneider, 2012). Clearly, anxiety disorders such as GAD, take a toll on many levels, including health care use, work and school performance, and family life.

Factors Influencing Treatment

The course and effectiveness of treatment is affected by several individual factors, including comorbid psychiatric disorders, age and age of onset, and gender.

Comorbidity. GAD is often considered to be an at-risk factor in developing other psychiatric disorders (Carmin, Mohlman, & Buckley, 2004). GAD in adolescence is most commonly comorbid with depression, bipolar, and substance abuse disorders (ADAA, 2014). Nearly one-half of those diagnosed with depression are also diagnosed with an anxiety disorder (Masi et al., 2004). Youth with a comorbid anxiety disorder and bipolar disorder experienced “longer duration of mood symptoms; more severe ratings of depression; and family history of depression, hopelessness, and somatic complaints during their worst lifetime depressive episode” (Sala et al., 2010). According to a Nationally Representative Study, GAD and substance use disorders (SUDs) are highly comorbid (Magidson, Liu, Lejuez, & Blanco, 2012) especially during adolescence (Roberts, Roberts, & Xing, 2007). GAD-SUD comorbidity is correlated with many negative psychosocial outcomes, impaired functioning, and higher hospitalization rates (Magidson et al., 2012). In conclusion, GAD adolescents with a comorbid disorder are likely to

have more severe symptoms, an increased length of time required for treatment, and a decreased ability to function, which may lead to greater costs over the course of their lifetime.

Age and age of onset. An earlier age of onset for a GAD diagnosis is linked to greater symptom severity (Le Roux, Gatz, Wetherell, 2005) and higher prevalence of comorbid anxiety, mood, and substance use disorders, yet better health related quality of life (HRQL) outcomes (Chou, 2009). The majority of studies on the general adult population show that the onset of GAD symptoms most commonly occurs during late adolescence to early adulthood (Beesdo, Pine, Lieb, & Wittchen, 2010; Wittchen, Zhao, Kessler, & Eaton, 1994). For example, in a large sample of Canadian elderly adults with GAD (65 and older), the onset of this disorder was during adolescence with a reported mean age of 16.9 and more than half of the sample were diagnosed prior to age 14 (Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010).

Age is also related to symptom severity in GAD. A study found that levels of GAD symptom severity varied in intensity over time during adolescence (Wijsbroek, Hale, Van Doorn, Raaijmakers, & Meeus, 2010). This was more likely to occur with girls than boys. Conversely, other studies found no significant difference between girls and boys in reference to the average age of onset (McLean et al., 2011). Symptom severity may also be triggered by life stressors such as the entrance into high school and other developmental factors.

Within a sample of young people aged 12-21 (n=882), investigators found that the older GAD adolescents “continue to come for treatment when compared with the younger GAD patients who typically dropout at an earlier rate” (Baruch, Vrouva, & Fearon, 2009, p. 72). This information may be helpful in preempting proper care for younger adolescents with GAD as they are more likely to have earlier termination of treatment.

Therapeutic Interventions

Proper therapeutic treatment may decrease anxiety symptoms and could reduce the likelihood of other comorbid disorders developing, reducing the burden to society and to the individual (Wittchen, 2002). In this study, psychotherapy modalities include individual, family, and a combination of these two (i.e. mixed) for treatment of this disorder.

Individual therapy. In a meta-analysis of 55 studies on the effects of psychotherapy on treating anxiety in adolescents, it was found that the effect size for individual therapy was larger than for group therapy (Reynolds, Wilson, Austin, & Hooper, 2012). In addition, they found that parental involvement in therapy with their adolescent was not indicative of greater effectiveness when compared with being treated individually.

One of the most common types of therapy for anxiety is cognitive behavioral therapy. Manassis et al. (2002) and other studies propose that CBT is a supportive and effective treatment for adolescent anxiety disorders. A study by Waters (2008) outlines the treatment of GAD in girls which combined an interpersonal skills (IP) component with traditional cognitive behavioral therapy (CBT). The IP portion in this model of treatment focused on interpersonal avoidance, passive and aggressive interpersonal styles, and co-rumination. In addition, the CBT approach incorporated psychoeducation, somatic management, cognitive restructuring, exposure therapy and problem-solving. Both adolescent and parent-report measures exhibited positive results for the treatment of adolescent girls with GAD. Other results included a decrease in GAD and depressive symptoms and improvements in interpersonal functioning for all participants (Waters, 2008).

Family therapy. Numerous family factors have associations with anxiety severity, including attachment, rearing strategies and intrafamily conflict in connection with child anxiety

(Bögels & Brechman-Toussaint, 2006; Hudson & Rapee, 2001; Hudson & Rapee, 2002). Family involvement is also encouraged in order for families to evaluate their role in adolescent anxiety symptoms. Including the family in treatment may lead to better treatment outcomes, as it can also address ways in which family members can help implement the treatment provided to the adolescent with GAD.

Family involvement in treating identified patients with GAD has also been studied to determine the value of this approach. Results have brought mixed opinions on the matter (Ginsburg, Siqueland, Masia-Warner, Hedtke, 2004). An early study by Barrett, Dadds, and Rapee (1996) showed that treatment response increased when parents were involved in their child's treatment. More recently, Wood (2003) conducted a study in which participants exhibited greater improvement for children ages 6 to 13 with anxiety (including a decrease in disorder severity) when treated in the context of the family in comparison to a child-focused CBT program. Another study also confirms that parental involvement with the adolescent at the beginning of treatment helps the parent to have a "more positive perception of the anxious adolescent" (Manassis et al., 2002, p. 216).

It is also important to note that an adolescent's gender has an impact on family processes regarding systemic and parental accommodation. Accommodation is defined as when parents (or other family members) change their own behavior to help a child diminish or avoid distress related to the child's disorder (Lebowitz et al., 2013). According to that study, almost all (97%) parents accommodated on some level to their child's anxiety; most either participated in symptoms or modified family routines as a result. Parents of girls with anxiety disorders were found to be more accommodating than the parents of boys with a similar diagnosis (Lebowitz et al., 2013). The gender-parental pattern interaction is linked to family distress. Most parents

(71%) experienced distress as a result of accommodating their child's anxiety and yet *not* accommodating the child's symptoms also brought negative consequences such as exacerbation of child's anxiety and distress (73%) and the child's increase in anger was reported as being a frequent occurrence (56%) (Lebowitz et al., 2013). Family therapy may help address this distress, and assist family members find the most effective responses in relation to this disorder.

However, not all studies support an additional advantage of involving family members in the treatment process (Breinholst, Esbjørn, Reinholdt-Dunne, & Stallard, 2012). One study found that there was no significant difference among clients who attended individual or family therapy or a combination of the two (i.e. mixed) in treatment (Masi, Miller, & Olson, 2003).

Dropout

In psychotherapy settings, dropout is also referred to as premature termination or attrition. The current study will utilize the definition of dropout as a participant attending only one session of therapy (Johansson & Eklund, 2006; Hamilton, Moore, Crane, & Payne, 2011). In youth mental health services, dropout has been a consistent problem (Warnick, Gonzalez, Weersing, Scahill, & Woolston, 2012). One study found that mean psychotherapy dropout rates range from 17 to 29% across all mental health diagnoses (Hamilton, Moore, Crane, & Payne, 2011). Across disorders, when youth drop out of treatment they experience higher levels of impairment in comparison with those who finish the course of treatment (Armbruster & Kazdin, 1994). In summary, dropout poses a significant obstacle for mental health providers, leading to increased costs and decreased therapeutic benefit to both adolescents and families.

Readmission Rate

Readmission rate (or recidivism) is often referred to in medical treatment as either disease recurrence or a return to a previous behavior (Mackie et al., 2001; Whitson, Heflin, &

Burchett, 2006). Other settings modify this definition in order to reflect a return to treatment (Crane, 2008; Crane & Payne, 2011; Crane & Payne, 2007; Hamilton, Moore, Crane, & Payne, 2011). In this particular study, readmission rate is defined as a patient returning to therapy after a 90 day lapse in care (i.e. to begin a 2nd Episode of Care) with the same provider type and diagnosis (Crane & Payne, 2011). A return to care may reflect a previously incomplete resolution of mental health problems leading to increased medical care utilization compared with those without mental illnesses (Crane & Christenson, 2008). However, it may be valuable to note that a return for another episode of care can also be an indication of symptom maintenance and stability throughout the course of the illness in various chronic disorders (Crane, Chiang, & Fawcett, under review).

Cost and Cost Effectiveness

Cost. There are no known studies about the cost of treating adolescents with GAD specifically, but research has addressed it in the broader population. For example, the economic costs of therapeutic treatment for those with GAD is often difficult to decipher as most countries list cost in general terms among anxiety disorders or GAD combined with depression (Revicki et al., 2012). However, one study provides helpful insight into how much it costs to treat anxiety disorders. The sample included insured, employer-based individuals and found the mean total medical cost of those diagnosed with any anxiety disorder was \$6,475 with an increase of \$2,138 for those patients with GAD specifically (Marciniak et al., 2005). GAD specific cost estimates were obtained from primary care patients in the United States in a study by Olfson & Gameroff (2007). They discovered that GAD patients had median medical care costs of \$2,375 which was significantly higher than those without GAD at \$1,448 (median medical care costs).

An Australian study estimated that the total medical care costs for GAD were an Australian (AU) \$112 million. They also approximated how much it would cost if these patients were to receive ‘optimal care based on evidence-based treatment and practice guidelines’. These costs would be an additional AU \$6 million (Issakidis, Sanderson, Corry, Andrews, & Lapsley, 2004). Despite this rise in cost for optimal treatment, this higher cost amount ought to be compared with the other indirect costs that could follow inadequate treatment at the onset.

Cost effectiveness. Cost effectiveness is defined by which clinical treatment provides the best clinical outcomes per unit cost (Crane et al., 2013). Cost effectiveness should include the possibility of a “medical offset” effect, which describes a decrease in a patient’s overall health care use after a treatment or intervention (Law, Crane, & Berge, 2003). Research on this subject in connection to adolescents with GAD is restricted to the cost effectiveness in treating anxiety disorders as a whole. In particular, one study of clinically anxious children and adolescents in the Netherlands (aged 8-18 years), exhibited robust results of cost effectiveness that stated individual CBT was more effective and less costly than family CBT (Bodden et al., 2008). In contrast, another study found that the use of group interventions may potentially reduce the overall cost of CBT in patients with anxiety disorders (Roberge, Marchand, Reinharz, Marchand, & Cloutier, 2004).

There are many indications that appropriate interventions during the adolescent years can lead to better overall outcomes. However, numerous limitations exist with cost effectiveness research findings in treating anxiety disorders: few studies, shortcomings in methodology, differences in the methods used for cost evaluation, and a failure to include indirect costs in the total cost calculation (Roberge et al., 2004). Therefore, it is imperative to conduct more evidence-based research in this area to better choose the most cost-effective approaches during

adolescence (Issakidis et al., 2004; Kaltiala-Heino & Rimpela, 1999; Marciniak et al., 2005; Roberge et al., 2004).

The purpose of the current study is to discover which therapy modality and provider type is most cost effective in treating adolescents with GAD. In order to obtain these findings, this study will analyze the cost effectiveness which includes the analysis of the number of sessions, dropout and readmission rates, and total cost for an average dose of psychotherapy in the treatment of adolescents with GAD. Understanding these implications will offer further information concerning the most efficient and cost effective approach to therapy. These cost implications impact individuals, families, health insurers, educational institutions, potential employers, and society as a whole.

Research Questions

Notwithstanding the rising prevalence and considerable costs of anxiety disorders, very few studies have evaluated the cost effectiveness of family interventions for this specific demographic. Thus far, limited research has been conducted on readmission or dropout rates for adolescents with generalized anxiety disorder (GAD). There is also a need for further investigations to help understand variables that may influence a client returning for additional care. The following research questions aim to fill this gap in the literature:

1. In the first Episode of Care, what are the differences in cost-effectiveness, total cost, and treatment length (total number of sessions) for the treatment of generalized anxiety disorder in adolescence by provider type?
2. Which provider license types (Counselors, MSWs, MFTs or Psychologists) have the lowest dropout and re-admission rates for treating generalized anxiety disorder in adolescence?

3. What are the differences in cost-effectiveness, total cost, and treatment length (total number of sessions) between individual, family, and mixed therapy modalities for the treatment of generalized anxiety disorder in adolescence?
4. Which therapy modality (between individual and family therapy) has the lowest dropout and readmission rates for treating generalized anxiety disorder in adolescence?
5. What are the differences in dropout and readmission rates by age group (i.e. younger and older) for the treatment of generalized anxiety disorder in adolescence?
6. What are the differences in total cost of treatment by gender for generalized anxiety disorder in adolescence?

Method

Design

This study is a retrospective analysis using administrative data from Cigna. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) allows the use of nonidentifiable administrative data for retrospective statistical analysis. The data available for each client was: age, gender, primary and secondary DSM-IV diagnoses, current procedural terminology (CPT) code (family or individual therapy), treatment provider's license type, number of therapy sessions per participant, and dollar amount of each claim. The data does not provide unique subscriber or provider information that would allow for identification of a subscriber. A subset of the larger data set was created to look solely at adolescent patients (between 13 and 17 years old) with Generalized Anxiety Disorder (GAD) (DSM-IV 300.02) as their primary diagnosis. For an explanation of the data cleaning procedure and the original data set see Crane and Payne (2011).

Sample

Participants ($n=2,994$) included those patients who had been given a primary diagnosis of *generalized anxiety disorder (GAD, DSM-IV 300.02)*, and who received treatment for individual and/or family therapy from Cigna during 2001-2006. Participants were seen in outpatient settings. Participants' ages range from 13-17 ($M=15.11$, $SD=1.41$). This particular age range was chosen for convenience in this particular study. The younger adolescent age group included ages 13-15 ($M=14.02$, $SD=0.81$) at 56% of the sample ($n= 1683$). The older group were ages 16-17 ($M=16.51$, $SD=0.50$) and comprised 44% of the sample ($n= 1311$). In addition, participants were 40% male ($n= 1205$) and 60% female ($n= 1788$). Participants represented all regions of the United States except Hawaii. No additional demographic data were available for consideration.

Providers

This study typically includes the following six providers types: Marriage and Family Therapists (MFTs), Medical Doctors, Nurses, Professional Counselors, Psychologists, and Social Workers (MSWs). These providers were considered because they are nationally recognized as independently licensed health care practitioners (Crane & Payne, 2011). However, for this particular study, medical doctors patients ($n= 48$) and nurses patients ($n= 14$) have been eliminated from further analysis due to a small number of cases being treated by these providers when compared with the other providers included above. This may be explained by the fact that doctors and nurses should be considered bio-medical providers as they seldom do psychotherapy alone. As such, they are less likely to use psychotherapy exclusively when a combination of psychotherapy and medication would be more appropriate.

Definition of Terms

Episode of Care. Cigna defines an episode of care (EoC) as a continuous series of services for one participant. An episode of care ends after a participant has had no psychotherapy claims for 90 days or more. For this particular study, the number of sessions in the first episode of care ranged from 1 to 85 ($M = 8.10$, $SD = 8.862$).

Readmission. For the purposes of this study, a readmission is defined as a patient returning to therapy (after at least 90 days break) for an additional episode of care with the same provider type (Crane & Payne, 2011; Fawcett & Crane, 2013).

Total cost. Total cost is defined as the total dollar amount paid by Cigna for all therapy services during the episode of care.

Cost effectiveness. The formula for cost effectiveness is: Estimated cost effectiveness = 1st EoC average cost + (1st EoC average cost * readmission rate %) (Crane, 2008; Crane & Payne, 2011; Moore et al., 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.

Dropout. In the current study, dropout is defined as a participant attending only one session of individual or family therapy (Johansson & Eklund, 2006; Hamilton, Moore, Crane, & Payne, 2011). This definition was adopted in order to provide a relatively conservative measure of dropout.

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 in this study 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 would 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.

Preliminary Analyses

Among the 2,994 claims of Generalized Anxiety Disorder (GAD) as a primary diagnosis in adolescence, there were only 62 reported cases of GAD treated by doctors ($n=48$) and nurses ($n=14$). As a result, they were excluded from further analyses based on the small sample size. The final number of total claims in this study was 2,932.

After conducting preliminary analyses, it was revealed that cost and session data was positively skewed. As a result, it breaks the assumptions for normality for most inferential statistics. Log transformation of the cost and session variables was included in analyses in order to create a normal distribution. Log units create a lognormal distribution with parameters exhibiting the expected mean of the distribution and standard deviation (Limpert, Stahel, & Abbt, 2001).

Results

Research Question One

The first research question asked, “In the first Episode of Care, what are the differences in cost-effectiveness, total cost, and treatment length (total number of sessions) for the treatment of generalized anxiety disorder in adolescence by provider type?” The overall mean cost of treatment for GAD for the first episode of care is \$439.28 ($SD = \563.66). The total number of sessions for GAD treatment across all professions ranged from 1 to 103 ($M = 8.46$, $SD = 9.24$).

An ANOVA and Tukey HSD post hoc tests were run to determine differences across provider types in regard to cost-effectiveness, total cost in dollars and treatment length (total number of sessions). Table 1 includes the real and log transformed cost effectiveness per provider type for the treatment of adolescent GAD. In addition, Table 2 contains a summary of the real and log transformed total cost and Table 3 displays the total sessions in the first Episode of Care by provider type. Table 4 provides an overview of the cost per session by provider type. Descriptive statistics reveal that MFTs, counselors, and MSWs were similar in cost per session while psychologists were more costly per session.

Analysis of cost-effectiveness by provider type revealed significant differences [$F(4, 2927) = 15.657$, $p < .001$]. When analyzing total cost by provider type, there were significant differences [$F(4, 2927) = 18.374$, $p < .001$]. Again, the analysis of treatment length by provider type also revealed differences that were significant [$F(4, 2927) = 5.637$, $p < .001$].

Overall, for cost-effectiveness results, MFTs were most cost-effective in treating GAD in adolescence, followed by counselors, MSWs and then psychologists. The ranking of total cost by mental health provider type from lowest to highest total cost per session is as follows:

counselors, MFTs, MSWs and psychologists. Treatment length was shortest with MFTs followed by counselors, psychologists, and MSWs had the most average sessions in treatment.

Table 1. *Real and Log Total Cost Effectiveness by Provider Type and Therapy Modality*

Provider Type	N	Cost Effectiveness		LN Cost Effectiveness	
		<i>M</i> (\$)	<i>SD</i> (\$)	<i>M</i> (\$)	<i>SD</i> (\$)
MFTs	236	496.53*	759.44	5.48*	1.20
Counselors	507	513.75*	1099.67	5.47*	1.20
MSWs	997	590.53*	816.50	5.66*	1.22
Psychologists	921	685.42*	1025.47	5.80*	1.22
Industry Average	665	571.56	925.27	5.60	1.21

Therapy Modality	N	Cost Effectiveness		LN Cost Effectiveness	
		<i>M</i> (\$)	<i>SD</i> (\$)	<i>M</i> (\$)	<i>SD</i> (\$)
Individual	2041	555.23*	881.98	5.55*	1.23
Family	251	282.34*	365.87	5.11*	1.02
Mixed	640	1,059.47*	1,379.72	6.40*	1.08

Notes: * $p < 0.05$ LN is the natural log transformation of the data. Cost effectiveness: By provider type and therapy modality - the average cost of the first EoC plus the average cost of the first EoC times the readmission rate. Measures average cost effectiveness by provider type and therapy modality for a single EoC. LN Cost Effectiveness by Provider Type: $F(4, 2927) = 15.657, p < .001$. LN Cost Effectiveness by Therapy Modality: $F(2, 2929) = 82.276, p < .001$.

Table 2. *Real and Log Total Cost by Provider Type, Therapy Modality and Gender*

Provider Type	N	Total Cost		LN Total Cost	
		<i>M (\$)</i>	<i>SD (\$)</i>	<i>M (\$)</i>	<i>SD (\$)</i>
MFTs	236	353.81*	438.15	5.33*	1.05
Counselors	507	352.45*	572.25	5.30*	1.05
MSWs	997	406.33*	461.15	5.48*	1.06
Psychologists	921	475.48*	588.55	5.62*	1.07
Industry Average	665	308.91	515.03	5.43	1.06

Therapy Modality	N	Total Cost		LN Total Cost	
		<i>M (\$)</i>	<i>SD (\$)</i>	<i>M (\$)</i>	<i>SD (\$)</i>
Individual	2041	395.48*	527.26	5.39*	1.09
Family	251	243.88*	257.23	5.05*	0.96
Mixed	640	655.60*	689.86	6.10*	0.87

Gender	N	Total Cost		LN Total Cost	
		<i>M (\$)</i>	<i>SD (\$)</i>	<i>M (\$)</i>	<i>SD (\$)</i>
Male	1180	418.47	510.61	N/A	N/A
Female	1751	453.49	596.59	N/A	N/A

Notes: * $p < 0.05$ LN is the natural log transformation of the data. LN Total Cost by Provider Type: $F(4, 2927) = 18.374, p < .001$. LN Total Cost by Therapy Modality: $F(2, 2929) = 71.672, p < .001$.

Table 3. *Real and Log Total Sessions by Provider Type and Therapy Modality*

Provider Type	<i>N</i>	Total Sessions		LN Total Sessions	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
MFTs	236	7.51*	8.27	1.56*	0.97
Counselors	507	7.55*	8.79	1.56*	0.97
MSWs	997	8.70*	8.96	1.70*	0.99
Psychologists	921	8.33*	9.24	1.63*	1.01
Industry Average	665	8.02	8.82	1.61	0.99

Therapy Modality	<i>N</i>	Total Sessions		LN Total Sessions	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Individual	2041	7.54*	8.57	1.53*	1.00
Family	251	4.98*	5.12	1.19*	0.90
Mixed	640	12.77*	10.98	2.23*	0.81

Notes: * $p < 0.05$ LN is the natural log transformation of the data. LN Total Sessions by Provider Type: $F(4, 2927) = 5.637, p < .001$. LN Total Sessions by Therapy Modality: $F(2, 2929) = 104.132, p < .001$.

Table 4. *Cost per Session by Provider Type*

Provider Type	<i>N</i>	Cost Per Session	
		<i>M (\$)</i>	<i>SD (\$)</i>
MFTs	236	45.54	13.83
Counselors	507	44.26	13.64
MSWs	997	45.81	13.66
Psychologists	921	55.47	13.42

Research Question Two

Research question number two asked, "Which provider license types (Counselors, MSWs, MFTs or Psychologists) has the lowest dropout and re-admission rates for treating generalized anxiety disorder in adolescence?" In order to determine if differences exist, Chi square analyses were used. Analysis revealed no significant differences in dropout rates between provider types, $\chi^2(4, N = 2932) = 3.154, p = .532$. In contrast, the results for readmission rates between provider types were significant, $\chi^2(4, N = 2932) = 11.725, p < .05$. Results display (see Table 5) that MFTs have the lowest amount of clients returning to care for treatment, followed by counselors, and psychologists. MSWs had the highest readmission rate among the various provider types.

Descriptive statistics were run to include dropout rates by provider type and by therapy modality. Table 6 displays that MFTs have the lowest family therapy dropout rate (15.6%) when compared with the other professions. The highest family therapy dropout rate was counselors (28.2%) followed by MSWs (25%) and psychologists (19%). All of the professions except MFTs had a higher dropout rate for family therapy than with the individual therapy modality.

Research Question Three

Research question number three asked, "What are the differences in cost effectiveness, total cost, and treatment length (total number of sessions) between individual, family, and mixed therapy modalities for the treatment of generalized anxiety disorder in adolescence?" Results of ANOVA tests indicate a significant difference in cost-effectiveness by modality [$F(2, 2929) = 82.276, p < .001$]. Post-hoc comparisons indicate that family therapy is significantly more cost-effective than individual, which is significantly more cost-effective than mixed. Statistically significant differences were revealed for total cost between therapy modalities [$F(2, 2929) =$

71.672, $p < .001$]. Differences in number of sessions by therapy modality were likewise significant and indicated mixed sessions to be most prevalent, followed by individual, then family modality [$F(2, 2929) = 104.132, p < .001$]. Tables 1, 2, and 3 report the differences for these variables by therapy modality.

Table 5. *Dropout and Readmission Rates by Provider Type, Therapy Modality and Age*

Provider Type	<i>N</i>	% Dropout	% Readmission
MFTs	236	14.8	22.0*
Counselors	507	14.2	24.1*
MSWs	997	12.0	26.3*
Psychologists	921	14.3	26.2*
Industry Average	665	13.8	24.7

Modality	<i>N</i>	% Dropout	% Readmission
Individual	2041	16.1	22.9*
Family	251	23.9	9.2*
Mixed	361	N/A	43.6*

Age Group	<i>N</i>	% Dropout	% Readmission
Younger (13-15)	1651	13.1	27.5
Older (16-17)	1281	13.7	24.6

Notes: * $p < 0.05$

Table 6. *Dropout by Provider Type and Therapy Modality*

Provider Type	<i>N</i>	Individual Therapy (%)	Family Therapy (%)
MFTs	236	17.7	15.6
Counselors	507	17.6	28.2
MSWs	997	14.4	25.0
Psychologists	921	17.6	19.0

Research Question Four

The fourth research question asked, “Which therapy modality (between individual and family therapy) has the lowest dropout and readmission rates for treating generalized anxiety disorder in adolescence?” Chi square analyses were used to determine the difference between dropout and readmission rate rates by therapy modality. Analysis revealed a significant difference in dropout rates between therapy modalities, $\chi^2(2, N = 2932) = 124.200, p < .001$. Table 4 outlines the results that when treating GAD in adolescents, individual therapy has the lowest drop-out rate (16.1%), followed by family therapy with the higher dropout rate (23.9%). In addition, analysis of readmission rates also revealed significant differences, $\chi^2(2, N = 2932) = 149.343, p < .001$. Family therapy modality was listed as having the lowest prevalence of clients returning for further treatment (9.2%). Individual therapy had over double the prevalence of readmission to treatment at 22.9% when compared to family therapy. In addition, conducting mixed therapy was almost double the percentage (43.6%) of individual therapy readmission rates when treating GAD in adolescence.

Research Question Five

The fifth research question asked, “What are the differences in dropout and readmission rates by age group for the treatment of generalized anxiety disorder in adolescence?” Chi square was used to determine differences between dropout and readmission rates by the 2-group independent variable of younger (ages 13-15) and older (ages 16-17) adolescent age groups. Results indicated no statistical differences in dropout rates, $\chi^2(1, N = 2932) = .221, p = .639$, or readmission rates, $\chi^2(1, N = 2932) = 3.153, p = .076$, by age. See Table 5 for further reference.

Research Question Six

The final research question asked, “What are the differences in the total cost of treatment by gender for generalized anxiety disorder in adolescence?” An independent t-test was conducted to determine differences in the dependent variable of total cost by the 2-group independent variable of gender (i.e. male and female). Results indicated there was no significant difference by gender when treating adolescents with GAD, $t(2930) = 864625.493, p = .099$. The total average cost for the treatment of males was \$418.47 ($SD = \510.61) while the cost average for females was \$453.49 ($SD = \596.59). These results for gender are included in Table 2.

Discussion

The primary purpose of this study was to provide additional cost-effectiveness research for the treatment of adolescents diagnosed with GAD. This study analyzed numerous factors which influence overall treatment and provides useful information to be utilized by those working with these adolescents and their families.

Provider Type

The first research question aimed to assess the differences between cost-effectiveness, treatment length and total cost when compared by provider type for the treatment of adolescent GAD. Results showed that there were significant differences between the provider types. Significant differences in cost-effectiveness displayed MFTs and counselors as most cost-effective in treating this demographic followed by MSWs and psychologists as least cost-effective. When assessing total cost differences, counselors and MFTs had the lowest total cost. Again, MSWs and psychologists had a higher total cost. The same trend continued with treatment length as results showed that MFTs and counselors had the lowest number of sessions while psychologists and MSWs had the highest number of sessions in the first episode of care.

The second research question also assessed differences among treatment provider types; however, dropout and readmission rates were analyzed. No significant differences were found for dropout rates between provider types, but readmission rates did show significant differences. MFTs and counselors had the lowest readmission rate. Psychologists and MSWs had the highest readmission rates. Additionally, MFTs displayed a lower dropout rate than the other professions when conducting family therapy. Overall, these results suggest that MFTs and counselors are most cost-effective, take the least amount of time to treat adolescents with GAD, and are less likely than the other two providers to have clients return to care for further treatment. Perhaps these results are due to how MFTs and counselors are trained in systems theory and see the family as a connected whole. If the family is included in case conceptualization and treatment, it may be that other family members contribute to ongoing maintenance and stability.

Another consistent finding from these results suggest that MSWs and psychologists tend to take more sessions on average to treat adolescents with GAD and are more likely to have clients who are readmitted for continued care. To explain a higher readmission rate, it may be that MSWs tend to refer clients to community resources and then ask them to return for ongoing assessment. In regards to cost, psychologists were the most costly and were least cost effective. The average cost per session was highest with psychologists when compared to the other professions. On average, doctoral level providers are paid at a higher rate than are masters level providers.

Therapy Modality

Questions three and four examined the differences in the treatment of GAD in adolescence between therapy modality (i.e. individual, family, and mixed). The same factors

were assessed as discussed previously with provider types and significant differences were found by modality in all factors.

Family therapy was found to be most cost-effective, had the least number of sessions for treatment, and the lowest readmission rate when compared to individual and mixed therapy modalities. This could signify effectiveness in treatment over time as clients are less likely to return for more care and also able to make greater progress in a shorter amount of time in treatment. In contrast, family therapy had the highest dropout rate among the modalities with individual therapy having the lowest dropout rate. The high dropout rate for family therapy can possibly be explained by how many individuals there are to maintain in treatment across different modalities. Families are often difficult to schedule together due to varying life demands among family members. However, individual therapy only requires the attendance of one person and their own schedule for regular psychotherapy sessions. It may be easier for individuals to remain in treatment compared to families with multiple people involved.

Finally, results showed that mixed therapy was least cost effective and highest in total cost and average number of sessions in treatment. It is also the modality with the highest readmission rate. Explanation for these results is unclear from this current study. There is no information regarding why particular clients were assigned mixed therapy instead of individual or family therapy. It could be supposed that mixed therapy is utilized due to severity of the diagnosis to call upon multiple modalities in the course of treatment. Practitioners may see the need for GAD adolescents with severe symptoms to be seen individually as well as with family members for additional support.

Age and Gender

Age. The fifth question evaluated differences in dropout and readmission rates between younger adolescents (ages 13-15) versus older adolescents (ages 16-17). Some studies suggest that the prevalence rate of GAD and symptom severity increased over time during adolescence (McLean et al., 2011; Wijsbroek et al., 2010). In addition, dropout has been found to be more likely in younger adolescents when compared with the older group who tend to continue treatment (Baruch et al., 2009). Yet according to the sample in the current study, there were no significant differences between the younger and older age groups.

Gender. Question six aimed to discover differences in cost of treatment by gender. Girls have been found to be twice as likely to have GAD as boys and it was hypothesized that girls would be more costly to treat considering the higher prevalence (Merikangas et al., 2010). The results showed girls were more costly than boys by an average cost of \$35; however, it was statistically insignificant for the purpose of this study.

Professional and Clinical Implications

This study provides valuable information regarding the cost-effectiveness of treating adolescents with GAD for health care providers as well as clinicians. The results exhibit that family therapy is more cost-effective in treating this population than individual or mixed therapy. Overall, it requires less time in treatment and is less likely to have clients return for further help. This is especially important for professionals who are involved with a specified time-limit for treatment. However, family therapy with GAD adolescents has the highest dropout rate. Upon entering treatment, both clinicians and families would benefit from addressing these concerns to anticipate potential dropout and to ensure adequate service is provided.

In addition, health care providers, insurance companies, and government bodies regulating payment to mental health professionals would profit from considering the results of this and other similar studies which emphasize the cost-effectiveness of family therapy. Treating a family system could lead to effective cost management. Other studies (Crane & Christenson, 2008; Law & Crane, 2000) have also shown that medical benefits are experienced by the patient in treatment as well as the non-identified patient involved. This provides insight as to the value of treating individual problems in a relational setting.

Generalized anxiety disorder is also related to problems in work settings and overall quality of life due to psychosocial and role functioning impairments (Revicki et al., 2012). Therefore, if adolescents with GAD could be properly treated earlier in life, they might be more likely to manage or avoid facing these issues on a greater scale which becomes more costly to treat in adulthood (Rickels & Schweizer, 1990).

Limitations

As this study may provide useful information for health care providers and clinicians, it is also critical to identify possible limitations that may require readers to interpret these results with caution. The design of this study is based on retrospective analysis which initially limits any collection of further data for exploration. This study lacks information regarding a patient's personal and medical history which may influence symptom severity as well as the various reasons for early termination or eventual readmission to treatment. As a result, this is not considered a 'gold standard' cost-effectiveness study (Husereau et al., 2013).

Personal and medical information would prove helpful in understanding which cases required longer treatment due to concurrent health complications or possible trauma or abuse.

Knowing this could also provide insight as to why and when mixed therapy was utilized as noted previously due to the severity of GAD symptoms. Thus, related costs would be better explained.

In this study, dropout is defined as attending one session of therapy and not returning for further treatment. Readmission is when a patient receives treatment and returns for more care. These simplistic definitions are useful in this study considering the information provided. Yet, both definitions are unable to fully capture the reasons behind why adolescents with GAD either stopped coming to therapy abruptly or returned for more treatment services. It would be ideal to know and categorize the reasons for each variable (i.e. dropout and readmission). For example, dropout may be due to changing to a different provider or location for treatment. Alternatively, those returning to care may have been more ready for treatment when compared with previous involvement. It is a major limitation of this study to not have access to this information as fewer sessions and low readmission rates allude to successful treatment when it may actually not be accurate. In addition, symptom alleviation outcomes are not able to be analyzed from the data available.

Directions for Future Research

Future research could identify indirect costs or unify methods across cost evaluation studies for improved comparison (Roberge et al., 2004). As GAD is a risk factor in developing other psychiatric disorders and general medical problems, cost-effectiveness studies of comorbidity with other disorders would continue the conversation started in this study (Carmin et al., 2004; Marciniak et al., 2005). In addition, GAD has only been applied to adolescents in the DSM-IV as of 1994. This has resulted in limited studies that address issues connected to this demographic.

It would be valuable if future research could answer questions related to the severity of diagnosis and overall persistence of symptoms as reported by clients over time via their Global Assessment Functioning scores. This information could be utilized to gather more personal data in connection with therapy modality and provider type to improve upon what constitutes the measure of successful treatment for clinical significance. Furthermore, knowledge of the provider's training could offer insight into how that influences why they chose certain diagnoses and therapy modality over another. Finally, it would be informative to study the cost-effectiveness of treating adolescents with GAD who have parents with or without an existing psychiatric disorder in a family therapy setting due to GAD's link to being genetically inherited and in connection with systems theory.

Conclusion

This current study involves an analysis on cost data from a national insurance company and presents useful information regarding the treatment of GAD in adolescence. This disorder is highly prevalent in adolescence and is also connected to higher health care utilization and medical costs (Revicki et al., 2012). Improved treatment outcomes can be a lasting result of early intervention and diagnosis (Lydiard, 2000).

In order to make informed decisions concerning treatment options and funding allocation for this illness, it is valuable to identify influential factors of cost-effectiveness, dropout, readmission rates, gender and age. However limited these findings may be to specific variables, the results of this study are supported by previous research proposing that adolescents with GAD can be effectively treated in the context of family therapy to provide ongoing support, improved coping mechanisms, and long-term treatment gains (Bodden et al., 2008). Cost-effective

treatment of this diagnosis in adolescence has the potential to benefit individuals, families, health insurers, educational institutions, potential employers, and society as a whole.

References

- Anxiety and Depression Association of America (2014). Generalized Anxiety Disorder. Retrieved May 6, 2014, from <http://www.adaa.org/understanding-anxiety/generalized-anxiety-disorder-gad>
- Albano, A. M., Chorpita, B. F., & Barlow, D. H. (2003). Childhood anxiety disorders. In E. J. Mash, & R. A. Barkley (Eds.), *Child psychopathology* (2nd ed, pp. 279-329). New York, NY: Guilford Press. ISBN 978-1-57230-609-7.
- American Medical Association (2006). *Current Procedural Terminology*. Chicago: American Medical Association.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). doi:10.1176/appi.books.9780890423349.
- Armbruster, P., & Kazdin, A. E. (1994). Attrition in child psychotherapy. *Advances in Clinical Child Psychology, 16*, 81-108.
- Ballenger, J. C., Davidson, J. T., Lecrubier, Y., Nutt, D. J., Borkovec, T. D., Rickels, K., & ... Wittchen, H. (2001). Consensus statement on generalized anxiety disorder from the International Consensus Group on Depression and Anxiety. *Journal of Clinical Psychiatry, 62*, 53-58.
- Barrett, P. M., Dadds, M. R., & Rapee, R. M. (1996). Family treatment of childhood anxiety: A controlled trial. *Journal of Consulting and Clinical Psychology, 64*(2), 333-342. doi:10.1037/0022-006X.64.2.333
- Baruch, G., Vrouva, I., & Fearon, P. (2009). A follow-up study of characteristics of young people that dropout and continue psychotherapy: Service implications for a clinic in the

- community. *Child and Adolescent Mental Health*, 14(2), 69-75. doi:10.1111/j.1475-3588.2008.00492.x
- Beecher, B. (2009). The medical model, mental health practitioners, and individuals with schizophrenia and their families. *Journal of Social Work Practice*, 23(1), 9-20. doi:10.1080/02650530902723282
- Beesdo, K., Knappe, S., & Pine, D. S. (2009). Anxiety and anxiety disorders in children and adolescents: Developmental issues and implications for DSM-V. *Psychiatric Clinics of North America*, 32(3), 483-524. doi:10.1016/j.psc.2009.06.002
- Beesdo, K., Pine, D. S., Lieb, R., & Wittchen, H. (2010). Incidence and risk patterns of anxiety and depressive disorders and categorization of generalized anxiety disorder. *Archives of General Psychiatry*, 67(1), 47-57. doi:10.1001/archgenpsychiatry.2009.177
- Bodden, D. M., Dirksen, C. D., & Bögels, S. M. (2008). Societal burden of clinically anxious youth referred for treatment: A cost-of-illness study. *Journal of Abnormal Child Psychology*, 36(4), 487-497. doi:10.1007/s10802-007-9194-4
- Bodden, D. M., Dirksen, C. D., Bögels, S. M., Nauta, M. H., De Haan, E., Ringrose, J., & ... Appelboom-Geerts, K. J. (2008). Costs and cost-effectiveness of family CBT versus individual CBT in clinically anxious children. *Clinical Child Psychology and Psychiatry*, 13(4), 543-564. doi:10.1177/1359104508090602
- Bögels, S. M., & Brechman-Toussaint, M. L. (2006). Family issues in child anxiety: Attachment, family functioning, parental rearing and beliefs. *Clinical Psychology Review*, 26(7), 834-856. doi:10.1016/j.cpr.2005.08.001
- Breinholst, S., Esbjørn, B. H., Reinholdt-Dunne, M., & Stallard, P. (2012). CBT for the treatment of child anxiety disorders: A review of why parental involvement has not

enhanced outcomes. *Journal of Anxiety Disorders*, 26(3), 416-424.

doi:10.1016/j.janxdis.2011.12.014

Brumariu, L. E., Obsuth, I., & Lyons-Ruth, K. (2013). Quality of attachment relationships and peer relationship dysfunction among late adolescents with and without anxiety disorders. *Journal of Anxiety Disorders*, 27(1), 116-124.

doi:10.1016/j.janxdis.2012.09.002

Carmin, C. N., Mohlman, J., & Buckley, A. (2004). Anxiety disorders in late life. In *Encyclopedia of Applied Psychology*. (Vol. 1, pp. 145- 154). Amsterdam; Boston: Elsevier Academic Press.

Chou, K. (2009). Age at onset of generalized anxiety disorder in older adults. *The American Journal of Geriatric Psychiatry*, 17(6), 455-464. doi:10.1097/JGP.0b013e31818f3a93

Crane, D. R., Chiang, F. F. & Fawcett, D. (2011). *The Cost Effectiveness of Outpatient Individual and Family Therapy for Schizophrenia in Managed Care*. Manuscript submitted for publication.

Crane, D. R., & Payne, S. H. (2007). The costs of providing psychotherapy: Individual versus family therapy. *The Newsletter of the European Family Therapy Association*. January.

Crane, D. R. (2008). The cost-effectiveness of family therapy: A summary and progress report.

Journal of Family Therapy, 30(4), 399-410. doi: 10.1111/j.1467-6427.2008.00443.x

Crane, D. R., & Christenson, J. D. (2008). The medical offset effect: Patterns in outpatient services reduction for high utilizers of health care. *Contemporary Family Therapy: An International Journal*, 30(2), 127-138. doi:10.1007/s10591-008-9058-2

- Crane, D. R., & Payne, S. H. (2011). Individual and family therapy in managed care: Comparing the costs of treatments by the mental health professions. *Journal of Marital and Family Therapy, 37*, 273-289. doi:10.1111/j.1752-0606.2009.00170.x
- Crane, D. R., Christenson, J. D., Dobbs, S. M., Schaalje, G. B., Moore, A. M., Pedal, F. F. C., Ballard, J., & Marshall, E. S. (2013). Costs of treating depression with individual versus family therapy. *Journal of Marital and Family Therapy, 39*, 457-469. doi: 10.1111/j.1752-0606.2012.00326.x
- de Albuquerque, J. G., & Schneider, S. (2012). Perceived intrafamilial connectedness and autonomy in families with and without an anxious family member: A multiple informant approach. *Child & Family Behavior Therapy, 34*(4), 324-341. doi:10.1080/07317107.2012.732885
- Fawcett, D., & Crane, D. R. (2013). The influence of profession and therapy type on the treatment of sexual dysfunctions. *Journal of Sex & Marital Therapy, 39*(5), 453-465. doi:10.1080/0092623X.2012.665814
- Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191. doi:10.3758/BF03193146
- Ginsburg, G. S., Siqueland, L., Masia-Warner, C., & Hedtke, K. A. (2004). Anxiety disorders in children: Family matters. *Cognitive and Behavioral Practice, 11*(1), 28-43. doi:10.1016/S1077-7229(04)80005-1
- Greenberg, P. E., Sisitsky, T., Kessler, R. C., Finkelstein, S. N., Berndt, E. R., Davidson, J. T., & ... Fyer, A. J. (1999). The economic burden of anxiety disorders in the 1990s. *Journal of Clinical Psychiatry, 60*(7), 427-435. doi:10.4088/JCP.v60n0702

- Hamilton, S., Moore, A. M., Crane, D. R., & Payne, S. H. (2011). Psychotherapy dropouts: Differences by modality, license, and DSM-IV diagnosis. *Journal of Marital and Family Therapy, 37*(3), 333-343. doi:10.1111/j.1752-0606.2010.00204.x
- Hudson, J. L., & Rapee, R. M. (2001). Parent-child interactions and anxiety disorders: An observational study. *Behaviour Research and Therapy, 39*(12), 1411-1427. doi:10.1016/S0005-7967(00)00107-8
- Hudson, J. L., & Rapee, R. M. (2002). Parent-child interactions in clinically anxious children and their siblings. *Journal of Clinical Child and Adolescent Psychology, 31*(4), 548-555. doi:10.1207/153744202320802214
- Husereau, D., Drummond, M., Petrou, S., Carswell, C., Moher, D., Greenberg, D., & ... Loder, E. (2013). Consolidated Health Economic Evaluation Reporting Standards (CHEERS) statement. *Pharmacoeconomics, 31*(5), 361-367. doi:10.1007/s40273-013-0032-y
- Issakidis, C., Sanderson, K. K., Corry, J. J., Andrews, G. G., & Lapsley, H. H. (2004). Modelling the population cost-effectiveness of current and evidence-based optimal treatment for anxiety disorders. *Psychological Medicine, 34*(1), 19-35. doi:10.1017/S003329170300881X
- Johansson, H., & Eklund, M. (2006). Helping alliance and early dropout from psychiatric out-patient care. *Social Psychiatry & Psychiatric Epidemiology, 41*(2), 140-147. doi:10.1007/s00127-005-0009-z
- Kaltiala-Heino, R., & Rimpelä, A. (1999). Are mental health promotion and prevention of mental disorders in adolescence worthwhile?. *Psychiatria Fennica, 30*, 225-243.

- Kearney, C. A., & Albano, A. M. (2004). The functional profiles of school refusal behavior: Diagnostic aspects. *Behavior Modification*, 28(1), 147-161.
doi:10.1177/0145445503259263
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., Ustün, T. B., & Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiologia E Psichiatria Sociale*, 18(1), 23-33.
- Law, D. D., Crane, D. R., & Berge, J. M. (2003). The influence of individual, marital, and family therapy on high utilizers of health care. *Journal of Marital and Family Therapy*, 29(3), 353-363. doi:10.1111/j.1752-0606.2003.tb01212.x
- Lebowitz, E. R., Woolston, J., Bar-Haim, Y., Calvocoressi, L., Dauser, C., Warnick, E., & ... Leckman, J. F. (2013). Family accommodation in pediatric anxiety disorders. *Depression and Anxiety*, 30(1), 47-54. doi:10.1002/da.21998
- Le Roux, H., Gatz, M., & Wetherell, J. (2005). Age at onset of generalized anxiety disorder in older adults. *The American Journal of Geriatric Psychiatry*, 13(1), 23-30.
doi:10.1176/appi.ajgp.13.1.23
- Limpert, E., Stahel, W., & Abbt, M. (2001). Log-normal distributions across the sciences: Keys and clues. *BioScience*, 51(5), 341–352. doi: 10.1641/0006-3568
- Lydiard, R. (2000). An overview of generalized anxiety disorder: Disease state–appropriate therapy. *Clinical Therapeutics: The International Peer-Reviewed Journal Of Drug Therapy*, 22(SupplA), A3-A19. doi:10.1016/S0149-2918(00)89070-0
- Mackie, J., Groves, K., Hoyle, A., Garcia, C., Garcia, R., Gunson, B., & Neuberger, J. (2001). Orthotopic liver transplantation for alcoholic liver disease: a retrospective analysis of

- survival, recidivism, and risk factors predisposing to recidivism. *Liver Transplantation: Official Publication of the American Association for the Study of Liver Diseases and the International Liver Transplantation Society*, 7(5), 418-427. doi:10.1053/jlts.2001.23789
- Magidson, J. F., Liu, S., Lejuez, C. W., & Blanco, C. (2012). Comparison of the course of substance use disorders among individuals with and without generalized anxiety disorder in a nationally representative sample. *Journal of Psychiatric Research*, 46(5), 659-666. doi:10.1016/j.jpsychires.2012.02.011
- Manassis, K., Mendlowitz, S. L., Scapillato, D., Avery, D., Fiksenbaum, L., Freire, M., & ... Owens, M. (2002). Group and individual cognitive-behavioral therapy for childhood anxiety disorders. A randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41(12), 1423-1430. doi:10.1097/00004583-200212000-00013
- Marciniak, M. D., Lage, M. J., Dunayevich, E., Russell, J. M., Bowman, L., Landbloom, R. P., & Levine, L. R. (2005). The cost of treating anxiety: The medical and demographic correlates that impact total medical costs. *Depression and Anxiety*, 21(4), 178-184. doi:10.1002/da.20074
- Masi, G., Sbrana, B., Poli, P., Tomaiuolo, F., Favilla, L., & Marcheschi, M. (2000). Depression and school functioning in non-referred adolescents: A pilot study. *Child Psychiatry and Human Development*, 30(3), 161-171. doi:10.1023/A:1021395504617
- Masi, M. V., Miller, R. B., & Olson, M. M. (2003). Differences in dropout rates among individual, couple, and family therapy clients. *Contemporary Family Therapy: An International Journal*, 25(1), 63-75. doi:10.1023/A:1022558021512
- Masi, G., Millepiedi, S., Mucci, M., Poli, P., Bertini, N., & Milantoni, L. (2004). Generalized anxiety disorder in referred children and adolescents. *Journal of the American Academy*

of Child & Adolescent Psychiatry, 43(6), 752-760.

doi:10.1097/01.chi.0000121065.29744.d3

McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (2011). Gender differences in anxiety disorders: Prevalence, course of illness, comorbidity and burden of illness. *Journal of Psychiatric Research*, 45(8), 1027-1035. doi:10.1016/j.jpsychires.2011.03.006

Merikangas, K., He, J., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., & ... Swendsen, J. (2010). Lifetime prevalence of mental disorders in U.S. adolescents: Results from the National Comorbidity Survey Replication-Adolescent Supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*, 49(10), 980-989.

doi:10.1016/j.jaac.2010.05.017

Moore, A. M., Hamilton, S., Crane, D. R., & Fawcett, D. (2011). The influence of professional license type on the outcome of family therapy. *American Journal of Family Therapy*, 39(2), 149-161. doi:10.1080/01926187.2010.530186

Olfson, M., & Gameroff, M. J. (2007). Generalized anxiety disorder, somatic pain and health care costs. *General Hospital Psychiatry*, 29(4), 310-316.

doi:10.1016/j.genhosppsych.2007.04.004

Pekarik, G. (1992). Posttreatment adjustment of clients who drop out early vs. late in treatment. *Journal of Clinical Psychology*, 48(3), 379-387. doi:10.1002/1097-4679(199205)48:3<379::AID-JCLP2270480317>3.0.CO;2-P

Plaisier, I., de Graaf, R., de Bruijn, J., Smit, J., van Dyck, R., Beekman, A., & Penninx, B. (2012). Depressive and anxiety disorders on-the-job: The importance of job characteristics for good work functioning in persons with depressive and anxiety disorders. *Psychiatry Research*, 200(2-3), 382-388. doi:10.1016/j.psychres.2012.07.016

- Revicki, D. A., Travers, K., Wyrwich, K. W., Svedäter, H., Locklear, J., Mattera, M., & ... Montgomery, S. (2012). Humanistic and economic burden of generalized anxiety disorder in North America and Europe. *Journal of Affective Disorders, 140*(2), 103-112. doi:10.1016/j.jad.2011.11.014
- Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: A meta-analytic review. *Clinical Psychology Review, 32*(4), 251-262. doi:10.1016/j.cpr.2012.01.005
- Richards, H. J., & Hadwin, J. A. (2011). An exploration of the relationship between trait anxiety and school attendance in young people. *School Mental Health, 3*(4), 236-244. doi:10.1007/s12310-011-9054-9
- Rickels, K; Schweizer, E (1990). The clinical course and long-term management of generalized anxiety disorder. *Journal of Clinical Psychopharmacology, 10*(3 Suppl), 101S–110S. doi:10.1097/00004714-199006001-00017.
- Roberts, R. E., Roberts, C., & Xing, Y. (2007). Comorbidity of substance use disorders and other psychiatric disorders among adolescents: Evidence from an epidemiologic survey. *Drug and Alcohol Dependence, 88*, S4-S13. doi:10.1016/j.drugalcdep.2006.12.010
- Roberge, P., Marchand, A., Reinhartz, D., Marchand, L., & Cloutier, K. (2004). Évaluation économique de la thérapie cognitivo-comportementale des troubles anxieux. *Canadian Psychology/Psychologie Canadienne, 45*(3), 202-218. doi:10.1037/h0086988
- Sala, R., Axelson, D. A., Castro-Fornieles, J., Goldstein, T. R., Ha, W., Liao, F., & ... Birmaher, B. (2010). Comorbid anxiety in children and adolescents with bipolar spectrum disorders: Prevalence and clinical correlates. *Journal of Clinical Psychiatry, 71*(10), 1344-1350. doi:10.4088/JCP.09m05845gre

- Schniering, C. A., Hudson, J. L., & Rapee, R. M. (2000). Issues in the diagnosis and assessment of anxiety disorders in children and adolescents. *Clinical Psychology Review, 20*(4), 453-478. doi:10.1016/S0272-7358(99)00037-9
- Wagner, K. (2001). Generalized anxiety disorder in children and adolescents. *Psychiatric Clinics of North America, 24*(1), 139-153. doi:10.1016/S0193-953X(05)70210-0
- Warnick, E. M., Gonzalez, A., Weersing, V., Scahill, L., & Woolston, J. (2012). Defining dropout from youth psychotherapy: How definitions shape the prevalence and predictors of attrition. *Child and Adolescent Mental Health, 17*(2), 76-85. doi:10.1111/j.1475-3588.2011.00606.x
- Waters, A. M., Donaldson, J., & Zimmer-Gembeck, M. J. (2008). Cognitive-behavioural therapy combined with an interpersonal skills component in the treatment of generalised anxiety disorder in adolescent females: A case series. *Behaviour Change, 25*(1), 35-43. doi:10.1375/bech.25.1.35
- Whitson, H., Heflin, M., & Burchett, B. (2006). Patterns and predictors of smoking cessation in an elderly cohort. *Journal of the American Geriatrics Society, 54*(3), 466-471. doi:10.1111/j.1532-5415.2005.00641.x
- Wijsbroek, S. M., Hale, W. W., Van Doorn, M. D., Raaijmakers, Q. W., & Meeus, W. J. (2010). Is the resolution style 'exiting statements' related to adolescent problem behavior? *Journal of Applied Developmental Psychology, 31*(1), 60-69. doi:10.1016/j.appdev.2009.08.002
- Wittchen, H. (2002). Generalized anxiety disorder: Prevalence, burden, and cost to society. *Depression and Anxiety, 16*(4), 162-171. doi:10.1002/da.10065

- Wittchen, H., Nelson, C. B., & Lachner, G. G. (1998). Prevalence of mental disorders and psychosocial impairments in adolescents and young adults. *Psychological Medicine*, 28(1), 109-126. doi:10.1017/S0033291797005928
- Wittchen, H., Zhao, S., Kessler, R. C., & Eaton, W. W. (1994). DSM-III—R generalized anxiety disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 51(5), 355-364. doi:10.1001/archpsyc.1994.03950050015002
- Wolitzky-Taylor, K. B., Castriotta, N., Lenze, E. J., Stanley, M. A., & Craske, M. G. (2010). Anxiety disorders in older adults: A comprehensive review. *Depression and Anxiety*, 27(2), 190-211. doi:10.1002/da.20653
- Wood, J. (2003). Child anxiety disorders: Parent-child communication as a change mechanism. *Dissertation Abstracts International*, 64.