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The Impact of Family Dynamics and Treatment Times for ADHD Children

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Abstract

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Margaret Elizabeth Stewart Wilson

MA, Loyola University, 1998

BS, St. Mary's College of Maryland, 1995

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Attention deficit hyperactivity disorder (ADHD) is a serious mental health condition that affects many of children. Studies show that 42-77% of children with ADHD may not be receiving treatment. Factors such as parent ethnicity, race, preference for treatment, socioeconomics, and child gender have been studied but do not account for the high numbers of untreated children. Differences between parents has been shown to effect ADHD treatment, the potential effects of family dynamics, children living in single or dual parent families, on ADHD treatment has not been studied. This secondary analysis finds there is a relationship between family dynamics, with the onset and duration of ADHD treatment. Family dynamics, parent gender, and parent race were found to have significant effect on ADHD treatment, especially date of first treatment. Child age, gender, and race also had significant effect on ADHD treatment times. Bowen's family systems theory views the family as an interdependent system with components explaining how stressors affect family functioning. Family stress as well as parental differences regarding ADHD and mental health treatment are unique stressors that would affect children in a dual parent family differently than children in a single parent family. In this study, parent gender and parent race had a significant effect on treatment times for children with ADHD. Implications for social change include increased understanding of barriers to ADHD treatment, stressing the importance of intentional inclusion of fathers in ADHD research, and highlighting the need for more specific research on parent gender, race, and family dynamics.

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Chapter 1: Introduction to the Study

Introduction

Attention deficit hyperactivity disorder (ADHD) is defined by *The Diagnostic and Statistical Manual of Mental Disorders,* (5th ed.; DSM-5; American Psychological Association [APA], 2013) as hyperactivity and/or inattention that occurs persistently and negatively impacts development or function. ADHD is divided into three categories, inattentive, hyperactive, or combined type. Thus, ADHD is the correct term for inattentive or hyperactive disorders replacing attention deficit disorder (ADD) or other previous titles (APA, 2013). This nomenclature was in place during this study. ICD 9 and 10 codes 314.0, F90.1, F90.2, F90.9 were used for ADHD identifiers for this study as well. ADHD is found in children ages 3-18 years and affects 5-12% of children (APA, 2013; Bush, 2010; Centers for disease Control and Prevention [CDC], 2008; Charach et al., 2010; Visser et al., 2016).

Yet despite the high numbers of children with ADHD, as many as 42-77% of children with ADHD symptoms may not be receiving treatment (Berger-Jenkins, 2012; Bussing et al., 2015; Bussing et al., 2003; Rowland et al., 2015). These are high numbers in general, but especially serious considering the potential long-term effects of ADHD (Gjervan & Nordahl, 2010; Kolla et al., 2016; Kuriyan et al., 2013; Miranda et al., 2016). While many researchers have examined factors contributing to the lack of treatment, none have fully captured this dilemma (Rowland et al: 2015; Sayal et al., 2015). Parent ethnicity, racial basis, stigma, parent preference for treatment, socioeconomics, and gender, have been previously studied (Berger-Jenkins, 2012; Bussing et al., 2007;

Bussing et al., 2007; Ghosh et al., 2015; Lawton et al., 2016; Starr, 2007). Children from all groups do receive treatment, although the rates for each group may differ, none seem to account for the large discrepancy between ADHD symptoms and lack of treatment (Bussing et al., 2005; Charach et al., 2010; Hong et al., 2013; Kendall et al., 2003; Lawton, et al., 2016; Singh, 2008).

Because prior research does not fully account for the high numbers of undertreated children, examining alternative areas of impact is warranted. The potential differences of family dynamics, especially children living in single or dual- parent families are a viable factor to consider when examining barriers to treatment. Given the additional stress on family functioning, dual parent households may be subject to greater impact by dissimilar views regarding the need for treatment while single-parent households may not (Chen et al., 2008; Cussen et al., & 2012; Ghosh et al., 2015; van der Veen-Mulders et al.; 2017). The decision-making process regarding treatment is complex and challenging for parents (Lewis-Morton et al., 2014; Mills, 2011; Stroh et al., 2008; van der Veen-Mulders et al., 2017). This study could serve to further research to examine factors influencing any differences between mothers and fathers that were found. It could also highlight the need for greater efforts to include fathers, or fathers and mothers, in data collection.

Given the growing numbers of single parent families, knowing if family dynamics or parent gender influence treatment decisions could help reduce this barrier. The dynamics of living in a single or dual parent family or of having one versus two parents involved in treatment decisions is an area with limited research. However, this research

area is of potential value as parents are the gatekeepers to children's treatment (Brinkman et al., 2009; Cassano et al., 2006; Mills, 2011; Stroh et al., 2008). In addition, if family dynamics are found to negatively impact treatment decisions, providers will need information to encourage more paternal presence during office visits, surveys, assessments, or other practices essential to the treatment process. Similarly understanding potential differences related to parent gender could guide further research and clinical practice to address each parent specifically to their needs. Reducing barriers to treatment should help children enter treatment earlier as well as remain longer.

Treatment for ADHD is known to be both beneficial and essential (American Academy of Pediatrics [AAP], 2011; APA, 2013; Charach et al., 2011; Gershon & Gershon, 2002). Learning coping skills to combat impulsivity and difficulties with nonpreferred tasks, learning attention regulation and organizational strategies, as well as other coping strategies benefits children both immediately and in the long term. The use of various medications is recommended to address the biomedical aspect of ADHD helping children to attend and sustain focus better is also beneficial to children with ADHD (Hodgkins et al., 2012; The MTA Cooperative Group [MTA], 1999)**.** The MTA Cooperative group (1999) one of the largest long term ADHD studies found that a combination of behavior therapy and medication was most effective for children with ADHD. These findings are supported by the AAP and the APA as well as additional meta-analyses (AAP, 2011; APA, 2013). Parent training has been found to be especially helpful with preschoolers (Charach et al., 2011; Gartlehner et al., 2011; Gershon & Gershon, 2002).

This chapter will include a summary of the literature on perceived parental barriers to treatment, influence of child age and gender on treatment, influence of parent ethnicity, and the impact a child with ADHD has on the family. The gaps in the literature regarding paternal inclusion in treatment decision making will be addressed as will the gaps in relation to differences between single and dual parent households. Exploration of parental treatment barriers is essential as children require parental permission and assistance to enter into treatment (Brinkman et al., 2009; Bussing et al., 2007; Mills, 2011; Stroh et al., 2008).

In this study I will examine the potential differences between single- and dual-parent families and parent gender regarding the onset and duration of treatment for children with ADHD. The large volume of children with ADHD and the significant dangers to children with untreated ADHD make the study of barriers to treatment paramount to children's mental health. (APA, 2013; Rowland et al., 2015; Sayal et al., 2015). A greater understanding of potential barriers can help providers address, remit, and possibly prevent identified barriers thus allowing children with ADHD greater access to mental healthcare.

Background

Five to twelve percent of children ages four years and older may be diagnosed with ADHD (APA, 2013; Bush, 2010; CDC, 2008; Visser et al., 2014). The DSM-5 cited research indicating 5% of children have ADHD (APA, 2013). However, other researchers have shown a much higher rate, 7% to as high as 15.5% of the population has ADHD (Froehitch et al., 2007; Rowland et al., 2015).

A significant number of children do not receive treatment or evaluation for ADHD (Berger-Jenkins et al., 2012; Bussing et al., 2003; Rowland et al., 2015). Berger-Jenkins et al., (2012) found that children of African American and Hispanic parents who had diagnosis of ADHD were not receiving treatment. Even after participating in a study about service utilization almost half of parents did not attend follow-up appointments and over 70% did not initiate treatment (Berger-Jenkins et al., 2012). Bussing et al., (2003) found similar results with only 23% of children identified with ADHD receiving treatment. Parents may recognize the child's symptoms are a problem, yet they fail to seek evaluation or treatment (Bussing et al., 2003).

Cultural variations in understanding ADHD have been found to negatively influence help seeking (Bussing et al., 2003; Ghosh, et al., 2015; Lawton et al., 2016; Olanyian, 2007). Mistrust of medications used for ADHD, as well as mistrust of doctors and the diagnostic process is often reported as a concern by minority parents (dosReis et al., 2007; Olanyian, 2007). For example, some African American parents may feel African American children are over diagnosed (Bailey & Owens, 2005). Cultural variations regarding behavioral norms or behavior as controllable versus a mental health illness impacts parental decisions to seek treatment (Ghosh et al., 2007; Hong et al., 2013; Lawton, et al., 2016; Oh & Kendall, 2009; Pajo & Cohen, 2013; Perry et al., 2005).

Many children also experience significant delay between symptom onset and evaluation as well as between evaluation on treatment (Berger-Jenkins et al., 2012; Bussing et al., 2003; Purper, 2007). Some studies have found delays ranging from 1 to 4.9 years between symptom onset and treatment (Brinkman et al., 2009; Bussing et al.,

2005; Coletti et al., 2012; World Federation for Mental Health, 2006). These delays in treatment are well-established in the literature. The substantial delays, up to 4.9 years, are of significant concern highlighting the need for continuing research and interventions to reduce these delays and help children receive more timely treatment (Brinkman et al., 2009; Bussing et al., 2005; Coletti et al., 2012; World Federation for Mental Health, 2006). Cultural attributes towards ADHD, denial of symptoms, fear of medication, and fear of stigma contribute to delays in treatment (Brinkman et al., 2009; Lawton et al., 2016; Starr, 2007; Sayal et al., 2006; Starr 2007; Waschbusch et al., 2011).

It is important to consider the child's gender when exploring reasons for treatment avoidance. ADHD is diagnosed in males far more often than females, at rates between 2:1 up to estimates of 5:1 (APA, 2013; Bussing et al., 2003; Visser et al., 2014). Boys are also frequently found to receive higher rates of evaluation and treatment than girls (Bussing et al., 2003; Skogli et al., 2013). In addition, males are found to be the subject of more studies and referred more often for ADHD symptoms by teachers (Babinski, et al., 2011; Skogli et al., 2013). While researchers have shown that girls are under-identified, girls are now being included in studies more frequently (Babinski et al., 2011; Scuitto & Eisenberg, 2007). It is important for clinicians to be aware of gender disparity in referrals and diagnoses to ensure that gender is not a barrier to treatment (Babinski, et al., 2011; Bussing et al., 2003; Skogli et al., 2013).

Family Dynamics

Family dynamics is also an area that has not been well explored in regard to care. Children require parental permission to enter care (Brinkman et al., 2009; Mills, 2011;

Stroh et al., 2008). The number of parents in the household is rarely addressed as a factor influencing access to care (Bussing et al., 2007; Cassano et al., 2006; Phaeres, 2005; Singh, 2003). Parental understanding of symptoms as well as the knowledge of, and ability, to navigate healthcare systems is also necessary to gain care. While these factors can be influenced by parent ethnicity, socioeconomics, and fear of stigma, they can also be influenced by family dynamics (Bussing et al., 2007; Chen et al., 2007; Ghosh et al., 2015; Kendall et al., 2003; McLeod et al., 2007). Although there is a notable lack of paternal presence in research studies on children with ADHD, there is a body of literature demonstrating clear differences in parental views on symptom severity and the need for treatment (Chen et al., 2008; Ghosh et al., 2015; Phaeres, 2005; Mills, 2011; Singh, 2003; van der Veen-Mulders et al., 2017; Waschbusch, et al., 2011).

Overwhelmingly, the mother is the principal informant in surveys collecting data on children. With only one parent responding, the influence of fathers and their child's access to mental health care is questioned (Cassano et al., 2006; Fabiano, 2007; Markel & Weiner, 2012; Phaeres, 2005; Singh, 2003). Studies that do include responses from mothers and fathers may still be analyzed singly as "parents" rather than individually (Phaeres, 2005; Perry et al., 2005; Singh, 2003; Waschbusch, et al., 2011). Very few studies seek a balanced response between mothers and fathers. In addition, they do not address whether single or dual parent families are included. (Chen et al., 2008; Mills, 2011; Singh 2003).

Researchers have shown clear parental differences relating to understanding and acceptance of ADHD (Ghosh et al., 2015; Singh, 2003; Waschbusch et al., 2011). Living

in a single parent household has been correlated with both more and less involvement in treatment for children (Ghosh et al., 2015; Waschbusch et al., 2011). Single parents have also been found less likely to turn in survey results which may impact their inclusion in the literature (Cussen et al., 2012). The gender and ethnicity of the parent has been found to impact treatment-seeking (Ghosh, et al., 2012; Singh, 2003). The relationship between parent gender and child gender has also been found to be a factor (Mayfield et al., 2018). In a single parent household, a child of a parent less disposed to treatment-seeking could be negatively impacted by the single parental gatekeeper (Ghosh, et al., 2012; Singh, 2003). On the other hand, single parents have also been shown to be more outcome oriented and thus more apt to seek treatment and follow treatment recommendations (Waschbusch et al., 2011). Thus, the influence of single versus dual parents' merits further exploration.

In a two-parent household, there are two parents involved in the decision-making process towards mental health treatment (Brinkman, et al., 2009; Mayfield et al.; 2018; van der Veen-Mulders et al., 2017). Parents are responsible for obtaining treatment for their children yet their views on symptom severity and need for treatment often differ (Ghosh, et al., 2015; Markel, & Wiener, 2014; Mills, 2011; Stroh et al., 2008; van der Veen-Mulders et al., 2017; Zwirs et al., 2006). The presence of a child with ADHD is correlated with marital discord. Disagreements between parents in behavioral expectations or feelings towards mental health treatment could affect onset or continuation of treatment (Ghosh, et al., 2015; Mohammadi et al., 2012; Waschbusch et al., 2011). Marital dissatisfaction as well as depression and anxiety may also affect

families with children that have ADHD (Cussen et al., & 2012; Mohammadi et al., 2012). A child's treatment can be delayed, terminated, or cause discord within the family (Mills, 2011; Stroh et al., 2008).

Both single and dual parent families offer constructive benefits as well. In dual-parent households, spouses can provide support and lessening stress or feelings of isolation. Single parents may find solo decision making less stressful than conflicting opinions in dual parent households (Bussing et al., 2015; Moen et al., 2014; Mohammadi et al., 2012). Single parents may be more outcome oriented, potentially improving odds of a child receiving treatment (Waschbusch et al., 2011).

This study will focus on the gap in the literature regarding the potential influence of family dynamics, specifically living in a single or dual parent household (Bussing et al., 2007; Cassano et al., 2007; Markel & Weiner, 2012; Phaeres, 2005; Singh 2003). Given the established differences in opinions towards mental health treatment for ADHD between parents, exploring the possible impact of single or dual parent status is important as it may aid in the understanding of continuing barriers to care (Ghosh et al., 2015; Markel & Wiener, 2014; Mohammadi et al., 2012; Singh, 2003; van der Veen-Mulders et al.; 2017; Waschbusch et al., 2011). This study will also highlight the significant lack of paternal inclusion in research studies on ADHD (Cassano et al., 2006; Markel & Wiener, 2014; Phares, 2005; Singh, 2003). Influencing fathers in surveys and studies about all aspects of ADHD from symptom recognition, negative impact of ADHD on academic and social growth, understanding treatment options, navigating healthcare to obtain

services, treatment preferences, and recommended treatment options, is an essential next step to advocate for (Cassano et al., 2006; Phares, 2005; Singh, 2003).

Problem Statement

There is a problem in under-treatment of children with ADHD; between 40-70% of children meeting criteria do not receive treatment (Berger-Jenkins, 2012; Bussing et al., 2015; Bussing et al., 2007; Rowland et al., 2015). Despite researchers indicating ADHD treatment is effective, children are experiencing significant delays or absence of treatment for ADHD (Brinkman et al., 2009; Bussing et al., 2007; Bussing et al., 2005; Bussing et al., 2015; Coletti et al., 2012; World Federation for Mental Health, 2006). This problem has negatively impacted children with ADHD because delayed treatment is associated with significant negative outcomes on both childhood and adult function in the areas of learning, relationships, and occupation (APA, 2013; Babinski et al., 2011; Gjervan & Nordahl, 2010; Kolla et al., 2016; Kuriyan et al., 2013; Miranda et al., 2016; Rowland et al., 2015). A possible cause of this problem is family structure. There are known differences between parent genders and ethnicity, yet little is known regarding the impact of living in single or dual parent families (Chen et al., 2008; Ghosh et al., 2015; Mills, 2011; Phaeres, 2005; Singh, 2003; van der Veen-Mulders et al., 2017; Waschbusch et al., 2011). Perhaps a study which investigates the potential the relationships between single and dual parent families, parent gender and ethnicity, and child age, gender and ethnicity by ANVOVA could remedy the situation. Given that clear differences between mothers and fathers is demonstrated, the relationship between single or dual parent families, parent gender, and treatment decisions is a potential factor that clearly needs

additional research (Ghosh et al., 2015; Mayfield et al., 2018; Singh, 2003; Waschbusch et al., 2011).

Purpose of Study

The purpose of this retrospective cohort quantitative study is to discover the potential relationship of family dynamics on the onset or duration of treatment for ADHD. Specifically, the potential correlation between single or dual parent families, parent race and gender, as well as child age, gender and race on ADHD treatment onset and duration will be explored. A correlation between single or dual parents, parent gender, and/or parent race and ADHD treatment onset or duration could improve our understanding of barriers to treatment by indicating the need for further exploration of the potential impact of family dynamics and parental differences. While differences of opinion on symptom severity or need for treatment are known, few studies on parental attitudes towards ADHD include both fathers and mothers as separate variables to analyze. In addition, information regarding single or dual parent households is rarely given or noted (Chen et al., 2008; Mills, 2011; Singh 2003).

This study will be a secondary analysis which allows us to examine relationships between the covariates of family dynamics, single or dual parent families, gender of parents, and parent race. The dependent variables are the age of the child at the beginning of treatment and the end of treatment, as well as the duration of treatment. Additional independent variables are age, race, and the gender of the child. Questions 1 and 2 will be analyzed through stepwise regression to best address the covariates of family dynamics,

parent gender, and parent race supported by the literature analysis. Questions 3 and 4 are more exploratory in nature and thus a backwards regression is suitable.

Research Questions and Hypotheses

The research questions, null, and alternative hypotheses are stated below.

Research Question 1: Is there a relationship between family dynamics, after controlling for parental race and parental gender, and ADHD treatment onset of their child?

$H_1$1: There is relationship between family dynamics, after controlling for parental race, and parental gender, and onset of ADHD treatment of their child.

$H_0$1: There no is relationship between family dynamics, after controlling for parental race, and parental gender, and onset of ADHD treatment of their child.

Research Question 2: Is there a relationship between family dynamics, after controlling for parental race and parental gender, and length of ADHD treatment of their child?

$H_1$2: There is relationship between family dynamics, after controlling for parental race and parental gender, and length of ADHD treatment of their child.

$H_0$2: There no is relationship between family dynamics, after controlling for parental race and parental gender, and length of ADHD treatment of their child.

Research Question 3: Is there a relationship between child age, gender, and race and onset of ADHD treatment?

$H_1$3: There is a relationship between child age, gender, and race and onset of ADHD treatment.

$H_0$3: There is no relationship between child age, gender, and race and onset of ADHD treatment.

Research Question 4: Is there a relationship between child age, gender, and race and length of ADHD treatment?

$H_1$4: There is a relationship between child age, gender, and race and length of ADHD treatment.

$H_0$4: There is no relationship between child age, gender, and race and length of ADHD treatment.

Theoretical Framework

The theoretical framework for this study will be Bowen's family systems theory. This theory sees the family as an emotional unit with strong interdependence between family members and emotional change (Bowen, 1985). The concept of the nuclear family emotional process has been used to explain the relationship between family members (Bowen, 1985). Bowen's family systems theory has also been used to address cultural and gender differences within the family (Garrett-Peters et al.; 2011; Riina & McHale; 2015). The presence of a child with a medical or psychological disorder can increase stress in a family introducing or magnifying discord which in turn may affect their ability to care for their child including obtaining mental health treatment (Mills, 2011; Mohammadi et al., 2012; Perelli, 2011). Given the nature of the nuclear family concept in family systems theory dual parent families may be affected more than single parent families as the greater number of individuals within the family may complicate decision-making. This could result in delay or early termination of treatment for the child.

Nature of the Study

This study will be a secondary analysis which allows us to examine relationships between variables. The covariates are family dynamics, single or dual parent families, gender and race of parents. The dependent variables are the age of the child at the beginning of treatment and the end of treatment, as well as the duration of treatment. Additional independent variables are age, race, and gender of the child. This is consistent with family systems theory, which focuses on relationships between family members and external variables such as illness (Perilli, 2011). This study will examine the relationship between single and dual parent families. the onset of treatment, and the duration of treatment. A correlation between these variables could improve our understanding of barriers to treatment by indicating the need for further exploration of the potential impact of household status and parental differences. While differences of opinions on symptom severity or need for treatment are known, few studies on parental attitudes towards ADHD include fathers and mothers or whether the families are single or dual parent households (Chen et al., 2008; Markel & Wiener, 2014; Mills, 20011; Singh, 2003; van der Veen-Mulders et al.; 2017).

Sources of Information or Data

Data for this study has been obtained through a Freedom of Information Act (FOIA). Medicaid billing records (deidentified) born between 1985-2000 will be examined for differences between treatment length and onset for children single and dual parent families residing in Washington DC and using Medicaid services for ADHD

treatment. Age, gender, and race of parents, and age and gender of the child will also be examined for potential relationships to treatment onset or duration.

The data were analyzed through a combination of ACNOVA and backwards regression. ACOVA was used to examine the potential relationship between single or dual parent households, parent gender and race on treatment onset and length. Backwards regression will be used to explore the nature between child age and gender.

Definitions

Dual parent/co-parenting: Dual parent families will be researched in this study. Dual parent, or co-parenting families are defined as children living with two parents as indicated through Medicaid data.

Family dynamics: the composition of the family, whether there is a single parent or dual parents of the child with ADHD.

Length of treatment: The amount of time between initial and last treatment appointment per Medicaid billing records. Treatment will include medication visits, psychotherapy, and primary care visits billed for ADHD management.

Onset of treatment: The date of first treatment begins per Medicaid records. Study participants will have been enrolled in Medicaid since birth. Neither diagnosis nor treatment will have affected Medicaid status. Treatment will include medication visits, psychotherapy, and primary care visits billed for ADHD management.

Parent: will include those identified as “mother” and “father” on Medicaid records.

Single parent families: Single parent families are defined as children living with a single parent as indicated through Medicaid data.

Assumptions

There are many assumptions that could be made about the influences on single or dual parent families. By using Medicaid data, this study attempts to remove socioeconomic variable; however, that does limit generalization. The literature review covers topics such as stigma, marital stress, differences between parents, and maternal versus paternal influence. There are still many other variables that could influence a parent's decision to seek treatment for their child with ADHD. While there are many theories on barriers to care, no one theory accounts for the high numbers of children with ADHD who do not receive treatment. This study is an initial foray into a previously unstudied variable. While differences between parents have been studied, the potential difference between single or dual parents has not been thoroughly studied.

Scope and Delimitations

Children receiving treatment through Medicaid were chosen for this study for several reasons. First, the data is available through a FOIA request and hundreds to thousands of families can be easily analyzed. Second, Medicaid data includes a wealth of information about families that allows multiple variables and covariables to be studied. Third, using families on Medicaid removes socioeconomic differences as a variable.

The population of Washington DC children with ADHD enrolled in Medicaid was chosen because it is close to wear the author lives and works thus making any revelations useful to her immediate practice. While a FOIA request could obtain records from

multiple states, a smaller area is more manageable for this first analysis of potential influence. If the findings show that the number of parents has a significant effect on treatment onset or duration, further research into other states as well as families using private insurance would be warranted to corroborate findings and establish a basis for generalization. Any findings from this study would be limited to Washington DC, or other urban areas with similar profiles. Given the exploratory nature of this study, those limitations are acceptable at this time.

Limitations

The preexisting nature of the data could be considered a barrier to some. Archival data is often considered weaker due to potential unknown factors such as collection measures or standards. Archival data has also been collected for a purpose other than the intended study and thus may have limitations. In this case, the data was collected by the federal government and is likely to have been collected with appropriate standards. The archival nature of the data is necessary to answer the research questions regarding length and onset of treatment which both occur in the past.

Significance and Social Change

High numbers of untreated children with ADHD as well as the known negative effects of ADHD on lifelong function make addressing barriers to care a significant subject for social change (Gjervan & Nordahl, 2010; Kolla et al., 2016; Kuriyan et al., 2013; Miranda et al., 2016). Rowland et. al, 2015.) Addressing the continuing questions as to why treatment delays and avoidance endure despite years of research documenting the efficacy of treatment for ADHD is essential to the community at large as well as those

providing mental health services (Berger-Jenkins et al., 2012; Brinkman et al., 2009; Bussing et al., 2003; Bussing et al., 2005; Coletti et al., 2012; Kordon et al., 2006; World Federation for Mental Health, 2006). The puzzle regarding treatment delay and avoidance has been examined extensively for many years (Berger-Jenkins et al., 2012; Brinkman et al., 2009; Bussing et al., 2003; Bussing et al., 2005; Coletti et al., 2012). Research the leads to potential reduction of barriers and increases in treatment will effect social change by minimizing harmful effects of ADHD and improving lifelong function for children with ADHD. Parent, marital, and family stress will also be reduced as families better navigate health care systems. While this study will likely not solve this complicated puzzle, it should add a missing piece to help us fill in gaps that affect our overall understanding of multifaceted problem.

At this time, the factors on parental-decision making regarding ADHD treatment are not fully understood. Since parents are the gatekeepers to a child's access to treatment, understanding the factors affecting their decision process is essential (Brinkman et al., 2009; Cassano et al., 2006; Mills, 2011; Stroh et al., 2008). To date, research studies have almost exclusively relied on maternal data (Cassano et al., 2006; Ghosh et al., 2015; Phaeres, 2005; Singh 2003). There is a significant absence of paternal, as well as dual parent information regarding factors that affect seeking treatment. This is significant as the few studies that have included paternal information have found clear differences between paternal and maternal data (Chen et al., 2008; Ghosh et al., 2015; Phaeres, 2005; Singh 2003; Waschbusch et al., 2011). This study will add to the inadequate data on parental differences. Adding to the limited body of work

including and analyzing potential differences between mothers and fathers is substantial as this is a key factor in decisions regarding whether or not a child receives treatment for ADHD (Chen et al., 2008; Ghosh et al., 2015; Phaeres, 2005; Singh 2003). Given the critical gap in this area, research to support change to better increase paternal inclusion in research studies as well as in the diagnostic process is a significant benefit to social change (Ghosh et al., 2015; Phaeres, 2005; Singh 2003).

While fathers are rarely included in research studies, the number of parents in the household is also rarely examined for potential contribution to barriers in treatment seeking Ghosh et al., 2015; Singh, 2003). Studies that do include maternal and paternal responses often analyze answers as a single unit rather than separate entities (Phaeres, 2005; Perry et al., 2005; Singh, 2003). The number of family members is also rarely included in demographic information or entered as a covariable (Bussing et al., 2007; Phaeres, 2005; Perry et al., 2005; Singh, 2003). Family dynamics are also an under-researched area. Marital discord, stress, and different opinions about ADHD may affect treatment seeking decisions (Ghosh et al., 2015; Mohammadi et al., 2012; Singh, 2003; Waschbusch et al., 2011). Research contributing to the understanding family dynamics has on treatment engagement or avoidance can lead to custom parent education regarding mental health treatments addressing the unique needs of single or dual parents as well as mothers and fathers. Tailored parent education could provide individual support for each parent by addressing stigma, stereotypes, fears, and/or misinformation that may delay treatment.

Given the clear need for additional research on both parental differences and family dynamics, this study will study the potential differences between treatment onset and length in single and dual parent families. In the hopes it will help support ongoing efforts to increase paternal inclusion in research and clinical settings. This study will also support the importance of surveying both parents to gain a more inclusive view of the factors that affect parental decision-making regarding treatment for ADHD leading to opportunities for tailored parent instruction. As parental differences and family dynamics are better understood, the delays in treatment can hopefully be shortened. This will effect social change by improving access to treatment for ADHD which will in turn improve lifelong function for the child and decrease family stress. Considering the negative long-term effects of ADHD, research that reduces barriers and improves treatment access is a clear social benefit.

Summary

As the literature shows, children with ADHD are experiencing significant deficits in treatment. National and worldwide studies show delays between 1.9- 4 years before treatment is initiated (Coletti et al., 2012; and Ghanizadeh, 2007; Purper & Ouakil 2007; World Federation for Mental Health's 2006). Up to 42%-77% of children with ADHD may not be receiving any treatment (Berger-Jenkins, et al., 2012; Bussing et al., 2015; Bussing et al., 2003; Rowland, et al., 2015). Caucasian boys were two times more likely to receive evaluation, diagnosis, and treatment than minority children. Boys in general are five times more likely to receive an evaluation than girls (Bussing et al., 2003). Although the number of children with ADHD continues to rise, barriers to treatment still

prevent over half of children with ADHD for receiving services (Rowland et al., 2015; Visser et al., 2012).

Given the negative immediate and long term effects of ADHD, long delays and treatment avoidance are serious concerns (APA, 2013; Babinski et al., 2011; Gjervan & Nordahl, 2010; Kordon et al., 2006). ADHD impairs children's academic and social functioning. Family function can also be disrupted by ADHD in children resulting in marital discord and increased stress (Mohammadi et al., 2012). Long term effects such as substance abuse, relationship issues, jail time, difficulties in the workplace and in relationships are significant concerns as well (APA, 2013; Babinski et al., 2011; Gjervan & Nordahl, 2010; Kolla et al., 2016; Kuriyan et al., 2013; Miranda et al., 2016).

Ethnicity, gender, stigma, and socioeconomic status have been studied regarding their influence on treatment seeking for ADHD. While each has impact on treatment seeking, understanding their impact has not led to increases in treatment seeking (Brinkman, et al., 2009; Ghosh, et al., 2015; Lawton, et al., 2016; Starr, 2007). The influence of parent knowledge of ADHD, preferences for addressing problematic behavior, and help seeking are being included in more research. Since parents are the gate keepers to treatment, understanding the effect they have on treatment seeking is essential (Mills, 2011; Stroh, et al., 2008; Zwirs, et al., 2006).

While aspects such as parental attributes towards behavior and help seeking, ethnicity, and culture have been investigated, the influence of living in a single or dual parents in the family has received extremely little attention significant spousal differences regarding behavior concerns and mental health treatment have been found (Bussing et

al.,2007; Chen, et al., 2008; Cussen et al., 2012; Kendall et al., 2003). These differences have also been found to delay or prevent children from accessing treatment (Ghosh, et al., 2015). With extremely few studies including information from fathers, additional research is needed on the potential effects of paternal and maternal disagreements regarding treatment for ADHD (Chen, et al., 2008; Mills, 2011; Markel, & Wiener, 2014; Mills, 2011; Stroh, et al., 2008; Singh, 2003; van der Veen-Mulders, et al., 2017; Zwirs, et al., 2006).

Few research studies include information from both parents for parent responders. Having a child with ADHD is known to cause marital discord (Chen, et al., 2008; Cussen et al., 2012; Markel & Weiner, 2012; Mohammadi et al., 2012; van der Veen-Mulders, et al., 2017). Differences between spousal views and marital discord could place children with ADHD at risk for delayed treatment or denial of treatment (Ghosh, et al., 2015; Mohammadi et al., 2012; Waschbusch et al., 2011). Given the growing numbers of single parent families, knowing if family dynamics influence treatment decisions could help reduce this barrier.

The potential differences between single or dual parent families are a viable factor to consider when examining barriers to treatment. The following chapter will examine the literature on known barriers as well as explore the influence of parental attributes. Research on spousal differences will be presented to demonstrate the impact on treatment seeking. The gaps in the literature regarding paternal inclusion in treatment decision making will be addressed as will the gaps in relation to differences between single and dual parent households. The effects of ADHD on family dynamics will be reviewed to

understand the potential impact of family dynamics will demonstrate the need for additional research in this area, specifically whether single or dual parent families effect treatment decisions.

Chapter 2: Literature Review

Introduction

Often initially diagnosed during childhood, ADHD is a well-known childhood disorder (National Institutes of Mental Health [NIHM], 2008a). Depending on sources, 5-15.5% percent of children may be diagnosed with ADHD (APA, 2013; Bush, 2010; CDC, 2008; Rowland et al., 2015; Visser et al., 2016). Unfortunately, many children with ADHD symptoms and diagnoses do not receive treatment. Studies have found that between 40-70% of children in studies with ADHD symptoms have not received treatment (Berger-Jenkins et al., 2012; Bussing et al., 2015; Bussing et al., 2003; Rowland, et al., 2015). Many others have significant delays, 1 to 4.9 years, between symptom onset and evaluation or treatment (Brinkman et al., 2009; Bussing et al., 2005; Coletti et al., 2012; World Federation for Mental Health, 2006).

Given that ADHD can cause serious impairment of functioning for children which may continue into adulthood, lengthy delays and absence of treatment are serious concerns (APA, 2013; Brinkman et al., 2009; Bussing et al., 2005; Coletti et al., 2012; Gjervan & Nordahl, 2010; Kolla et al., 2016; Kuriyan et al., 2013; Miranda et al., 2016; World Federation for Mental Health, 2006). Therefore, it is essential that potential barriers be discovered and examined in order to reduce their negative effects.

The literature review will examine the potential differences between single and dual parent families regarding the onset and duration of treatment for children with ADHD. The influences of parent gender and race will also be reviewed to establish their potential relationship on parental decisions regarding ADHD treatment for their children.

Culture, socioeconomic status, race, socioeconomic status, education, and age are factors that have been previously analyzed, whereas number of parents in the household or parent gender is rarely addressed (Bussing et al., 2007; Cassano et al., 2006; Phaeres, 2005; Singh, 2003). In addition to family dynamics, variables such as parent gender and race, age of child, and child race will be explored and evaluated as potential barriers to diagnosis and treatment.

The potential differences between single or dual parent families and parent gender are viable factors to consider when examining barriers to treatment (Ghosh et al., 2015; Markel & Weiner, 2012; Waschbusch et al., 2011). When maternal and paternal views towards ADHD are compared, there are often more differences than similarities (Markel & Weiner, 2012; Waschbusch et al., 2011). Dissimilarities between single and dual parent families have rarely been studied; however, differences between single mothers and dual parent families have been found (Ghosh, et al., 2015; Waschbusch, et al., 2011). Given the additional stress on family functioning dual parent households may be subject to greater impact by contradictory views regarding the need for treatment while single parent households may not (Chen et al., 2008; Cussen et al., 2012; Lewis-Morton et al., 2014; Markel & Weiner, 2012). The decision-making process regarding treatment is complex and challenging for parents (Brinkman, et al., 2009; Mills, 2011; Stroh et al., 2008; van der Veen-Mulders et al., 2017).

This study could indicate whether further research on single or dual parent households with children with ADHD was warranted while also serve to further quantitative or qualitative research to examine factors influencing any differences

between mothers and fathers that were found. As well as highlight the need for greater efforts to include fathers, or fathers and mothers, in data collection. The possible differences between households may indicate additional research should also give greater attention to the inclusion and comparison of both parents for attitudinal data (Phares, 2005; Singh, 2003).

This chapter will review the literature relevant to ADHD treatment for children, parental attributes and differences regarding ADHD symptoms and treatment, the influence of parental gender on ADHD treatment, and barriers to ADHD treatment. The literature search strategy will be discussed highlighting the lack of paternal inclusion in research on children with ADHD. Concerns regarding the frequent combination of mother and father data when clear differences have been established will also be addressed (Chen et al., 2008; Ghosh et al., 2015; Phaeres, 2005; Mills, 2011; Singh, 2003; van der Veen-Mulders et al., 2017; Waschbusch et al., 2011). The theoretical foundation and conceptual framework will be discussed. A review of ADHD diagnostic criteria and best treatment practices is also included for reference and comparison to studies including information about ADHD.

Literature Search Strategy

For this study a variety of psychological data bases were used. PsycINFO, PsychARTICLES, PsycEXTRA, Academic Search Complete, MEDLINE with Full Text and ERIC were initially searched. MEDLINE and ERIC were dropped from later searches with SAGE Premier, SociINDEX with Full Text added later. PsycINFO, PsychARTICLES, and SAGE Premier, yielded the most successful results. Google

searches were used for news articles related to ADHD as well as mental health stigma. Google Scholar was used occasionally as well for resources not found in the through Walden. The APA Website, the DSM-5 website, the CDC website, and NIH websites were also used as resources.

ADHD, attention deficit, and attention deficit hyperactivity disorder, children, and adolescent were significantly used search terms. Attention deficit was the most significant descriptor for the disorder ADHD. ADHD and attention deficit were used in conjunction with: children, age, childhood, female, male, girls, boys, gender, age, race, sex, ethnicity, age, onset, duration, school, preschool, family, diagnosis, treatment, barriers, executive function(s) medication, and therapy. ADHD was also combined with parent(s), parental, family, age, race, sex, ethnicity, race, age, gender, female, male, mother, father, mom(s), dad(s), onset, duration, diagnosis, treatment, barriers, belief(s), attributions, medication, and therapy. Stigma, barrier, mental health, culture, attributions, were additionally combined with ADHD.

The literature search focused mainly on the previous fifteen years. Research started in 2012 and continued through 2018. Given the nature of several seminal sources; sources as old as 1980, Morrison and Teta's (1980) study on attitudes towards mental illness and The MTA Study on ADHD (1999) were included. Singh (2003) and Phares (2005) seminal work on the absence of paternal input is essential to understanding the significance of this deficit. Peer reviewed literature comprises the bulk of the sources used. Agency reports such as the CDC, NIH, American Academy of Pediatrics, and the Agency for Healthcare Research and Quality, were also included as they contained

essential statistics and practice guidelines. In addition, media articles were also included to demonstrate the connection between media and parental attributes towards ADHD and mental health stigma as identified in peer reviewed articles.

Theoretical Foundation

The theoretical framework for this study will be Bowen Family System's Theory. Dr. Murray Bowen created the Bowen family systems theory through the 1950's and 60's, developing it through the 1970's. Noticing the disparity between reported behavior and actual behavior, Dr. Bowen thoroughly examined human behavior using the family system as the unit of study rather than the individual. This theory sees the family as an emotional unit with strong interdependence between family members and emotional change (Bowen, 1985). Bowen's family systems theory has also been used to address cultural and gender differences within the family (Garrett-Peters et al., 2011; Riina & McHale; 2015). Stressors cause tension which affects the emotional connectedness between family members resulting in dysfunction in family function. Bowen theory has eight components: triangles, differentiation of self, nuclear family emotional process, family project process, multigenerational transmission process, emotional cutoff, sibling position, and societal emotional process. The concept of differentiation of self is related to the ability to make decisions and cope with stress (Bowen, 1985).

The concept of the nuclear family emotional process has been used to explain the relationship between family members. These patterns occur in single parent families as well as families with two parents whether they are intact or blended families. According to Bowen theory, increased protracted tension can impair family function (Bowen, 1985).

The presence of a child with a medical or psychological disorder can increase stress in a family introducing or magnifying discord which in turn may affect their ability to care for their child including obtaining mental health treatment (Perelli, 2011; Mills, 2011; Mohammadi et al., 2012). Given the nature of the nuclear family concept in family systems theory dual parent families may be affected more than single parent families as the greater number of individuals within the family may complicate decision-making. Effects from triangles or emotional cutoff could come into play more easily in dual parent families. This could result in delay or early termination of treatment for the child (Bowen, 1985).

History of Attention-Deficit/Hyperactivity Disorder

Often initially diagnosed during childhood, ADHD is a well-known childhood disorder (NIHM, 2008a). Depending on sources, 5-12% of children may be diagnosed with ADHD (APA, 2013; Bush, 2010; CDC, 2008). Recognized in the early 20th century, the number of people diagnosed with ADHD has increased significantly in the last 30 years (Singh, 2008b). Over this time the etiology and nosology of ADHD have undergone changes as well (AAP, 2011; APA, 2013). High frequencies of diagnoses, changing understanding of criteria, and misunderstanding of symptoms related to ADHD have resulted in some challenges regarding the validity of ADHD. Mental illness stigma and fear of negative side effects of stimulant medications used to treat ADHD have fueled this controversy (Singh, 2008b; Visser et al., 2014). However, given the large volume of research on the subject, including the National Institutes of Medicine's long-

term MTA (1999) study as well as backing from the APA with enhanced diagnostic criteria, ADHD is a valid psychological disorder (APA, 2013; NIMH, 2008a).

The DSM-5 is the primary reference for ADHD and other psychiatric disorders. It classifies ADHD as a developmental neuropsychiatric disorder comprised of inattention, or hyperactivity-impulsivity occurring alone or together that inhibits development and function in multiple settings such as work, school, or home (APA, 2013). Trouble sustaining tasks, focus, emotional dysregulation, forgetfulness, and disorganization are also hallmarks of ADHD (Bush, 2010). These behaviors are intrusive and interfere with occur with greater intensity and frequency than similar aged peers. Disruptive behavior disorders, learning disorders, mental retardation, and mood disorders, should be ruled out via differential diagnosis. As should personality, psychotic, neurocognitive disorders. Comorbidity is frequent, conduct disorders, specific learning disorders, autism, and obsessive-compulsive disorder, are a few of the more common disorders comorbid with ADHD (APA, 2013).

Detailed Description of ADHD

Research has changed our understanding of ADHD. The focus initially was on dysfunction of the brain, followed by hyperactivity. Impulsivity, executive function, and cognitive deficits were studied later. Current literature on ADHD demonstrates a great interest in cognitive deficits considered related to ADHD. These can include emotional dysregulation, working memory, inhibition, organization, hyperactivity, inattention, flexibility, and the separation of emotion and cognition (Zainab & Mayhall, 2012). Problems in executive function is considered by some as a key component of ADHD

symptoms (Pennington & Ozonoff, 1996). Neurological research has shown a possible connection between executive function and ADHD through a link between base ganglia and frontal cortex circuits (Schulz et al. 2005; Zainab & Mayhall, 2012).

Recently as technology has advanced and electronic imaging provides images of differences in brains of individuals with and without ADHD, studies have returned to the focus on brain development and function. Cognitive neuroscientists and biopsychologists study neural processing to gain a better understanding of how ADHD affects information processing. (Bush, 2010; CDC, 2012; Zainab & Mayhall, 2012). Genetic and environmental factors connected to development of ADHD are also studied. While it is understood that a genetic link exists, this link is still being explored (CDC, 2012).

ADHD is classified in the DSM-5 as developmental neuropsychiatric disorder consisting of three subtypes: predominately inattention, predominantly hyperactive-impulsive, and combined presentation. Individuals must meet the criteria for one of the subtypes with onset of symptoms occurring prior to age 12. Symptoms must also occur in greater frequency and duration than appropriate for their developmental level (APA, 2013). In addition, social situations, home, school, or work are significantly impaired by ADHD symptoms (APA, 2013; Singh, 2008a).

Subtypes of ADHD

ADHD is grouped into three subtypes: inattention, hyperactive-impulsive, and combined presentation. These subgroups are defined in the DSM-5 and include specific examples are included (APA, 2013). DSM-5 diagnostic criteria are provided for each

subgroup which will be discussed more thoroughly in the in diagnostic criteria section of this chapter. This section will explore the characteristics and examples of each subtype.

Predominantly Inattentive Presentation.

It is important to remember that individuals with ADHD have a true difficulty with sustained focus, it is not a result of defiance or misunderstanding due to comprehension difficulties. Appearing to fail to listen or drift off, as well as difficulties with organization such as time management, tidiness of materials or belongings, failing to follow instructions, or difficulty sustaining and finishing tasks, duties, or assignments are signs of inattention. Individuals with inattentive type may both hypo-focus and hyper-focus. The dichotomy of the ability to sustain focus for preferred tasks with the inability to do so for nonpreferred tasks triggers debates over the concept of inattention, or inability to attend (Bush, 2010; Singh, 2008). This is challenging to understand and bringing willfulness and individual choice into question as factors rather seeing ADHD as the predominate influence. Reframing the concept from inability to attend to properly regulating attention may be more a more precise explanation of the difficulties individuals with ADHD face (Bush, 2010; Zainab & Mayhall, 2012). Children with inattentive type can struggle with attention yet sit quietly and appear well-behaved. Because they do not appear to struggle or do anything "wrong" they may not be referred for assessment. Assessments may also miss the internal difficulties (NIMH, 2013).

Predominantly Hyperactive/Impulsive Presentation.

Individuals with predominantly hyperactive-impulsive presentation are often described as restless, "on the go" or "driven by a motor" (APA, 2013). Young children

may climb or run seemingly inappropriately. Sitting or playing quietly and waiting turns to play or speak can be extremely difficult which can adversely affect social relationships (APA, 2013; NIH 2013). Children and parents may also be judged negatively for the lack control the child seems to display. The potential desire for immediate gratification, or lack of ability to delay gratification, may influence impulsivity. Decisions with long-term consequences may be particularly affected by impulsive actions. Thus understanding and accepting delayed gratification is extremely challenging. (APA, 2013). Social, academic, and occupational activities are often negatively impacted by hyperactivity and impulsivity symptoms (APA, 2013).

Combined Presentation.

Individuals diagnosed with a combined presentation have met the criteria for both inattentive presentation and hyperactive/impulsive presentation. Meeting both criteria indicates a high number of symptoms that interfere with social, academic, or occupational functioning because both inattention and hyperactivity-impulsivity can affect decision making, children with a combined presentation may be more at risk for injury, academic difficulties, substance abuse, or incarceration (APA, 2013).

Etiology of ADHD

The quest to understand the underlying factors responsible for ADHD has been the subject of a great deal of psychological research. Genetic and environmental factors are both known to play a role in the complex etiology of ADHD (Willcutt, 2008). Yet unlocking the genetic connection is challenging (Akutagava-Martins et al., 2013). Genetic links to ADHD are a subject of great interest. Studies looking at intact families

and families with adopted children have found that ADHD is genetically linked. The most common link is the most direct, parents to children; however, more indirect links from other relatives such as uncles, aunts, or grandparents have also been found (Wilcutt, 2008). Children with inattention, hyperactivity, and impulsivity are more frequently related to parents with ADHD than children in the general population (APA, 2013; Rommelse, 2010). In addition, deficits in executive function have moderate heritability (Rommelse, 2010)

Evolving symptoms add to the difficulties of understanding ADHD. In addition, there have been disagreements regarding age of onset criterion for over 20 years (APA, 1994; Barkley & Biederman, 1997; Charach et al., 2011; Curchack-Lichtin et al., 2014; Waschbusch et al., 2007). With symptoms difficult to differentiate from normal developmental behaviors in children under age six, there had been a strong preference for age of onset criterion to begin between six and seven years of age (AAP, 2011; APA, 1994; Charach et al., 2011; Curchack-Lichtin et al., 2014; Waschbusch et al., 2007). According to the DSM-5, symptoms of ADHD are now required to be present before age 12 (APA, 2013). This new age of onset seems to reflect ongoing criticism requiring symptoms to occur prior to age seven (Barkley & Biederman, 1997; Keiling et al., 2010). However, with more research studying younger children, the AAP (2011), the APA (2013), and the Agency for Healthcare Research and Quality (2011) have recognized the need for diagnostic and treatment protocols for younger children. While generally requiring impairment in two settings, this requirement may be inappropriate as it bars

nonschool aged children from diagnosis even though their symptoms may be significantly impacting (Curchack-Lichtin et al., 2014; Lahey, 2014).

Understanding these behaviors as symptoms rather than willful misbehaviors is crucial to identifying ADHD (Bussing et al., 2003). Parents must acknowledge these symptoms and believe that intervention is necessary to initiate treatment. Cultural differences in behavior norms or attributions affect symptom identification as well as decisions to enter treatment (Bussing et al., 2003).

Parent Influences on Access to ADHD Treatment

The ability to access mental health services can be problematic for people of any age (CDC, 2011). Children and adolescents face further barriers as they legally cannot initiate mental health services independently (APA, 2008; APA, 2010; CDC, 2011). Parental permission is required for medical and mental health services. This permission may be affected if parents are unaware of the signs and symptoms of mental health disorders. Parents must also possess the necessary knowledge and skills to seek treatment (Bussing et al., 2007).

Researchers have shown that many children with ADHD have not been receiving mental health services (Bussing et al., 2007; Bussing et al., 2007; Kendall et al., 2003; McLeod et al.; 2007). Children are dependent on their parents to access mental health care. Thus, examining barriers to care involves examining factors that may influence parental decisions. Socioeconomics, parent ethnicity, and stigma have been previously examined and found to have some effect on treatment avoidance Bussing et al., 2007;

Kendall et al., 2003; McLeod et al., 2007). Although these are all valid influences, none explain the high percentage of treatment avoidant parents.

Parent knowledge of symptoms and preferences for treatment have been explored as influencing variables (Bussing et al., 2003, Berger-Jenkins, 2012; DeNissco et al., 2005; Ghosh et al, 2015, Waschbusch et al., 2011.) Parent ethnicity has also been explored and found to be a potential factor in treatment decisions Ghosh, et al., 2015; Lawton, et al., 2016; Olanyian, 2007). Despite evidence of clear differences between maternal and paternal views, parent gender influence of treatment seeking has been poorly studied. (Cassano et al., 2006; Phaeres, 2005; Singh 2003). Family dynamics, whether living with one or two decision making parents has not been studied hardly at all. Given the established gender differences and marital discord in families with children with ADHD, the lack of studies including single or dual parents as a variable is concerning **(**Ghosh, et al., 2015; Singh, 2003; van der Veen-Mulders, et al., 2017; Waschbusch et al., 2011)

Throughout literature analyzing parental attributes towards ADHD, there is a significant absence of paternal involvement. The category “parents” is used to delineate parental responses in most studies. This occurs despite mothers overwhelmingly severing as the sole respondents. The few studies including both mother and father responses primarily combine both responses into a single category. It appears that there is an assumption that maternal and paternal responses are equal and interchangeable. This assumption continues even though it has been consistently challenged by other studies citing the critical need for change. Both the intentional inclusion of paternal participation

in studies, and clinical work, as well as the separate analysis of maternal and paternal data is supported by literature examining differences between the two populations (Phares, 2005; Singh, 2003).

Parental Knowledge of ADHD Symptoms and Treatment

Lack of understanding ADHD can delay or impede diagnosis and treatment (dosReis et al., 2010; McLeod et al., 2007). This presents a serious concern as parents are exposed to myths and misinformation regarding ADHD through biased media (dosReis et al., 2010; McLeod et al.,2007). A review of the literature on ADHD shows parents' understanding of the symptoms of ADHD and choices for treatment have significantly varied (Bussing et al., 2007; Chen, et al., 2008; Singh, 2003; Singh 2008). Even when symptoms are recognized as problematic, treatment is frequently delayed or not initiated (Bussing et al., 2003; Berger-Jenkins, 2012; Ghosh et al, 2015, Sayal et al., 2006.) After concerns are identified and a perceived need for care is acknowledged, parents must possess the decision-making skills to acquire appropriate care (Berger-Jenkins, 2012). Parental choice for information about ADHD should also be considered in the discussion of parent influence. News media and social networks are often the top sources of information for parents, especially minority parents. (Bussing et al., 2015).

Parent Preferences for Treatment

Parental preference is an additional barrier. Several studies have found parents to be resistant to medication (Bussing et al., 2003; Berger-Jenkins et al., 2012; Bussing et al., 2010; DeNissco et al., 2005; Taylor et al., 2006). Waschbusch et al., (2011) found 70.5% of parents interviewed were medication avoidant. In their Waschbusch et al.,

(2011) surveyed 183 parents of medication naive children diagnosed with ADHD found that despite recognizing a problem and seeking help, parent preference was to avoid medication rather than utilize the most effective treatment. The other significant finding was that 29.5% of parents were outcome oriented and thus focused on the treatment with the most successful outcome. Outcome oriented parents tended to have higher stress, lower socioeconomic status, less education, and more impaired children than medication avoidant parents in the study (Waschbusch et al., 2011). This study confirms parent preference directly impacts treatment and treatment delays.as well since medication avoidant parents are less likely to seek treatment (Bussing et al., 2003; Berger-Jenkins, 2012; Ghosh et al, 2015, Sayal et al., 2006; Waschbusch et al., 2011).

However, a potential bias to this study was the recruitment flyers which indicated the study goals were to help parents reduce or eliminate medication usage. Thus the authors may have attracted parents more medication resistant. They may have also skewed participant answers with potentially anti-medication language leading participants to feel choosing medication avoidant was a more desirable answer.

In a longitudinal cohort design of 70 parents examining lack of treatment for minority children with ADHD, Berger-Jenkins et al., (2012) found Hispanic parents were less likely to participate in follow up appointments (51.4%) or utilize ADHD treatments (52.9%) than African American parents (40.5%, 37.3%). This study examined parent ethnicity, socioeconomics, and child gender resulting in useful information regarding which children are likely to face barriers to treatment. It is one of the few to study non-English speakers and to separate race beyond white and minority looking a minority

population as separate variables. Non-English-speaking parents participated in only 18.2% of follow up appointments and implemented ADHD treatments only 21.2%. Parents in the lowest socioeconomic bracket had the highest rate of not attending follow up appointments (51.4%) or utilizing ADHD treatments (45.1%). Parents who were concerned with medication usage participated in follow-up appointments 2.4 times less (Berger-Jenkins et al., 2012). This study also found parents who were concerned with medication usage were significantly less likely to use ADHD treatments. Parental concern regarding treatment was more predictive of medication avoidance than demographic features (Berger-Jenkins et al., 2012). Despite different designs and a nine-year difference, both Bussing et al., (2003) and Berger-Jenkins et al., (2012) show disproportionally high numbers of minority children and children in poverty not receiving evaluations or treatment. The addition of questioning parents regarding medication preferences added additional key information regarding treatment barriers and avoidance.

Bussing et al., (2005) also found parental perceptions were a potential barrier to treatment as they prevented parents from selecting treatments that are potentially helpful. The role of illness, symptom severity, child gender, and interpretations of behavior locus of control influenced parental treatment decisions. The findings of these other studies may indicate that the potential bias in Waschbusch et al's., (2011) recruitment flyers is less likely to have an influencing effect (Berger-Jenkins et al., 2012; Bussing et al., 2005; Waschbusch et al., 2011).

Other studies have also demonstrated the importance of parental preference on treatment outcomes (Brinkman et al., 2009; Coletti et al., 2012; Ghosh, et al., 2015).

Pairing parents with preference treatment is thought to improve adherence (Coletti et al., 2012). When behavior is seen as problematic but not in need of professional treatment, parents are less likely to utilize mental health services (Bussing et al., 2005; Coletti et al., 2012). Nonadherence and termination of medication has also been a significant concern in multiple studies. Throughout many studies the number of children taking medication drops steadily over time (Gajria, 2014). Parents who used agreed to use of medication for their children were also likely have times when medication was forgotten, intentionally skipped, or terminated (Bussing et al., 2015 Brinkman et al., 2009).

Parent Ethnicity

Cultural influences and racial bias can negatively impact children's access to care (Ghosh, et al., 2015; Lawton et al., 2016; Olanyian, 2007). African American and Latino families may view symptoms and need for care differently than Caucasian families Lawton, et al., 2016; Olanyian, 2007; Perry et al.,2005). Many studies have found that parents labeled white, Caucasian, or Western European are more likely to seek treatment for their children. Stimulant use is also found to be higher in these populations (Bussing et al., 2005; Charach et al., 2010; Ghosh et al., 2015; Starr, 2007).

Parent ethnicity may also affect choices to use medication for treatment (Lawton, et al., 2016; Olanyian, 2007; Perry et al.,2005). Negative treatment expectations, distrust of medication, and lack of trust in treatment providers seems to reoccur as a theme for African American parents (Bussing et al., 2003; Bussing et al., 2005; Olanyian, 2007). In a significant study by Ghosh et al, (2012), the odds of receiving treatment were reduced by 83% if a child was from a minority family. This effect was found even when only one

parent was from a minority group. The odds of receiving treatment were affected by parent gender; 19% lower when the minority parent was the mother and 47% lower when the minority parent was the father (Ghosh, et al., 2012). This is one of few studies that examine both maternal and paternal influences as well as the effect of ethnicity on attributions towards ADHD. This study highlights the serious need for additional research including fathers as well as diverse families. Given today's population and frequent marriages between individuals of different backgrounds, understanding the influence of ethnicity and culture on treatment avoidance is essential.

Treatment was affected for African American and Hispanic children was negatively impacted in a study where they had a prior diagnosis of ADHD and later participated in a study about utilization of care. Over 47% of parents did not attend follow up mental health appointments and 72.9% of children were not receiving any treatment (Berger-Jenkins, 2012). Considering that these children had a prior diagnosis of ADHD, were not in treatment at the time of the study and did not enter treatment after participating in the study, this indicates a significant number of African American and Hispanic children with a diagnosis of ADHD did not receive treatment. In addition, even participating in a study about under-utilization of mental healthcare for ADHD, most parents did not change their opinions on treatment for ADHD (Berger-Jenkins, 2012). This finding is supported by earlier research by Bussing et al., (2003). They found only 39% of children in their study had been evaluated while 88% had recognizable symptoms. Of the 39% evaluated, only 32% had been given a diagnosis of ADHD. The percentage of children in treatment was even lower, only 23% (Bussing et al., 2003).

These results were also directly related to ethnicity. Caucasian children were twice as likely to have entered care as African American children. The authors felt that parent recognition differed between ethnicities and recommended additional research on ethnic differences (Bussing et al., 2003).

Reviewing literature including parents from a wide range of ethnic groups both inside and outside the United States yields similar findings. The neuro-biological concept of ADHD is less accepted by non-Western cultures. Parents of children with ADHD in these cultures face additional challenges of stigma, isolation, and conflict with family regarding diagnosis and treatment (Lawton, et al., 2016; Oh & Kendall, 2009; Perry et al., 2005). East Asian, Korean, Hispanic, Iranian, and African American parents were all found to struggle with knowledge of ADHD symptoms. How to access treatment was also concern for these groups (Ghanizadeh, 2007; Hong et al.2013, Lawton, et al., 2016; Oh & Kendall, 2009; Perry et al., 2005). Although many parents from these ethnicities did seek treatment, overcoming cultural obstacles, conflict with family members, shame, and isolation were shared themes (Berger-Jenkins et al., Ghanizadeh, 2007; Lawton, et al., 2016; Oh & Kendall, 2009; Pajo & Cohen, 2013; Perry et al., 2005).

Influences of Family Dynamics

Given the gap in the literature regarding single or dual parent influence on mental health treatment, in combination with the lack of understanding of barriers to care, examining family dynamics is a logical next step. Gender, Ethnicity, Socioeconomics, parent education, and stigma do not fully explain the significant numbers of untreated

children (Bussing et al., 2007; Chen, et al., 2008; Ghosh, et al., 2015; Kendall et al., 2003; McLeod et al., 2007).

Family Dynamics

Understanding whether or not living in a single or dual parent household influences mental health treatment could help us understand more about parental decisions to enter or refuse treatment. The little research that can be found disagrees regarding whether a single parent household correlates with more or less treatment for children (Ghosh et al., 2015; Waschbusch et al., 2011). Single parents' inclusion in the literature may be affected by their tendency to turn in fewer surveys (Cussen et al., 2012).

In a two-parent household, there are two parents involved in the decision-making process towards mental health treatment (Brinkman, et al., 2009). Parents are responsible for obtaining treatment for their children yet their views on symptom severity and need for treatment often differ (Ghosh, et al., 2015; Mills, 2011; Stroh, et al., 2008; Zwirs, et al., 2006). Since children cannot enter mental health treatment on their own, they are dependent on their parents who serve as gatekeepers to mental health services. Without paternal data, one must question the influence of father's in their child's access to mental health care (Fabiano, 2007; Markel & Weiner, 2012; Phaeres, 2005; Singh, 2003). Are fathers assisting in treatment access or contributing to delay (Markel & Weiner, 2012; Phaeres, 2005; Singh, 2003)?

Yet the decision to pursue treatment can be challenging for parents (Brinkman et al., 2009; Mills, 2011; Stroh et al., 2008). Although skewed heavily by higher numbers of maternal participants, surveys of parental attributions of ADHD found differences in

understand and beliefs about ADHD between fathers and mothers (Chen, et al., 2008; Ghosh et al., 2015; Keown, 2011; Mills, 2011; Markel & Weiner, 2012; Stroh, et al., 2008; Psychoigiou, et al., 2007; Singh, 2003). Understanding the potential influences of these differences on children's access to treatment is crucial to understanding barriers to treatment. Although the literature shows that parental differences can negatively affect treatment, whether or not this effect is greater or lesser for single parent families is unknown.

Family functioning is negatively impacted in households with a child with ADHD (Cussen et al., 2012; Mills, 2011). However, it is not known if this is greater or lesser in single or dual parent families. Marital discord is correlated with having a child with ADHD (Ghosh, et al., 2015; Mohammadi et al., 2012; Waschbusch et al., 2011). Having a child with ADHD can also increase incidents of anxiety and depression in parents (Cussen, et al., 2012; Mohammadi et al., 2012). Having a child in the family with ADHD can negatively impair family function (Brinkman, et al., 2009; DeNisco et al., 2005). Parents may struggle with conflict within the family or between parents (Brinkman, et al., 2009; Ghosh, et al., 2015). Marital dissatisfaction as well as depression and anxiety may also affect families with children that have ADHD (Cussen et al., 2012; Mohammadi et al., 2012). A child's treatment can be delayed, terminated, or cause discord within the family (Mills, 2011; Stroh, et al., 2008).

In regard to parental stress influencing treatment, van der Veen-Mulders, et al., (2017) found that differences in parental stress influenced parental agreement of child symptoms. When parental stress levels differed, their ratings of child problems also

differed (van der Veen-Mulders, et al., 2017). Markel and Wiener, (2014) found differences between mothers and fathers in regard to attributions towards ADHD behaviors and conflict. This study is one of the few that included responses from mothers and fathers analyzed separately highlighting the importance of doing so. In the studies separating parent gender, differences are often found (Ghosh, et al., 2012; Mayfield et al., 2018; van der Veen-Mulders, et al., 2017). Studying the role of conflict resulting from differing parental attributions is a key factor supporting increased paternal participation, separate analysis of parental answers, and the potential effects of single or dual parent households. Markel and Wiener, (2014) felt increasing paternal participation was key to reduce conflict; however, they acknowledge the difficulty of this recommendation given the limited inclusion of fathers in studies (Markel and Wiener; 2014). The continuing evidence of discrepancies between parental views is clear indication that both parent gender and family dynamics may play a key role in ADHD treatment decisions. Positive aspects should be considered as well. There are also two parents available to support behavioral changes and time commitments for treatment appointments. Insurance coverage, time availability, and other factors may also be positively influenced by a dual parent household. Although the presence of a child with ADHD is correlated with marital discord, spouses can still provide support reducing stress or feelings of isolation (Bussing et al., 2015; Moen et al.,2014; and Mohammadi et al., 2012). On the other hand, single parents may experience less discord as they are the sole decision makers. This study would indicate whether further research on single or dual parent households with children with ADHD was warranted. The possible differences between households may indicate

additional research should also give greater attention to the inclusion and comparison of both parents for attitudinal data (Phares, 2005; Singh, 2003). Positive aspects should be considered as well. There are also two parents available to support behavioral changes and time commitments for treatment appointments. Insurance coverage, time availability, and other factors may also be positively influenced by a dual parent household. Although the presence of a child with ADHD is correlated with marital discord, spouses can still provide support reducing stress or feelings of isolation (Bussing et al., 2015; Moen et al., 2014; and Mohammadi et al., 2012). On the other hand, single parents may experience less discord as they are the sole decision makers. This study would indicate whether further research on single or dual parent households with children with ADHD was warranted. The possible differences between households may indicate additional research should also give greater attention to the inclusion and comparison of both parents for attitudinal data (Phares, 2005; Singh, 2003).

Parent Gender

There are noticeable omissions of paternal data in the literature. Although this gap is clear, only a few authors have addressed it (Bussing et al., 2007; Phaeres, 2005; Singh 2003). The article by Phares (2005) is important to include because it is a follow up to a 1992 article on the same topic, the absence of fathers in research literature. Phaeres's (2005) literature review shows small gains regarding the inclusion of fathers. A review of 514 articles found only 24.7% of the studies included maternal and paternal data that was analyzed separately. 28.2% of the studies had information from fathers but combined maternal and paternal answers into a "parent" category. Articles comprised of

paternal data only were 2.1%. In comparison to the 1992 study, 26.2% of the studies had separately analyzed maternal and paternal data, 24.4% had combined data, and 1.4% paternal only. It is quite possible this number is higher since many studies refer to respondents as "parents" and do not indicate the gender of the parent. This literature review showed the pattern of failing to include fathers continued for 13 years.

Another study reviewing in the absences of fathers that only 8% of articles since 1990 specified inclusion of fathers (Singh, 2003). This study asked two questions: why was paternal data absent, and does paternal data influence our understanding and treatment of children with ADHD? The author felt the few studies that did include fathers demonstrated differences in opinions regarding ADHD treatment and that maternal data should not be considered "parent" data (Singh, 2003). Singh's (2003) qualitative study of mothers and fathers is one the few to include fathers in in-depth interviews. Fathers required significant encouragement before agreeing to participate; even then many protested their knowledge of their child's diagnosis or their ability to contribute to the interview. Fathers and mothers approached the narrative structure of the interviews differently. Mothers followed a transformative narrative structure similar to those of medical illnesses while fathers focused on medication concerns. Fathers questioned medication necessity and efficacy throughout their interview (Singh, 2003). Singh (2003) found many fathers identified with their son's problematic behaviors and worried that their sons were weak or different. Father ascribed their son's behaviors to absence of motivation, mother's indulgent parenting style, or "boys will be boys", rather than to a medical model (Singh, 2003). This study is important as it is one of the few

including paternal interviews capturing fathers' genuine feelings and thoughts in an open format. Singh's (2003) study shows demonstrative evidence that fathers have distinct views regarding their son's ADHD. Areas such as fathers' identification with sons' symptoms and concerns regarding weakness and isolation indicate significant need to include fathers in research studies and clinical sessions (Singh, 2003).

Another large meta-analysis by Cassano et al., (2006) supports the findings by Phaeres (2005) and Singh (2003). Of 702 studies, 55% included only maternal input; only 1% looked at paternal input. While 17% of studies included both mothers and fathers, their data was combined. A small increase in the number fathers included in research was found in this meta-analysis. In addition, 28% of studies including mothers and fathers indicated parent gender as separate variable (Cassano et al., 2006).

While a few studies do include both parents, often no effort is made to distinguish maternal versus paternal response. The responses are treated equally despite clear differences between parental attributes shown in multiple studies (Cassano et al., 2006; Chen, et al., 2008; Ghosh, et al., 2015; Mills, 2011; Phaeres, 2005; Perry et al., 2005; Singh, 2003; Waschbusch et al., 2011). In addition to the few studies addressing the lack of paternal information, only 5 of the 70 studies included in this dissertation have the word "father" in the title and only 6 include data from fathers. With recent studies finding that differences between parental delays or prevents treatment for children with ADHD, research on fathers as well as research comparing mothers and fathers is essential (Ghosh, et al., 2015). Considering the known differences between parental attributes towards mental health treatment, it is surprising that the literature continues to show a failure to

include fathers in surveys (Fabiano, 2007; Markel & Weiner, 2012; Phaeres, 2005; Singh, 2003).

A review of the few studies analyzing maternal and paternal information separately demonstrates the importance of including both mothers and fathers, as well as considering their responses separate variables (Chen, et al., 2008; Mayfield et al., 2018; van der Veen-Mulders, et al., 2017). Mayfield, et al., (2018) and van der Veen-Mulders et al., (2017) found significant differences between maternal and paternal ratings of children's behavior. These differences were considered important to treatment seeking and clinician diagnostic impressions (Mayfield et al., 2018; van der Veen-Mulders, et al., 2017). This confirms earlier findings that differences in symptom severity and duration effect treatment seeking and diagnosis (Chen, et al., 2008). Paternal views of ADHD behaviors as transient and controllable conflict with maternal views of ADHD behaviors as biologically disease based. These conflicts impact decisions to seek mental health treatment potentially delaying treatment when two parents differ (Chen, et al., 2008; van der Veen-Mulders, et al., 2017). At this time research regarding similar delays with single parents of either gender does not appear to have been studied. The little research that can be found regarding whether a single parent household correlates with more or less treatment for children does not show any conclusive trends (Ghosh et al., 2015; Waschbusch et al., 2011).

Child Age and Gender Compared to Onset of ADHD Symptoms, Diagnosis, and Treatment

The majority of children are diagnosed with ADHD during school years. Children displaying impulsive or hyperactive behaviors may be diagnosed earlier than those with inattentive type (APA, 2013; Kordon et al., 2006; Singh, 2008a; Waschbusch et al., 2006). Symptoms can change or manifest differently depending on age. Younger children may manifest hyperactivity more prevalently while inattention may develop later. Loosing objects or forgetting tasks may be less likely in younger children who are less independent by virtue of age (APA, 2013; Kordon, et al., 2006; and Singh, 2008a). Hyperactivity and impulsivity may morph into a more internalized restlessness or fidgetiness during late adolescence (APA, 2013; and Singh, 2008a). Despite the changes in symptom manifestation, impairment to academic, social, or occupational function can still be problematic. This may be especially true for individuals with comorbid diagnoses (Nikolas & Burt, 2010). It is important to understand the changing nature of symptoms to also understand when evaluation or treatment is necessary. Symptoms that evolve and change may be challenging for parents to understand and accept.

Emerging research demonstrates a reasonable case for diagnosing children as young as four years old (AAP, 2011; APA, 2013; Charach et al., 2011). The Agency for Healthcare Research and Quality (2011) (AHRQ) conducted a meta-analysis of ADHD studies and evidenced based treatments for children 3-4 years old. Under Congressional direction AHRQ conducted the Effective Health Care Program. The goal of this program is to support and conduct research on health care services including the clinical

effectiveness, comparative outcomes, and appropriateness of pharmaceuticals and devices to be used with Medicaid, the Children's Health Insurance Program (CHIP), and Medicaid. Through both private and public sector organizations they conduct Comparative Effectiveness Reviews to improve the quality of health care. In this thorough analysis AHRQ examined behavioral, psychosocial, pharmaceutical, and the combination of these interventions for effectiveness and adverse events. This meta-analysis is relevant to this dissertation because it provides essential data supporting the diagnosis and treatment of ADHD in children as young as 4 years old. The studies given the most attention in the AHRQ analysis focus on parent behavior training and thus reference parent understanding, knowledge, and attitudes towards ADHD and ADHD treatments (Charach et al., 2011).

Other studies of note include Visser et al., (2016) analyzed insurance claims for ADHD on a national and state level to assess treatment patters for young children with ADHD. This study found a yearly increase of children diagnosed from age two- five years old between 2008-2014. (Visser et al., 2016). There is conflicting data regarding the age most children receive diagnosis. Many studies find children most commonly diagnosed between ages six to twelve years old (Garbe, et al., 2012; Lawson et al., 2012). However, Visset et al., (2014) found that children described as having severe ADHD were diagnosed by four years old fifty percent of the time. The differences between results could be related to symptom severity reported by parents as well as study design. Visser et al., (2014) conducted 95, 677 parent interviews over 3 separate surveys over eight years. In comparison, Lawson et al., (2012) surveyed 15, 055 parents in Texas

during 2006-2007 only. The goal of Lawson et al's., (2012) study was to study medication usage in newly diagnosed children. Thus, their sample included a specific population rather than all children with ADHD, (Lawson et al., 2012).

Studies discuss appropriate criteria for young children but information regarding age of initial treatment is sparse (Bunte et l., 2014; World Mental Health Foundation, 2004). Younger children receiving behavior therapy or parent training rather than medication may under-represented in studies examining treatment effects that include medication (AAP, 2011; Charach, et al., 2011). The question regarding specific age of symptom onset has been difficult to assess as up to 77% of children with ADHD are not evaluated or undergoing treatment (Berger-Jenkins et al., 2012; Bussing et al., 2003; Ghosh et al., 2015). However, Visser et al., (2014) comprehensive study found the median age of diagnosis was 6.2 years old with children with symptoms reported as severe diagnosed as young as 4.4 years old. This cross-sectional study has the advantage of examining trends over an eight-year time span with a large number of respondents from across the United States. Given the breadth of data and the more recent data, their results are the strongest reported.

Given the disparity between onset of symptoms and treatment age, determining specific age of symptom onset is difficult. Lack of clear information regarding onset of symptoms and time to evaluation or treatment is a detriment to understanding barriers to care. However, substantial delays, up to 4.9 years, are of significant concern highlighting the need additional research on the age of onset is needed to help study and reduce this

delay so children can assess treatment in a timely manner (Brinkman et al., 2009; Bussing et al., 2005; Coletti et al., 2012; World Federation for Mental Health, 2006)**.**

Gender Influences of ADHD Treatment

ADHD is diagnosed in males far more often than females, at a rate of 2:1 (APA, 2013; Visser et al., 2014). In a study on treatment barriers, Bussing et al., (2003) found less than 60% of those recognized as having a problem had been evaluated, only 32% received a diagnosis, and 77% were not receiving current treatment. Of those children recognized as having serious concerns, 57% of boys had been evaluated but only 20% of girls received evaluation. ADHD treatment was also significantly less for girls, 35% for boys, and only 9% for girls. Caucasian boys were two times more likely to receive evaluation, diagnosis, or treatment (Bussing et. al., 2003). Boys are often referred by teachers more often for ADHD (Skogli et al., 2013). Generalizations of gender differences include higher prevalence of diagnosis for boys as well as hyper incidents of hyperactivity and impulsivity. Boys are also thought to possess more executive function issues while girls have better coping strategies (Fisher et al., 2014).

Gerson (2002) conducted a meta-analytic literature to study gender differences. Recognizing the lack of females in previous studies, Gershon (2002) specifically widened the search parameters from previous studies and sought studies that directly compared males and females with ADHD. His study confirms findings from other studies boys are more impaired than girls in relation to hyperactivity. Boys were also found to have more externalizing problems and less internalizing problems than females. Teachers found

males more inattentive than females. Males were found to perform better intellectually than females (Gershon, 2002).

This study was intentionally similar to a previous study by Gaub and Carlson (1997) who reported similar findings revealing consistency in these findings from 1979 through 1999 (Gershon, 2002). Gershon (2002) discussed concerns that females with ADHD are potentially unrecognized due to rating biases and subtler symptom presentation. Girls are thought to have fewer impulsive symptoms. Coexisting disorders as well as externalizing versus internalizing symptoms sets boys and girls apart (Skogli et al., 2013).

Skogli et al., (2013) examined potential gender differences in symptom severity and executive function between medication naive males and females. Parent ratings, neurological tests and coexisting symptoms were investigated using analysis of variance and random forest classification. Females had 2.2 higher comorbid diagnoses for anxiety than males (Skogli et al., 2013).

While studies initially focused more heavily on males, females with ADHD are being included in studies more frequently now (Babinski, et al., 2011; Gershon, 2002; Skogli et al., 2013). However, at least one study found that teachers recognize ADHD symptoms in girls at a much higher rate than boys (Vukojevic et al., 2012). The authors posited that since attending is an expectation at school, students who fail to attend may stand out (Vukojevic et al., 2012). Yet, in general the literature supports the under identification of girls (Scuitto & Eisenberg, 2007; Visser et al., 2014)

Less frequent identification of females may be related to perception of symptoms and symptoms requiring professional help. These perceptions may be influenced by parent culture (Brinkman et al., 2009; Lawton, et al., 2016; Starr, 2007; Sayal et al., 2006; Starr 2007; Waschbusch et al., 2011). Parents found African American girls and Caucasian girl's behavior problematic but not needing professional help. African American boys were also not seen as needing help where Caucasian boys were (Bussing, et al., 2015). Data on boys and girls shows inconsistences.

Parental attributions have not been well studied for differences between mothers and fathers (Cassano et al., 2006; Phaeres, 2005; Singh 2003). Nor has the impact of family dynamics been examined in relationship to parental treatment decisions. Yet clear differences between mothers and fathers regarding ADHD symptoms and treatment have been found (Chen, et al., 2008; Ghosh, et al., 2015; Phaeres, 2005; Mills, 2011; Singh, 2003; van der Veen-Mulders, et al., 2017; Waschbusch et al., 2011). Culture, socioeconomics, and child gender have been found to influence treatment decisions. The influence of parent gender and family dynamics, whether children live in a single or dual parent family warrants further study to explore potential relationships on treatment decisions (Phaeres, 2005; Mills, 2011; Markel & Weiner, 2012; Singh, 2003). Better understanding of potential gender differences in symptom presentation would be beneficial. In addition, understanding which symptoms are likely to lead to diagnosis versus those often missed may be beneficial in improving education and awareness for parents and educators.

Summary

A literature review of ADHD treatment barriers for children reveals that there are continuing concerns with under-treatment of children. Significant treatment delay and avoidance has been noted for decades and sadly continue (Berger-Jenkins et al., 2012 Bussing et al., 2003, Berger-Jenkins et al., 2012; Visser, et. al, 2014). There is also a consistent pattern of "parent" responses that are in fact predominantly mothers as respondents. Few studies actively include fathers or analyze mother and father answers separately (Phares, 2005; Singh, 2003). This trend continues despite key studies demonstrating differences between maternal and paternal attributions towards ADHD (Ghosh et al., 2015; Waschbusch et al., 2011). Little research at all exists examining whether living in a single or dual parent family impacts treatment decisions. Family dynamics is rarely included as a demographic.

Several key studies have investigated treatment avoidance and treatment delay for ADHD. Visser et al., (2014) completed a comprehensive analysis the National Survey of Children's Health finding the median age of ADHD diagnosis was 6.2 years old with 69% of children diagnosed taking medication. Children with ADHD receiving treatment from a mental health professional was 51.1%. ADHD was diagnosed almost twice as often in boys; 15.1% vs 6.7%. Children diagnosed were most likely Caucasian or black. Hispanic children were half as likely to receive a diagnosis. Children in English speaking households were four times more likely to receive an ADHD diagnosis than children in non-English speaking households. They were also less likely to be taking ADHD medication. ADHD diagnosis of multiracial and minority children was found to have

decreased while diagnoses for White and Black children increased. Children in families living below 200% of the federal poverty level were more likely have an ADHD diagnosis than families with higher income. This cross-sectional study has the advantage of examining trends over an eight-year time span with many respondents from across the United States. Given the breadth of data and the more recent data, their results are the strongest reported.

Bussing et al., (2003) screened 266 students finding less than 60% of those recognized as having a problem had been evaluated, only 32% received a diagnosis, and 77% were not receiving current treatment. Parent race, socioeconomics, and child gender were significant variables. Of those children recognized as having serious concerns, 57% of boys had been evaluated but only 20% of girls received evaluation. ADHD treatment was also significantly less for girls, 35% for boys, and only 9% for girls. Caucasian boys were two times more likely to receive evaluation, diagnosis, or treatment. While more students in the lowest socioeconomic bracket were evaluated, only 16% utilized ADHD treatments (Bussing et al., 2003). This study is significant in that it identified the high numbers of children who met ADHD criteria but were not receiving any services. It is referenced often by those continuing to explore treatment avoidance and barriers. Several additional studies were also done from the original data to continue to explore treatment avoidance and barriers.

Berger-Jenkins, et al., (2012) conducted a longitudinal cohort design study with minority parents also found parents who were concerned with medication usage were significantly less likely to use ADHD treatments. Parental concern regarding treatment

was more predictive of medication avoidance than demographic features (Berger-Jenkins, et al., 2012). This study is important is it is one of the few to indicate that non-English speaking parents were included. The focus on minority parents gives essential information of the differences, and similarities, between minority and non-minority parents. Medication concerns occur in both populations (Berger-Jenkins et al., 2012; Waschbusch et al., 2011).

The impact of medication preference on treatment utilization was a key aspect of several studies. In a survey of 183 parents of medication naive children diagnosed with ADHD, Waschbusch et al., (2011) found 70.5% of parents interviewed were medication avoidant as opposed to 29.5% who were outcome oriented; focused on treatment outcome versus treatment modality. Overwhelmingly, parent preference was to avoid medication rather than utilize the most effective treatment. (Waschbusch et al., 2011). This study demonstrates parent preference directly impacts treatment. The influence of parent preference on treatment seeking supports the call for parents to be assessed individually rather than as a single variable. Parents from two parent households may face additional burdens as differences between maternal and paternal views of ADHD have been established as has marital discord in families with children with ADHD. Non agreement between parents could delay or negate treatment seeking for the child. (Berger-Jenkins et al., 2012; Bussing et al., 2005; Waschbusch et al., 2011).

In a study comparing African American and Caucasian children, Bussing et al., (2005) found parental perceptions were a potential barrier to treatment as they prevented parents from selecting treatments that are potentially helpful. Child gender was a specific

factor regarding parental help seeking behavior. Parental perceptions of behavior locus of control and mental illness were also influencing factors. The authors acknowledge that while mothers may be present for treatment visits, fathers may have an impact on final treatment decisions (Bussing et al., 2005; Singh 2003).

Given the impact of medication preference on treatment utilization, understanding both maternal and paternal views would be essential as differences could lead to delays in treatment. Differences in parental opinions on behaviors requiring mental health services or medication have been established as a factor in mental health treatment utilization (Berger-Jenkins et al., 2012; Waschbusch et al., 2011). Parental differences in combination with family dynamics, whether there are one or more parents involved in the treatment decision process could be a key factor in parental help seeking (Bussing et al., 2005).

Ghosh et al., (2012), found that the odds of receiving treatment were reduced by 83% if a child was from a minority family. This concurs with findings that treatment is significantly lower in non-English speaking families by Visser et. al., (2014). Ghosh et al, (2012), found this effect was present even when only one parent was from a minority group. Parent gender affected treatment decisions as well; treatment odds were 47% lower if the father was a minority and 19% lower if the mother was a minority (Ghosh, et al., 2012). By examining maternal and paternal influences separately, this study gives us rare key insights into the significant effects of culture and parent gender. The findings demonstrate the serious need for research studies to intentionally include fathers as separate variables as well as diverse families. Given today's population and frequent

marriages between individuals of different backgrounds, understanding the influence of ethnicity and culture on treatment avoidance is essential.

Throughout literature analyzing parental attributes towards ADHD, there is a significant absence of paternal involvement. The category "parents" is used to delineate parental responses in most studies. This occurs despite mothers overwhelmingly severing as the sole respondents. The few studies including both mother and father responses primarily combine both responses into a single category. It appears that there is an assumption that maternal and paternal responses are equal and interchangeable. This assumption continues even though it has been consistently challenged by other studies citing the critical need for change. Both the intentional inclusion of paternal participation in studies, and clinical work, as well as the separate analysis of maternal and paternal data is supported by literature examining differences between the two populations (Phares, 2005; Singh, 2003).

Phaeres (2005) conducted an important follow up to a 1992 article on the absence of fathers in research literature. Phaeres's (2005) literature review shows small only gains regarding the inclusion of fathers. Less than one-fourth of studies included mothers and fathers that was analyzed separately. Studies that included both parents, overwhelmingly combined the answers into a single "parent" category. Between 1992 and 2005 there was a decrease of 1.5% of studies analyzing maternal and paternal data separately. There was only a 6% increase in articles focusing on paternal data. The pattern of failing to include fathers is supported by two other studies. The lack of acknowledgment regarding

maternal and paternal differences regarding ADHD symptoms and treatment is concerning.

Singh's (2003) of maternal and paternal differences regarding children's ADHD is essential to understanding the impact of parental gender differences. The literature review combined with qualitative interviews of mothers and fathers provides an in-depth analysis of the negative effects of excluding fathers (Singh, 2003). The author felt the few studies that did include fathers demonstrated differences in opinions regarding ADHD treatment and that maternal data should not be considered "parent" data (Singh, 2003). Fathers in the study were reluctant participants feeling they lacked knowledge of their child's diagnosis. Mothers and fathers focused on different topics during interviews. Mothers followed a pattern similar to medical illness while fathers concentrated of locus of control and medication concerns. The interview format provides detailed information regarding both mothers' and fathers' feelings and concerns making this study seminal to understanding parent gender differences in regard to children's ADHD (Singh, 2003).

The trend of lacking paternal inclusion is also supported by a large meta-analysis by Cassano et al., (2006). The few studies that included maternal and paternal input combined the answers into a single category. Only 1% of studies focused on paternal input while 55% focused on maternal input only. (Cassano et al., 2006).

A few key studies demonstrate the importance of including both mothers and fathers, as well as considering their responses separate variables (Chen, et al., 2008; Mayfield et al., 2018; van der Veen-Mulders, et al., 2017). Significant differences between maternal and paternal ratings were found in two recent studies confirming

similar earlier studies. The authors found the differences between parent genders important to treatment decisions and clinical practice (Chen, et al., 2008; Mayfield et al., 2018; van der Veen-Mulders, et al., 2017).

Parent stress, conflict, and marital discord in families with children with ADHD are common themes in the literature (Mohammadi et al., 2012; Markel & Weiner, 2012; van der Veen-Mulders, et al., 2017). Parental stress and ratings of child problems were related (van der Veen-Mulders, et al., 2017). Differences between parental attributions affected stress and conflict (Markel & Weiner, 2012). Increasing paternal participation was seen as a potential factor for decreasing parental stress (Markel & Weiner, 2012). The continuing evidence of discrepancies between parental views is clear indication that both family dynamics and parent gender may play a key role in ADHD treatment decisions.

Conclusions

In conclusion, this study will examine several potential barriers to ADHD treatment for children. The main focus is on whether children with single or dual parent families begin treatment earlier or have different lengths of treatment, followed by whether parent gender impacts onset or duration of ADHD treatment. Parent race, child age and gender will also be examined for their relationship to ADHD treatment.

As the literature review demonstrated, families with children diagnosed with ADHD are under stress (Chen et al., 2008; Cussen et al., 2012). The decision of whether or not to have a child evaluated and treated for mental health issues is challenging. Parents' ethnicity, culture, personal biases influence their decisions (Brinkman, et al.,

2009; Ghosh, et al., 2015 Lawton, et al., 2016; Starr, 2007). Parent gender is a factor as mothers and fathers differ in regards to attributions towards symptom severity and treatment for ADHD (Chen, et al., 2008; Ghosh, et al., 2015; Phaeres, 2005; Mills, 2011; Singh, 2003; van der Veen-Mulders, et al., 2017; Waschbusch, 2011). Family dynamics as a factor in treatment decisions has not been studied yet bears investigation due to the differences between maternal and paternal views and the increased conflict in families with children with ADHD (Ghosh, et al., 2015; Markel & Weiner, 2012; Mohammadi et al., 2012; Waschbusch et al., 2011).In dual parent families there are additional issues as parents are more likely to differ in opinions regarding ADHD Ghosh, et al., 2015; Mohammadi et al., 2012; Waschbusch et al., 2011).

The literature recognized the 3:1 ratio of boys to girls diagnosed with ADHD (APA, 2013). Thus, gender of the child does affect diagnosis. In examining whether the age of the child affected diagnosis, the literature was less clear. While younger children are being diagnosed more frequently, the question of age driving initial diagnosis and treatment does not seem clear at this time (Berger, 2011; Visser et al., 2016).

This study is attempting to see if this dichotomy affects the onset of treatment or duration of treatment for children with ADHD. The Australian study by Ghosh et al., (2015) supports the concept that divergent parent views can delay treatment for children. Not only does it delay treatment start, it affects choice of treatment as many families with spouses of different ethnicity disagreed on using stimulants for ADHD. Fathers' especially were against using stimulants (Ghosh, et al., 2015). This effectively sets the stage for analyzing our data of Medicaid families with children with ADHD in

Washington DC. If parental disagreement is an additional variable, more research can be done on this subject. Practitioners can also incorporate this knowledge into working with parents during initial and follow up visits.

Current diversity and mixed ethnicity marriages in America, as well as high numbers of single parents support the need for more diverse samples in research studies. As well as analyzing parent gender, family dynamics, and other demographics as separate variables. The term “parent” has been clearly shown to be an inaccurate representation of actual parents who have divergent opinions on ADHD based on their gender, culture, as well as potentially based on their socioeconomics and family dynamics. With recent studies finding that differences between parental delays or prevents treatment for children with ADHD, research on fathers as well as research comparing mothers and fathers is essential (Ghosh, et al., 2015).

Chapter 3: Research Methods

Introduction

The intent of this quantitative study is to explore the relationship between single and dual parents with the onset and duration of treatment for children with ADHD. A correlation between these variables could improve our understanding of barriers to treatment by indicating the need for further exploration of the potential impact of household status and parental differences. While differences of opinion on symptom severity or need for treatment are known, few studies on parental attitudes towards ADHD include fathers and mothers or whether the families are single or dual parent households (Chen, et al., 2008; Mills, 2011; Singh 2003).

Parents are responsible for obtaining treatment for their children yet their views on symptom severity and need for treatment often differ (Mills, 2011; Stroh, et al., 2008; Zwirs, et al., 2006). The majority of studies that survey parents do not indicate whether mothers or fathers have completed the survey or if there is a difference if both respond. Mothers are primary respondents with few studies including both parents or focusing on fathers. In addition, they do not address whether single or dual parent families are included. (Chen, et al., 2008; Mills, 2011; Singh,2003). This essential information is not included in most studies and is thus rarely analyzed. Yet the few studies that do include such information show distinct differences between mothers and fathers as well as when one of more parents were from a minority group (Chen, et al., 2008; Ghosh, et al., 2015; Phaeres, 2005; Mills, 2011; Singh, 2003; Waschbusch et al., 2011).

The significant delay, between two to four years between symptom recognition and treatment is of serious concern (Brinkman et al.2009; Bussing et al., 2005; Coletti et., 2012; World Federation for Mental Health, 2006)**.** Especially since as between fifty to seventy-seven percent of children qualifying for a diagnosis of ADHD receive treatment (Berger-Jenkins, 2012; Bussing et al., 2007;). With five to twelve percent of children diagnosed with ADHD combined with the significant dangers to children with untreated ADHD, the study of potential barriers to treatment vital to children's mental health. (APA, 2013; Bush, 2010; CDC, 2008; Rowland et al., 2015). A greater understanding of potential barriers can help providers address, remit, and possibly prevent identified barriers thus allowing children with ADHD greater access to mental healthcare. This chapter will review the research design and rationale, the data collection method, the population the operationalization of constructs, and threats to validity.

This chapter will discuss the secondary analysis research design of this study and the rationale for this design. The methodology of the study will follow discussing the population, sampling procedures, participants, and data collection. Threats to validity and ethical procedures will also be discussed.

Research Design and Rationale

This study will be a retrospective cohort quantitative analysis which allows us to examine relationships between the covariates of single or dual parent families, parental gender, and parental race and the dependent variables of age of the child at the beginning of treatment and the end of treatment, as well as the duration of treatment. Additional independent variables are the age, race, and gender of the child. This is consistent with

Family Systems Theory, which focuses on relationships between family members and external variables such as illness (Perilli, 2011). Questions one and two will be analyzed through Stepwise regression to best address the covariates of family dynamics, parent gender, and parent race supported by the literature analysis. Questions three and four are more exploratory in nature and thus a backwards regression is suitable.

Since the study will use archival data, there are no time constraints. Access to necessary variables was established prior to embarking on this study. Using archival data is appropriate as we are examining age of treatment onset and length, events that occur in the past. This study will examine the relationship between single and dual parent families. the onset of treatment, and the duration of treatment. The design choice is consistent with the research questions and will advance our knowledge regarding barriers to service. A correlation between these variables could improve our understanding of barriers to treatment by indicating the need for further exploration of the potential impact of single parents, dual parents, gender of the parent, parent ethnicity on ADHD treatment. While differences of opinions between parents on symptom severity or need for treatment are known, few studies on parental attitudes towards ADHD include fathers and mothers, compare mothers and fathers, or whether the families are single or dual parent households (Chen, et al., 2008; Mills, 20011; Singh, 2003).

Methodology

Population

The target population is children born between 1985 and 2000 receiving treatment for ADHD through MEDICAID in Washington, D.C. Parental demographic

data is also included. Data for this study has been obtained through a Freedom of Information Act (FOIA). Medicaid billing records (deidentified) of children born between 1985- 2000 will be examined for differences between treatment length and onset for children with billing codes for ADHD treatment. Children born between 1985 and 2011 will be included to ensure all children reached 18 years old within the selected period. The large data set will allow for stratified sampling of children in all relative categories. Children in single and dual parent families, identified by Medicaid data as guardian "Mother", "Father", or "both" will be included. Children living with other relatives or foster care will not be included as that is not the purpose of this study. Age, sex, and race of parents and children will be examined for potential relationships to onset or duration of treatment. The location of Washington D.C. was chosen because it is local to the author and MEDICAID data is easily accessible.

Sampling and Sampling Procedures

Due to the lower instances of fathers in previous studies, it would be helpful to use a stratified sampling procedure to ensure that equal numbers of each variable. However, there may not be enough of each variable to sample for the same reason it would be useful to sample that population. The strength of a stratified sample would lie in capturing equal representation of mothers, fathers, single parents, dual parents, race, as well as female and male children with ADHD. Intentional oversampling of smaller populations would allow for better analysis of effect as well as decreases standard errors.

If stratified sampling can be used, mothers, fathers, single parents, dual parents, race, as well as female and male children with ADHD will be sampled from the

MEDICAID data to form each group. Children living with guardians other than mothers or fathers would be excluded since this exploratory analysis focuses on the potential impact of single or dual parents. It could be advantageous to student other guardians at a later point but at this time they do not fit the parameters of this study. Children born between 1985-2000 and diagnosed with ADHD will be included. Child and parent demographics will be included as well as treatment modalities for the children, medication, therapy, or other interventions.

Procedures for Data Collection

The data will be obtained via FIOA request to Washington D.C. MEDICAID. A representative there worked with me to determine the exact data need to fulfill my research questions. Informed consent was given when parents signed up for MEDICAID. Medical billing records for ADHD treatment with demographic information; race, gender, date of birth for children, will be used. Individuals are assigned a number that cannot be related back to any actual person. Children enrolled in Medicaid since birth through age twenty-one, with billing codes for ADHD treatment were chosen for this study. Choosing children enrolled for their entire childhood eliminates any question of enrollment solely for ADHD treatment. It also allows analysis of any treatment throughout their entire childhood. Treatment may include medication visits, psychotherapy, or primary care visits for ADHD management. MEDICAID billing data is a reputable source of data for the study serving a large population of people. Data regarding patient services are recorded for billing purposes as well as for procedure and budget analysis to plan and coordinate services for patients. Since MEDICAID is funded

by the federal government, use of funds is analyzed frequently. Proper data collection is essential for these outcomes.

Instrumentation and Operationalization of Constructs

This study will be a secondary analysis which allows us to examine relationships between variables. The covariates are family dynamics; single or dual parent families, gender of parents, and race of parents. The dependent variables are the age of the child at the beginning of treatment and the end of treatment, as well as the duration of treatment. Additional independent variables are, gender, race, and age of the child. Parent is defined as mother or father caring for a child with ADHD. The label parent will include those individuals identified as “mother” and “father” on Medicaid records “Single” is one parent caring for the child with ADHD as indicated through Medicaid data. Dual parent families are two parents defined as children living with two parents as indicated through Medicaid data. The child age at treatment onset will be determined through medical records per Medicaid records. Study participants will have been enrolled in Medicaid since birth. Treatment will include: medication visits, psychotherapy, and primary care visits billed for ADHD management. Duration of treatment will be the length of treatment from beginning to end measured by months. Gender of the child and parents will be indicated on medical records. Parent race will follow MEDICAID coding procedures.

Variables from MEDICAID billing records will be used and analyzed through Stepwise regression for questions one and two and backwards regression for questions three and four to examine potential relationship between variables, whether having a

single or dual parent influences treatment onset or duration. Parent and child gender and ethnicity would also be analyzed for correlation.

Data Analysis Plan

The software used for analysis will be IBMSPSS Statistics 25. Children living with guardians other than mothers and fathers were excluded as this study is specifically examining the potential relationship between single or dual parents. Children must be diagnosed with ADHD and receiving pharmaceutical, psychotherapeutic, or primary care treatment for ADHD. Parent and child race and gender must also be included. Data not meeting these criteria were excluded. Questions one and two will be analyzed through stepwise regression to best address the covariates of family dynamics, parent gender, and parent race supported by the literature analysis. Questions 3 and 4 are more exploratory in nature and thus a backwards regression is suitable.

Research Questions Research and Hypotheses

The research questions, null, and alternative hypotheses are stated below.

Research Question 1: Is there a relationship between family dynamics, after controlling for parental race and parental gender, and ADHD treatment onset of their child?

$H_1$1: There is relationship between family dynamics, after controlling for parental race, and parental gender, and onset of ADHD treatment of their child.

$H_0$1: There no is relationship between family dynamics, after controlling for parental race, and parental gender, and onset of ADHD treatment of their child.

Research Question 2: Is there a relationship between family dynamics, after controlling for parental race and parental gender, and length of ADHD treatment of their child?

$H_1$2: There is relationship between family dynamics, after controlling for parental race and parental gender, and length of ADHD treatment of their child.

$H_0$2: There no is relationship between family dynamics, after controlling for parental race and parental gender, and length of ADHD treatment of their child.

Research Question 3: Is there a relationship between child age, gender, and race and onset of ADHD treatment?

$H_1$3: There is a relationship between child age, gender, and race and onset of ADHD treatment.

$H_0$3: There is no relationship between child age, gender, and race and onset of ADHD treatment.

Research Question 4: Is there a relationship between child age, gender, and race and length of ADHD treatment?

$H_1$4: There is a relationship between child age, gender, and race and length of ADHD treatment.

$H_0$4: There is no relationship between child age, gender, and race and length of ADHD treatment.

Threats to Validity

Threats to external validity include potential multiple treatment interference. Children may be receiving medication as well as therapeutic services. Office visits are

also included in MEDICAID data. Psychotherapy services have a specific code in MEDICAID. Office visits indicate if medication management was part of the visit. For the purposes of this study only psychotherapy or medication management will be included to ensure that only visits for ADHD are included in the data. Reactivity could also be an issue as parents are aware they are observed when completing MEDICAID forms. Since gender and race are stable characteristics, they should not be affected. Since there are no experimental variables or arrangements, external threats related to said variables would not be present.

Maturation could be a threat to internal validity; however, by including only children born prior to June 2000 will be included. This will ensure all children have reached age 18 in the selected period., the data is collected beyond the range of the youngest children thus covering them fully from ages four through seventeen. Potential experimental mortality will be addressed through original selection of MEDICAID records. Only children present in MEDICAID from ages four to seventeen will be included.

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Ethical Procedures

Archival data will be used in this study. Thus, there will be no human participants, no recruitment of participants, and no experiment. All data used will be anonymous and have personal identifiers removed prior to being released to me. A FOIA will be used to access identified Medicaid records. Data will be stored only on my computer which is password protected. After use, data will be handled as directed by MEDICAID. IRB approval will be obtained as well.

Summary

In summary, this study will be a quantitative secondary analysis examining the relationship between the covariates parent family dynamics, single or dual parents, parent race, and gender. The independent variables are child age, race, and gender with the dependent variables of ADHD treatment onset and duration. Using Stepwise regression and Backwards Stepwise Regression the relationship between these variables will be analyzed to determine if single or dual parent families, after controlling for parent gender or parent race has a significant relationship with ADHD treatment onset or duration. The purpose of this study to explore the role family dynamics may have on ADHD treatment. While differences between mother and father attributions of ADHD have been established, few studies include paternal data as a separate variable (Chen, et al., 2008; Ghosh, et al., 2015; Mills, 2011; Mayfield et al., 2018; Phaeres, 2005; Perry et al., 2005; Singh, 2003; van der Veen-Mulders, et al., 2017; Waschbusch et al., 2011).

Fewer studies have investigated the potential impact of family dynamics may have on ADHD treatment for children. This is a valid question given the known differences between parents as well as the role of gatekeeper parents play to mental health treatment for children.

The following chapter will review the results of the data analysis. Potential relationships between parent family dynamics and gender and ADHD treatment onset and duration will be shared. Potential relationships between parent race, child age, child gender and ADHD treatment will also be shared.

Chapter 4: Results

Introduction

The purpose of this quantitative secondary analysis is to discover the potential relationship of family dynamics on the onset or duration of treatment for ADHD. Specifically, the potential correlation between family dynamics, the single or dual parent families, parent race and gender, as well as child age, gender and race on ADHD treatment onset and duration will be explored. A correlation between single or dual parents, parent gender, and/or parent race and ADHD treatment onset or duration could improve our understanding of barriers to treatment by indicating the need for further exploration of the potential impact of family dynamics and parental differences. While differences of opinion on symptom severity or need for treatment are known, few studies on parental attitudes towards ADHD include both fathers and mothers as separate variables to analyze. In addition, information regarding single or dual parent households is rarely given or noted (Chen et al., 2008; Mills, 2011; Singh 2003).

Chapter 4 will discuss the data collection process, the representation of the sample to the population, and the results. As this study uses archival data with no identifiers, no pilot study was completed nor are there concerns of ethical harm to participants. This study will be a secondary analysis which allows us to examine relationships between the covariates of family dynamics, single or dual parent families, gender of parents, and parent race.

The dependent variables are the age of the child at the beginning of treatment and the end of treatment, as well as the duration of treatment. Additional independent

variables are age, race, and gender of the child. Questions 1 and 2 were planned as stepwise regression to best address the covariates of family dynamics, parent gender, and parent race supported by the literature analysis. Questions 3 and 4 were planned as backwards regression is suitable. Minor adjustments were made after operationalizing the archival data that was received. These changes are reported in the Discrepancies in Data Collection section. Each question will be listed with the amendments. After sharing the results of the data analysis, the results will be discussed in relationship to the research questions and hypotheses.

Data Collection

Walden Institutional Review Board (IRB) approved this research on 8/17/20; approval number 08-17-20-0262251 (Appendix C). The data has been obtained via request of District of Columbia Medicaid (Appendix A). Informed consent was given when parents signed up for Medicaid. Information regarding the application and qualification process for Medicaid in the District of Columbia can be found in Appendix B. Medical billing records for ADHD treatment with demographic information; race, gender, date of birth for children, will be used. Individuals are assigned a number that cannot be related back to any actual person. Baseline descriptive include children who qualified for Medicaid since birth through age 21, with billing codes for ADHD treatment were chosen for this study. Children born between 1985-2000 and diagnosed with ADHD will be included. Qualifying for Medicaid is generally based on income and indicates living below the poverty level.

Children living with mother, father, or both were included. Children living in any other family structure were not included at this time as this is an exploratory investigation into the possible relationship between children living with single parents, both parents, as well if parent gender influenced ADHD treatment. Additional family structures should be included in follow up studies. Families included were Hispanic, Black, and White. Families of other races had too few representatives to be included.

Discrepancies in Data Collection

Chapter 4 also explained that some changes to the research questions analysis were necessary once the data was reviewed. Key research question findings were discussed showing this study did show a relationship between family dynamics and ADHD treatment for children. Parental gender and race as well as child race and age also impacted ADHD treatment.

Some minor adjustments to the data analysis plan were necessary after operationalizing the received archival data. These were made to honor the original study goals and reflect the literature study. These changes allowed the data analysis to stay true to the goals of evaluating the impact of family dynamics on ADHD treatment onset or duration. The changes will be described followed by the research questions listed with their amendments.

Research Questions 1 and 2

RQ 1 and 2 are mirror images or each other with the dependent variable changing from onset or treatment to length of treatment. The changes affected the use of the independent variables, not the dependent variables. For conciseness, the changes will be

explained together. Questions one and two of this study will be best served by a one-way Analysis of covariance (ANCOVA) rather than Stepwise regression as previously planned. Family dynamics is defined as mother, father, both. This includes the gender of the parent. Since we are also comparing children who live either parent or with both parents, the comparison of family dynamics answers the research question best. Question one will still examine Family dynamics, controlling for the covariate, parent race, with age at first diagnosis as dependent variable. Information regarding parent gender will be addressed through family dynamics of mother, father, both. Question two mirrors question one, as before, with the length of ADHD treatment as the dependent variable. Controlling for parent race allowed the analysis show any relationship was related to family dynamics. Unfortunately, that meant that the possible influence of parent race was not included in the research questions. The literature indicates that parent race may be an influence on ADHD treatment indicating the analysis of the possible relationship of parent race and treatment onset and duration should occur. RQ 1 and 2 will have an addition, RQ1A: Is there are relationship between parent race and ADHD treatment onset for their child? And RQ2A: Is there are relationship between parent race and ADHD treatment duration for their child?

> **Original RQ1.** Is there a relationship between family dynamics, after controlling for parental race and parental gender, and ADHD treatment onset of their child?
>
> **Amended RQ1.** Is there a relationship between family dynamics and ADHD treatment onset of the child, after controlling for parental race?

Original RQ2. Is there a relationship between family dynamics, after controlling for parental race and parental gender, and length of ADHD treatment for their child?

Amended RQ2. Is there a relationship between family dynamics, after controlling for parental race, and length of ADHD treatment of the child?

Research Question 3

In question three, "child age" and "onset of ADHD" are the same data. The age at onset of treatment continues to answer the initial question of child age; however, the analysis process must now change. The question of relationship between gender and onset of treatment will be better analyzed by t-Test while the question of relationship between race and onset of treatment will be analyzed with one-way ANOVA rather than both by ANOVA as previously discussed.

Original RQ3. Is there a relationship between child age, gender, and race and onset of ADHD treatment?

Amended RQ3. Is there a relationship between child gender, and race and onset of ADHD treatment defined as age at first DOS?

Research Question 4

Question four will be best served by addressing each part of the question. Linear Regression will best analyze whether the child age at first diagnosis (DOS) predicts the length of treatment. As in RQ3, a t-test will best analyze the potential relationship of gender and a one-way Analysis of Variance (ANOVA) the potential relationship of race for this study.

Original RQ4. Is there a relationship between child age, gender, and race and length of ADHD treatment?

Amended RQ4. Is there a relationship between child age at first DOS, gender, and race and length of ADHD treatment?

Sampling and Sampling Procedures

The population for this study included children born in the District of Columbia between 1985-and 2000 with at least 1 billing code for ADHD between 1985-2011. Only children listed as residing with their mother, father, or both were included as this study is focusing on the family dynamics between single and dual parent families defined as living with their mother, father, or both. At this time the data, as explained in the literature review, supports focusing on maternal, paternal, or dual parent household. Due to extremely small numbers of children from Asian, American Indian, Alaskan Native, or other were combined into a single category labeled “other”.

The demographics of the District of Columbia for 2010 were 48% White, 32.5% Black, and 20.8% Hispanic and 46% White, 46% Black, and 11.3% Hispanic in 2019 (US Census Bureau, 2019). The Medicaid enrollment by race in 2013 was 2% White, 85% Black, 8% Hispanic (KFF, 2010). The retrospective data for this study is similar to the statistics for Medicaid enrollment by race. This indicates the sample is proportional to the population.

Results

This study was designed to examine the potential relationship between family dynamics and ADHD treatment in children, measured by age at onset of treatment and length of ADHD treatment.

Research Question 1

Question one used a one-way ANCOVA. There was a significant effect of family dynamics on ADHD treatment onset of children, when controlling for parental race at the $p<.05$ level [$F(1,2) = 16.024$, $p=.000$]. Post hoc comparisons using indicated that the age at first date of service for children who lived with both parents (*M= 11.08, SD= 3.361*) was different from the age at first date of service for children who lived with their father (*M=12.34, SD= 3.106*). There was significant difference in the age at first date of service for children who lived with their father (*M*=12.34, SD= 3.*106*) compared to those who lived with their mother (*M=11.359, SD= .050*). Results reported in Table 1-3. There was a significant effect of parental race on onset of ADHD treatment, $p<.05$ level [$F(2,6466) = 6.203$, $p=.002$]. Post hoc comparisons using Tukey HSD test indicated that the mean ADHD treatment onset age for Black (not Hispanic) children (*M=11.38, SD=3.647)* was significantly different from White children (*M=13.56, SD=4.439).* Also, there was a significant difference in ADHD treatment age of first DOS between Hispanic (*M=11.24, SD=3.359)* and White children (*M=13.56, SD=4.439).* However, there was no difference in the age of first DOS between Black (not Hispanic) children (*M=11.38, SD=3.647)* and Hispanic children *(M=11.24, SD =3.359).* Results reported in Tables 4-6.

Table 1

Means and Standard Deviations of Family Dynamics and Child Age at First Date of Service (DOS) for ADHD

Parents	Mean	SD	N
Both	11.08	3.361	699
Father	12.34	3.106	393
Mother	11.36	3.707	5377
Total	11.39	3.646	6469

Table 2

One-Way Analysis of Covariance of Family Dynamics and Child Age at First DOS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	469.675[a]	3	156.558	11.836	.000	.005
Intercept	31052.623	1	31052.623	2347.576	.000	.266
Parent Race	39.717	1	39.717	3.003	.083	.000
SPSS Parents	423.903	2	211.951	16.024	.000	.005
Error	85515.952	6465	13.228			
Total	924678.000	6469				
Corrected Total	85985.627	6468				

Note. a. R Squared = .005 (Adjusted R Squared = .005)

Table 3

Post-Hoc Pairwise Comparisons: Family Dynamics and Age at First DOS

(I)SPSS Parents	(J) SPSS Parents	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
Both	Father	-1.261*	.229	.000	-1.810	-.712
	Mother	-.291	.147	.141	-.642	.060
Father	Both	1.261*	.229	.000	.712	1.810
	Mother	.970*	.190	.000	.514	1.426
Mother	Both	.291	.147	.141	-.060	.642
	Father	-.970*	.190	.000	-1.426	-.514

Note. Based on estimated marginal means *. The mean difference is significant at the .05 level. b. Adjustment for multiple comparisons: Bonferroni.

Table 4

Means and Standard Deviations of Parent Race and Child Age at DOS

	N	Mean	Std. Deviation
Black Not Hispanic	6243	11.38	3.647
Hispanic	192	11.24	3.359
White	34	13.56	4.439
Total	6469	11.39	3.646

Table 5

One-Way Analysis of Covariance of Parent Race and Child Age at DOS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	633.967[a]	8	79.246	5.998	.000
Intercept	21668.951	1	21668.951	1640.055	.000
Parents	139.026	2	69.513	5.261	.005
Parent Race	97.896	2	48.948	3.705	.025
Parents Parent Race	44.351	4	11.088	.839	.500
Error	85351.660	6460	13.212		
Total	924678.000	6469			
Corrected Total	85985.627	6468			

Note. a. R Squared = .007 (Adjusted R Squared = .006)

Table 6

Post-Hoc Pairwise Comparisons Parent Race and Age at First DOS

(I) Parent Race	(J) Parent Race	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Black Not Hispanic	Hispanic	.134	.267	.616	-.39	.66
	White	-2.180*	.626	.001	-3.41	-.95
Hispanic	Black Not Hispanic	-.134	.267	.616	-.66	.39
	White	-2.314*	.678	.001	-3.64	-.99
White	Black Not Hispanic	2.180*	.626	.001	.95	3.41
	Hispanic	2.314*	.678	.001	.99	3.64

Note. *. The mean difference is significant at the 0.05 level.

Research Question 2

Question two also used a one-way ANCOVA to analyze the relationship between family dynamics, after controlling for race, and length of child ADHD treatment. The

results show there was not a significant effect of family dynamics on length of ADHD treatment, when controlling for parental race at the p<.05 level [F (1,2) = .265, p=.767]. Results in Tables 7 and 8. The second part of RQ2 used a one-way ANOVA to analyze the relationship between parent race and ADHD treatment length, measured in months. There was a significant effect of race on length of ADHD treatment, p<.05 level [F (2,6466) = 18.441, p=.000]. Post hoc comparisons using Tukey HSD test indicated that the mean ADHD treatment length for Black (not Hispanic) children (M=2.176, SD=2.523) was significantly different from White children (M=0.923, SD=1.641), but not from Hispanic children (M=1., SD=22.323). There was also significant difference in the length of treatment between White children (M=11.076, SD=19.691) and Hispanic children (M=14.302, SD=22.323). Results in Tables 9-12.

Table 7

Means and Standard Deviations of Family Dynamics and Length of ADHD Treatment (years)

Parents	Mean	SD	N
Both	2.01	2.526	699
Father	1.98	2.429	393
Mother	2.10	2.524	5377
Total	2.09	2.518	6469

Table 8

Analysis of Covariance of Family Dynamics and Length of ADHD treatment (years)

Note. a. R Squared = .006 (Adjusted R Squared = .006)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	247.542[a]	3	82.514	13.082	.000	.006
Intercept	2160.011	1	2160.011	342.458	.000	.050
Parent Race	238.147	1	238.147	37.757	.000	.006
SPSS Parents	3.348	2	1.674	.265	.767	.000
Error	40777.154	6465	6.307			
Total	69185.000	6469				
Corrected Total	41024.696	6468				

Table 9

Post- Hoc Multiple Comparisons Family Dynamics and Length of ADHD Treatment (years)

(I) SPSS Parents	(J) SPSS Parents	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a] Lower Bound	Upper Bound
Both	Father	.026	.158	1.000	-.353	.405
	Mother	-.050	.101	1.000	-.292	.192
Father	Both	-.026	.158	1.000	-.405	.353
	Mother	-.076	.131	1.000	-.391	.239
Mother	Both	.050	.101	1.000	-.192	.292
	Father	.076	.131	1.000	-.239	.391

Note. Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Table 10

Means and Standard Deviations Parent Race and Length of ADHD Treatment Months

	N	Mean	Std. Deviation
Black Not Hispanic	6243	26.1062	30.27094
Hispanic	192	14.3021	22.32292
White	34	11.0760	19.69075
Total	6469	25.6768	30.10224

Table 11

Analysis of Variance for Parent Race and Length of ADHD Treatment (months)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	38919.440[a]	8	4864.930	5.398	.000
Intercept	44902.081	1	44902.081	49.822	.000
Parents	53.693	2	26.846	.030	.971
Parent Race	16653.091	2	8326.546	9.239	.000
Parents Parent Race	4957.164	4	1239.291	1.375	.240
Error	5822025.125	6460	901.242		
Total	10125951.608	6469			
Corrected Total	5860944.564	6468			

Note. a. R Squared = .007 (Adjusted R Squared = .005)

Table 12

Post-Hoc Multiple Comparisons of Family Dynamics and Length of ADHD Treatment Months

(I) Parent Race	(J) Parent Race	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Black Not Hispanic	Hispanic	11.80410*	2.19967	.000	7.4920	16.1162
	White	15.03013*	5.16263	.004	4.9097	25.1506
Hispanic	Black Not Hispanic	-11.80410*	2.19967	.000	-16.1162	-7.4920
	White	3.22603	5.58592	.564	-7.7242	14.1763
White	Black Not Hispanic	-15.03013*	5.16263	.004	-25.1506	-4.9097
	Hispanic	-3.22603	5.58592	.564	-14.1763	7.7242

Note. *. The mean difference is significant at the 0.05 level

. Research Question 3

Question three results show a significant difference for both gender and race in relationship to onset of ADHD treatment. For child gender a t-test was used. Results, tables 13-15, show there was a significant difference in ADHD treatment (age at first DOS) between female children (M=11.74, SD =3.614) and male children (M=11.23, SD= 3.650), t (6467) = 5.223, p =.00. A one-way analysis was used to analyze the relationship between onset of treatment and race. Results are shown in Tables 16-18. There was a significant effect of race on onset of ADHD treatment, p<.05 level [F (2,6466) = 6.203, p=.002]. Post hoc comparisons using Tukey HSD test indicated that the mean ADHD

treatment onset age for Black (not Hispanic) children (M= 11.38, SD= 3.647) was significantly different from White children (M=13.56, SD= 4.439). Also, there was a significant difference in ADHD treatment age of first DOS between Hispanic (M=11.24, SD=3.359) and White children (M= 13.56, SD= 4.439). However, there was no difference in the age of first DOS between Black (not Hispanic) children (M= 11.38, SD= 3.657) and Hispanic children (M=11.24, SD = 3.359).

Table 13

Means and Standard Deviations of Child Gender and Age at First DOS

	Child Sex	N	Mean	Std. Deviation	Std. Error Mean
Age at First DOS	Female	1969	11.74	3.614	.081
	Male	4500	11.23	3.650	.054

Table 14

Levene's Test for Equality of Variances for Gender and Age at First DOS

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Age at first DOS	Equal variances assumed	.716	.398	5.223	6467	.000	.514	.098	.321	.706
	Equal variances not assumed			5.243	3786.694	.000	.514	.098	.322	.706

Table 15

T-Test for Gender and Age at First DOS

				95% Confidence Interval	
		Standardizer	Point Estimate	Lower	Upper
Age at first DOS	Cohen's d	3.639	.141	.088	.194
	Hedges' correction	3.639	.141	.088	.194
	Glass's delta	3.650	.141	.088	.194

Note. a. The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.

Table 16

Means and Standard Deviations for Child Race and Age at First DOS

	N	Mean	Std. Deviation	Std. Error
Black Not Hispanic	6243	11.38	3.647	.046
Hispanic	192	11.24	3.359	.242
White	34	13.56	4.439	.761
Total	6469	11.39	3.646	.045

Table 17

Analysis of Variance for Child Race and Age at first DOS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	164.669	2	82.334	6.203	.002
Within Groups	85820.958	6466	13.273		
Total	85985.627	6468			

Table 18

Multiple Comparisons for Child Race and Age at First DOS

		Mean			95% Confidence Interval	
(I) Child Race	(J) Child Race	Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Black Not Hispanic	Hispanic	.134	.267	.870	-.49	.76
	White	-2.180*	.626	.001	-3.65	-.71
Hispanic	Black Not Hispanic	-.134	.267	.870	-.76	.49
	White	-2.314*	.678	.002	-3.90	-.72
White	Black Not Hispanic	2.180*	.626	.001	.71	3.65
	Hispanic	2.314*	.678	.002	.72	3.90

Note. *. The mean difference is significant at the 0.05 level.

Research Question 4

And last, Question 4 is broken into three parts. Linear regression was used for to analyze if child age at first DOS predicted ADHD treatment length (in months. The results of the regression, Tables 19-21, indicated that child age at first DOS explained 10.5% of the variance (R2= .325, F (1,6467) = 762.604, p=.00). It was found that child age at first DOS predicted ADHD treatment length of ADHD treatment (Beta= -.325,

p=.000). This indicates a moderate relationship between child age at first DOS and length of ADHD treatment. A t-test, Tables 22-23, was used to analyze the potential relationship between gender and length of treatment. There was a significant difference between length of treatment (months) between females (M=123.3269, SD =28.50426) and males (M=26.7050, SD= 30.72195), t (4022.481) = -4.282, p =.000. This regression model summary indicates a moderate relationship between gender and length of ADHD treatment. To analyze the relationship between race and length or treatment a one-way ANOVA was conducted, Tables 24-25. There was a significant effect of race on onset of ADHD treatment, at the $p<.05$ level [F (2,6466) = 18.441, p=.000]. Post hoc comparisons using Tukey HSD test, Table 26, indicated that the mean length of treatment (in months) for black (not Hispanic) children (M= 26.1062, SD= 30.27094) was significantly different from White children (M=14.3021, SD= 22.32292). Also, there was significant difference in length of treatment (in months) between Black (not Hispanic) children (M= 26.1062, SD= 30.27094) and Hispanic children (M= 14.3021, SD= 22.32292). However, there was no difference in length of treatment (in months) Hispanic children (M= 14.3021, SD= 22.32292) and White children (M= 11.0760, SD = 19.69075).

Table 19

Linear Regression of Child Age and Length of ADHD Treatment

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325[a]	.105	.105	3.449

Note. a. Predictors: (Constant), length of tx months

Table 20

Analysis of Variance of Child Age and Length of ADHD Treatment

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9070.064	1	9070.064	762.604	.000[b]
	Residual	76915.563	6467	11.894		
	Total	85985.627	6468			

Note. a. Dependent Variable: Age at first DOS

b. Predictors: (Constant), length of tx months

Table 21

Coefficients of Child Age and Length of ADHD Treatment

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	12.396	.056		219.950	.000
	Length of tx months	-.039	.001	-.325	-27.615	.000

Table 22

Means and Standard Deviations of Child Gender and Length of ADHD Treatment

	Child Sex	N	Mean	Std. Deviation	Std. Error Mean
Length of tx months	Female	1969	23.3269	28.50426	.64237
	Male	4500	26.7050	30.72195	.45798

Table 23

Levene's Test for Child Gender and Length of ADHD Treatment

		Levene's Test for Equality of Variances		
length.of.tx.months	Equal variances assumed	10.858	.001	-4.158
	Equal variances not assumed			-4.282

Table 24

Means and Standard Deviations for Child Race and Length of ADHD Treatment

	N	Mean	Std. Deviation	Std. Error
Black Not Hispanic	6243	26.1062	30.27094	.38312
Hispanic	192	14.3021	22.32292	1.61102
White	34	11.0760	19.69075	3.37694
Total	6469	25.6768	30.10224	.37427

Table 25

Analysis of Variance for Child Race and Length of ADHD Treatment

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	33240.951	2	16620.475	18.441	.000
Within Groups	5827703.614	6466	901.284		
Total	5860944.564	6468			

Table 26

Post-Hoc Multiple Comparisons for Child Race and Length of ADHD Treatment

					95% Confidence Interval	
(I) Child Race	(J) Child Race	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Black Not	Hispanic	11.80410*	2.19967	.000	6.6475	16.9607
Hispanic	White	15.03013*	5.16263	.010	2.9277	27.1326
Hispanic	Black Not	-11.80410*	2.19967	.000	-16.9607	-6.6475
	White	3.22603	5.58592	.832	-9.8687	16.3208
White	Black Not	-15.03013*	5.16263	.010	-27.1326	-2.9277
	Hispanic	-3.22603	5.58592	.832	-16.3208	9.8687

Note. *. The mean difference is significant at the 0.05 level.

Summary

The purpose of this a quantitative secondary analysis was to examine the relationship parent family dynamics, race, and gender to offer insight into the possible relationship between family dynamics and ADHD treatment onset and duration for children. The results from this analysis support most of our research questions. There is a

definitive relationship between family dynamics and onset of ADHD treatment but not length. The difference in family dynamics also showed a significant difference between parent genders and children living with both parents. Child gender, and child race were also significant to ADHD treatment. Child gender was significant to age at first DOS and with treatment length. Child race was somewhat significant to age of onset of treatment and treatment length depending on the variable. Race of parents and adults was significant to age of onset of treatment and treatment length was significant between some racial groups.

These findings and their relationship to the literature and the research questions will be explored further in Chapter 5. The data will be summarized and compared to the literature review. Clinical implications for how this information can be used to reduce barriers to treatment will also be discussed. Recommendations for future research will also be discussed in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

ADHD affects 5-12% of children between ages 4-18 years (APA, 2013; Bush, 2010; CDC, 2008; Visser et al., 2014). Despite the high numbers of children with ADHD, as many as 42-77% of children with ADHD symptoms may not be receiving treatment (Berger-Jenkins, 2012; Bussing et al., 2015; Bussing et al., 2003; Rowland, et al., 2015). The literature review indicated parent race and gender may be influencing factors to receiving ADHD treatment (Berger-Jenkins et al., 2012). Many children experience delays in accessing treatment ranging from 1 to 4.9 years between symptom onset and treatment (Brinkman et al., 2009; Bussing et al., 2005; Coletti et al., 2012; World Federation for Mental Health, 2006)**.**

The literature review showed many factors have been examined in relationship to the lack of treatment, yet none have fully captured this dilemma (Rowland et al: 2015; Sayal et al., 2015). These factors include parent ethnicity, racial basis, stigma, parent preference for treatment, socioeconomics, and gender, have been previously studied (Berger-Jenkins, 2012; Bussing et al., 2007; Bussing et al., 2007; Ghosh et al., 2015; Lawton et al., 2016; Starr, 2007). Although the rates for each group may differ, children from all groups do receive treatment. These factors alone do not seem to account for the large discrepancy between ADHD symptoms and lack of treatment (Bussing et al., 2005; Charach et al., 2010; Singh, 2008; Hong et al., 2013; Kendall et al., 2003; Lawton et al., 2016).

Given the continuing questions, a new area of exploration is warranted, family dynamics. The potential differences of family dynamics, children living single or dual

parent families had limited presence in the literature when examining barriers to treatment. Parent stressors, the difficulties in decision making, and differences between mothers and fathers are known (Chen et al., 2008; Cussen et al., & 2012; Ghosh et al., 2015; van der Veen-Mulders, et al., 2017;). Parents are gatekeepers to children's treatment, the influence of one parent versus two parents in this decision process could aid in understanding barriers to ADHD treatment (Brinkman et al., 2009; Cassano et al., 2006; Mills, 2011; Stroh et al., 2008).

This study was undertaken to examine potential differences between family dynamics and onset and duration of ADHD treatment. The purpose is to add to the body of knowledge regarding barriers to ADHD treatment. As potential barriers to treatment are better understood, they can be mitigated hopefully reducing delays to ADHD treatment. Few studies in the literature review included both fathers and mothers as separate variables when assessing parental attitudes towards ADHD to analyze. Information detailing single or dual parent households is rarely reported is studies (Chen, et al., 2008; Mills, 2011; Singh 2003). This study will look at children living with mothers, fathers, and dual parent families and the relationship between family dynamics and onset and duration of ADHD treatment. While family dynamics is the core component, parents' race as well as children's race, and age was also included as they were salient in the literature review. The author hopes the study findings will help reduce barriers in the future and encourage more researchers to include both parents as separate variables in studies regarding children and ADHD treatment. This information could also

highlight the need for greater efforts to include fathers, or fathers and mothers, in data collection.

Study Findings

In summary, this study did show a relationship between family dynamics and ADHD treatment for children. Child gender, and child race were also significant to ADHD treatment. Children living with both parents entered treatment at an earlier age, on average 11.08 years than those living with fathers, on average 12.33 years. This data shows children started treatment at a younger age when living with both parents. This was a significant question of this study whether living with a single or dual parent impacted the onset of treatment. Children living with mothers entered treatment at an average 11.36 years. This was statistically different than children living with their fathers (*M= 12.33*), and it is 1 year later than children living with mothers; 1.3 years from living with both parents. This delay in treatment for children living with fathers is supported by findings in the literature review indicating fathers are often more reticent regarding ADHD treatment while mothers are often more in support of treatment. Mothers would affect treatment times in single, mother-led household and in a dual parent household. In regard to length of treatment time and family dynamics, no significant difference was found. Children with both parents were in treatment an average of 2.046 years, children living with their father an average of 2.021 years, and children with mothers and average of 2.096 years.

When analyzing child gender, there was a significant difference between boys and girls. Boys, average age 11.23 entered treatment sooner than girls, average age 11.74 did.

While statistically significant in our data analysis, the age is quite close and gives hope that the delays for girls receiving ADHD treatment are becoming smaller. The standard deviations were 3.65(m) and 3.61 (f) respectively which in developmental years is a large range meaning children could enter treatment at 7.58- 14.88 according to this data. This could be due to the large sample size and the significant variation between treatment times. Reexamining the data comparing specific windows might give additional information in the future. The length of treatment time between females and males was also found to be significant, yet also close in actual time; Females *(M=23.3269, SD =28.50426)* and males *(M=26.7050, SD= 30.72195*). While this too, gives hope that the disparity between genders is closing, the large sample size may have affected the results. Comparing the two groups over similar lengths of treatment, or defining outliers to remove would also be beneficial in further studies. There was also a significant difference in gender and length of treatment. Males stayed in treatment an average of 26.70 months while girls were in treatment less an average of 23.33 months. There was however a very large standard deviation between the lengths of treatment, M= 30.72 (m) and M= 28.50 (f) likely because the time analyzed was so long at 18yrs. The standard deviation times were also shorter for girls possibly supporting that girls do remain in treatment less time. The actual difference of an average of 3.37 months may not be significant to this analysis but whether it has substantial impact on boys or girls receiving treatment is a good question. I did not find specific lengths of time required to address ADHD for children. That given the large standard deviation indicates that this question likely needs additional research.

A moderate relationship between child age at first DOS and length of treatment was found; child age at first DOS explained 10.5% of the variance.

The effect of child race was found significant on the onset and length of ADHD treatment. Black (M= 11.38) and Hispanic (M=11.24) children differed significantly from white (M=13.56) children in regard to onset of ADHD treatment. There was no significant difference between Black and Hispanic children at age at first DOS. The standard deviation here was approximately 3.5 for Black and Hispanic children (SD =3.65 Black; SD = 3.36 Hispanic) but much higher for white children (SD= 4.44). It is interesting that this data shows Black and Hispanic children entering ADHD treatment at a younger average age; by more than 2yrs younger. The literature generally indicates that White children enter treatment earlier than non-White children. There were significantly more Black children in the data than Hispanic or White. There were also five times more Hispanic children than White children in this data. These numbers are reflective of DC Medicaid population.

In regard to the relationship between race and length of treatment, there was significant difference between Black children (M = 26.11) and White children (M=11.08) and between Black (M = 26.11) and Hispanic (M= 14.30) children. There was no difference between in treatment length between Hispanic (M= 14.30) and White children. The standard deviation here was once again high, (SD= 301.27 Black, SD= 22.32 Hispanic, and SD= 19.69 White). It is interesting that Black children had the longest length of treatment and White children the shortest. With a great deal of the literature indicating that White people access ADHD treatment more often, it could be expected

that White children were in treatment longer. However, this is not what this data shows. For future studies it would be interesting to look further into the length of treatment and what specific treatments children are receiving.

The results from this analysis support most of our research questions. There is a definite relationship between family dynamics and onset of ADHD treatment but not length. Child gender, and child race were also significant to ADHD treatment. Child gender was significant to age at first DOS and with treatment length. Child race was somewhat significant to age of onset of treatment and treatment length depending on the variable. Age of onset of treatment was significant between Black and White children as well as Hispanic and White children. There was no difference between Black and Hispanic children. For length of treatment Black and Hispanic children were in treatment longer than white children; however statistical significance was only found between Black and White children and Black and Hispanic children. These findings reflect the literature in some aspects while countering it in others. This could be due to the population of participants which was considerably higher for Black children, much higher for Hispanic children, and smallest for White children. It could also be due to the large age range studied which may have contributed to the large standard deviations found.

Limitations

The limitations of this study are few and revolve mostly on the use of archival data. Since archival data was collected for a purpose other than the intended study, it can be can be considered weaker due to potential unknown factors such as collection measures or standards. The data used for this study was collected by the District of

Columbia government and is likely to have been collected with appropriate standards. The District of Columbia uses this data for MEDICAID documentation and implementation requiring proper data collection. For this study archival data is necessary to answer the research questions. This study looks at the child from age 5-18 to ensure data on this entire time period is collected to answer the research questions regarding length and onset of treatment. Conducting study of this length would be extremely cumbersome and thus archival data was used.

The use of MEDICAID data could also be considered a limitation as it represents a specific population. This is true and thus the population defined. This is an exploratory analysis into the relationship between family dynamics and ADHD treatment. Using a broader sample is recommended for the future. Comparing a larger sample from families with private insurance would be useful data to compare with the results of this study in the future.

Recommendations for Research and Practice

Future recommendations when studying ADHD treatment for children include using parent gender as a separate and specified respondent entry. Mother and father replies should both be solicited, with emphasis on equal number of fathers, and analyzing mother and father responses separately rather than jointly. This recommendation can also be made for all studies on mental health issues and children. There is clear evidence in the literature review and this study indicating that mothers and fathers have differing opinions and on mental health services for children. It is also clear that these differing opinions affect treatment decisions (Ghosh et al., 2015; Mills, 2011; Markel & Wiener,

2014; Stroh et al., 2008; van der Veen-Mulders et al.; 2017; Zwirs et al., 2006). Fathers were underrepresented in this study and are historically underrepresented (Bussing et al., 2007; Phaeres, 2005; Singh 2003). It is essential that be corrected in future research.

Other recommendations include using family dynamics as a variable when researching parental attributes regarding mental health treatment for children, especially ADHD. Understanding more of the potential differences between mothers and fathers as well as whether living in a single or dual parent family impacts treatment decision can help reduce barriers to treatment, hopefully helping to decrease the long delays between symptom onset and treatment (Berger-Jenkins et al., 2012; Bussing, et al., 2003; Purper, Ouakil 2007). As this was a relatively small sample, repeating a similar study on a larger population could yield additional information. This study also combined ADHD treatment into a single variable as it was an exploratory study. Analyzing parental attributes towards medication, therapy, or a combined approach would add an additional layer of information. Last, this study focused on mothers and fathers, a very simplistic approach but appropriate for this initial study. Future studies should include other caregivers such as foster parents, grandparents, and others.

Implications for Social Change

This study has several potential implications for social change. The goal of this study was to assess the potential impact of family dynamics on ADHD treatment for children. Looking at whether living in a single or dual parent family and whether parent gender impacted treatment onset or duration. The literature review indicated these areas have not been the subject of much research (Bussing et al., 2007; Phaeres, 2005; Perry et

al., 2005; Singh, 2003). Yet clear differences between maternal and paternal attributes towards ADHD were seen in the literature and this study (Chen, et al., 2008; Ghosh, et al., 2015; Phaeres, 2005; Singh 2003). In addition, parent race was also an influencing factor which supports literature regarding this concern and the need for practitioners to continue to address it (Ghosh, et al., 2015).

These findings are important because they can help researchers studying barriers to ADHD and other mental health treatment to children (Brinkman et al., 2009; Cassano et al., 2006; Mills, 2011; Stroh et al., 2008). Encouraging the inclusion of more fathers in studies, and as a separate variable from mothers is likely to enhance our understanding of parental feelings and concerns towards mental health treatment. As concerns are known, they can be addressed. These findings support previous information that fathers should be more included in treatment decisions and the treatment process as their opinions may differ and are likely to have some influence in decisions. Additionally, practitioners and students should be aware of the lack of paternal inclusion in studies and treatment process, using this knowledge to increase paternal participation in both (Cassano et al., 2006; Ghosh, et al., 2015; Phaeres, 2005; Singh 2003). The findings regarding differences in parental race and ADHD treatment of children can also be used to help practitioners and researchers further identify these issues as well as means to address them. Understanding that race continues to be a factor affecting treatment decisions, practitioners should continue to explore the cultural implications and means to address cultural concerns.

The social change of expecting more paternal participation will hopefully lead to increased participation. This may allow fathers to become more familiar with the benefits of treatment for ADHD and thus more supportive. As more fathers are included and support this change it can effect societal change changing they dynamic of primary maternal respondents and primarily mothers as responsible for mental health care (Phaeres, 2005; Perry et al., 2005; Singh, 2003). Also under researched in family dynamics. Understanding that differing opinions, marital discord, or stress may impact treatment decisions is an important factor for practitioners to address (Ghosh, et al., 2015; Mohammadi et al., 2012; Singh, 2003; Waschbusch et al., 2011). Realizing that increased inclusion of fathers may help address this issue may help negate these negative factors, improving treatment access.

Recognizing the continued impact of race on ADHD treatment will help practitioners continue to develop unique cultural responses for each population (Ghosh, et al., 2015; Lawton, et al., 2016; Olanyian, 2007). These actions should decrease barriers to treatment and delays to ADHD treatment allowing children to receive services soon remediating negative effects of ADHD and learning lifelong coping strategies. Lastly, acknowledgment that males continue to be diagnosed sooner than females is important to addressing this negative factor (Bussing et al., 2003). Because race and gender have been previously studied, some may think the impact of both is less relevant. While there may have been improvement, both parent race and child gender continue to related to barriers to treatment. Continued to examination of the reasons behind these variables will help reduce these barriers further. As barriers and delays to ADHD treatment are reduced,

children can benefit sooner, and perhaps longer, from therapeutic interventions for ADHD.

Methodological, Theoretical, Empirical Implications

Methodological implications include designing studies to include more representation of fathers in studies regarding mental health treatment and their children. This includes seeking fathers are participants in significant numbers as well as entering mother and father data separately. Recognizing that mothers and fathers may have significant differences of opinion and recording their answers separately is important to reflect their unique perspectives.

Reviewing the theoretical framework for this study, Bowen Family Systems Theory, families are emotional units with family members experiencing strong interdependence (Bowen, 1985). Including family dynamics in demographic data is important as well as analyzing differences in single or dual parent households when studying parental attributes towards ADHD or mental health treatments of children. As indicated by the literature and this study, mothers and fathers can have different opinions on mental health treatment for ADHD (Ghosh, et al., 2015; Phaeres, 2005; Singh 2003). Families can have multiple structures such as single parent or dual parent households. Living with a child with ADHD can increase stress or discord within a family, impacting access to treatment (Mills, 2011; Mohammadi et al., 2012; Perelli, 2011). Bowen Family System's Theory includes the concept of the nuclear family as well as Triangles and Emotional Cutoff (Bowen, 1985). It was posited that these factors may affect dual parent families more than single parent families. This study set out to explore whether children

in families with 2 parents would start, or stay in treatment, differently than those in single parent families. The findings suggest that children in single parent families led by fathers entered treatment later than those living with mothers or dual parent families. This exploratory information should be reassessed on a larger scale with a more varied sample.

Conclusion

Barriers to ADHD treatment have been well established for children with ADHD (Berger-Jenkins, 2012; Bussing et al., 2015; Bussing et al., 2003; Rowland, et al., 2015). With 5-12% of children between 4-18 affected by ADHD, this is a grave concern (APA, 2013; Bush, 2010; CDC, 2008; Visser et al., 2014). As the literature review demonstrated, researchers have attempted to establish factors correlated with barriers yet despite significant research, barriers continue (Rowland et al: 2015; Sayal et al., 2015).

This study was designed as an introductory look at the potential influence of family dynamics and parent gender. These variables have been underrepresented in the literature yet differences in parental opinions has been established (Chen, et al., 2008; Ghosh, et al., 2015; Mills, 2011; Singh 2003). Using Bowen's Family System's Theory, this study explored the potential of family conflict and its influence on access ADHD treatment (Bowen, 1985; Brinkman et al., 2009; Cassano et al., 2006; Mills, 2011; Stroh et al., 2008). Additional variables of parental race, child gender, and child race were also included based on the literature review. As parents are gatekeepers to children's treatment, the differences between parental gender, race, and family dynamics are important variables to study when attempting to understand potential barriers to treatment (Brinkman et al., 2009; Cassano et al., 2006; Mills, 2011; Stroh et al., 2008).

The key findings in this study indicate that family dynamics and parent gender was correlated with significant differences in ADHD treatment onset and length. In addition, parental race was also significant to ADHD treatment. These findings can be to design additional studies with larger and more varied populations to check for similar findings correlating family dynamics and parent gender with differences in access to ADHD treatment. This study also highlighted research indicating a significant lack of inclusion of fathers in research studies regarding ADHD treatment and mental health treatment for children. Despite this lack being identified over 20years ago, little effort to close that gap seems to have been made (Phaeres, 2005; Perry et al., 2005; Singh, 2003; Waschbusch, et al., 2011). The literature review highlighted the prevalence of reporting "parental" data which was either not identified as mother or father or consisted almost entirely of mothers as participants. It is clear that this trend cannot continue. Differences between mothers and fathers and their views on ADHD treatment clearly exist and do impact treatment for children.

An essential take away from this study should be the call to action for researchers to actively include fathers and mothers as participants. To collect data and analysis separately to ensure father's voices as represented. Studies replicating previous studies that included only mothers could be conducted including fathers for comparison data. Studies using combined parental data or mothers as primary respondents should acknowledge that as a study limitation. The paternal perspective as a distinct and unique voice regarding ADHD treatment has been missing for far too long.

Also important is the acknowledgement that family dynamics, parent gender, and parent ethnicity have significant impact on access to ADHD treatment. Additional research is needed to explore the independent and collective impact these key variables play. Family dynamics was a key variable of this study. The literature and study findings indicate family dynamics can influence treatment for ADHD (Chen, et al., 2008; Ghosh, et al., 2015; van der Veen-Mulders, et al., 2017;). However, the findings are still sparse and need to be expanded on. The combined impact of family dynamics and parent gender as well as parent ethnicity is also an area that needs further study. Each of these factors can affect treatment access but the interplay between or compounded impact has not been studied adequately (Chen, et al., 2008; Cussen et al., 2012; Ghosh, et al., 2015; van der Veen-Mulders, et al., 2017). Research focused on these variables is needed to help address the delays and barriers to ADHD treatment for children.

This research is needed because of the impact it will have on children and families. Delays in ADHD treatment negatively affect children and their families. The struggles of ADHD children affect them throughout their life from their families to school, to work and adult relationships. If barriers to treatment can be reduced, it is likely the negative impacts can also be reduced which is of great benefit to the children themselves but also to all those they interact with thus positively effecting social change.

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Appendix A

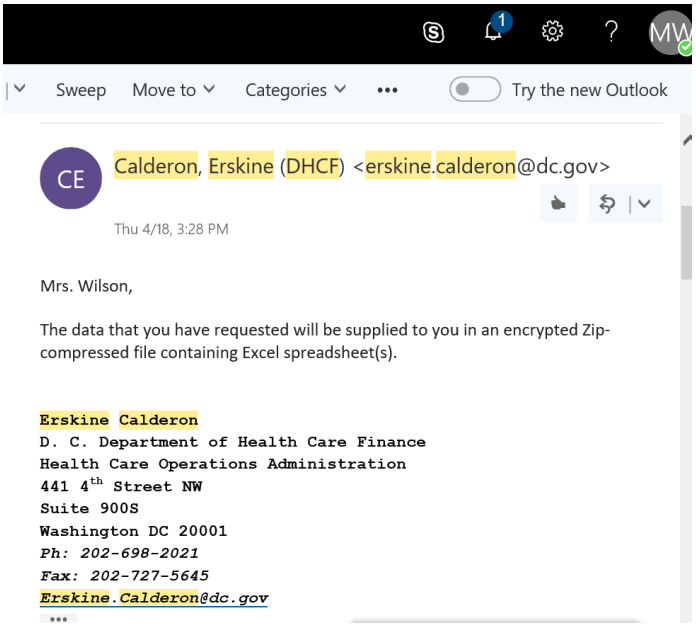

Figure A1. Email indicating District of Columbia Medicaid staff will provide data for this study.

Appendix B

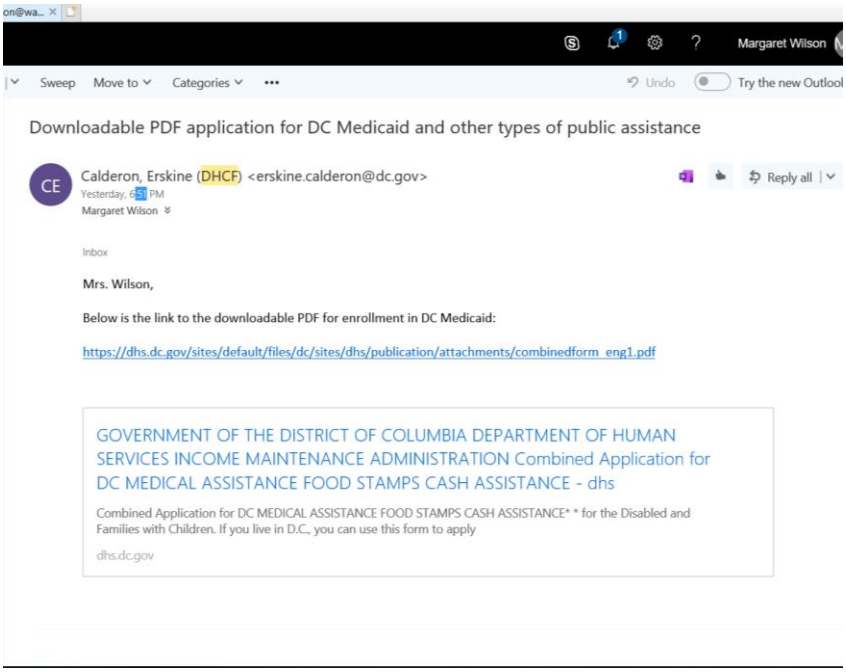

Figure B1. Email including the link to the 21-page District of Columbia Medicaid application used to begin the application process which is then completed over the phone or in person by the applicant.