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QUALITY OF LIFE AMONG ADULTS WITH ATTENTION DEFICIT
HYPERACTIVITY DISORDER (ADHD): COMPARATIVE STUDY BETWEEN THE
THREE PRESENTATIONS OF ADHD

DISSERTATION

Doctor of Philosophy in the Department of Rehabilitation Counseling in the College of
Education at the University of Kentucky

By
Amani A. Kettaneh
Lexington, Kentucky

Director: Dr. Sonja Feist-Price, Professor of Rehabilitation Counseling
Lexington, Kentucky

2015

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ABSTRACT OF DISSERTATION

QUALITY OF LIFE AMONG ADULTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD): COMPARATIVE STUDY BETWEEN THE THREE PRESENTATIONS OF ADHD

Attention deficit hyperactivity disorder (ADHD) has been the subject of much research and controversy. Although ADHD was once believed to affect only children, recent research indicates that the symptoms of ADHD persist past childhood and adolescence, well into college age and adulthood. ADHD negatively impacts several life domains, such as perceived general health, college education, employment, social life, and psychological health. For some, this negative impact results in lowering the level of quality of life (QOL) or life-satisfaction. The purpose of this study is to describe the experiences that influence the level of QOL among different presentations of adults with ADHD. Information was gathered by using a survey and qualitative interviews with different presentations of adults with ADHD to collect and analyze their perceptions (thoughts, feelings, beliefs, and opinions) about the impact of this condition on their QOL level and different life domains.

Keywords: Quality of life, ADHD, General Health, Employment, Social Life, Mental Health.

Amani A. Kettaneh

Student's Signature

December 10, 2015

Date

QUALITY OF LIFE AMONG ADULTS WITH ATTENTION DEFICIT
HYPERACTIVITY DISORDER (ADHD):
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DEDICATION

In memory of my great father (Dr. Aziz Kettaneh)
To the model of my life – my great mother (Mrs. Amira Balawi)
Whose affection, love, encouragement, and prayers of my days and nights make me able to
get such success and honor.
To my love, my home, my partner, my husband, my friend,
and all things
(Muad Maya)
To my greatest accomplishment: Tala, Ameer, Seleem, and Ryan
To my family and my friends - for all your love and support.
To anyone, anywhere who is facing challenges (disability, discrimination, poverty, etc.)
but keep hoping for a better world - you inspire me

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I must thank, and acknowledge the tremendous support and help of both my parents for giving me the strength to reach for the stars and chase my dreams.

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Chapter I

Introduction

Attention deficit hyperactivity disorder (ADHD) is an enduring psychiatric disorder characterized by developmentally excessive levels of inattention, hyperactivity, and impulsivity (Spencer, Biederman, Wilens, & Faraone, 2002). The burden of this disorder is considerable and is often characterized by academic or occupational impairments and dysfunctions within the family and society (Adler, 2006). ADHD impacts multiple areas of brain functions and life activities, such as school, work, family life, and interpersonal relations as a result of the underlying pathology (Ustun, 2007).

Once believed to be primarily limited to childhood, both researchers and clinicians increasingly have become aware that the persistence of ADHD into adulthood causing disruptions to both professional and personal life (Marks, 2004). In part, this conceptual shift is the byproduct of numerous longitudinal studies (Mannuzza, Klein, & Bessler, 1998; Weiss, Hechtman, Milroy, & Perlman, 1985), which have demonstrated that as many as 60% of individuals with ADHD symptoms in childhood continue to have difficulties in adult life (Harpin, 2005). Moreover, in some cases, ADHD symptoms can worsen with age and are likely to be accompanied by co-morbid diagnoses, such as depression, anxiety, or bipolar disorder (Wilens, Biederman, & Spencer, 2000).

A number of psychosocial problems have consistently been found to be more prevalent among adults with ADHD relative to the general population (Biederman et al., 2008). Common psychosocial problems include unemployment or underemployment, social isolation, and psychological distress, including anxiety and depression. ADHD into adulthood can lead to severe impairment of social relations and ability to match expectations of work performance. Symptoms of inattention more often remain into adulthood (Kessler, Katzman, & Chokka, 2010), potentially leading to risky behaviors such as increasing incidents of alcohol consumption and accidents while driving (Barkley & Cox, 2007). Adults with ADHD also experience deficits of executive functioning, which can contribute to impairments in daily life (Barkley & Fischer, 2011; Barkley & Murphy, 2010). Together, the symptoms of ADHD that persist into adulthood have the

potential to affect an individual's level of quality of life (QOL) and productivity. Little known about the ways in which the three presentation of ADHD impact QOL

Purpose Statement

The purpose of this explanatory study is to contribute to the understanding of quality of life (QOL) as it is experienced among adults with ADHD, and how this experience of QOL is different among different presentations of ADHD (inattentive, hyperactive-impulsive, and combined inattentive & hyperactive-impulsive). The condition of ADHD, as with any other disability can disrupt participation in valued activities and interests, which can negatively impacts QOL and well-being levels (Devin, 1994). Across all health rehabilitation professions, QOL has become an important measure of outcomes in both research and clinical settings (Agarwal, Goldenberg, Perry, & Ishak, 2012). Understanding the relationships between QOL and other variables is an important research goal. Through discerning the variables that affect QOL, interventions to improve QOL may be identified and prioritized (Bishop, 2005).

There are numerous reasons why it is important to examine the level of QOL among adults with ADHD. First, ADHD is one of the most commonly diagnosed disorders affecting children with implications into adulthood. In 2011, over five million children aged 5–17 had ADHD (Bloom, Cohen, & Freeman, 2011), and as mentioned earlier, 60% of those children or adolescents continue to have difficulties into their adult life. It is increasingly important to understand the processes by which adults with ADHD develop psychosocially and establish an identity that incorporates their diagnosis. Less is known about ADHD in adulthood compared to the body of knowledge that exists for children (Weyandt & DuPaul, 2006); hence, this research project will fill this void.

Second, adults with ADHD are at an increased risk for negative outcomes in various domains, including academic (Montero, 2002), vocational (Bayne, 2007), social (Scott, 2006), and familial (Eakin, 2001), as well as at increased risk for psychopathology (Miranda, Soriano, Fernandez, & Melia, 2008). Given that these outcomes are also associated with lower levels of life quality and satisfaction, it seems plausible that adults with ADHD could be more vulnerable to a lower level of QOL or life satisfaction. This is important because higher levels of QOL could provide a buffer against the development of these negative outcomes (Bateman, 2011). Given research indicating that higher levels

of QOL are associated with increased competence in the academic, vocational, and social domains (Gilman & Huebner, 2006; Suldo & Huebner, 2006), increased levels of QOL among adults with ADHD may contribute to more positive outcomes in the academic, vocational, and social domains.

From a rehabilitation perspective, the identified psychosocial problems that adversely impact QOL are clearly amenable to intervention. Such interventions would include assisting with the attainment of or increase in level of employment or number of vocational activities, assisting with social and community integration, identifying community resources, and providing adjustment and psychological counseling. A greater understanding of the relationship between QOL and the psychosocial problems commonly associated with ADHD would allow rehabilitation professionals to prioritize these interventions, develop better plans for working with people with ADHD, and potentially allow for the planning for and prevention of psychosocial problems (Bishop, Berven, Hermann, & Chan, 2002). However, to date, there is an extremely limited amount of research relevant to QOL and the various psychosocial problems experienced by adults with ADHD (Schott, 2012), particularly as it relates to the presentation or ADHD subtype.

Given increased evidence related to the importance of fostering life quality or satisfaction in the overall population (Diener & Diener, 1996), as well as recent suggestions regarding the importance of increasing positive academic, vocational, social, and psychological outcomes for adults with ADHD (DuPaul, 2007), it is important to gain a clearer understanding of how QOL may be related to ADHD symptoms. Research on the relationship between adult ADHD effects and QOL, in terms of established QOL domains is currently limited.

Research Questions

The purpose of this study is to contribute to the understanding of QOL as it is experienced among people with ADHD, using a large, community-based, non-clinical sample. This study is specifically designed to address what are seen, from a rehabilitation perspective, as limitations in the existing research. A primary limitation is the focus of the existing research on medically-based interventions and the limited scope of the research in terms of identifying the effects on QOL of variables amenable to

rehabilitation interventions. QOL will be conceptualized in this study according to the model proposed by Chubon (1995). In this model QOL is measured as subjective satisfaction with various life domains that have been established as being important to persons with chronic illnesses.

Based on a review of the literature social, psychological, and vocational variables are most commonly associated with ADHD. The relationships of these variables to QOL, as it relates to the presentation of ADHD, will be assessed. A qualitative component will also be included in this study to identify potential areas for future research. The guiding research questions are as follows:

RQ1: What factors are significant predictors of the QOL of adults with ADHD with different presentations?

RQ2: What experiential aspects of ADHD do adults feel are important to the quality of their lives?

RQ3: How does ADHD impact the psychological, vocational, and social domains of adults with ADHD?

RQ4: Why does ADHD impact the psychological, vocational, and social domains of adults with ADHD?

Chapter II

Literature Review

Attention-deficit/hyperactivity disorder (ADHD)

Attention-deficit/hyperactivity disorder (ADHD) is a highly prevalent, clinically heterogeneous disorder that causes an enormous burden on society in terms of financial costs, stress to families, and adverse academic and vocational outcomes (Biederman, Faraone, Monuteaux, Bober, Cadogen, 2004). ADHD is a multifactorial disorder with complex etiology and strong genetic underpinnings (Faraone, Biederman, 2005). ADHD consists of two subtypes, which include inattention, hyperactivity and combined (American Psychiatric Association, 2013).

The inattention component of ADHD is manifested as daydreaming, distractibility, and difficulty focusing on a single task for a prolonged period of time, whereas the hyperactivity component is expressed as fidgeting, excessive talking, and restlessness (American Psychiatric Association, 2013). The symptoms of ADHD may predispose an individual to accidents, create strain in interpersonal relationships, and disrupt the environment through interruptions and inappropriate behavior. Some researchers noted that the more overt symptoms of hyperactivity/ impulsivity tend to wane early in life, whereas the more covert symptom of inattention tends to persist over time (Biederman et al., 2004).

The areas of impairment associated with ADHD in childhood include academic and social dysfunction and skill deficits. Adolescents with ADHD are at high risk for academic failure, low self-esteem, poor peer relationships, parental conflict, delinquency, smoking, and substance abuse (Barkley et al., 2010). Adults with retrospectively defined childhood-onset and persistent ADHD show a pattern of psychological dysfunction, psychosocial disability, psychiatric comorbidity, and school failure that resembles the well-known features of childhood ADHD (Biederman, Faraone, Milberger, Curtis, Chen, & Marris, 1996).

Prevalence of ADHD among Adults

Attention-deficit/hyperactivity disorder (ADHD) is a worldwide and highly prevalent disorder, estimated to affect 5%–10% of children (Faraone, Sergeant, Gillberg, & Biederman, 2003) and 4% of adults (Faraone & Biederman, 2005; Kessler et al.,

2006). Once believed to be primarily limited to childhood, both researchers and clinicians increasingly have become aware of the persistence of ADHD into adulthood causing disruptions to both professional and personal life (Marks, 2004). In part, this conceptual shift is the by-product of numerous longitudinal studies (Mannuzza, Klein, & Bessler, 1998; Weiss, Hechtman, Milroy, & Perlman, 1985), which have demonstrated that as many as 60% of individuals with ADHD symptoms in childhood continue to have difficulties in adult life (Harpin, 2005). Biederman et al. (2005) estimates that 8 million adults in the United States are currently battling symptoms of ADHD and that the cumulative impacts of these symptoms on quality of life are extraordinarily profound. Moreover, in some cases, ADHD symptoms can worsen with age and are likely to be accompanied by co-morbid diagnoses such as depression, anxiety, or bipolar disorder (Wilens, Biederman, & Spencer, 2002).

Despite variability in rates of persistence of ADHD, several predictors of persistence have been identified, including family history of ADHD, psychiatric comorbidity, and psychosocial adversity (Biederman, 2004). In a study that used Rutter's indicators of adversity (i.e., severe marital discord, low social class, large family size, paternal criminality, maternal mental disorder, and foster care placement) to predict ADHD-related psychopathology, the risk for ADHD was found to increase significantly with each increase in the number of adversity indicators (Biederman et al., 1996; Mick, Biederman, Faraone, Sayer, & Kleinman, 2002).

Follow-up studies have found that 50%–66% of children with ADHD persist with this disorder into adulthood (Biederman et al., 1993). Current epidemiologic studies in the U.S. estimate the prevalence of adults with ADHD to be between 4% and 5% (Faraone 2007; Fischer et al., 2003; Kessler 2006; Sobanski et al., 2008; Tamam et al., 2008) Furthermore, studies of referred and non-referred adults with a clinical diagnosis of childhood-onset and persistent ADHD revealed that clinical correlates (e.g. demographic, psychosocial, psychiatric, and cognitive features) mirrored well-documented findings among children with ADHD (Biederman et al., 2004).

Prospective studies that followed individuals with ADHD from child to adulthood have also shown a reduction of hyperactive and impulsive symptoms over time, with strongest decline during adolescence, while the inattentive symptoms persisted into

adulthood (Biederman, 2006; Hart, Lahey, Loeber, Applegate, & Frick., 1995). To date, nearly all research of subtype differences in ADHD has been performed in children, and only two studies have covered this subject in adults with ADHD (Sobanski, 2006). ADHD was found to be 1.3% for the “Inattentive Type”, 2.5% for the “Hyperactive-Impulsive Type”, and 0.9% for the “Combined Type”. Results implied that ADHD subtypes may be less prevalent in adults, the lower prevalence could also have been due to DSM-IV diagnostic thresholds being too restrictive for use in the diagnosis of adults with ADHD. Further research is recommended to evaluate whether DSM-5 would consider establishing thresholds that are developmentally referenced rather than fixed across the lifespan. Consistent with some studies, the most prevalent ADHD subtype for both genders was the hyperactive-impulsive subtype. The combined and inattentive ADHD subtypes had higher levels of comorbid psychopathology than the hyperactive-impulsive ADHD subtype (Cahill, Coolidge, Segal, Klebe, Marle, & Overmann, et al. 2012).

An exploratory study conducted by Millstein, Wilens, Biederman, and Spencer (1997) on 149 clinically referred adults with ADHD. They found that adults with ADHD combined type suffered more often from substance use disorders than adults with predominantly inattentive type, but did not differ in the rates of depressive episodes and anxiety disorders. In terms of psychosocial functioning, only educational outcomes were assessed, which showed that adults with ADHD combined type had more often been placed in special classes than adults with predominantly inattentive type. In a genetic family study conducted by McGough and colleagues (2005) to examine patterns of psychiatric comorbidity in adults with ADHD, results indicated that participants with the combined presentations suffered about twice as frequently from substance use disorders and showed a trend toward higher rates of oppositional defiant and conduct disorders, compared to adults with ADHD inattentive type.

More researchers assessed psychiatric comorbidity and psychosocial functioning in a community-based and clinically referred sample of adults with persons who are diagnosed with ADHD in comparison with a community-based control group. In both ADHD samples they found significantly higher rates of comorbidity than in their control group, with the ADHD combined type suffering the most pronounced comorbid

symptoms. This was particularly prominent for the clinically referred subgroup in which individuals with ADHD combined type presented with the highest number of comorbid psychiatric disorders and the highest symptom severity of eating disorders, substance use disorders, oppositional defiant, and conduct disorders, as well as antisocial and borderline personality disorders. Whereas no differences were found between the combined and inattentive subtype groups for symptom severity of depression and general anxiety. There were no significant differences for educational level or number of married persons within the subgroups (Sprafkin, Gadow, Weiss, Schneider, & Nolan, 2007).

Another study conducted by Murphy, Barkley, and Bush, (2002) to assess psychosocial functioning and comorbid psychiatric disorders in 60 adults with ADHD combined type and 36 adults with ADHD predominantly inattentive type relative to each other and to a community control group. They showed that individuals in both ADHD groups had significantly fewer years of education, were less likely to have graduated from college and were more likely to have received special education placement in high school. Both ADHD groups were more likely to experience lifetime dysthymia, substance use disorders, and anxiety disorders than control subjects. Contrary to the preceding cited studies, the two ADHD groups did not differ in educational level and comorbidity for abuse disorders with similar rates of college graduates and substance use disorders in both groups.

Criteria of Diagnosis

Attention-deficit hyperactivity disorder (ADHD) is the most prominent and prevalent mental disorder in children and adolescents (Olfson, 1992; Biederman, 2005). Despite a great deal of research, this disorder remains one of the most difficult disorders to categorize as evidence by the frequent changes in its criteria in the revisions of DSM (American Psychiatric Association, 1994, 2013). Yet, ADHD diagnosis and research are firmly embedded in controversies, none more longstanding, or more basic, than establishing a consensus on which criteria define the disorder. Over the past two decades, revisions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) have resulted in numerous changes in the diagnostic criteria of ADHD. These changes have primarily reflected attempts to more accurately capture the clinically observed subtypes of this disorder.

In the DSM-III, the heterogeneity of symptoms in this disorder was apparent in the changing number of dimensions developed. Initially, the DSM-III subdivided the ADHD population into two subtypes: 1) Attention-Deficit Disorder without Hyperactivity (ADD/WO); and 2) Attention-Deficit Disorder with Hyperactivity (ADHD/H). Although validation studies (Lahey, Carlson, & Frick, 1997) suggested that ADD/WO is a distinct behavioral category, the revised edition of the DSM-III listed a single Attention Deficit/Hyperactivity Disorder (AD/HD) marked by inattention, hyperactivity, and impulsivity.

The 1994 edition of the DSM was the first to successfully differentiate symptom patterns into subtypes. The DSM-IV field trials empirically confirmed distinct behavioral dimensions of inattention and impulsivity/hyperactivity, providing evidence for separate subtypes of ADHD (Applegate et al., 1997). In a factor analytic study, Lahey, et al. (1998) reconfirmed that the symptoms of ADHD could be grouped into two factors which are inattention and impulsivity.

The DSM-IV (1994), therefore, recognized the two primary behavioral dimensions of inattentiveness and impulsivity in ADHD, which in adulthood are subdivided into two subtypes. The first type is Predominantly Inattentive Type which describes individuals who present with attention deficits without clinically significant levels of hyperactivity or impulsivity. The second type is Predominantly Hyperactivity Type which describes individuals who are present clinically significant levels of hyperactivity or impulsivity without presenting significant level of attention deficit. The third subtype is the Combined Type which presents with significant inattention, hyperactivity, and impulsivity. The inclusion of the term "Predominantly" is meant to distinguish the two subtypes. This later type was added to emphasize that these diagnostic categories are not mutually exclusive (American Psychiatric Association, 1994).

In 2013, the American Psychiatric Association published a new edition of their Diagnostic & Statistical Manual of Mental Disorders (DSM), the reference widely used for diagnosing ADHD and other psychiatric disorders.

The definition of ADHD has been updated in the DSM-5 to more accurately characterize the experience of affected adults. This revision is based on nearly two decades of research showing that ADHD, although a disorder that begins in childhood,

can continue through adulthood for some people (Barkley & Murphy, 2010). Previous editions of the DSM did not provide appropriate guidance to clinicians in diagnosing adults with the condition. By adapting criteria for adults, DSM-5 aims to ensure that children with ADHD can continue to get care throughout their lives if needed (Biederman, 2005). Changes in DSM presentations and behavioral items for ADHD are likely to result in changes in the prevalence rate of this disorder (Kearl, 2010; Wolraich, Hannah, Pinnock, Baumgaertel, & Brown, 1996).

In the 5th edition, there were some useful changes in the diagnostic criteria for ADHD. The first change evident in the DSM is referring to the age of onset. Previously, a diagnosis of ADHD required that at least some symptoms of ADHD had been present in the individual by age 7. DSM-5 raised the age criterion to having several ADHD symptoms present by age 12 or earlier (American Psychiatric Association, 2013; Brown, 2013). Second, adults and adolescents can now be officially diagnosed with this disorder. Fewer symptoms are required for diagnosing adults. Previously the diagnosis of ADHD required at least six of the nine listed symptoms of inattention and/or six of the nine symptoms of hyperactivity/impulsivity. Currently, only five symptoms from either set are required for diagnosis of persons 17 years or over (American Psychiatric Association, 2013). The third change of the DSM-5 as it relates to ADHD is regarding the comorbidity with autistic spectrum disorders. Previously, the diagnosis of ADHD was not supposed to be made for individuals diagnosed with a disorder on the autistic spectrum. DSM-5 allows diagnosis of both disorders when criteria for both are met (American Psychiatric Association, 2013; Brown, 2013).

As it relates to the DSM-5, people with ADHD show a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development. Patterns of inattention include the following symptoms: 1) Fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities; 2) has trouble holding attention on tasks or play activities; 3) does not seem to listen when spoken to directly; 4) does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked); 5) has trouble organizing tasks and activities; 6) often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time; 7) often loses things necessary

for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones); 8) is easily distracted; and 9) is often forgetful in daily activities (American Psychiatric Association, 2013).

On the other hand, the hyperactivity-impulsivity includes the following patterns: 1) Often fidgets with or taps hands or feet, or squirms in seat; 2) often leaves seat in situations when remaining seated is expected; 3) often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless); 4) usually unable to play or take part in leisure activities quietly; 5) is often "on the go" acting as if driven by a motor; 6) talks excessively; 7) blurts out an answer before a question has been completed; 8) has trouble waiting his/her turn; and 7) often interrupts or intrudes on others (e.g., butts into conversations or games) (American Psychiatric Association, 2013).

To diagnose a child up to age sixteen with this order, six or more symptoms of each pattern (inattention and hyperactivity-impulsivity) have been present for at least 6 months, and they are inappropriate for the developmental level. Five or more symptoms of each pattern are required to diagnose adolescents or adults of 17 years or older with this order. However, with any age, symptoms of both patterns should have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level (American Psychiatric Association, 2013).

The following conditions must be met to diagnose an individual with ADHD: 1) Several inattentive or hyperactive-impulsive symptoms were present before age 12 years; 2) several symptoms are present in two or more setting, (e.g., at home, school or work, with friends or relatives, in other activities); 3) there is clear evidence that the symptoms interfere with or reduce the quality of social, school, or work functioning; and 4) the symptoms do not happen only during the course of schizophrenia or another psychotic disorder. The symptoms are not better explained by another mental disorder (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

Based on the types of symptoms, three kinds (presentations) of ADHD can occur which are Combined Presentation, Predominantly Inattentive Presentation, and Predominantly Hyperactive-Impulsive Presentation. The Combined Presentation is identified if enough symptoms of both criteria inattention and hyperactivity-impulsivity

were present for the past 6 months. Predominantly Inattentive Presentation is identified if enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months. Predominantly Hyperactive-Impulsive Presentation is determined if enough symptoms of hyperactivity-impulsivity, but not inattention were present for the past six months. Because symptoms can change over time, the presentation may change over time as well. The symptoms that a person experiences the most, tell us what form of ADHD they have. These symptoms also need to impact the individual's day to day life and significantly affect their daily functioning in order to be considered a diagnosed case of ADHD. No two people are alike so nobody is likely to experience these symptoms in exactly the same way (American Psychiatric Association, 2013).

The etiology of ADHD has yet to be conclusively determined, and a precise test for diagnosing is yet to be developed. Hence, ADHD diagnosis and its treatment, remains controversial (Halperin & Schulz, 2006). Although many researchers and clinicians believe ADHD is the product of neurobiological dysfunction, the National Institutes of Health Centers for Disease Control note "although research has suggested a central nervous system basis for ADHD, further research is necessary to firmly establish ADHD as a brain disorder" (National Institute of Health, 2000, p. 183).

The heterogeneity of individuals with ADHD would suggest a complex etiology involving a number of interacting factors (Nigg, 2005; Pennington, 2005). Family environment, for example, has been shown to be a significant factor in the development of disruptive behaviors (Barkley, Anastopoulos, Guevremont, & Fletcher, 1992; Moffitt, 1990; Nierenberg et al., 2005). Other studies point to the primacy of genetics as the root cause of ADHD, noting, for example, that it tends to run in families (Faraone & Biederman, 1997; Brown, 2013). The diagnosis and treatment of ADHD in adult can be a challenge because hyperactive symptoms tend to decrease with age, thus making it more difficult to diagnose adults with ADHD (Nierenberg et al., 2005).

Furthermore, adults with ADHD tend to present less with externalizing and hyperactive symptoms, compared to ADHD when initially diagnosed in childhood, which further complicates referral and diagnosis (Karam et al., 2008). In addition, adults with ADHD are often associated with a number of psychiatric comorbidities such as major depressive disorder (MDD), generalized anxiety disorder (GAD), alcohol and/or

substance abuse, bipolar disorder (BD), and a variety of conduct or behavioral disorders. Therefore, many symptoms that are directly attributable to ADHD are often mistakenly associated with other psychiatric conditions and consequently not appropriately treated (Fischer et al., 2007; Kessler et al., 2006).

Summary

Attention deficit hyperactivity disorder (ADHD) has a long history of clinical and scientific publications. However, relatively little research has investigated the functioning of adults with ADHD, and little is known about the associated factors or predictors of its heterogeneity (Biederman, 2004; Biederman et al., 2004; Spencer, 2004; Kessler et al., 2006). According to Goldstein (2013), while 3,000 studies have been conducted on ADHD in children, only approximately 100 studies are available on ADHD adults. There are several reasons led to this a paucity such as the heterogeneity in defining and making accurate diagnosis regarding ADHD.

Although the criteria for the diagnosis of ADHD are updated in the DSM-5, more research is needed to study the impact of ADHD with different presentations in adults on different life domains. Recent investigations suggest that a negative relationship between adults with ADHD and productive outcomes (Brooks & Goldstein, 2001). Meyer and Sagvolden (2006) has observed that ADHD adults are prone to focus on life's difficulties and challenges and frequently present with both a pessimistic view of the world and a helpless perception of their ability to be successful in every day life. However, attempts to help these individuals combat documented problems in living are hampered by the limited information in this area (Jensen & Copper, 2002; Ramsay, 2005). To date, there is virtually no enough data available regarding effective interventions or services to serve this population of adults with ADHD. New directions in research to serve this large group of adults with ADHD is needed.

Chapter III

Conceptual Framework

The field of quality of life (QOL) is still young, and much remains to be learned. There are, however, emerging areas of agreement and the framework for understanding the QOL construct is consistently becoming more coherent as the special interest of QOL groups refine its original set of statements (Schalock et al. 2002). Across all health rehabilitation professions, QOL has become an important measure of outcomes in both research and clinical settings (Agarwal et al., 2012). Improvement in QOL has become a widely accepted goal of treatment, and QOL has emerged as a common outcome measure in assessing the efficacy of services, interventions, and programs (Bishop, 2000). QOL has become an increasingly important focus of theory, research, and practice in rehabilitation in general (Bishop, 2000; Fabian, 1991; Day & Jankey, 1996). In fact, convincing arguments have been made in the rehabilitation literature for adopting QOL as the primary rehabilitation outcome (Livneh, 1988; Rossler, 1990).

From a rehabilitation perspective, understanding the relationships between QOL and other variables is an important research goal. Through discerning the variables that affect QOL, interventions to improve QOL may be identified and prioritized (Bishop, Berven, Hermann, & Chan, 2002). QOL measures have become a vital and often required part of health and rehabilitation outcomes appraisal. For populations with chronic disease or disability, the measurement of QOL provides a meaningful way to determine the impact of the provided health care and rehabilitation services (Berzon, Donnelly, Simpson, Simon & Tilson, 1995). Indeed, rehabilitation researchers and writers started calling for the recognition and implementation of QOL as the central and encompassing purpose of rehabilitation (Bishop & Feist-Price, 2002).

Conceptualization of Quality of Life

There is no universally accepted definition of quality of life (QOL). Nearly all researchers reviewing the QOL literature have decried the lack of a uniform or consistently applied definition (Bishop & Feist-Price, 2002). Many have also highlighted its vague and overly inclusive characteristics. QOL is an ambiguous concept and ethereal entity; it is something that many people may talk about, but which nobody very clearly knows what to do about described. QOL has individualistic meaning-that is, a different

meaning for different individuals (Barofsky, 2012; Bognar, 2005; Nordstrom & Lubkin, 1990).

Similarly, because different disciplines utilize a broad concept for different reasons and with different purposes. Thus, it may be said that QOL has different meanings, and therefore different definitions for different disciplines. For example, Hughes, Hwang, Kim, Eisenman, and Killian (1995) reviewed research articles related to QOL across multiple disciplines, including community psychology, community integration, mental health, and employment. In 87 studies reported over 23 years, these authors identified 44 definitions of QOL, 1,243 QOL measures, and 15 dimensions of QOL, with each dimension composed of several components. Feinstein suggested that QOL represents "a kind of umbrella under which are placed many different indexes dealing with whatever the user wants to focus on" (Bishop, Chapin, & Miller, 2008; Feinstein, 1987, p. 635). Some other writers (e.g., Anderson & Burckhardt, 1999; Farquhar, 1992) have attributed the lack of a single, unified definition of QOL to the fact that researchers in so many different disciplines use the concept with different purposes and different measurement techniques. For example, in psychology perspective, QOL has been treated as "goodness of fit" between individuals and the environment of a particular community. The emphasis by community psychologists has been on the provision of resources as a means of improving the well-being of communities (Bognar, 2005).

A review of the literature shows that a variety of terms have been equated with QOL, including life satisfaction, self-esteem, well-being, health, happiness, functional status, and value of life (Barofsky, 2012; Frank-Stromborg, 1988). QOL is generally conceptualized as a multidimensional construct in medical, health, and rehabilitation research. These dimensions have typically included various combinations of life satisfaction, adaptive functioning across multiple domains, health perceptions, psychological factors, social factors, and goal achievement (Pain, Dunn, Anderson, Darrah, & Kratochvil, 1998).

From public health, QOL has also been conceptually treated from a need assessment perspective. The basic task of need assessment is to gather information about a particular population and use that information to develop and/or revise programs for that population (Coulter, 1997). In applied health science research, QOL has been defined

in more narrow terms, referred to as health-related quality of life (HRQOL). Definitions of HRQOL generally include the three major components of physical, mental, and social function (Angermeyer, Holziner, Kilian, & Matschinger, 2001).

In rehabilitation counseling, QOL has been described as "an overarching psychosocial outcome in rehabilitation practice" (Livneh 2001, p. 154), and "the generally accepted philosophical goal of rehabilitation counseling" (Bishop & Feist-Price, 2001, p. 35). Rehabilitation researchers have suggested that QOL can contribute to rehabilitation practice in various components of the rehabilitation process, including vocational evaluation, rehabilitation planning, counseling, and program evaluation (Bishop & Feist-Price, 2001; Fabian, 1991; Livneh, 1988, 2001; Roessler, 1990; Rubin, Chan, & Thomas, 2003)

In an extensive review of the literature, Ferrans (1990a) distinguished five broad categories of QOL definitions that are useful to health care. These include: 1) normal life which is described as a normative standard where comparisons are made with similar persons who are healthy and of the same age; 2) happiness/satisfaction; 3) achievement of personal goals; 4) social utility, which is described "as the ability to lead a socially useful life" (p. 250); and 5) natural capacity, which focuses on "a person's physical and/or mental capabilities (actual or potential)" (p. 251). She further identifies the dimensions or domains of QOL under four headings: health and physical functioning, psychological and spiritual, social and economic, and family (Ferrans, 1990b; Nilsson, 2012).

QOL may also be defined in terms of objective measures, such as physical function, employment, income, socioeconomic status, and support networks. At the same time, it could be defined in term of subjective measures, such as self-reported attitudes, perceptions, and aspirations (Cummins, 2000; Diener, Oishi, & Lucas, 2002; Frank-Stromborg, 1988).

There are also those who offer a subjective definition of QOL. For example, the World Health Organization (WHO) introduced a holistic definition of QOL as an individuals' perception of their position in life in the context of their culture and value systems in which they live and in relation to their goals, expectations, values and concerns incorporating physical health, psychological state, level of independence, social

relations, personal beliefs, and their relationship to salient features of the environment (World Health Organization Quality of Life Group, 1995). This definition became very important in its application to people because of its holistic view of health, and many researchers followed this definition (Coulter, 1997).

Several authors have distinguished attributes of QOL that are specifically identified in the research literature as being significant for people with disability. Some of the important attributes of QOL for people with disability identified in the literature are level of perceived control over one's life, the self-assessed level of health status, and the degree of social support (Brown, Bowling, & Flynn, 2004; Fuhrer, Rintala, Hart, Clearman, & Young, 1992), health and job/major activity (Aronson, 1997), dependence/independence and assertiveness (Bach & McDaniel, 1993), interpersonal relationships (Young & McNicoll, 1998), and attitudes toward life, work opportunities, and level of resources (Boswell, Dawson, & Heininger, 1998).

“Fortunately, despite the confusion over and difficulty in defining QOL, there appears to be increasing consensus on a number of general points. Because QOL is a construct used in such a wide variety of contexts, there may never be a universal consensus about what QOL is and what it is not, but definitional clarity and consensus appear to be more attainable today than ever” (Bishop & Feist-Price, 2002, p. 37). Even though the field is still young and much remains to be learned, there are emerging areas of agreement about the framework for understanding QOL. The construct of QOL is becoming steadily more coherent as the special interest group in QOL refines its original set of statements (Cummins, Lau, & Stokes, 2004). The latest iteration comprises four QOL conceptualization principles: 1) QOL is multidimensional and influenced by personal and environmental factors and their interactions; 2) has the same components for all people; 3) has both subjective and objective components; and 4) is enhanced by self-determination, resources, purpose in life, and a sense of belonging (Schalock & Verdugo, 2002).

In addition to the QOL principles, three essential characteristics of the QOL concept are embedded in these four principles. First, QOL exists in two quite different forms: 1) objective features that can be observed and measured within the public domain through such properties as physical quantities and frequencies; and 2) a subjective

domain that exists only within the private consciousness of each individual and is verified only through repeated responses provided by the person concerned. One consequence of this dichotomy is that any comprehensive estimate of life quality must comprise both subjective and objective measures (Cummins, 2005; Raphael, Rukholm, Brown, Hill-Bailey, & Donato, 1996).

Second, QOL should not be defined primarily in terms of either its objective or its subjective component. Both are valid indicators of life quality. Moreover, because there is normally such a weak relationship between these indicators, both need to be measured in any global determination of life quality (Cummins, 2000).

Third, QOL should not be defined in terms of ‘opportunity’. There are at least two reasons for this. First, objectively presented opportunities (e.g. job enhancement) may not be seen positively by the person. Second, the experience of opportunity for QOL enhancement is more likely a causal variable, not an end state or outcome (Cummins et al., 2004).

In summary, the four conceptualization principles outlined above have taken us to the next stage of defining QOL by referring to four different approaches: Global, Dimensional, Focused, and Combination approaches. It remains evident, however, that this latest set of definitional approaches continues to lack authority. There remains much that is uncertain and so the task of reshaping our conceptualization must continue. One way of directing attention to potentially useful ideas in this regard is to examine the views of contemporary researchers on some of the central issues that are now ripe for debate.

Global Definitions of QOL

Global definitions appear to be the most common type of definition of the concept of quality of life (QOL). Global life definitions are concerned with assessment of life as a whole, and can be used as a means of gaining insight into the degree a person views that they are experiencing QOL (Vincent, Phillipson, & Downs, 2006). Global definitions focus on the attributes of all areas of life that matters to the individual (Martin, Rodham, Camfield, & Ruta, 2010; Rossler, 1990). The global definitions of QOL are all-encompassing, but because of their generality they tell little about the possible components of QOL or how the concept could be operationalized. They usually

incorporate ideas of satisfaction/dissatisfaction and happiness/unhappiness (Vincent et al., 2006). However, other researchers argued that happiness and satisfaction are conceptually different, stating that satisfaction implies a judgmental or cognitive experience, while happiness suggests an experience of feeling or affect (Davern, Cummins, 2005). Therefore, QOL has also been defined more subjectively in terms of an individual's own evaluation of their life experiences (Bond & Corner, 2004; Hanestad, 1990).

QOL includes both conditions of life and the experience of life, which are determined by both inner and outer forces. One's sense of global well-being is always dependent on the subjective characteristics of the person and the objective characteristics of the situation. Inner (subjective) factors influencing QOL include aspiration level, past experience, personal expectations, and perceptions of current conditions (Cummins, 1996; Davern & Cummins, 2005; Lehman, 1988). QOL is also affected by the level of environmental resources and stressors as indicated by a variety of social indicators (Nay and Garratt, 2009; Schalock, Keith, Hoffman, & Karen, 1989). Some researchers considered QOL to comprise of inner factors relating to what a person thinks about his/her life, and outer factors that measure behavior such as social contact and activities (Crosby & Bogg's 1993; Cummins, 2005, Havighurst, 1963). Researchers developed this theme with the inclusion of self-evaluation through comparison in their definition of the possession of resources necessary to the satisfaction of individual needs, wants and desires, participation in activities enabling personal development and self-actualization, and a satisfactory comparison between oneself and others (Diener et al., 2002; Mauceri & DiMarco, 2014; Shin & Johnson, 1978; Solomon, 1995). Solomon (1995) suggested that efforts should be directed toward comparing the distribution patterns of individuals with reported satisfaction. The analysis of the discrepancies and the mechanisms mediating between distribution patterns of individuals is one of the most important and most rewarding fields of QOL research.

Dimensional Definitions

Dimensional definitions are those that break quality of life (QOL) down into a series of component parts or dimensions, or identify certain characteristics deemed essential to any evaluation of QOL, all of which may contribute to the global definitions.

In this sense, they are more useful definitions for empirical work than global definitions as they are a step closer to operationalizing the concept (Farquhar, 1995; Verdugo, Schalock, Keith, & Stancliffe, 2005). The basic assumption underlying the use of dimensional definitions is that people's sense of well-being has a lot to do with their feelings about various aspects of life that concern them. Most people are clearly more satisfied and pleased with some aspects of their lives than with others, but it is generally assumed that the more domains people feel positive about, the stronger their sense of well-being (Cummins, 1996; Schalock & Verdugo, 2002).

The dimensional definition of QOL assumes that people carve up the totality of their lives into multiple sections and keep track of achievements and QOL in these sections (Dijkers, 2003). Changes in one domain of QOL appear to affect other domains in quite instrumental ways. This conceptualization of QOL has led to the statement that “there is no set boundary where one dimension ends and the next begins” (Kelley-Gillespie, 2009, p. 256). This concept suggests that low satisfaction in one domain affects other domains by motivating individuals to seek higher satisfaction in other domains. This demonstrates the diverse inter-relationships that are possible between life domains. Relationships may also be relating to the enabling function of some domains (Cohen, Gottlieb, & Underwood, 2000). This has led some researchers to propose interactive domains of QOL, with the analogy of a “Rubik’s Cube”; when one domain changes, changes are seen in the other domains (Marinelli & Plummer, 1999).

Cohen et al. (2000) used data on life satisfaction, including 10 different facets or domains, to assess this concept of Rubik’s Cube. He reported that inter-relationships between facets have been seen. Questionnaire based measures of QOL that are based on independent domains of QOL may lack validity, as experienced QOL may consist of inter-connected domains (Martin, 2012; Schalock, 2004). Clearly, there are some facets of experience that have a great deal of meaning and importance for small fractions of the public (e.g., artistic expression) but are of little relevance to the general population. However, it would not be feasible to attempt to identify and measure all of them (Felce & Perry, 1995).

A number of research efforts have been undertaken to identify an inclusive list of life domains. For example, Cantril (1965) asked respondents in 13 countries to define

their hopes, fears and concerns, and to say what their "best possible" life and "worst possible" life would be like. To obtain an accurate picture of individual reality, respondents were not required to select between categories or alternatives but answered open-ended questions during a lengthy interview. The material was then content analyzed and organized into general categories of concerns. One result of that effort was a list of 18 domains that could be said to fully capture the concerns of a representative American sample (as cited from Corley, Elswick, Sargeant, & Scott, 2000).

In 1978, a study conducted by Flanagan attempted to identify relevant life domains empirically, based on 6,500 critical incidents collected from nearly 3,000 people of various ages, races, backgrounds, and regions of the country. From this material, he identified 15 quality of life domains grouped into five general dimensions which are physical and material well-being, relations with other people, social activities, and personal fulfillment and recreation (Dijkers, 2003).

Jenaro et al. (2005) assembled a large number of possible life domains drawing from previous surveys. Important life aspects identified by various national and international organizations and a series of interviews. From this information, a questionnaire was developed to tap the concerns identified, and administered the survey to national samples. Responses were then used to the concern in perceptual space and group them into content-oriented clusters, or domains. Eight domains were identified and used in subsequent QOL assessments.

Domains identified through various research efforts revealed that certain domains are common across most of the studies. These include work, leisure, health, financial situation, social support, physical environment, and aspects of self-fulfillment (Cummins, 1992c; Dijkers, 2003). Typically, satisfaction measures have been used more frequently to assess QOL domains rather than happiness measures. This may be because use of the term "happiness" seems inappropriate for some domains (Pavot & Diener, 1993). Pavot and Diener stated that all things considered will follow items assessing satisfaction with specific characteristics of the domain. Research-specific dimensional definitions are useful in that researchers have considered the concept of QOL in terms of the focus of their research, and therefore have begun the process of operationalization (Cummins, 2005).

Focused Definitions

Focused definitions are those definitions that refer to only one or a small number of the components of quality of life (QOL). The most common form of this type of definition refers only to the components of health/functional ability. Focused definitions can be either explicit or implicit (Cummins, 2005; Farquhar, 1995). Explicit focused definitions are found in research that uses such terms as health related QOL or a micro-economic definition of QOL rather than the term QOL itself (Cummins, 2005). For example, in Farquhar (1995), a micro-economic definition of QOL was described as the level of satisfaction individuals achieve as a result of their consumption of market goods, leisure, and public goods. In contrast to explicit focused definitions, implicit focused definitions occur where researchers use the term QOL, but defined it in terms of one or two components of the whole concept they are focusing on one or a small number of the components of QOL, but do not make this explicit (Cummins, 2005; Farquhar, 1995).

In these circumstances it is difficult for the reader to assess how the authors fully interpret the term. Indeed, in some papers it appears that focused definitions rather limited definitions are the author's full interpretation of the term. Again focused definitions are usually limited to the components relating to health and functional status. A more recent example of this type of definition was in research on the assessment of QOL in clinical trials by Cox et al. (1992). They did not define QOL, but they operationalized it in terms of health and functional status measures, in such contexts it would be more suitable to use the term health-related QOL rather than QOL itself (Cummins, 2005; Farquhar, 1995).

Combination Definitions

There are other definitions of quality of life (QOL) that appear in the expert literature. These definitions overlap with other types of definitions. These definitions are global, however, they also specify components or dimensions (Cummins, 2005; Farquhar, 1992). For example, some researchers looked at other's definitions and described QOL as an abstract and complex term representing individual responses to the physical, mental and social factors that contribute to normal daily living (Anderson & Burckhardt, 1999; Cummins, 1997a; Holmes & Dickerson, 1987). In these situations, QOL comprises many diverse areas, all of which contribute to the whole, including personal satisfaction, self

esteem, performance ability, comparison with others, previous knowledge or experience, economic status, general health, and emotional status, all as factors contributing to the overall QOL. Researchers stated that QOL was recognized to be a dynamic concept representing individual responses to the physical, mental, and social effects of illness which influence the extent to which personal satisfaction with life circumstances can be achieved, and allows favorable comparison with others (Cummins, 2005; Farquhar, 1995).

Similarly, Oleske, Heinze, and Otte (1990) used a diary as a means of understanding QOL of persons with cancer. Respondents were asked to record the occurrence of health problems in their diary, and the resulting data led them to conclude that the majority of reported problems were related to the physical dimension of QOL. Researchers did not, however, ask respondents to record the social problems that occurred, although they used a definition of QOL that included this dimension (Diener et al., 2002; Farquhar, 1995).

Development of Quality of Life Assessment in Health and Rehabilitation Counseling

Historical development and evolution of the concept of quality of life (QOL) in the social sciences and health has occurred. However, this development of a modern or individualized notion of QOL was neither immediate nor inevitable (Bishop et al., 2008; Rapley, 2003). In the first half of this century, QOL in this nation was largely measured by the material level of living. The higher the level in a country, the better the life of its citizens was presumed to be (Cummins, 1997a). Yet, in the 1960's, the opinions climate changed. This gave rise to a call for broader indicators of QOL, which materialized into the "Social Indicator" movement (Veenhon, 1996).

Noll (2002) points to the development of two contrary conceptualizations of QOL. The first one, based on the works of writers such as Erikson and Unsitalo (1987) and Erikson (1993), centered on notions of the social well-being as a welfare issue. In this work, welfare is conceived of as based on access to resources by which people can control and direct their level of living, and in the provision of that public policy may have leverage. Under this concept, resources are defined in terms of money, property, knowledge, physical energy, social relations, and security. This view focused exclusively on objective indicators of the level of living or QOL of society as a whole (Cummins,

1997a; Rapley, 2003). Therefore, the idea of QOL was located at the beginning of social indicators movement of the 1960s (Cummins, 1997a; Noll, 2002; Veenhoven, 1996).

In the second contrary of QOL, in the mid-1960s, as described by (Noll, 2000), QOL research or welfare measurement was shifted in focus from QOL assessment based on population statistics to assessment primarily based on the perspective of subjective indicators at the level of the individual. During this time the individual's unique perspective about life circumstances was increasingly recognized as an important component of QOL (Bishop et al., 2008). In the course of this shift in focus from objective to subjective indicators of QOL was the recognition that social indicators accounted for a relatively small percentage of the individual's overall QOL (Day & Jankey, 1996). Simultaneously, it was recognized that in the individual's experience of well-being, objective variables were outweighed by the individual's subjective perception of one's objective circumstances in the context of changing values and priorities (Bishop et al., 2008).

During the 1970s, the concept of QOL was born as an alternative to the more and more questionable concept of the affluent society and became the new, but also much more complex and multidimensional goal of societal development (Noll, 2002). Land's (2000) description of the flurry of activity at this time, which depended on widespread acceptance of active societal structures and process for greater good, captures the period well. During this period, a number of highly influential studies (e.g., Andrews & Withey, 1976; Campbell, Converse, & Rogers, 1976) stimulated the rapid growth of QOL research in the social sciences. These studies explored the nature, dynamics, and components of QOL, life satisfaction, and well-being (Bishop et al., 2008).

This high level of research activities continued into the 1980s, and significant advances in theory development were made in this decade. In addition to this theoretical claims, human services recognition of the potential for the application of QOL concepts in policy development, clinical practice, and outcome assessment (Bishop et al., 2008). QOL has become an increasingly complex construct over the course of its use. It is now widely used to describe everything including individual's happiness with their contents (Rapley, 2003).

This exponential growth of research with QOL construct in the social sciences

and health related fields were essentially mirrored in rehabilitation counseling (Bishop et al., 2008). Rehabilitation counseling has a long history of association with the concept of QOL. The discussion and promotion of the concept in the rehabilitation literature spans at least 40 years (Roessler, 1990). Numerous writers and researchers have advocated for QOL to serve as the primary criterion for determining rehabilitation interventions and outcomes (Livneh, 1988; Roessler, 1990, Rubin et al., 2003, Shalock, 1997). Historically, employment was the primary outcome goal of rehabilitation counseling. The state federal vocational rehabilitation (VR) program was developed with the goal of increasing employment among persons with disabilities, and VR agencies have developed services and interventions designed to help meet that goal. Over time, however, the evolution of the profession, and shifts in philosophies, standards, expectations, and professional knowledge have created a need to reevaluate and modify outcome goals, and therefore, outcome measurement. Indeed, rehabilitation researchers and writers started calling for the recognition and implementation of QOL as the central and encompassing purpose of rehabilitation, and it is perhaps now safe to say that QOL has become the generally accepted philosophical goal of rehabilitation counseling (Bishop & Feist-Price, 2002).

Quality of Life Research in Attention Deficit Hyperactivity Disorder (ADHD)

The condition of Attention Deficit Hyperactivity Disorder (ADHD), as with any other disability, can disrupt participation in valued activities and interests, which can negatively impact the quality of life (QOL) and well-being level (Devin, 1994). A number of psychosocial problems have consistently been found to be more prevalent among adults with ADHD relative to the general population (Biederman et al., 2008). Adults with ADHD are at an increased risk for negative outcomes in various domains, including academic (Monterey, 2002), vocational (Bayne, 2007), social (Schott, 2012), and familial (Eakin, 2001), as well as increased risk for psychopathology (Miranda et al., 2008). Given that these outcomes are also associated with lower levels of life quality and satisfaction, it seems plausible that adults with ADHD could be more vulnerable to a lower level of QOL. Research indicates that higher levels of QOL are associated with increased competence in the academic, vocational, and social domains (Gilman & Huebner, 2006; Suldo & Huebner, 2006).

ADHD researchers and clinicians have long been interested in understanding the

psychosocial correlates of ADHD and reducing the negative consequences of ADHD in cognitive, emotional, social, and vocational functioning. However, the formal study of QOL in ADHD is a relatively recent endeavor (Agrwal, 2012). From a rehabilitation perspective, the identified psychosocial problems are clearly amenable to intervention. Such interventions would include assisting with the attainment of or increase in level of employment or number of a vocational activities, assisting with social and community integration, identifying community resources and providing adjustment and psychological counseling. A greater understanding of the relationship between QOL and the psychosocial problems commonly associated with ADHD would allow rehabilitation professionals to prioritize these interventions, develop better plans for working with people with ADHD, and potentially allow for the planning for and prevention of psychosocial problems (Bishop, Berven, Hermann, & Chan, 2002). However, to date, there is an extremely limited amount of research relevant to QOL and the various psychosocial problems for adults with ADHD (Schott, 2012).

In order to enhance an individual's QOL, rehabilitation services must necessarily target a wide range of body, self, and social system objectives (Bishop, 2000; Livneh, 1988). Understanding such relationships is particularly important, not only for understanding the dynamics of ADHD, but also for planning efficacious interventions (Bishop, 2000). Given increased evidence related to the importance of fostering QOL in the overall population (Diener & Diener, 1996), as well as recent suggestions regarding the importance of increasing positive academic, vocational, social, and psychological outcomes for adults with ADHD (DuPaul, 2007), it is important to gain a clearer understanding of how life quality may be related to ADHD symptoms. Research on the relationship between ADHD effects and the QOL, in terms of established QOL, is needed. The following section is reviewing studies that have examined the association of ADHD among adults and different variables or indicators of QOL which include: 1) education attainment; 2) employment status; 3) social support; and 4) psychological health.

Education Attainment

A nationwide rise in the number of college students with disabilities is being reported. The greatest increase has been seen in students with so-called “hidden

disabilities” such as learning disabilities, ADHD, and psychiatric disabilities. While information about education and children with ADHD abounds, a greater understanding of the intricacies of adults with ADHD is needed. ADHD affects approximately 2% to 4% of the college student population (Schott, 2012). According to Scott, research suggests that approximately 2% of college students receiving disability services have ADHD, but this number may be inaccurate due to the hidden nature of the diagnosis.

College students with ADHD are at greater risk of experiencing academic and psychological difficulties (Shames & Alden, 2005). An ADHD can be highly stigmatizing, and claiming an ADHD identity may lead to negative stereotypes regarding aspects of being a person with a disability.

Even though children and adults diagnosed with ADHD are generally of average to above average intellectual ability, it is estimated that 25% to 35% of students with ADHD fail to graduate from high school (Barkley, 2006). Researchers analyzed U.S. data and found that nearly one-third of students with the most common type of ADHD either drop out or delay high school graduation. That rate is twice that of students with no psychiatric diagnosis (Breslau, Breslau, Bohnert, Lucia, & Schweitzer, 2009). Breslau and colleagues proposed that ADHD is a serious disorder that affects a person's ability to be successful in school and subsequently in a way that can limit success in life. People who drop out of high school are more likely to be reliant on public assistance, which negatively impacts on the individual's ability to be successful and contribute to society, not just in school, but also for the rest of life.

Successful completion of college is often out of reach for a majority of young adults with ADHD. Longitudinal studies report a rather pessimistic figure of only 5% of ADHD students graduating from college, whereas forty-one percent of the general population is successful in this endeavor (Monterey, 2002). Moving away from home is normative at this stage, those with ADHD may struggle in the absence of the daily structure, organization, and supervision provided by parents (Barkley, 1998). Indeed, all effective psychosocial treatments for ADHD require support and environmental contingencies from parents and teachers, who are no longer closely supervising the individual's behavior (Pelham, et al., 2005). Additionally, the social skills deficits that often accompany ADHD may leave those with the disorder not equipped to manage the

challenges associated with forming a new peer group (Frazier, Youngstrom, Glutting, & Watkins, 2007).

Students with ADHD face a number of obstacles once they are admitted to college. Many factors, some intrinsic to the student and others extrinsic to the campus, moderate success in higher education. Overlapping or multiple diagnoses, psychological distress, poor social and interpersonal skills, persisting cognitive deficits (especially in the area of executive functioning), and alcohol abuse are important factors that must be understood as institutions of higher education strive to promote access and provide effective support services on their campuses (Wolf, 2001).

Fried et al. (2013) studied 404 students with ADHD and 349 without ADHD and examined whether ADHD is an independent contributor to grade retention when adjusting for IQ, learning disorders, and social class. These researches found that 28% of individuals with ADHD repeated a grade compared with 7% of controls. Among participants with ADHD, social class, and IQ were significant predictors of high school dropout or repeated grade.

Poor academic achievement, school failure, and being less likely to complete a high school or college education than their non-ADHD peers, are all risk factors for students with ADHD (DuPaul, Weyandt, O'Dell, & Varejao, 2009). Heiligenstein, Guenther, Levy, Savino, and Fulwiler (1999) found that there were lower GPAs, self-reported academic problems, and a higher probability of being on academic probation for the ADHD college students than their control group. They suggested that external factors affected the symptoms of ADHD, such as the specific university, loss of support due to living away from home and family, and the lack of individualized education. Norwalk, Norvilitis, and MacLean (2009) found that habits, skills, and academic adjustment were all negatively correlated to ADHD symptoms.

Shifrin, Proctor, and Prevatt (2010) conducted a study to examine the difference between college students with and without ADHD in regard to their work performance in college. This study assessed the degree to which symptoms of inattention, hyperactivity and impulsivity are evident on the job performance. This study revealed that ADHD has a detrimental impact on the work performance of college students in multiple areas. College students with ADHD do exhibit more in on-the-job difficulties than their non-

ADHD peers, and thus may require extra support with their work-related endeavors.

Little is known about how students with ADHD adapt to the developmental challenges that accompany the college years. For those with ADHD, the transition to college may exacerbate their vulnerability to alcohol and substance related problems. Going to college often requires moving away from home, forming a new peer group, and meeting new academic standards (Barkley, Murphy, & Kwasnik, 1996). Individuals with ADHD are significantly less likely to graduate from high school or college, or to have completed a postgraduate degree (Biederman, 2006).

When students begin college, they are suddenly without the structure of high school and the support system of home, and the demands for organized, self-directed study are greater than ever before. These conditions can be particularly challenging for those with ADHD, who have inordinate difficulty focusing, staying on task, organizing their time, and interacting with professors and peers. For these reasons, some students with ADHD may discover the condition in college for the first time. They may find that their old academic and social coping mechanisms are no longer adequate for the rigors of college (Monterey, 2002). In short, more research is required to investigate the needed intervention that provides the structure, support and accountability for adult students with ADHD in this new environment.

Employment Status

Nadeau (2005) pointed out that the manifestations of attention deficits in adults are most evident in the workplace environment. Statistically, adults with ADHD are unlikely to maintain consistent and stable employment (Nadeau, 2002). Reduced educational achievement may limit employment options for adults with ADHD. In addition, individuals with ADHD miss significantly more days of work, and are more likely to be fired, change jobs, and have worse job performance evaluations than those without ADHD (Secnik, Swensen, Lage, 2005). Murphy and Barkley (1996) found that in comparison to adults without ADHD, those with the disorder were significantly more likely to have been fired from a job, impulsively quit a job, and have chronic employment difficulties. This is most likely due to the numerous symptoms that can be present with the disorder.

Kupper et al. (2012) reviewed the negative effects of ADHD in adulthood on

work productivity and occupational health. They found that ADHD is associated with higher levels of unemployment. Adults with ADHD who are employed experience workplace impairment and reduced productivity, as well as behavioral issues such as irritability and low frustration tolerance. Kupper and associates also found that, adults with ADHD are at increased risk of accidents, trauma and workplace injuries. Finally, indirect effects of ADHD on occupational health were found to include reduced educational achievement and increased rates of substance abuse and criminality.

Individuals with ADHD usually exhibit several symptoms that may impede the goal of attaining employment goals. According to Douglas (1988), these symptoms are the inability to sustain interest and attention, inconsistent adaptation of arousal in specific situations, the need for immediate reinforcement, and poor impulse control. These impairments can result in poor academic performance, poor employment performance, impairments in peer and family relationships, aggression, and recklessness (Weiss & Hechtman, 1993). Performance at work is often affected by ADHD traits (Bayne, 2007). ADHD-related symptoms contributed to or were responsible for job loss. These symptoms included tardiness, such as the lack of focus, lack of motivation, boredom, lack of organization, and problems controlling their temper may contribute to job loss. Many adults with untreated ADHD experience considerable emotional distress as a result of repeated failures, underachievement, broken relationships, and family conflict (Nadeau, 2005).

According to Nadeau (2005), cluster of challenges to executive functioning often associated with ADHD in adults can cause tremendous problems on the job. Impulsivity can lead an employee to over-commit and then be unable to follow through. Impulsivity can also lead to jumping from task to task with little follow through and task completion. Restlessness and boredom can lead to an employee having a hard time sitting at a desk productively working. Memory difficulties can cause problems when the ADHD adult forgets repeated verbal requests from supervisors. Patterns of procrastination cause others to see the person as unmotivated and unreliable. Also, general untidiness can interfere with the worker's ability to keep track of multiple tasks.

These situations can adversely affect productivity (Barkley, 2002), but research to that end, as measured by income loss and cost to the US economy, has been limited.

Biederman (2006) evaluated productivity by comparing two groups of adults aged 18-64, including a group of 500 individuals diagnosed with ADHD and 501 without ADHD in order to evaluate the impact of ADHD on individual's employment status, income, and quantify the costs of ADHD on workforce productivity in the US. This study revealed that fewer people with ADHD were employed full time, and a lower average household income compared with control subjects, regardless of academic achievement or demographic characteristics. On the basis of this study, the loss of workforce productivity associated with ADHD in the United States in 2003 was estimated between \$67 billion and \$116 billion (Biederman, 2006).

In summary, a good number of adults with ADHD are discriminated against because of their disorder. A lack of understanding of the disorder leads to a lack of understanding in working with the adults with the disorder. Education and promotion of awareness of ADHD in the workplace would certainly benefit all involved.

Social Support

Although social problems are not part of the diagnostic criteria for ADHD, the social relationship difficulties faced by young adults with this disorder are profound (Hoza, 2007; Whalen & Henker, 1992). The ability to successfully interact with others is considered one of the most important aspects of social development for all ages. Some researchers have found that inadequate social skills in interacting with peers can affect an ADHD individuals' progress in many areas and are critical to interpersonal success (Elliot & Gresham, 1987).

Wolf (2001) argued that peer relations and social skill deficits are significant contributing factors to the poor academic performance and high attrition rates of college students with hidden disabilities such as ADHD. Mikami (2010) showed that individuals with ADHD might exhibit delinquent and antisocial behaviors during adolescence that persist into adulthood and often experience difficulties in educational performance, occupational functioning, interpersonal relationships, and self-esteem in adulthood. According to Landgraf (2007), increasing evidence suggests that ADHD persists across the life cycle and is associated with a wide range of psychosocial problems including low self-esteem, marital discord, and poor parenting skills in communication.

Children with ADHD are more likely to encounter rejection from their peers and

through negative interactions at home as well. In fact, recent work has linked childhood ADHD (Clarke, Ungerer, Chahoud, Johnson, & Stiefel, 2002) and its often co-morbid oppositional behavior (Gomez & Gomez, 2002) to negative attachment, implying that even rejection by parents, in many instances, is persistent. Downey and colleagues (1997) proposed that precisely this kind of early rejection could lead to elevated rejection sensitivity, which, in turn, can influence relational adjustment through adulthood. Negative outcomes seen in adults with high rejection sensitivity resulted in increased conflict with colleagues, staff, employers, and early dating partners, as well as lower social competence level (Purdie & Downey, 2000). Adults with greater rejection sensitivity also showed jealousy and aggression towards their romantic partners, contributing to elevated unhappiness by their partners and leading to increased likelihood of termination of relationships over a one-year period (Downey & Feldman, Ayduk, 2000). Given that chronic rejection in childhood often co-occurs with ADHD, it seems possible that rejection sensitivity contributes to enduring lack of social skills and self-esteem into adulthood stage.

Tse (2012) used a mixed-methods research design approach to evaluate the impact of ADHD on social skills and self-esteem. Based on a sample of 88 college students and adults with ADHD, Tse found that ADHD symptoms play a significant role in affecting the social skills and self-esteem of adults with ADHD. Furthermore, the low social skills and self-esteem affected social interaction and achievement level.

In the workplace, adults with ADHD experience more interpersonal difficulties with employers and colleagues (Harpin, 2005). At home, relationship difficulties and break-ups are more common. In a retrospective study, Biederman et al. (1993) found that adults with ADHD were more likely to be divorced or separated and were of a lower socioeconomic status than adults without ADHD. The risk of drug and substance abuse is significantly increased in adults with persisting ADHD symptoms who have not been receiving medication. In addition, the genetic aspects of ADHD mean that adults with ADHD are more likely to have children with ADHD. This in turn causes further problems, especially as the success of parenting programmes for parents of children with ADHD are highly influenced by the presence of parental ADHD (Sonuga-Barke, Daley, Thompson, 2002). ADHD in parents and children can lead to a cycle of difficulties

(Harpin, 2005).

In summary, the study of friendship in ADHD is less developed relative to the more extensive literature on peer rejection and social skills deficits in this population. Therefore, conclusions about friendship in ADHD are tentative. There is extremely limited published, empirical research on this topic (Hoza et al., 2005). Support from family, peers, and professionals is critical in helping adults with ADHD developing social skills and career choices that will build upon their strong points and make best use of their chances for success.

Psychological and Mental Health

Although clinicians working with children are often cognizant of the clinical presentation of pediatric ADHD, those working with adults are not necessarily aware of how the disorder manifests in adulthood, making an accurate diagnosis of ADHD in adult difficult. Clinicians working with adult populations are not always well informed about the possibility and clinical presentation of ADHD among adults (Ratey et al., 1992). This is further complicated by the fact that adults have had time to develop compensatory strategies to help cope with their ADHD symptoms or mask them via self-medication (i.e., substance use). Accurate diagnosis is further complicated by the fact that many adults with ADHD have other comorbid disorders, and these disorders often have a number of symptoms that overlap considerably with those associated with ADHD (McGough et al., 2005).

The core ADHD symptoms of inattention, hyperactivity, and impulsivity are present in numerous other common psychiatric and neuropsychiatric conditions, such as anxiety disorders, affective disorders, dementia, and epilepsy (Shekim, Asamow, Hess, Zaucha, & Wheeler, 1990). Clinicians, familiar with the presence of these more commonly diagnosed disorders in adults, are likely to identify the constellation of symptoms as an indication of a mood or anxiety disorder (Ratey, Greenberg, Bemporad, & Lindem, 1992) rather than immediately consider adult in ADHD as the most likely differential diagnosis.

In adults, it has been reported that almost 80% of patients with ADHD present at least one lifetime psychiatric comorbidity (Adler et al., 2006; Kooij, Aeckerline, & Buitelaar, 2001; McGough, 2005). Consequently, those individuals have a higher

frequency of psychiatric disorders when compared to individuals without ADHD. Disorders commonly associated to ADHD in adults are major depression disorder, anxiety disorder, bipolar disorder, antisocial personality disorder, substances abuse or dependence disorder (Downey, Drelson, Pomerleau, & Giordani, 1997; Biederman, 2004; Wilens, 2004; McGough et al., 2005).

According to the calculations of Spencer et al. (2002), the most common comorbidity conditions with ADHD were anxiety disorders (50%), substance abuse (27%-46%), major depression disorder (24-27%), and antisocial personality disorder (12-27%). Shekim et al. (1990) reported that 76% of their participants had a comorbid DSM diagnosis. The most prevalent diagnoses were generalized anxiety disorder (53%), alcohol dependence or abuse (34%), drug abuse (30%), depression disorder (25%), and bipolar disorder (25%). A comorbid disorder in children or adult should not be dismissed as secondary to the stress of having ADHD, nor should ADHD be conceptualized as resulting from a comorbid disorder (Farone & Biederman, 1997).

The following section provides a review and critique for the existing studies that assessed the prevalence, relationship, and impact comorbid conditions of adults with ADHD. Taking into consideration a paucity of literature exists regarding this common variety of co-morbid ADHD in adults.

Co-morbidity between ADHD & Depression

Major depressive disorder (MDD) is one of the most common lifetime ADHD comorbidities (Biederman et al., 2004; Downey et al., 1997; McGough et al., 2005). While the lifetime prevalence of MDD among American population ranges from 4.8% to 15.0% (Center of Disease and Control Prevention, 2003), it rises to 24.4% in adults with ADHD (Grevet et al., 2006). The association between ADHD in adults and depression has already been described in very few studies (Biederman, 2004; McGough et al., 2005). The prevalence of ADHD with childhood onset among adults from a clinical sample of patients with current major depressive episode is described as over 16% (Alpert et al., 1996). A population based study found an ADHD prevalence of 9.4% among subjects presenting MDD during the previous 12 months (Kessler et al., 2006). Comorbidity with MDD raises the impact of ADHD on individuals and society (Secnik et al., 2005) and influences the therapeutic approach to ADHD (Kooij, Aeckerlin, & Buitelaar, 2001).

Therefore, MDD is one of the most commonly occurring mental disorders with high comorbidity among adults with ADHD.

In a review of the literature, Farone and Biederman (1997) found a familial link between ADHD and depression. The familial risk factors might be environmental, genetic, or a combination of both. Both depression and ADHD are known to have a genetic component. Plus, a dysfunctional family environment appears to be a risk factor for many psychiatric disorders. However, it is not clear if the familial association continues to be pervasive throughout the lifespan, or if familial risks decrease as individuals become less involved with their family of origin.

Fischer et al. (2007) conducted a study on 320 adults with ADHD in outpatient clinics. They found that individuals presenting ADHD and MDD had a higher frequency of generalized anxiety disorder and social phobia and a lower frequency of substance dependence, grade repetition, and school suspensions when compared to participants with ADHD and without MDD. Furthermore, adults presenting with ADHD and MDD symptoms reported higher demand for psychotherapy and pharmacological treatment prior to enrollment in the study when compared to ADHD participants free of MDD. This study was the first study implemented to evaluate the implications of comorbid MDD on a sample of adult with ADHD.

Another study conducted by Jacob et al. (2007) on 372 adults with ADHD. They found that the lifetime rates of comorbidity for ADHD were 57 % for mood disorders and 27 % for anxiety disorders. Notably, comorbidity with mood, anxiety disorders, personality disorders, or substance abuse/dependence was predictive of poor outcomes, while psychiatric and cognitive impairments are present in men and women with ADHD. Cumyn, French, and Hechtman (2009) conducted a comprehensive assessment study on 447 adults with ADHD (266 men and 181 women). Adults were aged between 17 and 74 years. They found that men with ADHD were more likely to have antisocial personality disorder and higher rates of current drug abuse, while women had higher rates of depression, panic disorder, anorexia, bulimia and borderline personality disorder.

In summary, previous researches shown a clear relationship between ADHD and depression. However, most of these studies are clinically based, thus they cannot be extrapolated to the general population. Studying the influence of ADHD on depression is

essential. There is a need for more research into earlier and more efficient ADHD diagnoses in patients who search for mental health care. Investigating rehabilitation accommodations and services for adults who expressed comorbid symptoms with ADHD and depression is essential to provide the effective interventions for this population.

Co-morbidity between ADHD & Anxiety

Anxiety is one of the most common disorders likely to be experienced in tandem with adults with ADHD. Biederman et al. (1996) reviewed treatment studies of adults with ADHD and found that 50% of the participants had a comorbid anxiety disorder. Shekim et al. (1990) reported that generalized anxiety disorder was the most common comorbid disorder in his study of adults referred for an ADHD evaluation. Schatz and Rostain (2006) reported that ADHD is often comorbid with anxiety disorders with rates approaching 25% in many samples.

In forming hypotheses regarding the etiology of ADHD, researchers have given varying amounts of attention to the comorbidity of ADHD and anxiety. Some researchers believe that anxiety may be a feature that is intimately tied to the pathogenesis of the disorder (Levy, 2004). Other researchers propose that ADHD with comorbid anxiety may be a characteristic that separates subtypes of ADHD or that patients with ADHD and comorbid anxiety are phenotypically different from those with the pure disorder (Pliszka, Carlson, & Swanson, 1999). Regarding the genetic factor, ADHD and anxiety are most likely inherited independently of one another (Biederman et al., 1993; Perrin & Last, 1996), as the two disorders do not co-segregate. Biederman and his colleagues also mentioned that relatives with ADHD do not exhibit higher rates of anxiety than relatives without ADHD.

Although research regarding ADHD in adults with comorbid anxiety are lacking, it is possible to draw inferences about the connection between adults with ADHD and anxiety from the literature in childhood ADHD with comorbid anxiety. Farone et al. (1993) have suggested that ADHD with comorbid anxiety presents a clinical profile that is quite different from ADHD without comorbidity. Specific deficits in the neuropsychological profile of children with ADHD and comorbid anxiety indicate impairment in the areas of visual distraction, processing speed, and scanning (Pliszka, 1998). Since the cognitive deficits of the adult with ADHD population are similar to the

pediatric population, it is anticipated that adults with ADHD and comorbid anxiety will exhibit deficits in these areas as well (Biederman et al., 1993; Riordan, Flashman, Saykin, Frutiger, Carroll, & Huey, 1999). Children with this type of comorbid ADHD tend to exhibit less impulsivity and have fewer conduct problems (Pliszka, 1992).

In a review chapter on this topic, Pliszka, Carlson, and Swanson (1999) noted that although 5% to 15% of the childhood population will have an anxiety disorder, between 15% to 35% of children with ADHD also manifest significant anxiety. Other studies place the prevalence of anxiety disorders comorbid with ADHD as high as 50% (Mancini, Van Ameringen, Oakman, & Figueiredo, 1999).

Although anxiety may decrease impulsive actions, it may also remediate the cognitive deficits seen in ADHD. Tannock, Ickowicz, Schachar (1995) examined 40 ADHD children in a working memory task, 22 of whom were non-anxious and 18 of whom were anxious. The ADHD/anxiety children made more errors when the digits were presented at longer intervals, implying a greater impairment of working memory relative to the ADHD when task difficulty increased. It is interesting that methylphenidate administration improved working memory among the children with ADHD who are non-anxious, but not in the ADHD participants who are anxious.

Roth et al. (2004) conducted a study on 28 adults with ADHD and compared them to 34 control participants. They found that memory dysfunction in adults with ADHD was decreased because of the situational anxiety associated with the task rather than poor working memory or decreased semantic organization. This result certainly supports the above assertion that one cause of the anxiety that may be prominent in ADHD is fear related to deficient social or cognitive functioning. In view of the fact that ADHD does lead to impairments in these areas, such fears can be considered to be appropriate reactions to threatening situations.

The Multisite Multimodal Treatment Project (MTA) implemented on children with ADHD produced a great deal of data on ADHD with comorbid anxiety. In one of the studies using the data from the MTA project, the ADHD/anxiety cohort was more inattentive than impulsive (March et al., 2000). Another MTA article found that the presence of anxiety had an ameliorating effect on comorbid conduct disorder (Levy, 2004). The last major study on anxiety and ADHD using the MTA data investigated

anxiety as a predictor and outcome variable (Jensen et al., 2001). A significant proposition that came out of this study was the concept that the “fears and worries that patients with ADHD face may be qualitatively different than phobic behavior that is often present in non-ADHD anxious patients” (p. 155). In support of this proposition, the researchers noted that in the MTA study, anxiety was more associated with negative affectivity and disruptive social behavior than with fearful/phobic behavior.

In summary, the presence of anxiety may partially inhibit the impulsivity and response inhibition deficits seen in ADHD. It may also, however, make working memory and other cognitive deficits worse. Additionally, the anxiety that individual’s with ADHD experience may be more related to inability to function in daily life because of social and cognitive insufficiency than typical phobic/ fearful behavior. In the manner of a self-fulfilling prophesy, the fears of poor cognitive performance seen in ADHD may actually end up further hindering the cognitive performance that was originally the source of anxiety.

The existing literature examining how anxiety interacts with ADHD suffers from some notable shortcomings. In most of the studies, analyses could not be performed stratifying groups into males and females. This limitation is present in recent landmark ADHD studies, such as the MTA studies (March et al., 2000). Moreover, most published studies used referred samples, which limits the generalizability of their results. Population studies need to be conducted using non-referred samples that include both children and adults with ADHD without comorbid anxiety, children and adults with ADHD and anxiety, and children and adults with neither disorder. Finally, research on adults with ADHD with comorbid anxiety are lacking, and more research in this area is recommended to investigate the impact of this comorbidity on individuals, as well as to provide effective treatments and interventions.

Co-morbidity between ADHD & Bipolar Disorder

The existence of comorbidity between attention deficit hyperactivity disorder (ADHD) and bipolar disorder has long been noted in the scientific literature (Faraone, Biederman, & Wozniak, 2012). Studies suggest that children and adults with ADHD have a high prevalence of comorbid bipolar disorder, and are more likely to have a positive family history of bipolar disorder (Dilsaver, Henderson-Fuller, & Akiskal, 2003; Secnik

et al., 2005). Similarly, children with ADHD are at higher risk of developing bipolar disorder in adulthood (Biederman et al., 1996a).

Kowatch, Youngstrom, Danielyan, Findling (2005) conducted a meta-analysis of extant studies on youth with ADHD. They estimated the prevalence of ADHD among youths with bipolar disorder to be 62%. Significantly elevated rates of bipolar disorder have also been reported in studies of youths with ADHD (Hensch, Himmerich, & Hegerl, 2011; Faraone et al., 1997), and this comorbidity has been confirmed in studies of adults with bipolar disorder and ADHD. Sachs, Baldassano, Truman, & Guille (2000) found significant ADHD comorbidity in adults with an onset of bipolar disorder before age 19, but not for those with older ages at onset. Likewise, several studies reported that rates of bipolar I disorder were significantly elevated in adults with ADHD (Bernardi et al, 2011; Klassen et al., 2010).

ADHD comorbid with bipolar disorder is a particularly morbid and disabling condition. For example, Butler, Arredondo, and McCloskey (1995) found high rates of bipolar I disorder (22%) in a hospitalized sample of ADHD patients. Wozniak et al. (1995) reported that youth with bipolar I disorder plus ADHD were at high risk for major depression, psychosis, psychiatric hospitalization, and severely impaired psychosocial functioning. Brent and colleagues (1988) reported that adolescents who committed suicide had higher rates of bipolar I disorder and ADHD compared with those whose attempts were not successful. Likewise, Arnold et al. (2011) found that youths with both disorders had poorer functioning, greater symptom severity, and more additional comorbidity than youths with only one of these two disorders.

Researchers reviewed five artifacts that could lead to ADHD and bipolar I comorbidity and reported the following: 1) The two disorders could fall on a continuum of psychopathology; 2) overlapping clinical features could lead to misdiagnoses; 3) the artificial splitting of a single syndrome could lead to apparent comorbidity of sub-syndromes; 4) one disorder could be a developmental precursor of the other; and 5) referral biases could exaggerate comorbidity because people with two disorders are more likely to be referred to treatment than those with one disorder. Because diagnosis drives treatment and the treatments for these two disorders are very different, determining whether ADHD and bipolar I comorbidity is valid or artifactual has considerable clinical,

scientific, and public health significance (Youngstrom, Arnold, & Frazier, 2010).

Faraone, Biederman, Mennih, Wozinak, and Spencer (1997) conducted a study on 140 children with ADHD who also satisfy diagnostic criteria for bipolar disorder, 120 children without ADHD, and 822 first-degree relatives to clarify the familial relationship status between ADHD and bipolar disorder. The researchers found that relatives of both ADHD sub-groups were at significantly greater risk for ADHD than relatives of non-ADHD controls, and the two subgroups of ADHD did not differ significantly from one another in their relatives' risk for ADHD. They also found that the risk is elevated five times for bipolar disorder among relatives when the proband child had bipolar disorder, but not when the proband had ADHD alone. In addition to that, they reported an elevated risk for major depression with severe impairment was found for relatives of ADHD and bipolar disorder, and both ADHD and bipolar occurred in the same relatives more often than expected by chance alone. As well as, there was a trend for random mating between ADHD parents and those with mania. The researchers of this study suggested that comorbid ADHD with bipolar disorder is familially distinct from other forms of ADHD and may be related to what others have termed childhood-onset bipolar disorder.

In addition, Faraone, Biederman, & Wozniak (2012) applied meta-analysis to family genetic studies of ADHD and bipolar I probands. Twenty bipolar proband studies provided 37 estimates of the prevalence of ADHD in 4,301 relatives of bipolar probands and 1,937 relatives of comparison probands. Seven ADHD proband studies provided 12 estimates of the prevalence of bipolar I disorder in 1,877 relatives of ADHD probands and 1,601 relatives of comparison probands. These studies found a significantly higher prevalence of ADHD among relatives of bipolar probands and a significantly higher prevalence of bipolar I disorder among relatives of ADHD probands.

ADHD has been recognized as a prevalent comorbidity in both adult (Sentissi et al., 2008; Tamam, Tuglu, Karatas, & Ozcan, 2006) and juvenile (Tamam, Karku, & Ozpoyraz, 2008; Sachs et al., 2000) patients with bipolar disorder, however, this comorbidity is less well understood. Epidemiological, neuroimaging, and family studies have highlighted a potential association between bipolar disorder and ADHD. However, this relationship is still equivocal and its exact nature remains to be characterized.

Considerably more data are available on the rates of ADHD in adults affected

with bipolar disorder. It has been proposed that the rate of ADHD comorbidity in bipolar disorder patients is as high as 38%–98% in children and adolescents (Sachs et al., 2000; Tamam et al., 2008) but it decreases with age; reaching 9%–35% in adult populations (Nierenberg et al., 2005; Sentissi et al., 2008). Only one study involving 73 adults with childhood-onset bipolar disorder found a lower rate of ADHD; only 4% of participants were diagnosed with ADHD (Jaideep, Reddy, & Srinath, 2006). The limited number of participants could explain the discrepancy between this study and the others.

The prevalence of ADHD and bipolar disorder comorbidity varies depending on the subtype of ADHD and bipolar disorder involved. For example, Millstein et al. (1997) reported higher rates of bipolar disorder in patients presenting the combined type of ADHD compared to patients with either the inattentive or the hyperactive impulsive subtypes of ADHD. Notably, bipolar disorder patients with comorbid ADHD are more likely to be diagnosed with type 1 bipolar disorder (Nierenberg et al., 2005). Notably, little information is available regarding the comorbidity between ADHD and bipolar II disorder. Clearly, more studies are needed to establish this potentially clinically-relevant relationship.

Adults with ADHD and bipolar disorder are generally less compliant to treatment (Tamam et al., 2006), which could partly explain why they present more serious and recalcitrant symptoms. The nature of ADHD symptoms (i.e., inattention, lack of organization and forgetfulness) may account for the additional difficulty of individual with both ADHD and bipolar disorder to adhere to treatment.

Finally, comparing to individuals with bipolar disorder, individuals who are diagnosed with both ADHD and bipolar disorder have lower functional scores, lower education, fewer partnerships, more suicide attempts, and more legal problems (Nierenberg et al., 2005; Sentissi et al., 2008).

A recent study in euthymic bipolar disorder outpatients reported that comorbid ADHD predicts significantly lower social functioning and adaptation compared to patients with bipolar disorder without ADHD (Sentissi et al., 2008). Furthermore, Patients with bipolar disorder with comorbid ADHD have lower attentional resources (Biederman et al., 1997), working memory and executive functions (Brown, 2006).

Taken together, prior work shows that the co-occurrence of ADHD and bipolar

disorder is not a rare event. The findings of previous studies suggest that the comorbid condition of ADHD and bipolar disorder has considerable negative impact on individuals' quality of life, overall functioning, and may thereby prevent patients from reaching their full potential. Several methodological limitations make studies on comorbid ADHD and bipolar disorder difficult to interpret. For instance, ADHD and bipolar disorder have been described at different developmental stages, such as, in childhood for ADHD and in adulthood for bipolar disorder (Katzman & Chokka, 2010). Moreover, symptoms overlap between the two disorders making the differential diagnosis and intervention process a challenge.

Co-morbidity between ADHD & Substance Use Disorders

In recent years, research has looked into the apparent connection between ADHD and increased risk for future substance use. Epidemiologic data show a higher correlation between ADHD and substance use than could occur by chance alone (Giedd, 2003). Although children with ADHD appear to be at increased risk for substance use in adolescence and adulthood (Flory & Lynam, 2003; Wilens, 2006), research has not, to date, pinpointed why.

In longitudinal studies of the lifetime course of ADHD, the question of whether ADHD is a predictor of future substance use has not been a primary focus (Moline & Pelham, 2003). Many of these studies do not include detailed substance use assessments. Additionally, a diagnosis of a substance use disorder in adolescence can fail to notice the gravity of the disorder due to symptoms not having yet reached their peak (Biederman et al., 1997; Mannuzza et al., 1991). One of the strongest predictors of future substance use problems, age of first substance use, has not unfortunately been included in many ADHD studies (Grant & Dawson, 1997; Molina & Pelham, 2003).

Murphy & Barkley (1996) compared adulthood-referred patients with and without ADHD and noted that the former had higher levels of antisocial symptoms and substance abuse disorder as well as symptom ratings of anxiety and depression. Tucker (1999) reported that high levels of hyperactivity are predictive of later substance use. It is unknown, however, if ADHD is the sole culprit, or whether this increased risk may be due to other overlapping childhood disorders, such as conduct disorder. Some researchers attribute to the combination of ADHD and conduct disorder to the increased risk of future

substance use (Flory & Lynam, 2003). Giedd (2003) reported that ADHD with either conduct disorder or bipolar affective disorder increases the risk of developing future substance abuse.

An overrepresentation of substance use disorders has also been found in studies of adults with ADHD. Wilens (2004) reported that 17%–45% of adults with ADHD have alcohol abuse or dependence, and 9%–30% have drug abuse or dependence. Adults with ADHD plus a substance use disorder also have an elevated risk of other psychiatric disorders compared with those who have either diagnosis alone. High rates of ADHD have been reported in first-degree relatives with substance use disorders. Wilens also reported that in adolescents and adults with ADHD, substance use problems are typically more substantial than in those without ADHD. Individuals with both diagnoses have been reported to have an earlier onset, a longer course, and a greater severity, with more relapses and greater difficulty remaining abstinent.

Wilens, Faraone, Biederman, and Gunawardene (2003) conducted a study of never-treated adults with ADHD found that the risk of substance use disorders was to be twice as high as comorbid bipolar disorder or juvenile conduct disorder that clearly increases the risk. ADHD itself appears to be a risk factor for later substance use disorders, with onset typically around 17–19 years of age.

Upadhyaya et al. (2005) found that college students with ADHD who actively display symptoms were more likely to engage in overindulgence in or dependence on an addictive substance than students with ADHD who were without current active symptoms. Kalbag and Levin (2005) suggest that the prevalence of ADHD in the general adult population ranges from 1% to 5%, but is estimated to be much higher (11% to 35%) in substance-abusing with adults.

Tobacco, marijuana, and drug use other than alcohol were found to be more prevalent in students who showed a lack of symptom control. The risk of substance use among adults with ADHD ranges from 12% to 24% (Tse, 2012). Another study conducted by Upadhyaya (2007) found that adults with ADHD and substance use disorder have an earlier age at onset of substance use disorder, and may take longer to achieve remission than those with only substance use disorder, and are likely to have a longer course, poorer outcome, and higher rates of other psychiatric comorbidities.

Rooney (2010) conducted a study on 39 college students to examine the risk behaviors patterns of alcohol use, illicit drug use, risky sexual behavior, and risky driving behaviors among young adults with ADHD. Rooney indicated that college students with ADHD are at increased risk for a number of problems related to substance use, sexual behavior, and driving. Specifically, college students with ADHD are at increased risk for alcohol dependence, and those with comorbid conduct disorder are at increased risk for non- marijuana illicit substance use.

In another study, 21% of the participants with cocaine-dependency were adults with ADHD and 10% of those with ADHD had a history of clear childhood-onset symptoms (Levin, Evans, & Kleber, 1998). Recent data suggest that adults who meet diagnostic criteria for current ADHD but for whom there is no clear evidence of some childhood symptoms (ADHD not otherwise specified) have characteristics similar in those with prototypic ADHD in terms of familiarity of ADHD, psychiatric comorbidity, neuropsychological disturbances, and impairment (Faraone, 2006) and may constitute a group with a viable subtype of ADHD (Wilens, 2004).

Although some clinicians and others worry about the abuse liability and potential kindling effect of early exposure to stimulants in children with ADHD, preclinical and clinical data do not appear to support such concerns. Earlier treatment appears to be associated with a reduced risk of later substance use (Upadhyaya et al., 2005; Wilens, 2004). For example, a meta-analytic exploration of the role of early stimulant treatment in later substance use disorders found that pharmacotherapy did not increase the risk; on the contrary, the evidence indicated a protective effect against later substance use disorders (Wilens et al., 2003).

In summary and after reviewing the literature examining the relation between ADHD and substance abuse among adolescents and adults, it appears that the diagnosis of ADHD in itself carry some increased risk for substance abuse. However, this risk of using substance abuse increases when ADHD is comorbid with another disorder, such as bipolar or conduct disorders. As such, this review calls for more research that directly examines the joint effects of ADHD comorbidity with other disorders on risk for substance abuse. There is also a need for more research that examines gender differences and rehabilitation interventions on the relation between ADHD and substance abuse.

Co-morbidity between ADHD & Antisocial Personality Disorder

Antisocial personality disorder is an adult diagnosis reflecting long-term characteristic rather than periodic functioning. Its prevalence is about 5.8% in males and 1.2% in females, and it has a high co-morbidity with ADHD (Downey et al., 1997). Torgersen, Gjervan, and Rasmussen (2006) have reported rates of 44% of antisocial personality disorder in adults with ADHD. Antisocial Personality Disorder is one of the most researched disorders in connection with ADHD and is the adult version of Conduct Disorder. Dykman (1993) found that children with ADHD who were also hyperactive and aggressive were at increased risk to have oppositional and conduct disorders. Antisocial Personality Disorder most closely resembles the hyperactive-impulsive type of ADHD. Both ADHD and Antisocial personality have difficulties with impulse control. There is a risk taking, thrill-seeker component to both, but the individual with antisocial personality disorder will typically have less regard for their own safety and the safety of others than the person with ADHD (Klein & Mannuzza, 2010; Lilienfeld & Waldman, 1990).

In studies of ADHD in children who have grown to adulthood (Abramowitz et al., 2004; Babinski, Hartsough, & Lambert, 1999), there is a high rate of diagnosis of antisocial personality disorder. Biederman et al. (2008) examined samples of adults diagnosed with ADHD in both referred and non-referred patients. They found a two to three fold increase in the rate of antisocial personality disorder compared with normal controls.

Findings from longitudinal, family and adoption, neuropsychological, psychophysiological, and other laboratory studies, Lilienfeld and Waldman (1990) indicated that ADHD with childhood-onset is associated with adult disorders characterized by antisocial behavior. However, there is still a question of whether this finding simply represents the continuation of conduct problems from childhood to adulthood. Mannuzza and colleagues (1993) conducted a study on 91 adults diagnosed with ADHD in their childhood. They found that adults with ADHD hyperactive type are seven times more likely to have an antisocial personality disorder or a drug abuse problem than the control sample.

Johansson and Andershed (2005) reported that the most distinguishing feature

found in persons with antisocial personality is the lack of empathy. There is a disregard for the feelings of others and a lack of appropriate guilt over their own inappropriate behavior. Johansson and Andershed explained that people with antisocial personality seek treatment only when they get in trouble and can get out of it by seeming to seek help. Usually when the situation that caused the person to seek treatment clears up, he/she discontinues therapy. In contrast, the adult with ADHD is often times overly sensitive to the reactions and feelings of others and may feel remorseful to the point of becoming depressed over his/her impulsive actions.

Schubiner et al. (2000) randomly selected adult inpatients from two substance abuse treatment facilities to assess the relationship between comorbid ADHD/antisocial personality disorder with substance abuse. Research findings indicated that those with ADHD, compared to those without ADHD, had significantly higher rates of antisocial personality disorder (69% vs. 29%). This finding suggested that a strong relationship exist among adults with substance abuse disorder and antisocial personality disorder.

Increased occurrence of antisocial behaviors such as theft, assault, vandalism, carrying a weapon, or possession of illegal drugs have often been reported in adults with ADHD (Barkley 2006). Furthermore, adults with ADHD are more likely to have been arrested, convicted and incarcerated than those without ADHD (Barkley, 2002), and are more likely to experience criminal recidivism (Young et al., 2009). In a recent study conducted by Westmoreland et al. (2009), findings show that ADHD in prison inmates is common and is associated with comorbid disorders (including substance abuse), worse health-related quality of life, and higher risk for suicidal behaviors.

Because of the considerable overlap in symptomatology between the two conditions of ADHD and antisocial personality disorder, there has been contention about whether they are really two separate disorders or different aspects of the same disorder (Barkley, 2002). Support for a distinction between the disorders comes from studies that showed a separation between the dimensions of inattention/restlessness and defiance/aggressiveness, with the latter representing antisocial personality disorder, in terms of outcome and relationship to other features (Abramowitz et al., 2004; Schubiner et al., 2000).

Concerns of a different sort have been expressed about the relationship between

antisocial personality disorder in ADHD. Abramowitz, Kosson, and Seidenberg (2004) reviewed data suggesting that the high rate of antisocial personality disorder in ADHD populations results from research samples being drawn from referred cases, biasing the samples towards a high prevalence of conduct disorder as it is the latter that causes troublesome behavioral disturbance leading to referral. The magnitude of this bias remains unknown and the uncertainty continues to obscure the importance of any association between ADHD and antisocial personality disorder.

In summary, persons with ADHD who are diagnosed with a comorbid condition of antisocial disorder experience considerably more personal and professional difficulties in their lives and are likely to require mental health services more frequently. Consequently, the consideration and treatment of ADHD and its associated comorbidity with antisocial disorder is essential to ensure the best possible patient outcomes. However, very few studies have investigated treatment of individuals with comorbid ADHD/ antisocial disorder, and to our knowledge, none of them have involved an adult population. Clearly, more research is needed in this field to better understand the biological mechanisms of the comorbid condition, as well as to provide practitioners with better tools to optimally assist individuals with managing life to a higher level of quality and satisfaction.

Summary

The condition of ADHD, as with any other disability, can disrupt participation in valued activities and interests, which can negatively impact the quality of life (QOL) and well-being level (Devin, 1994). Across all health and rehabilitation professions, QOL has become an important measure of outcomes in both research and clinical settings (Agarwal et al., 2012). Understanding the relationships between QOL and other variables is an important research goal. Through discerning the variables that affect QOL, interventions to improve QOL may be identified and prioritized (Bishop, 2005). A greater understanding of the relationship between QOL and the psychosocial problems commonly associated with ADHD would allow rehabilitation professionals to prioritize these interventions, develop better plans for working with people with ADHD, and potentially allow for the planning of and prevention of psychosocial problems (Bishop et al., 2002).

To date, there is an extremely limited amount of research relevant to QOL and the

various psychosocial problems for adults with ADHD (Schott, 2012). Research on the relationship between ADHD effects and the QOL, in terms of established QOL, is needed. Moreover, studying the relationship between QOL variables (health, academic, vocational, social, and psychological) and different presentations of ADHD in adults is recommended for the most effective interventions.

Chapter IV

Method

Current studies in the U.S. estimate the prevalence of adults with Attention Deficit Hyperactivity Disorder (ADHD) to be between 4% and 5% (Faraone 2007; Fischer et al., 2003; Kessler 2006; Sobanski et al., 2008; Tamam et al., 2008). The prevalence of ADHD was found to be 1.3% for the “Inattentive Type”, 2.5% for the “Hyperactive-Impulsive Type”, and 0.9% for the “Combined Type” (Sobanski, 2006).

The condition of ADHD can disrupt participation in valued activities and interests, which can negatively impacts quality of life (QOL) and well-being levels (Devin, 1994). Previous research on ADHD provides limited information about the QOL of adults with ADHD. Hence, more research is needed to better understand these relationships, and to facilitate improvements in clinical interventions, support services, and policy changes for adults with ADHD. Chapter IV describes the methods that will be used to explore the QOL of adults with ADHD using a mixed methods research design, involving the supplementation of quantitative data by a qualitative component.

This chapter addresses the following topics: a) Sample frame, b) Research design (including the rationale for using mixed methods), c) Procedures and data collection, d) Instrumentation, e) Variables; and f) Data analysis.

Sample Frame

This study used a community-based, non-clinical sample consisting of 113 participants. This sample size exceeded the required minimum number of participants ($N = 103$), which was determined by using a power analysis with G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) assuming the use of (a) multiple linear regression; (b) seven predictor variables; (c) a moderate effect size ($f^2 = .15$); (d) an acceptable level of power ($1 - \beta = .8$); and (d) a conventional level of statistical significance ($\alpha = .05$).

The population of interest for this study consisted of adults with three different presentations of ADHD (Predominantly Inattentive Presentation, Predominantly Hyperactive-Impulsive Presentation, and Combined Presentation). All of the participants were identified as meeting the DSM-5 diagnostic criteria of ADHD. An Attention Deficit Disorders Screening Survey (See appendix A- section 2) for adults based on the DSM-5 criteria reviewed by Grohol (2014) was administered to determine the category of

presentation of each individual. The sampling frame included individuals who were members, on the mailing lists, or who were otherwise associated with one of the following ADHD associations: Children and Adults with Attention Deficit Disorder (CHADD), Attention Deficit Disorder Adult (ADDA), and Louisville Adults with ADHD Satellite of CHADD.

Three specific sampling strategies were utilized for this study: Purposive critical case sampling, purposive criterion sampling, and snowball or chain sampling. Critical case sampling recognized key dimensions, such as an ADHD diagnosis. Critical case sampling was also important to focus specifically on individuals with a particular diagnosis of ADHD. Criterion sampling was important to identify adults with ADHD, specifically (1) Adults meeting the DSM-5 diagnosis of hyperactivity type; (2) Adults meeting the DSM-5 diagnosis of attention deficit type; and (3) Adults meeting the DSM-5 diagnosis of combined type. Studying all cases of ADHD with these particular conditions was the logic behind criterion sampling. Snowball or chain sampling was another sampling approach that helped to locate critical cases. Converging on a small number of critical cases in a particular region could lead to a chain of more key informants. Snowballing involved asking participants to refer other individuals who were diagnosed with ADHD, allowing the sample to grow with information-rich cases.

Inclusion and Exclusion Criteria

There were two criteria for selection into this study: (1) participants who were previously diagnosed with ADHD by physician, psychiatrist, psychologist, or other mental health care professionals, whilst currently satisfying the diagnostic criteria of the DSM; and (2) participants who were 18 years old or older. The rationale for the first prerequisite was to eliminate volunteers who had mistakenly self-diagnosed. Several conditions, such as depression, anxiety, and severe learning disabilities, have a documented co-morbidity with respect to persons with ADHD (Milich, et al, 2002).

The requisite for an age of 18 years or older was requested in this study. The term adult has meanings associated with social and legal concepts. In most of the world, including most of the United States, legal adult age is 18. On this basis, the researcher considered the age of 18 as a starting point in the stage of adulthood among individuals with ADHD.

Research Questions

The research questions that guide this study were as follows:

RQ1: What factors are significant predictors of the QOL of adults with ADHD with different presentations?

RQ2: What experiential aspects of ADHD do adults feel are important to the quality of their lives?

RQ3: How does ADHD impact the psychological, vocational, and social domains?

RQ4: Why does ADHD impact the psychological, vocational, and social domains?

Research Design

A mixed-method design was used in this study to address the research questions. Specifically, a descriptive correlational research design was used to address Research Question 1, and the exploratory qualitative design was used to address Research Question 2, 3, and 4. This design was characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data. The two methods of quantitative and qualitative will be integrated during the triangulation phase of the study.

Descriptive Correlational Design. The quantitative part of this mixed methods study, to address Research Question 1, used a descriptive correlational research design, because it described the characteristics of an existing population, involving an analysis of the statistical relationships between two or more quantitative variables; however, the researcher was not able to manipulate any of the variables (Creswell, 2009). The quantitative data were collected by means of a cross-sectional survey using four self-report instruments. Quality of life (QOL) was the dependent or criterion variable. The seven hypothesized predictors of QOL, based on a review of the literature, included presentation of ADHD, employment status, anxiety, depression, perceived social support, gender, and highest educational level. These variables are defined in Table 4.1.

Table 4.1. Definitions of Variables

| Variable | Functional Definition | Measurement Level | Operational Definition |
|--------------------------|-----------------------|-------------------|---|
| QOL | Dependent variable | Interval | Sum of scores for 20 items in the LSS (Chubon, 1995). Higher scores indicate higher quality of life. |
| Presentation of ADHD | Predictor variable | Ordinal | DSM-5 diagnostic criteria in the Attention Deficit Disorders Screening Test for Adults (Grohol, 2014): 1. Predominantly Inattentive 2. Predominantly Hyperactive-Impulsive 3. Combined. |
| Employment Status | Predictor variable | Ordinal | Classified by Item 7 in the ADHD Survey Section 1: Which of the following best describes your current employment status? 1. Employed full-time (30 hours or more) 2. Employed part-time (less than 30 hours) 3. Currently unemployed. |
| Anxiety | Predictor variable | Interval | Sum of scores for questions 2 and 3 (16 items) referring to anxiety in the AAQOL (Brod et al, 2006). |
| Depression | Predictor variable | Interval | Sum of scores for question 5 referring to depression in AAQOL (Brod et al, 2006). |
| Perceived Social Support | Predictor variable | Interval | Sum of scores for Items 4 and 6 in the AAQOL (Brod et al, 2006) referring to social support. |
| Gender | Predictor variable | Nominal | Classified by Item 2 in the ADHD Survey Section 1: What is your gender: 1. Male 2. Female |
| Level of Education | Predictor variable | Ordinal | Classified by Item 6 in the ADHD Survey Section 1: Which of the following best describes your highest level of education? 1. 8th grade or less 2. Some high school 3. High school graduate 4. Some college or technical school 5. College graduate 6. Master's degree or higher |

Exploratory Qualitative Design. In order to address RQ2, RQ3, and RQ4, an exploratory qualitative design was used in an attempt to explain subjectively how and why ADHD influences QOL. The rationale for supplementing the quantitative data with qualitative data was that, due to persons having a diagnosis of ADHD, the participants may not be able to tolerate a long span of focus to answer many items in a self-report questionnaire. Additionally, qualitative data provides a greater context by which to understand the data. The qualitative explanatory design used a semi-structured interview approach, in which the researcher developed rapport with the participants, and asked them to explain what experiential aspects of ADHD they felt were important to the quality of their lives, and to explain how and why ADHD impacted their health, psychological, vocational, and social domains.

The semi-structured interview approach was the most appropriate qualitative method because discussions with people with similar attributes can help a researcher to explore and develop issues that may be missed by a quantitative survey (Merriam, 2009). The qualitative study helps the researcher to understand the impact of ADHD from each participant's perspective and to add insight to the quantitative results. Using a combination of quantitative and qualitative approaches should provide a more complete understanding of the research problem than any one method by itself (Creswell & Plano Clark, 2011). Furthermore, a mixed methods design was important to assess QOL with both subjective and objective indicators. The central methodological debate within the QOL research community is informed by a differentiation between objective and subjective measures (Cummins, 2000; Randall & Morton, 2003). Cummins emphasized that research on QOL including both objective and subjective measures should be conducted through a mixed method approach that integrates both quantitative and qualitative methods.

Data Collection

Recruitment and Selecting Participants

Recruitment was not restricted to a specific geographic location, but was extended nationwide. Research participants for this study were solicited primarily through three venues. The first was through the website or on-site presentations at Children and Adults with Attention Deficit Disorder (CHADD) by providing information and a link for

participants to complete the study survey. CHADD is a national, non-profit organization that provides advocacy, education and support to people living with ADHD and their families. CHADD represents more than 12,000 members. Most are families of children and adults with ADHD. The second recruitment venue was through the website and at Attention Deficit Disorder Adult (ADDA). ADDA is a national, non-profit organization dedicated to providing education and support to adults with ADHD, and represents more than 8,000 members. Finally, the recruits also included participants currently involved in activities or support-peer classes within Louisville Adults with ADHD Satellite of CHADD. This center arranges support groups where adults with ADHD can discuss their challenges as well as their successes. This center represents more than 50 members.

In all, 450 postcards were mailed by the participating associations, including 200 postcards mailed by the CHADD, 200 by the ADDA, and 50 by the Louisville Adults with ADHD Satellite of CHADD. The investigator prepared 450 postcards that were mailed through the Associations to their members. The postcards briefly explained the study and recipients were asked to participate either by logging on to the web-page and completing the survey on-line or by returning the postcard to their local association (See appendix B). Questionnaires with return-postage paid envelopes were mailed to those recipients who responded that they would be willing to participate but they would prefer a paper-and pencil questionnaire.

The survey questionnaire was concurrently posted on a web-page via link connected to the investigator's Google Document. Both associations (CHADD & ADDA) web-pages provided a link to the web-page providing the questionnaire. Louisville Adults with the ADHD Satellite of CHADD advertised the web-page address in their newsletters. Interested participants logged on to the web site and completed the questionnaire on-line. Then the completed questionnaire appeared immediately in the spreadsheet of the investigator's Google document. The addresses of the participant or the name were not available to the investigator on receipt of the on-line response.

A total of 113 completed and usable surveys were returned including 52 mailed returns and 61 electronic replies, giving a response rate of 25%. For the most part, the returned surveys were completed in their entirety, with little or no missing data. One of the mailed surveys was unusable because it was only half-completed.

A limitation of the method of combined mailed and electronic participant solicitation and data collection used in this study is that it is impossible to know the response rate. That is, it is impossible to discern those respondents that received postcards and, as a result, completed the survey on-line, from those who found the link on the web-pages or who read about the survey in the newsletter. The percentage of mailed returns to postcards mailed was 11.1%.

Data Collection Techniques for Quantitative Design

Data were collected by the administration of self-report questionnaires that were made available to participants on a web-page or in a paper-and-pencil format. The questionnaires were identical in both formats except for the instructions for returning the questionnaires to the investigator and the way that participants provided their responses. Both of these methods were provided on the main web-page and main office building for the three mentioned associations that serve adults with ADHD (CHAAD in Lanham, Maryland, ADDA in Wilmington, Delaware, and Louisville Adults with ADHD Satellite of CHAAD in Louisville, Kentucky).

Instrumentation for Quantitative Survey

The cross-sectional survey involved the use of three instruments to collect quantitative data: 1) Adult ADHD Quality of Life Measure (AAQOL); 2) Attention Deficit Disorders Screening Test (Grohol, 2014); and 3) Life Situation Survey (LSS). A consent form was provided as well (see appendix A).

Adult ADHD Quality of Life Measure (AAQOL)

The self-report items of the AAQOL were generated based on a literature review, as well as patient and clinician input, indicating that adults with ADHD has an impact on functioning in five areas: work, daily activities, relationships, psychological well-being, and physical well-being. This questionnaire takes approximately 15 minutes to complete (Brod et al., 2006; Swindle, 2006).

The first part of the instrument (see Appendix A; Section 1) consists of nine items to elicit personal information about the participants, to provide a demographic profile of the sample, including age, gender, race/ethnic group, marital status, living arrangement, education attainment, employment status, and physical limitations.

The main part of the instrument (see Appendix A; Section 3) is a validated 29-item scale designed to assess health-related QOL in adults with ADHD. It consists of four subscales: life productivity (11 items), psychological health (6 items), life outlook (7 items), and relationships (5 items). Items are scored on a 5-point Likert-type scale ranging from 1 (not at all/never) to 5 (extremely/very often). The scores are computed by reversing scores for all but seven items. The total score for the 29 items is transformed to a 0 to 100 scale with higher scores indicating a better QOL (Matza, Johnston, Faries, Malley, & Brod, 2007).

Two studies investigated the reliability and validity of the AAQOL. The internal consistency was adequate and ranged from 0.75 to 0.93 for subscales, and construct and known-groups validity was supported (Agarwal et al., 2012). In the first validation study conducted with a managed-care sample, four distinct factors were identified through exploratory factor analysis, and the measure was shown to have good internal consistency reliability, construct validity, and discriminant validity. In addition, analysis of clinical trial data has found that the AAQOL is responsive to change in ADHD symptoms (Brod et al., 2006). Reliability and validity were also examined in this clinical trial sample, and results were consistent with the initial validation study (Matza et al., 2007).

Given the unique content and strong psychometric properties of the AAQOL, this instrument is likely to be useful in both research and clinical practice. Most clinical trials of treatment and rehabilitation services for adults with ADHD focus on symptom-based outcomes. The AAQOL is a valid and responsive tool that can be used in future trials to provide a broader picture of rehabilitation services outcomes. Furthermore, like other quality of life measures, the AAQOL is likely to be useful in clinical practice (Brod et al., 2006; Matza et al., 2007).

Attention Deficit Disorders Screening Test

All of the participants were identified as meeting the DSM-5 diagnostic criteria of ADHD based on scores on the Attention Deficit Disorders Screening Test. The Attention Deficit Disorders Screening Test for adults is a 20-item scale, based on the DSM-5 criteria to determine the type of ADHD presentation for each participant. Ten of the questions in the ADHD screening test measure the symptoms of the attention deficit presentation while the other ten questions measure the symptoms of the hyperactivity.

The participants were categorized in the hyperactive presentation if the total score for hyperactivity is greater than the total score for attention deficit. At the same time, the participants were categorized in the inattentive presentation if the total score for attention deficit is greater than the total score for hyperactivity. If the total scores for hyperactivity and attention deficit are the same (or nearly so) then the participants have the combined presentation.

This test requires five to ten minutes to be completed (See Appendix A; Section 2). Using these criteria the participants were classified as either (1) Predominantly Inattentive; (2) Predominantly Hyperactive-Impulsive; or (3) Combined.

The reliability and validity of this screening test have been supported in the DSM and few studies. A study conducted on 60 adults patients with ADHD indicated that the 20-item screening scale was internally consistent (ranged from 0.88 to 0.89) and had high test-retest reliability over 3-weeks in the three groups of ADHD (ranged from 0.43 to 0.72) (Adler, Spencer, & Faraone, 2006). This assessment is a valid instrument for measuring the presentation of ADHD across adults with ADHD.

Life Situation Survey (LSS)

The Life Situation Survey (LSS, Chubon, 1995) is a 20-item scale developed to provide a comprehensive and subjective assessment of health-related QOL, which is sensitive to a spectrum of chronic illnesses and disabilities (See Appendix A; Section 4). The items were derived from several QOL indicator areas considered applicable to the general population and other areas determined to be especially relevant to persons with chronic illnesses and permanent disabilities. Thus, it is suitable for use with a broad spectrum of populations (Foster, Marshall, & Peters, 2000). Ten traditional areas of measurement were gleaned from existing measures of QOL, and additional areas were sought through the use of a critical incidents technique. The resulting 20-item scale includes 10 items representing ten accepted quality of life domains, and an additional 10 items representing difficulties that may be experienced by persons with chronic illnesses or disorder. Items are rated on a seven point interval scale, and respondents are asked to indicate the extent to which they agree or disagree with each of the 20 statements. The LSS assessed different domains including work and/or school, security, leisure, public

support, nutrition, stress, sleep, mobility, social nurturance, autonomy, earnings, energy level, health, social support, mood/affect, and self-esteem. This incomplete list demonstrates the comprehensive nature of the measure, and the relevance of the domains to rehabilitation counseling planning (Foster et al, 2000; McCauley & Bremer, 1991). This questionnaire can be completed in five to seven minutes.

Reports of internal consistency reliability range from 0.70 to 0.89 by using test-retest method (Chubon, 1995). Validity of the LSS was supported by finding significantly higher QOL scores among several studies. These studies were implemented on different populations, such as prison inmates, hospital patients, university students, and rehabilitated spinal cord injured adults (Clayton & Chubon, 1994). In sum, the findings from the studies indicated an acceptable degree of reliability and validity with diverse populations (Foster et al., 2000; McCauley & Bremer, 1991).

Data Collection Techniques for Qualitative Design

Interviews in person or on the phone with 20 participants from Children and Adults with Attention Deficit Disorder Association (CHADD) and the Louisville chapter of CHADD were conducted using a semi-structured format with open-ended questions. The sample size of 20 was based on the assertion that (a) data saturation will occur after the interview responses become repetitive and contain no new information (Creswell, 2009); and (b) in health research "the experience of most qualitative researchers is that, in interview studies, little that is new comes out of transcripts after you have interviewed 20 or so people" (Green & Thorogood, 2009; p. 120).

The investigator followed some procedures to recruit 20 participants for the semi-structured interviews: (a) a flyer was posted on the CHADD website (see appendix D); (b) 50 flyers were placed in the office at Louisville Satellite of CHADD; (c) the flyer was posted in the newsletter for the Louisville Satellite of CHADD; and (d) the flyer was posted at the end of the quantitative questionnaires for the people who were interested in conducting an interview as well as completing the questionnaires. The participants had the option to communicate with the investigator directly via email or through the main office to arrange for interview. Six participants conducted the interviews in person at the Louisville Satellite of CHADD, and 14 persons participated via phone interview. Eight participants participated in both questionnaire and interview.

Each interview lasted approximately 30-60 minutes. The interview was recorded and transcribed by the researcher. Participants were asked to answer the following question from The ADHD Impact Module (AIM-A) which is a self-reported scale comprising of four global quality of life items (See Appendix C), five economic impact items, and five multi-item scales that capture key concepts identified during patient and clinical interviews (Agarwal et al, 2012): 1) How would you rate the overall quality of your life right now? 2) Has ADHD and its symptoms limited your ability to achieve what you want in life? Please explain how and why? 3) Do you feel you are on the right track with your life? Please explain how and why? and 4) How much do you agree with the following statement: Over the past few weeks, I've had more good days than bad days". Please explain how and why? (See Appendix C).

Quantitative Data Analysis

Variables

The variables used in the quantitative study are defined for references purposes in Table 4.1. Quality of life (QOL) was the dependent or criterion variable. The seven hypothesized predictors of QOL, based on a review of the literature, included presentation of ADHD, employment status, anxiety, depression, perceived social support, gender, and highest educational level.

The quantitative data were transcribed into the data editor of SPSS version 20.0 to conduct the statistical analysis, using the protocols described by Field (2011). The first stage of the data analysis was to construct a profile of the participants, using frequency distributions (counts and percentages) based on the demographic characteristics of the participants (including age, gender, race/ethnic group, marital status, living arrangement, education, employment status, and physical limitations). The second stage of the data analysis was to operationalize the variables defined in Table 4.1, and to present the descriptive statistics (e.g., minimum, maximum, mean, and standard deviation) for the interval level variables. The final stage of the analysis was to address Research Question 1: What factors are significant predictors of the QOL among adults with ADHD with different presentations? Answering this question led to the testing of the following seven hypotheses:

H1: Presentation is a significant predictor of QOL in adults with ADHD;

- H2: Employment Status is a significant predictor of QOL in adults with ADHD;
- H3: Anxiety is a significant predictor of QOL in adults with ADHD;
- H4: Depression is a significant predictor of QOL in adults with ADHD;
- H5: Perceived Social Support is a significant predictor of QOL in adults with ADHD;
- H6: Gender is a significant predictor of QOL in adults with ADHD;
- H7. Highest level of education is a significant predictor of QOL in adults with ADHD.

A predictive model, defined by a multiple linear regression equation, based on the method of ordinary least squares, was computed using SPSS version 20.0 as follows:

$$\hat{Y} = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \epsilon$$

Where: \hat{Y} = the predicted average value of the dependent variable (i.e., QOL); β_0 = the estimated baseline constant or intercept (i.e., the value of \hat{Y} when all the predictor variables are zero). β_1 to β_6 are the estimated partial regression coefficients for the SEVEN predictor variables, respectively: X_1 = Presentation; X_2 = Employment Status; X_3 = Anxiety; X_4 = Depression; and X_5 = Perceived Social Support; X_6 = Gender; X_7 = Highest level of education. The residual error (i.e., the difference between the predicted and the measured value of the dependent variable) is represented by the symbol ϵ .

The β coefficients indicated the relative strengths and directions (positive or negative) of the correlations between the dependent variable and each of the predictor variables. The β coefficients were standardized, so that they ranged from -1 to +1. By standardizing the coefficients, it was possible to compare the relative strength of each predictor variable as a contributor to QOL. The larger the value of the standardized coefficient, the more important was the variable as a predictor.

The seven hypotheses were tested by statistical inference. The hypothesis that a β coefficient was significant (i.e., not equal to zero) was supported if $p < .05$ for the corresponding t -test statistic. The adjusted R^2 value (i.e., the proportion of the variance in the dependent variable that is explained by the variance in the predictor variables) provided an estimate of the effect size. The interpretation of the effect size was: $R^2 = .04$ is “the minimum effect size representing a practically significant effect for social science data”, whereas $R^2 = .25$ represents a “moderate effect”, and $R^2 = .64$ represents a “strong effect” (Ferguson, 2009, p. 533).

Regression is one of the most misused methods of statistical analysis because in practice, the data sometimes violate its many theoretical assumptions, so that the results may be compromised (Chatterjee, Hadi, & Price, 2007). These assumptions were checked, to ensure that an accurate predictive model is constructed. The first assumption was that the sample size ($N = 113$ participants) was large enough to provide sufficient power to test the hypotheses accurately. A minimum sample size of $N = 103$ participants was determined using a power analysis with G*Power software (Faul et al., 2009).

The second assumption was that the residual errors were normally distributed. This assumption was checked using a frequency distribution histogram, and the Kolmogorov-Smirnov test for normality (Field, 2011). Linked to the normality assumption was the absence of outliers (i.e., excessively large or small values that are not contiguous with a normal distribution). An outlier was identified if $p < .001$ for the Mahalanobis D^2 value computed by SPSS (Hisham, 2008).

The third assumption was that there should be no multicollinearity, meaning that the predictor variables should not be strongly correlated with each other (Chatterjee et al., 2007). The consequence of multicollinearity is the inflation of the variances. When extensive collinearity occurs, the variances are so far away from their true values that the standard errors and signs of the regression coefficients are biased, resulting in erroneous statistical inferences. The variance inflation factor (VIF) was used to measure multicollinearity in SPSS. The VIF should not be greater than 5.0. (Field, 2011). The final assumption was homoscedacity or homogeneity of variance. The residuals must be randomly distributed either side of their mean (zero) value. A plot of the residuals (the differences between the predicted and the observed values) versus the predicted values was observed to determine if it indicated heteroskedacity, reflected by a regular geometric pattern (e.g., a wedge, diamond, or V shape). Heteroscedacity was a major concern, because it would invalidate the assumption that the variances do not vary systematically with respect to the effects being modeled (Chatterjee et al., 2007).

Qualitative Data Analysis

Content analysis was used as an inductive method to interpret the interview responses. Content analysis involves the coding and identification of themes. Each theme consists of a group of similar responses that the researcher identifies with the

same code because they all have common attributes reflecting the participants' perceptions about a defined topic (Krippendorff, 2004). The researcher used inductive inference (i.e., an exploratory, or bottom-up approach in which new themes were extracted to support the answers to the research questions). An exploratory approach was applied because it is not known prior to the analysis what the themes might be. The researcher did not depend upon or reproduce themes already defined in the literature, but allowed the themes to emerge inductively.

Each response was coded with the name of the respondent, followed by the primary theme. Each primary theme was then further classified into sub-themes, according to the way in which the primary theme was manifested (e.g., whether the participant expressed a positive or a negative viewpoint). All the responses with the same themes were aggregated and tabulated to summarize the evidence for each theme. The aggregated responses provided a rich description of each theme, in which the voices of the participants could be heard, unfiltered by the views of the researcher.

Triangulation was applied to compare and contrast the quantitative and qualitative data. The consistency between the quantitative and qualitative data was tested because it could potentially improve quality of the findings (e.g., if the respondents perceive similar outcomes using both quantitative and qualitative instruments, then at least the researcher can say that the credibility and dependability of the findings are improved (Denzin & Lincoln, 2008); however, the researcher did not make an *a priori* assumption that the consistency is required, or that consistency is beneficial. Quantitative and qualitative methods access different types of responses, because quantitative data are based on the positivist paradigm (i.e., facts are not related to feelings) whereas qualitative data are based on the constructivist paradigm (i.e., facts are related to feelings); consequently triangulation may invite contradiction and tension (Creswell & Plano-Clark, 2011).

Summary of the Methodology

A mixed methods research design was implemented to address the following research questions: RQ1: What factors are significant predictors of the QOL of adults with ADHD with different presentations? RQ2: What experiential aspects of ADHD do adults feel are important to the quality of their lives? RQ3: How does ADHD impact

their psychological, vocational, and social domains? RQ4: Why does ADHD impact psychological, vocational, and social domains?

RQ1 was addressed using a cross-sectional survey with a descriptive correlational design using a sample size of 113, which exceeded the minimum sample size based on power analysis. Three instruments were administered to collect the quantitative data: (1) Adult ADHD Quality of Life Measure (AAQoL; Brod et al., 2006); (2) Attention Deficit Disorders Screening Test (Grohol, 2014) and (3) Life Situation Survey (LSS, Chubon, 1995). Regression analysis was used to test seven hypotheses. QOL was the dependent or criterion variable. The seven hypothesized predictors of QOL, based on a review of the literature, included presentation of ADHD, employment status, anxiety, depression, perceived social support, gender, and education attainment.

Research Questions 2, 3, and 4 were addressed using an exploratory qualitative design. To achieve saturation, interviews with 20 participants were conducted using a semi-structured format with open-ended questions. Participants were asked to answer questions cited from AIM-A self-reported scale (Agarwal et al, 2012). A content analysis of the interview responses was conducted to extract emergent themes to help the researcher understand the impact of ADHD from the participants' perspective and also help to add insight to the quantitative results.

Chapter V

Results

The purpose of this study was to gain a more complete understanding of the relationships of selected variables (presentations of ADHD, employment status, social support, anxiety, depression, attainment education, and gender) to the quality of life (QOL) of people with attention deficit hyperactivity disorder (ADHD) (see Table 4.1). This chapter describes the results of the data analysis used to answer the research questions of the study. The results of the data analysis described included (1) the quantitative results; (2) the qualitative results, and (3) the triangulation.

Quantitative Results

The goal of the quantitative study was to address Research Question 1: What factors are significant predictors of the QOL of adults with ADHD? The results of the quantitative part of this study are presented in four sub-sections, including (a) Characteristics of Participants; (b) Descriptive Statistics; (c) Testing of Hypotheses; and (d) Summary.

Characteristics of Participants

The total number of participants ($N = 113$) exceeded the minimum sample size ($N = 103$) required by the power analysis. The characteristics of the 113 participants are summarized in Table 5.1. The gender of the majority of the participants ($n = 95, 84.1\%$) was male. The age range was from 18 to over 60. The most frequent age-group was 30-39 years ($n = 37, 32.7\%$) and the least frequent age-group was 18-20 years ($n = 3, 2.7\%$). The race of the participants included African American ($n = 11, 9.7\%$), Hispanic ($n = 12, 10.6\%$), and White (non-Hispanic) ($n = 90, 79.7\%$). The vast majority of the participants were married ($n = 52, 46\%$). Over half of the participants ($n = 66, 58.4\%$) reported that they live with their spouse/partner. The highest educational levels of the participants ranged very widely from 8th grade or less ($n = 3, 2.7\%$) to college graduate ($n = 38, 33.6\%$), with some participants having a Master's degree or higher ($n = 32, 28.3\%$). About two thirds of participants ($n = 76, 67.3\%$) were currently employed. The vast majority of participants ($n = 106, 93.8\%$) possessed personal transportation. The monthly household income of participants varied; however, over half ($n = 59, 52.2\%$) earned an income of over \$3,000 per month (the income categories in the survey were determined

by income loss and cost to the US economy (Barkley, 2002)), less than half of the participants ($n = 48$, 42.7%) reported that their physical activity was about the same comparing to most people of the same age group, while a substantial proportion ($n = 37$, 32,7%) reported that they were not so physically active.

Table 5.1. Characteristics of Participants (N = 113)

| Characteristic | Category | N | % |
|---|--|-----|------|
| Gender | Male | 95 | 84.1 |
| | Female | 18 | 15.9 |
| Age | 18-20 | 3 | 2.7 |
| | 21-29 | 23 | 20.4 |
| | 30-39 | 37 | 32.7 |
| | 40-49 | 26 | 23.0 |
| | 50-59 | 12 | 10.6 |
| | 60 or older | 12 | 10.6 |
| Race | African American | 11 | 9.7 |
| | Hispanic | 12 | 10.6 |
| | White (non- Hispanic) | 90 | 79.7 |
| Marital status | Divorced | 19 | 16.8 |
| | Married | 41 | 36.3 |
| | Never Married | 53 | 46.9 |
| Living arrangement | Live alone | 25 | 22.1 |
| | Live with friends | 11 | 9.7 |
| | Live with parents | 7 | 6.2 |
| | Live with relatives (not parents/spouse) | 4 | 3.5 |
| | Live with spouse/partner | 66 | 58.4 |
| Highest level of education | 8th grade or less | 3 | 2.7 |
| | High school graduate | 5 | 4.4 |
| | Some College or technical school | 35 | 31.0 |
| | College graduate | 38 | 33.6 |
| | Master's degree or higher | 32 | 28.3 |
| Employment status | Employed full- time (30 hours or more) | 76 | 67.3 |
| | Employed part- time (less than 30 hours) | 22 | 19.5 |
| | Currently unemployed | 15 | 13.3 |
| Limited by lack of transportation | No | 106 | 93.8 |
| | Limited | 4 | 3.5 |
| Monthly household income | < \$1,000 | 3 | 2.7 |
| | \$1,000-1,999 | 19 | 16.8 |
| | \$2,000-2,999 | 29 | 25.7 |
| | ≥ \$3,000 | 59 | 52.2 |
| Physical activity (compared to most people of same age) | About as physically active | 48 | 42.5 |
| | More physically active | 28 | 24.8 |
| | Not as physically active | 37 | 32.7 |

Descriptive Statistics

The descriptive statistics for the interval level variables in the statistical analysis are summarized in Table 5.2, and the frequency distributions of the categorical (ordinal) variables are summarized in Table 5.3. The responses to the Attention Deficit Disorders Screening Test for adults revealed that the sample encompassed all three presentations of ADHD including: predominantly inattentive ($n = 18$, 15.9%), predominantly hyperactive ($n = 14$, 12.4%) and combined ($n = 81$, 71.7%).

Table 5.2. Descriptive Statistics for Interval Level Variables

| Variable | <i>M</i> | <i>SD</i> | Minimum | Maximum |
|--------------------------|----------|-----------|---------|---------|
| QOL | 66.66 | 15.09 | 37 | 103 |
| Anxiety | 3.96 | 1.03 | 1 | 5 |
| Depression | 3.02 | 1.06 | 1 | 5 |
| Perceived Social Support | 5.82 | 1.67 | 2 | 9 |

Table 5.3. Frequency Distributions of Ordinal Variables

| Variable | Code | Category | n | % |
|----------------------|------|---------------------------|----|------|
| Employment Status | 1 | Unemployed | 15 | 13.3 |
| | 2 | Part time | 22 | 19.5 |
| | 3 | Full time | 76 | 67.3 |
| Presentation of ADHD | 1 | Predominantly inattentive | 18 | 15.9 |
| | 2 | Predominantly hyperactive | 14 | 12.4 |
| | 3 | Combined | 81 | 71.7 |

The correlation matrix (using on statistical significant at $p < .05$) indicated that QOL was significantly negatively correlated with Presentation of ADHD and Anxiety, but significant positively correlated with Employment status, and Perceived Social Support. Presentation of ADHD was significantly positively correlated with Anxiety, whilst Employment status was significantly negatively correlated with both Depression and Perceived Social Support. Depression was significantly positively correlated with Anxiety. Table 5.4 reflects a bivariate correlation matrix (Pearson's r) between Quality of Life, Presentation of ADHD, Employment status, Anxiety, Depression, and Perceived Social Support:

Table 5.4. Bivariate correlation matrix (Pearson's r) between Quality of Life, Presentation of ADHD, Employment status, Anxiety, Depression, and Perceived Social Support

| Variable | Quality of Life | Presentation of ADHD | Employment status | Anxiety | Depression | Perceived Social Support |
|--------------------------|-----------------|----------------------|-------------------|---------|------------|--------------------------|
| Quality of Life | 1 | | | | | |
| Presentation of ADHD | -.301* | 1 | | | | |
| Employment status | .252* | .082 | 1 | | | |
| Anxiety | -.415* | .353* | .136 | 1 | | |
| Depression | .153 | .054 | -.266* | .467* | 1 | |
| Gender | -.042 | .063 | -.178 | -.005 | -.053 | 1 |
| Perceived Social Support | .482* | -.020 | -.252* | .152 | .017 | 1 |

* Note: Significant correlation ($p < .05$)

The dependent variable, QOL, was measured using the LSS (Cronbach's alpha = .879 for 20 items). The mean QOL scores varied widely from 37 to 103 ($M = 66.66$, $SD = 15.09$). Figure 5.1 shows the scores for QOL approximated normality, reflected by the bell-shaped frequency distribution, with the mode at a score of 70.0. The mean scores for QOL did not vary significantly between males ($M = 65.22$) and females ($M = 66.93$), which is reflected by an overlapping confidence interval of 95% (in Figure 5.2).

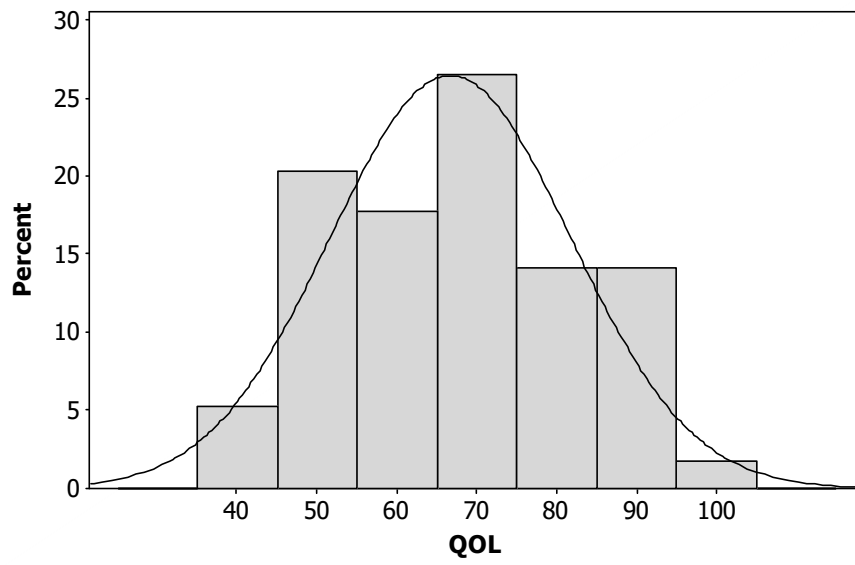


Figure 5.1. Frequency distribution of scores for QOL

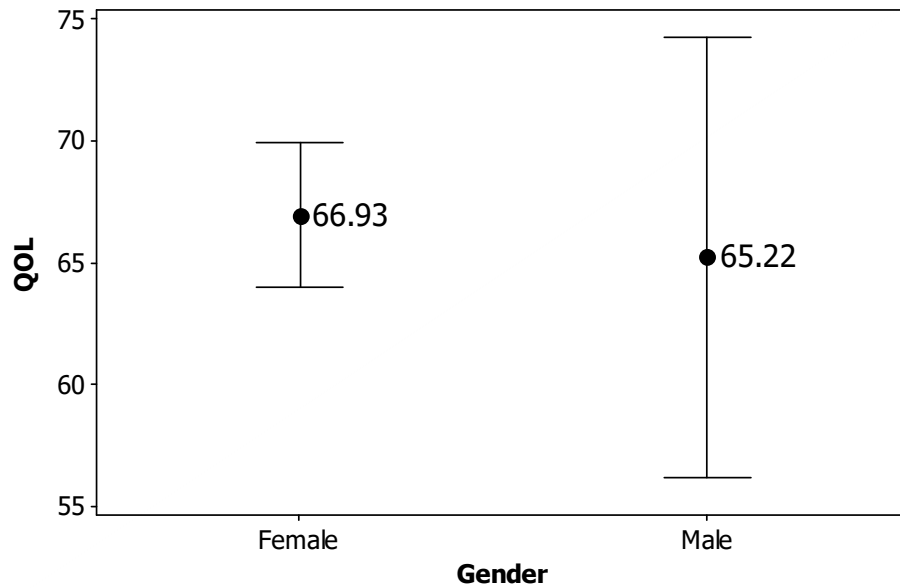


Figure 5.2. Mean scores \pm 95% CI for QOL vs. Gender

The strongly overlapping 95% confidence intervals (in Figure 5.3) indicated that the mean scores for QOL did not vary significantly with respect to the highest level of

education (ranging from $M = 62.20$ for high school graduates to $M = 71.74$ for College degree). The lack of a strong overlap in the 95% CI (in Figure 5.4) reflected that the QOL of participants who were employed full time ($M = 76.36$) was better than those who were employed part-time ($M = 64.05$) or unemployed ($M = 66.97$).

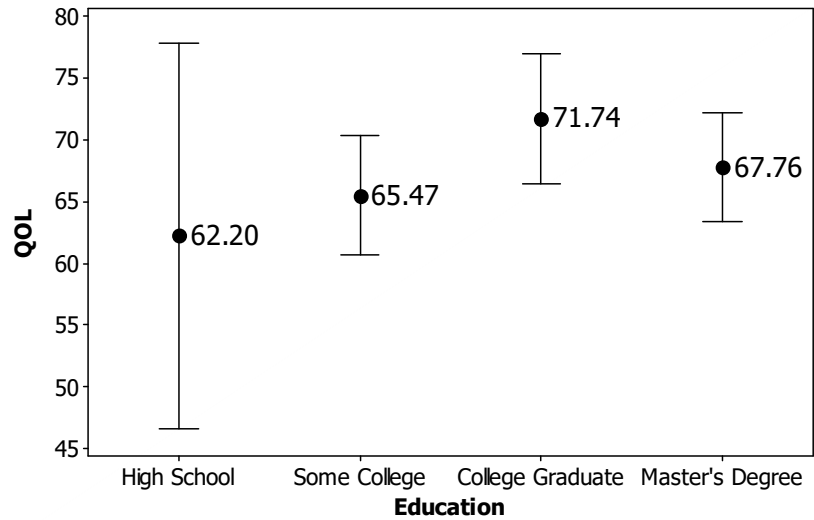


Figure 5.3. Mean scores \pm 95% CI for QOL vs. Education

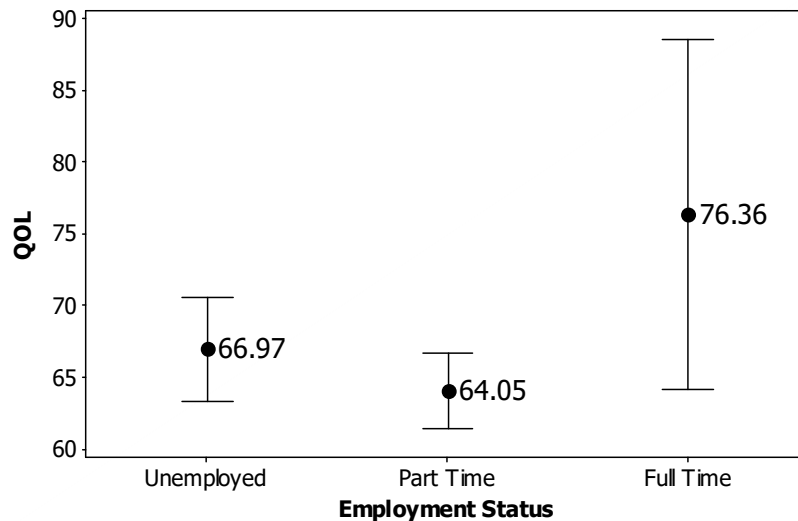


Figure 5.4. Mean scores \pm 95% CI for QOL vs. Employment Status

There was no overlap in the 95% CI (in Figure 5.5) as it relates to QOL of participants with a combined presentation of ADHD ($M = 64.49$.) was significantly lower than those who were predominantly inattentive ($M = 74.72$) or predominantly hyperactive ($M = 81.91$).

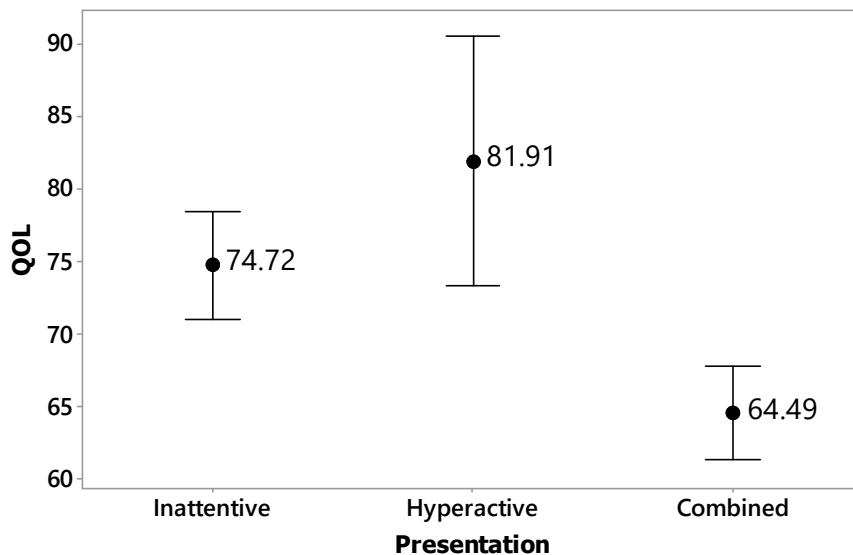


Figure 5.5. Mean scores \pm 95% CI for QOL vs. Presentation

The scores for *Anxiety* ($M = 3.96$, $SD = 4.00$) ranged widely from 1 to 5, with a skewed frequency distribution histogram, having a mode at a score of 4 on the right hand side (see Figure 5.6). The scores for *Depression* also ranged widely from 1 to 5 ($M = 3.02$, $SD = 1.06$), and were normally distributed, reflected by the approximately bell-shaped frequency distribution, with a mode at a score of 3.0 (see Figure 5.7). *Perceived Social Support* was reliably measured using 4 items (Cronbach's alpha = .658). The scores for Perceived Social Support ranged widely from 2 to 9 ($M = 5.86$, $SD = 1.67$) and were slightly skewed, indicated by the bell-shaped frequency distribution (see Figure 5.8) with a mode at 7 on the right hand side.

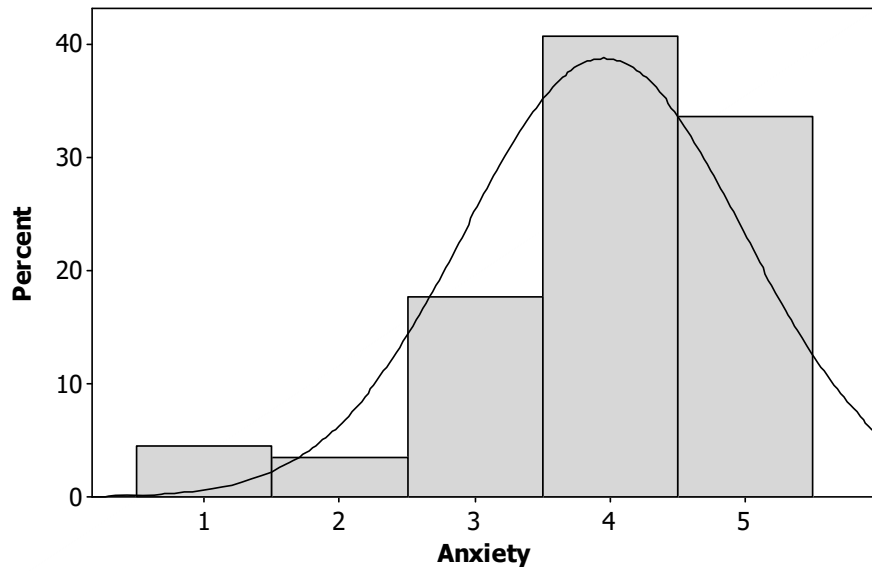


Figure 5.6. Frequency distribution of scores for Anxiety

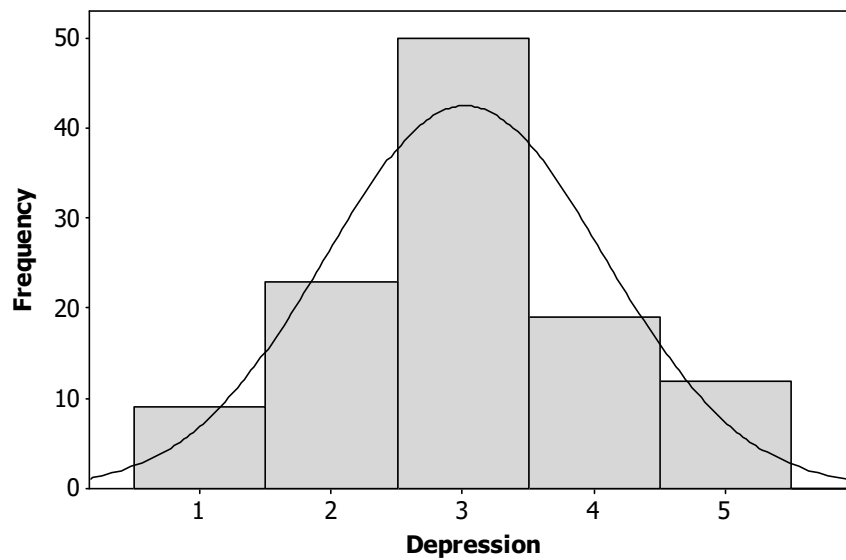


Figure 5.7. Frequency distribution of scores for Depression

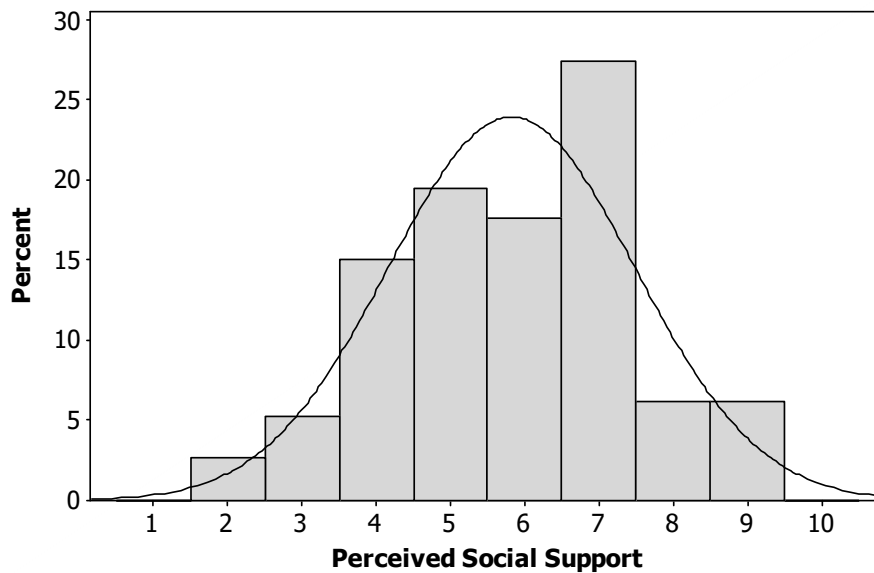


Figure 5.8. Frequency distribution of scores for Perceived Social Support

Comparison of Means between the Paper-and-Pencil and Online Responses

Because the data in this study were collected in two different ways (i.e., by mail and via web-page), it was important to ascertain whether significant differences existed between the two subsets of data. In order to determine whether there were any significant differences between the respondents who completed the questionnaire online and those who completed paper-and-pencil questionnaires, a series of independent samples t-tests were conducted comparing the means for the two groups on the independent and dependent variables. There were no significant differences at the alpha level of .05. The results of the t- tests are presented in Table 5.5.

Table 5.5. Independent Samples t-Test Comparison of Means between the Paper-and-Pencil and E-mailed Responses

| Measures | <u>Mean Difference</u> | <u>t</u> | <u>df</u> | <u>α</u> |
|----------|------------------------|----------|-----------|----------|
| LSS | 1.01 | 0.35 | 111 | 0.726 |
| AAQOL-GH | 0.34 | 0.52 | 111 | 0.605 |
| Anx. | 0.70 | 0.57 | 111 | 0.567 |
| ES | 0.04 | 0.15 | 111 | 0.878 |
| Dep. | -0.14 | -0.39 | 111 | 0.701 |
| SS | 0.20 | 0.43 | 111 | 0.665 |

Note: LSS = Life Situation Survey. AAQoL = Adult ADHD Quality of Life. GH = General Health. Anx. = Anxiety. ES = Employment Status. Dep. = Depression. SS = Social Support.

Testing of Hypotheses

The research hypotheses tested in this study were:

- H1: Presentation is a significant predictor of QOL in adults with ADHD;
- H2: Employment Status is a significant predictor of QOL in adults with ADHD;
- H3: Anxiety is a significant predictor of QOL in adults with ADHD;
- H4: Depression is a significant predictor of QOL in adults with ADHD;
- H5: Perceived Social Support is a significant predictor of QOL in adults with ADHD.
- H6: Gender is a significant predictor of QOL in adults with ADHD
- H7: Highest level of education is a significant predictor of QOL in adults with ADHD

The results of multiple linear regression analysis to test these hypotheses are presented in Table 5.6. The regression model was a significant fit to the data, indicated by adjusted $R^2 = .564$ ($F(7, 109) = 18.88, p < .001$). Consequently, over 50% of the variance in QOL was predicted by the model, corresponding to a moderately large effect size.

Table 5.6. Multiple Linear Regression Model to Predict QOL

| Predictor | Unstandardized | Standardized | <i>t</i> | <i>p</i> | VIF |
|----------------------------|----------------|--------------|----------|----------|-------|
| | Coefficient | Coefficient | | | |
| | B | β | | | |
| Constant | 58.019 | | 8.300 | <.001* | |
| Presentation of ADHD | -3.844 | -0.202 | -2.747 | .007* | 1.269 |
| Employment status | 4.385 | 0.220 | 3.154 | .002* | 1.140 |
| Anxiety | -5.876 | -.418 | -5.104 | <.001* | 1.572 |
| Depression | -.586 | -.041 | -0.548 | .585 | 1.336 |
| Perceived Social Support | 5.454 | .636 | 9.085 | <.001* | 1.149 |
| Gender | -.077 | -.002 | -0.027 | .979 | 1.096 |
| Highest level of education | 1.531 | .094 | 1.385 | .169 | 1.073 |

Note: * Significant predictor of QOL ($p < .05$)

The multiple linear model provided the statistical evidence at the .05 level of significance to support the following hypotheses (using the standardized regression coefficients (β), which accounted for the different measurement scales of the predictor variables, implying that the values could be directly compared): H1: Presentation is a significant negative predictor of QOL in adults with ADHD ($\beta = -0.202$, $t = -2.747$, $p = .007$); H2: Employment status is a significant positive predictor of QOL in adults with ADHD ($\beta = 0.220$, $t = 3.154$, $p = .002$); H3: Anxiety is a significant predictor of QOL in adults with ADHD ($\beta = -.418$, $t = -5.104$, $p = .001$); H5: Perceived Social Support is a significant positive predictor of QOL in adults with ADHD ($\beta = .636$, $t = 9.085$, $p < .001$). The largest standardized regression coefficient was for Perceived Social Support ($\beta = .636$) followed by Anxiety ($\beta = -.418$) implying that Perceived Social Support and Anxiety were the strongest and most important predictors of QOL. Employment status ($\beta = .220$) and Presentation ($\beta = -.202$) were less important and weaker predictors of QOL.

The statistical evidence did not support H4, H6, or H7. The p -value $> .05$ indicated that Depression was not a significant predictor of QOL in adults with ADHD ($\beta = -.041$, $t = -0.548$, $p = .585$). Also, gender was not a significant predictor, indicated by $p > .05$ for the regression coefficient ($\beta = -.002$, $t = -.027$, $p = .979$). Furthermore, highest level of education did not predict QOL ($\beta = .094$, $t = 1.385$, $p = .169$).

The unstandardized regression coefficients (b) using the measurement scales of the variables, predicted that the QOL of the participants decreased significantly (by - 3.844) for every one unit increase in the presentation level of ADHD (where 1 = predominantly inattentive; 2 = predominantly hyperactive-impulsive; 3 = combined). The negative sign indicates that participants with the combined type of ADHD reported the poorest QOL, whereas participants with the predominantly inattentive type of ADHD reported the best QOL. The negative regression coefficient is reflected in Figure 5.9 displaying a downward sloping line, predicting a linear decline in QOL with respect to the three levels of ADHD (between 1 = inattentive and 3 = combined).

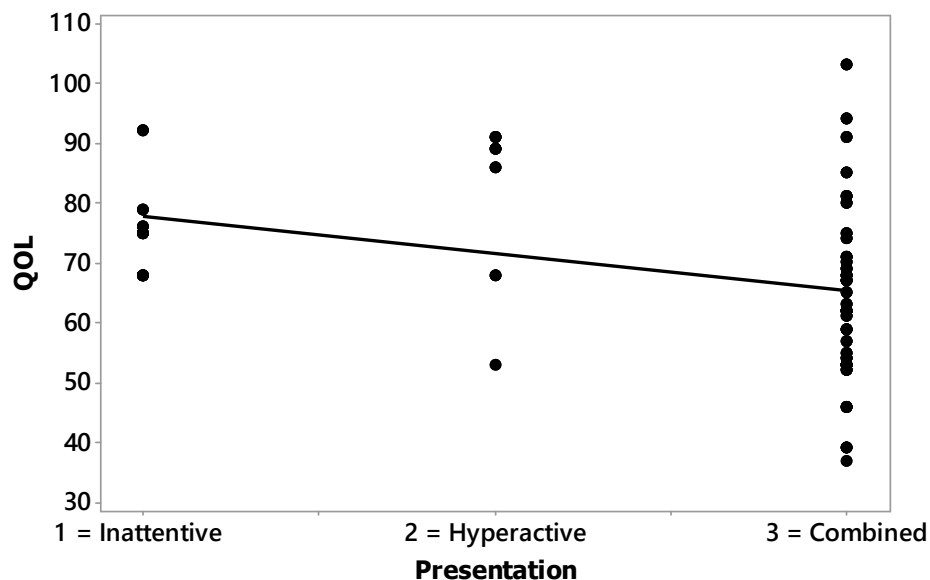


Figure 5.9. Relationship between QOL and Presentation of ADHD

The model predicted that QOL increased significantly (by +4.385) for every one unit increase in the level of employment status (where 1 = currently unemployed; 2 = employed part time; 3 = employed full time). The positive sign of the regression coefficient indicates that participants who were employed full time reported the best

QOL, while those who were unemployed reported the poorest QOL. The positive regression coefficient is reflected in Figure 5.10, displaying an upward sloping line, predicting an increase in QOL with respect to the three levels of employment status (between 1 = currently unemployed and 3 = employed full time).

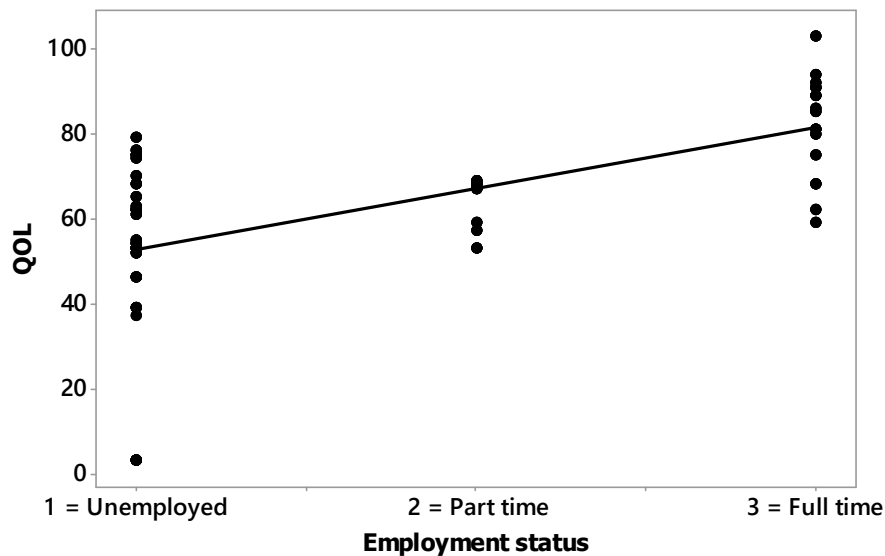


Figure 5.10. Relationship between QOL and Employment status

The model predicted that QOL decreased (by -5.876) for every one unit increase in Anxiety. The negative sign indicates that the participants with the highest level of anxiety reported the poorest QOL, while those with the lowest level of anxiety reported the best QOL. The negative regression coefficient is reflected in Figure 5.11, displaying a downward sloping line, corresponding to the decrease in QOL with respect to increasing levels of anxiety from 1 to 5.

The model predicted that QOL increased (by $+6.36$) for every one unit increase in Perceived Social Support. The positive sign indicated that the participants with the highest level of social support reported the best QOL, while those with the lowest level of social support reported the poorest QOL. The positive regression coefficient is reflected

in Figure 5.12, displaying an upward sloping line, predicting a linear increase in QOL with respect to increasing levels of social support (between 3 and 9).

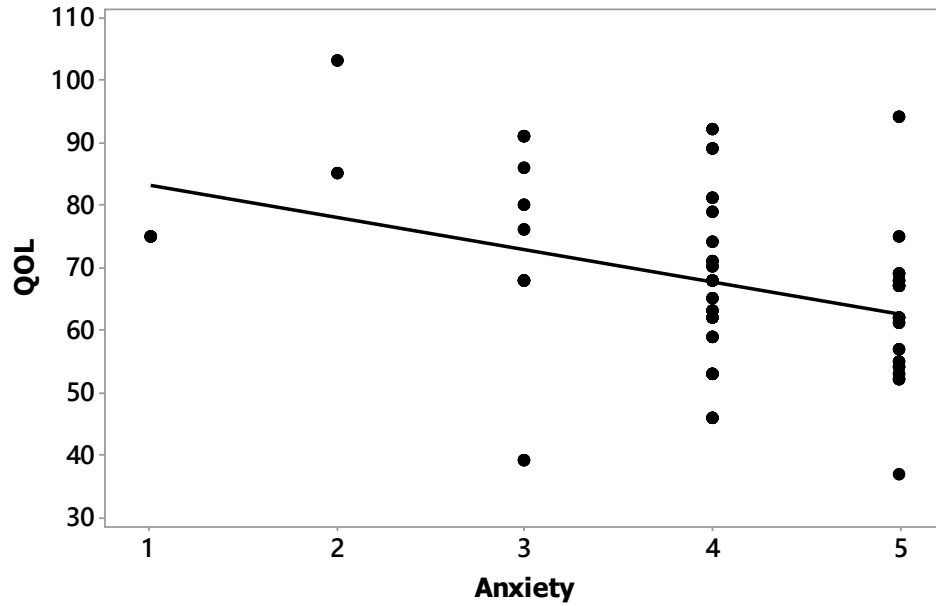


Figure 5.11. Relationship between QOL and Anxiety

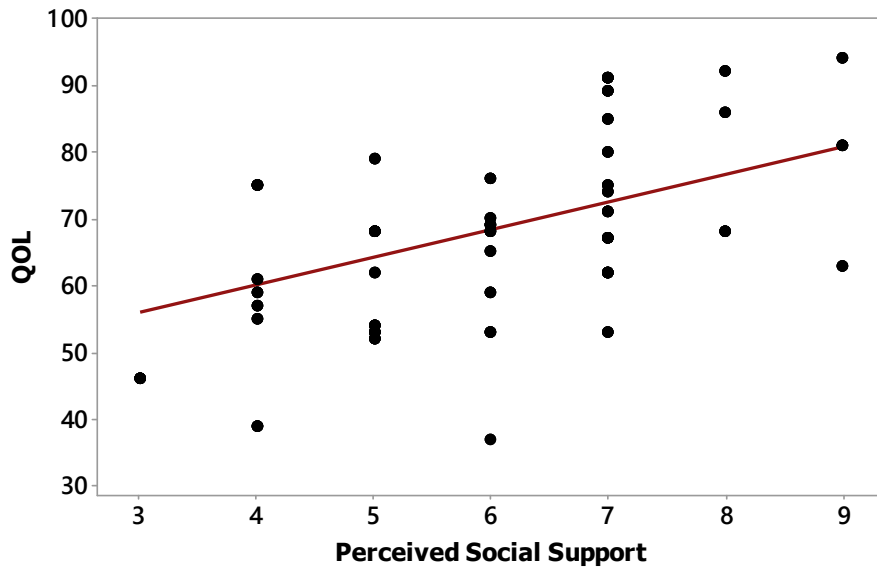


Figure 5.12. Relationship between QOL and Perceived Social Support

Testing of Assumptions

The model defined in Table 5.5 was assumed to be valid because the data did not violate the assumptions of multiple linear regression. The predictor variables were not multicollinear, indicated by the low values of the variance inflation factor statistics in Table 5.5 (VIF = 1.07 to 1.57). The standardized residuals were within the expected normal limits (± 3), and were randomly distributed with respect to the predicted values, as illustrated by the residual plot in Figure 5.13. The standardized residuals were normally distributed, reflected by the bell-shaped curve in Figure 5.14, and the normality test statistics (Kolmogorov-Smirnov $Z = 1.23, p = .096$). Furthermore, the inferences of the multiple linear regression analysis were not compromised by outliers, indicated by the maximum Mahalanobis $D^2 = 11.55, p = .040$.

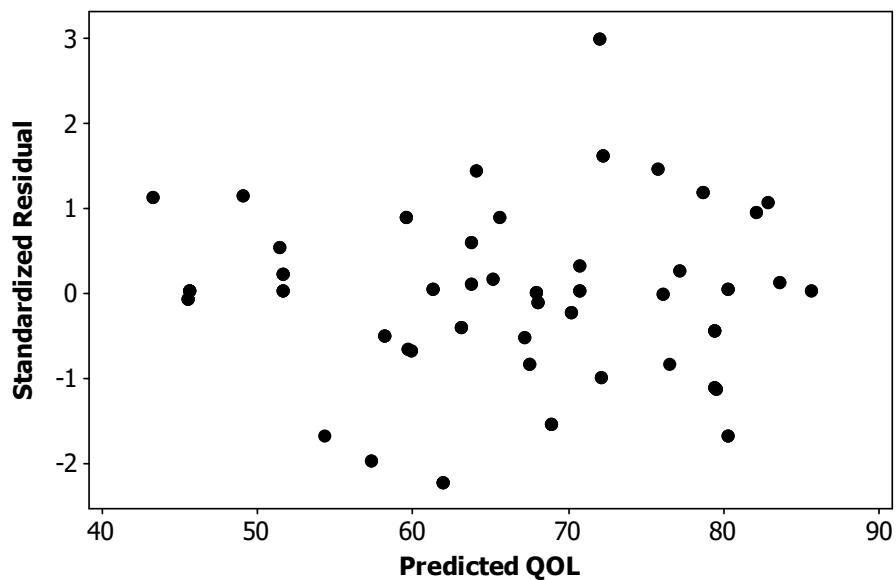


Figure 5.13. Distribution of standardized residuals vs. predicted QOL

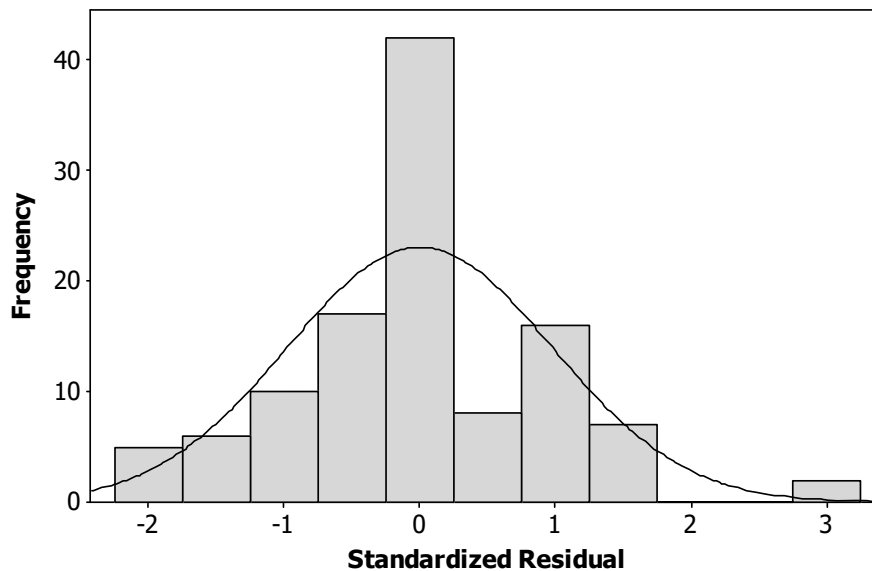


Figure 5.14. Normal distribution of standardized residuals

Qualitative Study

The aim of the qualitative study was to address Research Question 2: What experiential aspects of ADHD do adults feel are important to the quality of their lives? Research Question 3: How does ADHD impact their psychological, vocational, and social domains? and Research Question 4: Why does ADHD impact their psychological, vocational, and social domains? The results of the content analysis of the interview transcripts are presented in 10 sections. Each section provides evidence to classify each of the 10 primary themes, based on the aggregated significant statements of the participants, including: (1) Quality of Life; (2) Limited Achievement; (3) On the Right Track; (4) Anxiety; (5) Depression; (6) Social Support; (7) Relationships; (8) Education; (9) Employment; and (10) Medication.

Primary Theme 1: Quality of Life

The significant statements and sub-themes classified in Primary Theme 1: Quality of Life (QOL), are listed in Table 5.7. The significant statements were extracted from the responses to two interview questions “How would you rate the overall quality of your life

right now?”, and “How much do you agree with the following statement: Over the past few weeks, I’ve had more good days than bad days”.

Eighteen participants provided responses that were categorized in the sub-theme “Good”. The reasons given for experiencing a good QOL varied, including education, employment, health, and social support (e.g., “I realize that I am successful (have a Masters degree, a career, physically fit)”); “I have a greatly varied job, working with entertaining people”; “I live with fellow ADHD people in a decent flat”; “I have a very high level of QOL and fight feeling guilty when thinking about all the poverty and hunger and violence in the world”; “I’m happy with all aspects of my life, husband, kids, family, financial”; and “Physical safety and security is fine”.

Table 5.7. Significant Statements Classified in Primary Theme 1: Quality of Life

| Significant statement | Sub- theme |
|--|------------|
| I realize that I am successful (have a Masters degree, a career, physically fit) | 1. Good |
| Pretty decent. | 1. Good |
| I have a greatly varied job, working with entertaining people. I live with fellow ADHD people in a decent flat. | 1. Good |
| At this moment, I am content. | 1. Good |
| It is alright. | 1. Good |
| Pretty good, with some expected challenges. | 1. Good |
| Ok. | 1. Good |
| Very good | 1. Good |
| I have a very high level of quality of life and fight feeling guilty when thinking about all the poverty and hunger and violence in the world. | 1. Good |
| I'm happy with all aspects of my life, husband, kids, family, financial. But the ADHD symptoms are affecting my ability to function. | 1. Good |
| Overall quality is good, when I look closer and evaluate details I realize its full of small things that don't work. | 1. Good |
| Physical safety and security is fine. | 1. Good |
| My physical health is fair - I am sedentary and could benefit from exercise and regular sleep. | 1. Good |
| Overall everyone around me is happy, I am healthy, life is good. | 1. Good |
| Good | 1. Good |
| On paper: I have a good life. | 1. Good |
| I have not had anything horrible happen to keep me down. | 1. Good |

Table 5.7. Significant Statements Classified in Primary Theme 1: Quality of Life (continued)

| | |
|---|-------------|
| Pretty good | 1. Good |
| Average | 2. Average |
| Average, it could be better | 2. Average |
| Overall probably a 2 on a scale from 1-10 | 3. Poor |
| Fairly lousy. I feel misunderstood at home and on high-alert at work. Interestingly enough, I teach at a school for children with learning differences like ADHD, dyslexia, etc. | 3. Poor |
| Below average | 3. Poor |
| Poor | 3. Poor |
| Below average | 3. Poor |
| My mental, physical, emotional, and social health is not very good right now. | 3. Poor |
| I would rate it low. | 3. Poor |
| Bad days are when I walk around in circles unable to accomplish things I want to in my home. I can be up at seven and go to bed at 10 and not get a darn thing done even though I have been struggling with it all day. | 3. Poor |
| Right now, it feels pretty poor. Normally, I would say it is average. | 4. Variable |
| It is extremely variable. | 4. Variable |
| In the middle. I have been better and I have been worse. Sounds vague, but it's very true to me right now. | 4. Variable |
| Neither good nor bad. I am glad to be here, but life is a daily struggle. | 4. Variable |
| There's good and bad all rolled up into one. It's crazy how but it completely is. It's why my brain feels like it's about to spontaneously combust or fry out. How do you take all these thoughts, ideas, opinions (not my own) and make sense of this crazy shit! How do you take that and then try to add your own crazy twist, oh and then I like to get a little too theological or esoteric and really bend my mind. | 4. Variable |
| There are beautiful parts and awful parts to every week. Nothing is middle-ground or baseline, though. It's one end of the good/bad spectrum or both at the same time. It's always intense. | 4. Variable |
| My awareness has really only developed over the past few weeks. The 30+ years leading up to the past few weeks is another story. | 4. Variable |
| There are always bad moments. Bad moments don't equal a bad life or a bad day! | 4. Variable |
| It's difficult to measure the good and the bad in days for me. At my pace, things change by the hour. In fact, I likely have comorbid mood dysregulation for which I am being medicated. However, over the past few weeks, I have had more good hours than bad ones. I get out a lot, and try to reward myself for small successes. That keeps me upbeat. | 4. Variable |

Table 5.7. Significant Statements Classified in Primary Theme 1: Quality of Life (continued)

| | |
|---|-------------|
| There are beautiful parts and awful parts to every week. Nothing is middle-ground or baseline, though. It's one end of the good/bad spectrum or both at the same time. It's always intense. | 4. Variable |
| Up and down levels of self-esteem. | 4. Variable |

Two participants stated that their QOL was “average or normal,” but with no explanatory reasons. Eight participants reported that their QOL was poor, for a variety of reasons, including “ I feel misunderstood at home and on high-alert at work”; “ My mental, physical, emotional, and social health is not very good right now”; “Bad days are when I walk around in circles unable to accomplish things I want to in my home. I can be up at seven and go to bed at 10 and not get a darn thing done even though I have been struggling with it all day”.

Eleven participants reported that their QOL was variable. Significant statements exemplifying their fluctuations in QOL included “I have been better and I have been worse. Sounds vague, but it's very true to me right now”; “There’s good and bad all rolled up into one”; “There are beautiful parts and awful parts to every week”; “Nothing is middle-ground or baseline, though. It's one end of the good/bad spectrum or both at the same time”; “Over the past few weeks, I have had more good hours than bad ones”; and “At my pace, things change by the hour”.

Primary Theme 2: Limited Achievement

The significant statements and sub-themes classified in Primary Theme 2: Limited Achievement, are listed in Table 5.8. The significant statements were extracted mainly from the responses to the interview questions “Has ADHD and its symptoms limited your ability to achieve what you want in life?”

Fifteen participants believed ADHD limited their achievement, in many different ways, suggested by significant statements including “Limited, in many different aspect of my life. It really controls me”; “Sometimes, it is difficult for me to know what is normal.” “Did I not understand something said in a meeting because that the concept wasn't explained clearly, or because my brain couldn't process it?”; “I feel as if ADHD has

affected a lot in my life that maybe if I didn't have outcome would be different”; and “Every single day that passes and I still don't feel I'm where I want to be overall, is pretty much a bad day”.

Four participants talked about the struggles they had to achieve what they wanted in life (e.g., “I always feel like I am struggling”; “I feel like my ADHD has caused a lot of struggles”; and “It's made it a struggle, but it hasn't really limited it”). Three participants suggested that ADHD had not limited their achievement, but they had to work harder to reach their goals, exemplified by “It hasn't limited but I had to work twice as hard” and “I've come this far and have done well but having ADHD has definitely made me try that much harder”.

Table 5.8. Significant Statements Classified in Primary Theme 2: Limited Achievement

| Significant statement | Sub-theme |
|---|------------|
| I believe so | 1. Limited |
| I feel as if ADHD has affected a lot in my life that maybe if I didn't have outcome would be different. | 1. Limited |
| I have a hard time weeding out 'stuff' from my house and as a result I don't entertain as much as I might. | 1. Limited |
| I know deep down I can do more like I used to but something is off. | 1. Limited |
| I think so | 1. Limited |
| It does contribute to not doing what I want to accomplish | 1. Limited |
| Limited | 1. Limited |
| Limited in my personal life. | 1. Limited |
| Limited, but I have been working on it and improving since I was first diagnosed in 2004. | 1. Limited |
| Limited, in many different aspect of my life. It really controls me. | 1. Limited |
| Limited, prior to medication it was horrible and, due to my age and lack of awareness in the 1970's/80's I was an adult diagnosis. | 1. Limited |
| Limited. | 1. Limited |
| Something has certainly limited my ability to achieve what I want in life. | 1. Limited |
| Sometimes, it is difficult for me to know what is "normal." Did I not understand something said in a meeting because the concept wasn't explained clearly, or because my brain couldn't process it? How many distinct projects should I be able to manage at once? How far in advance should I be able to plan? | 1. Limited |

Table 5.8. Significant Statements Classified in Primary Theme 2: Limited Achievement (continued)

| | |
|--|----------------|
| At times I have struggled with sustaining my motivation to continue and finish tasks and projects. I love to plan but even getting started can become an issue at times. | 2. Struggle |
| I always feel like I am struggling | 2. Struggle |
| I feel like my ADHD has caused a lot of struggles. I also am in a lot of debt, have a low credit score, etc. | 2. Struggle |
| It's made it a struggle, but it hasn't really limited it. | 2. Struggle |
| If I have a want, my hyper focus allows me to achieve most of what I want in life. It just can make getting what I need an issue. | 3. Work harder |
| It hasn't limited but I had to work twice as hard. | 3. Work harder |
| I've come this far and have done well but having ADHD has definitely made me try that much harder. | 3. Work harder |

Primary Theme 3: On the Right Track

Significant statements and sub-themes classified in Primary Theme 3: On the Right Track, are listed in Table 5.9. The significant statements were extracted mainly from the responses to the interview question” Do you feel you are on the right track with your life? Please explain how and why?”

Table 5.9. Significant Statements Classified in Primary Theme 3: “On the Right Track”

| Significant statement | Secondary theme |
|--|-----------------|
| No. Not living up to my potential or doing enough to help others. | 1. No |
| No | 1. No |
| No. I'd like to find a program that would help me better understand what I'm actually good at and the types of careers that would suit me. Something to help me with my day-to-day. I'd feel more fulfilled if I could contribute to an organization without having to constantly be outside of my comfort zones. I need more work/life balance. I need to stay more on track of personal and household matters. | 1. No |
| I think I am on the "ok " track. I want something else, but I'm not sure what it is. Maybe this is the right track to get there, I am not sure. | 2. Unsure |
| I am pretty driven to overcome my disabilities and function to the best of my abilities. I may not be living the dream, but I have rarely | 3. Improving |

Table 5.9. Significant Statements Classified in Primary Theme 3: “On the Right Track” (continued)

| | |
|---|--------------------|
| sat on the siding without finding a way back to the main rails to progress on my life's journey | |
| Somewhat. I am better off than most 27 year olds but I could definitely be doing better | 3. Improving |
| I still struggle, but it is getting easier with time and practice of mindfulness. | 3. Improving |
| I took a step back in the last year, but I am back on track and I feel like I am going to be much better by the end of 2015. | 3. Improving |
| Today, Limited. At age 37 I'm finally beginning to understand. Because this is 100% my truth, I have a confidence about ADHD like nothing I've ever experienced. That alone is a great feeling. I am currently taking steps to improve my life, now that I have been pointed in the right direction. I hope to find a way to help others like me in the future. I feel a very strong need to do that. | 3. Improving |
| I am on track! (the very beginning of the track, but I'm on it!) | 3. Improving |
| I still believe I am capable of achieving my goals of becoming a physician. | 4. Achieving goals |
| I am working toward a more relaxed retirement. | 4. Achieving goals |
| I've done well with school and reviews are great. I've definitely had some bumps in organization of demands, but have worked through them | 4. Achieving goals |

Three participants reported they were not on the right track, indicated by “No”; “Not living up to my potential or doing enough to help others”; and “I need more work/life balance;” “I need to stay more on track of personal and household matters”. One participant was unsure, stating that “I want something else, but I'm not sure what it is. Maybe this is the right track to get there, I am not sure”.

Six participants reported that their attempts to get on the right track were improving, suggested by statements such as “I may not be living the dream, but I have rarely sat on the siding without finding a way back to the main rails to progress on my life's journey;” “I am better off than most 27 year olds but I could definitely be doing better;” “I still struggle, but it is getting easier with time and practice of mindfulness;” “ I

took a step back in the last year, but I am back on track and I feel like I am going to be much better by the end of 2015; and “ I am currently taking steps to improve my life”.

Four participants reported that they were on the right track, indicated by “I still believe I am capable of achieving my goals of becoming a physician;” ”I am working toward a more relaxed retirement;” and “I've done well with school and reviews are great;” and “I've definitely had some bumps in organization of demands, but have worked through them.”

Primary Theme 4: Anxiety

The significant statements classified in Primary Theme 4: Anxiety is listed in Table 5.10. Anxiety was reported as a symptom of ADHD in response to various interview questions, generally associated with other issues including (a) fear and disengagement (e.g., “I have had trouble making the leap for many things in my life, due to anxiety, fear, and general disengagement with the tasks and environments that I am in;” (b) inattention and parenting (e.g., “persistent anxiety, inattention, and parenting a rebellious teenager make things incredibly challenging on a daily basis;” (c) lack of sleep (e.g., “I want to be able to be able to relax or take that mid afternoon nap;” “I worry I won't sleep;” and (d) worrying about work and finances (e.g., “I'm super-stressed about work deadlines;” “I am worry about my future i.e. job, financially;” “I've had more bad days due to pressures of trying to manage my ranch from far away and financial pressures of trying to fix problems of rental house.” Anxiety was also associated with depression (e.g. “I am very depressed and have high levels of anxiety;” and “Anxious! Generally unhappy, unsatisfied, and guilt ridden”).

Table 5.10. Significant Statements Classified in Primary Theme 4: Anxiety

| Significant statement | Sub-theme |
|---|------------------------------------|
| Generally, I have had trouble making the leap for many things in my life, due to anxiety, fear, and general disengagement with the tasks and environments that I am in. I have always felt like I was different, obviously, that I didn't fit in, so I have often retreated mentally and emotionally in my own head. | 1. Anxiety, fear, disengagement |
| At both ends of the spectrum. All of my basic needs are taken care of and I have a great network of people around me, but persistent anxiety, inattention, and parenting a rebellious teenager make things incredibly challenging on a daily basis. There's a lot of struggle with no good solutions to resolving that struggle. | 1. Anxiety, inattention, parenting |
| Very tired of my internal mind constantly on the go. I want to be able to be able to relax or take that mid afternoon nap. | 2. Anxiety, lack of sleep |
| Just started treatment and it helps a lot but struggle with afternoon dosing because I worry I won't sleep | 2. Anxiety, lack of sleep |
| I'm super-stressed about work deadlines - even though these are totally self-inflicted. I had enough time to do the work and I avoided it, so now I am in a constant state of stress and panic. So I continue to avoid the anxiety and do things like participating in ADHD studies when I should be finishing my projects, which makes me feel worse about myself. | 3. Worry about work |
| I am still finding it hard to manage my ADHD symptoms and worry about my future i.e. job, financially | 3. Worry about work, finances |
| I've had more bad days due to pressures of trying to manage my ranch from far away and financial pressures of trying to fix problems of rental house. | 3. Worry about work, finances |
| My mental health is poor. I am very depressed and have high levels of anxiety related to my academic performance and career outlook - this is compounded by my ADHD. | 4. Anxiety, depression |
| Anxious. Generally unhappy, unsatisfied, and guilt ridden over everyday things (mostly things I don't do). | 4. Anxiety, depression |

Primary Theme 5: Depression

The significant statements classified in Theme 5: Depression is listed in Table 5.11, and was reported a symptom of ADHD by eight participants in response to various interview questions. Depression was manifested by statements such as “I'm not happy”; “I'm still unhappy”; and “There is minimal contentment”. One participant stated that he was “Still balancing the co-morbid relationship of depression and ADHD”. Another described the “feeling of the very extremely highs and the very quick face plant into

extreme lows, I'm really afraid that feeling will never go away. The thought of that makes me want to kill myself, but I absolutely will not". Three participants qualified the underlying reasons for their depression, including "all this extra effort to meet standards can be overwhelming"; "My job is unfulfilling and I have a hard time keeping up at home"; and "I wish I had received help for my ADHD prior to becoming depressed by my learning issues".

Table 5.11. *Significant Statements Classified in Primary Theme 5: Depression*

| Significant statement | Secondary theme |
|---|------------------------|
| I'm not happy | 1. Not happy |
| I have no "reason" to complain; yet I'm still not happy. | 1. Not happy |
| Internally: There is minimal contentment. | 2. Minimal contentment |
| Still balancing the co-morbid relationship of depression and ADHD | 3. Comorbidity |
| The only thing that really bothers me is the feeling of the very extremely highs and the very quick face plant into extreme lows, I'm really afraid that feeling will never go away. The thought of that makes me want to kill myself (but I absolutely will not). I could take anything in my life so long as it was so drastic and quick. Even though, I always have hope even when I'm depressed. Just hold on I tell myself, you always get through it. | 4. Highs and lows |
| I need to be careful as all this extra effort to meet standards can be overwhelming and could potentially lead to exhaustion or depression. | 5. Extra effort |
| Not good. I'm overall ok, but I'm unhappy. My job is unfulfilling and I have a hard time keeping up at home. | 5. Job, home |
| I wish I had received help for my ADHD prior to becoming depressed by my learning issues so that I would not have experienced a sense of learned helplessness in my younger years. | 5. Learning issues |

Primary Theme 6: Social Support

The significant statements and sub-themes classified in Primary Theme 6, Social Support, are listed in Table 5.12. The levels of social support reported by the participants were variable. One participant reported that he received good levels of social support from various sources, stating "I would not be where I am today without the support of dedicated parents, teachers, counselors, doctors and my wife". One participants stated that he was "On the right track with loving family" and other that "I'm married to a very

loving and understanding wife and have two great kids”. Three participants reported the good levels of support from their partners (e.g., “Having an understanding partner helps a lot”; “I’ve had success due to my husband”; and “At home my husband washes my clothes, cleans the house and completes most domestic tasks because I forget to do them or I’m overwhelmed”. Conversely, other participants reported poor levels of social support from their families, exemplified by “My family (partner or lack thereof and child) seem to want to pull me away from my career and take me elsewhere”; “Not having support at home and living 3000+ miles away from my family makes life difficult”; and “Lack of support at home has been a big issue”. In the working environment, one participant reported unsupportive co-workers, indicated by “I have other doctors I work with spread rumors about me and how incompetent I am” whereas another participant reported good support at work, stating “My boss is incredibly understanding and the workplace has a motivating environment”.

Table 5.12. Significant Statements Classified in Primary Theme 6: Social Support

| Significant statement | Sub-theme |
|---|--|
| I have a great wife...kids, a job, and participate on the board of my local community. I would not be where I am today without the support of dedicated parents, teachers, counselors, doctors and my wife, You need to be inspired to overcome the obstacles in life. I know I am very fortunate. | 1. Family, teachers, doctors, counselors |
| On the right track with loving family. | 1. Family |
| I feel like I am finally in a career that I could do long term but my family (partner or lack thereof and child) seem to want to pull me away from my career and take me elsewhere. | 1. Family |
| Having ADHD makes it feel like there is no track- that you're just wandering here and there. I think, after many years, I am finally on a track, but it's still hard to say whether or not it is the right one. Not having support at home and living 3000+ miles away from my family makes life difficult. | 1. Family |
| Lack of support at home has been a big issue | 1. Family |
| I'm married to a very loving and understanding wife and have two great kids. | 1 Family |
| Limited because I am slowly taking care of my symptoms and getting motor a hang of things. Having an understanding partner helps a lot. | 2. Partner |
| I work in a medical field and I've had success due to my husband who is very well respected. | 2. Partner |

Table 5.12. Significant Statements Classified in Primary Theme 6: Social Support (continued)

| | |
|---|---------------|
| At home my husband washes my clothes, cleans the house and completes most domestic tasks because I forget to do them or I'm overwhelmed. I do not feel like a normal functional adult. I am afraid to have children because my husband already has one.... Me | 2. Partner |
| Everyday I spend a large amount of time going over what I've done for the day to rule out mistakes and make sure I've done everything correctly. I have other doctors I work with spread rumors about me and how incompetent I am. | 3. Co-workers |
| My boss incredibly understands and the workplace has a motivating environment. | 4. Boss |

Primary Theme 7: Social Relationships

The significant statements and sub-themes classified in Primary Theme 7, Social Relationships, are listed in Table 5.13. Four participants talked about their friendships. Three were very concerned about problems making friends, suggested by “I have difficulties maintaining friendships”; “I no longer have friends and because I don't drive, people have stopped calling me”; and “I cannot seem to convince myself that I should make friends, for fear that I will embarrass or offend them”. One participant, however, was able to maintain friendships, indicated by “I try to balance time spent helping out elder friends.”

Three participants expressed concern about troubled relationships with their partners (e.g., “I am trying to hold on to an engagement that has already been broken off once”; “I feel that my own hyper arousal/hyper focus as well as my scattered brain will impede the progression of my relationship”; and “We have no directive as to where we are going as a couple let alone as parents and I feel like if I had been a better person, and could tolerate and handle myself this would not have happened in the first place”).

Three participants explained how the symptoms of ADHD affected their relationships, including “I couldn't stay anywhere too long. I couldn't stay in a relationship too long”; “my impulsiveness and compulsiveness comes from my ADHD and that has definitely caused my problems with my relationships throughout my life”; and “ADHD has made it difficult for me to "keep up" with others on their terms”.

Table 5.13. Significant Statements Classified in Primary Theme 7: Relationships

| Significant statement | Secondary theme |
|---|----------------------------------|
| I have difficulties maintaining friendships. | 1. Friends |
| I no longer have friends and because I don't drive people have stopped calling me. I would give anything to be able to call someone and go shopping or talk about a book I read...I can't even do that because by the time I have read a page I totally forget what I read and I have to start again. | 1. Friends |
| I cannot seem to convince myself that I should make friends, for fear that I will embarrass or offend them. I do have hope, though. I don't know why, but I do. | 1. Friends |
| I try to balance time spent helping out elder friends, my garden, my three cats. | 1. Friends |
| My relationships with my family have been strained for as long as I can remember. | 2. Family |
| I have a positive partner, a good relationship with my child | 2. Family |
| I have had two important LTRs end suddenly and badly, and I didn't see the signs coming. I am trying to hold on to an engagement that has already been broken off once. | 3. Partner |
| However, I feel that my own hyper arousal/hyper focus as well as my scattered brain will impede the progression of my relationship -which has been troubled. And when I'm upset in my personal life, my professional life suffers. | 3. Partner |
| I just found out he cheated on me almost a year ago... and we have no directive as to where we are going as a couple let alone as parents and I feel like if I had been a better person, and could tolerate and handle myself this would not have happened in the first place. | 3. Partner |
| I couldn't stay anywhere too long. I couldn't stay in a relationship too long. | 4. Could not stay too long |
| I'm not sure but I've been told that my impulsiveness and compulsiveness comes from my ADHD and that has definitely caused my problems with my relationships throughout my life. | 4. Impulsiveness, compulsiveness |
| ADHD has made it difficult for me to "keep up" with others on their terms, My most lacking achievements have been social. My inattention makes me seem careless and even stupid. | 4. Inattention |
| I see my place as being a positive force in the lives of my family and friends as well as the world in general, doing what I can when I can. | 5. Positive force |

Primary Theme 8: Education

The significant statements and sub-themes classified in Primary Theme 8, Education, are listed in Table 5.14. Dropping out of school and/or college was associated with ADHD (e.g., “I dropped out of high school...then dropped out of university”; “...dropped out of college”; “I have stalled finishing my B.A. degree”; and “I could not deal with university”). The reported symptoms of ADHD that made studying difficult included “I was so exhausted”; “It depended on how engaged I was with the class”; “It is severely impacting my ability to self-motivate”.

Difficulties in pursuing a good education resulted in missed opportunities (e.g. “I think I would been able to pursue further education and write longer without ADHD”; and “I missed a lot of opportunities”). ADHD also limited employment prospects (e.g., “It’s probably impossible to find a good job with comparable pay because I don’t qualify without a college degree” and “I now have a hard time earning increases or promotions at this level since a degree is necessary at my place of employment. Despite ADHD, some participants decided to pursue further education (e.g., “I really need to go back to school in order to advance in my current career” and “I hope to obtain a higher paying job with my Masters degree.” However, one participant had doubts about this decision, stating “I now think that trying to do this is the worst possible thing I could have done to myself, but I’m too far in terms of a financial investment and I’m hoping I can see it through”.

Table 5.14. Significant Statements Classified in Primary Theme 8: Education

| Significant statement | Sub- theme |
|---|----------------|
| Dropped out of college, multiple times. Can't ever seem to get ahead. Constantly feel stuck. | 1. Dropped out |
| I didn't do well in school and dropped out of college. | 1. Dropped out |
| I have stalled finishing my B.A. degree for two years. I felt that I failed early on and just couldn't recover. | 1. Dropped out |
| I could not deal with university, despite gaining entrance to a highly competitive degree. The lectures were too distracting and so I spent my time working instead. That made exams stressful. | 1. Dropped out |

Table 5.14. Significant Statements Classified in Primary Theme 8: Education (continued)

| | |
|--|--------------------------------------|
| I never attended college. I was so exhausted with school when I completed high school, I thought I was taking a break. I was probably just scared to go into the next "unknown" phase of my life. | 2. Exhausted |
| It is severely impacting my ability to self-motivate and complete work on my PhD | 2. Lack of motivation |
| At school, I was either an A or a C student. It depended on how engaged I was with the class, because I would zone out at school and have to study everything at home. | 2. Not able to engage in class |
| I would like to become a neuropsychologist, but I am simply not able to memorize as much information as I would need to in order to achieve the necessary degree. Studying is extremely difficult for me. | 2. Not able to memorize |
| I find it very difficult to learn how to study, especially for tests. I've been talked to about the possibility of having problems with my working memory which may or may not be connected to my ADHD. | 2. Not able to memorize |
| It took me 8 years to get through undergrad because I was not diagnosed | 2. Slow progress |
| I think I would been able to pursue further education and write longer without ADHD | 3. Missed opportunities |
| I applied to graduate school (without disclosing it) a few years ago and didn't get in. I know that in order to apply again, I'll have to disclose it, and that prevents me from even applying. | 3. Missed opportunities |
| I missed a lot of opportunities | 3. Missed opportunities |
| It's probably impossible to find a good job with comparable pay because I don't qualify without a college degree. I've reached my current income level after years of promotions/increases at my same employer because I've proven myself already, but I've pretty much reached my limit without a degree. | 4. Need a degree to get better job |
| I hope to obtain a higher paying job with my Masters degree even though this is the 4th time I am starting a program, I will not quit this time. | 4. Need a degree to get better job |
| My original goal was to become a dentist, but that's out of the question now. I really need to go back to school in order to advance in my current career. | 4. Need a degree to get better job |
| I began working full-time shortly after graduating high school. I started out earning excellent pay in comparison to others in my same level. I now have a hard time earning increases or | 4. Need a degree to get a better job |

Table 5.14. Significant Statements Classified in Primary Theme 8: Education (continued)

| | |
|---|--------------------------------------|
| promotions at this level since a degree is necessary at my place of employment. | |
| If I decided to quit my job, it's probably impossible to find a good job with comparable pay because I don't qualify without a college degree. I've reached my current income level after years of promotions/increases at my same employer because I've proven myself already, but I've pretty much reached my limit without a degree. | 4. Need a degree to get a better job |
| I don't know what the heck I am doing with my life. I've always been driven, motivated, and successful when I see something I want, and I've usually gotten it. But now I don't really know what I want except to stay at home and raise kids and not have to go to work ever again. This is of course not financially feasible and highly contrary to what I am doing with my life right now: pursuing a PhD. I now think that trying to do this is the worst possible thing I could have done to myself, but I'm too far in in terms of a financial investment and I'm hoping I can see it through. | 4. Need a degree to get a better job |
| I am presently a Soldier and have been holding back from getting out of the Army. I am now very confident enough to exit the military and have started my Masters degree online I will also have strategies in place to support my family by enlistment into the reserves for two years, so that we will continue to have medical coverage while I am completing my graduate education. | 4. Need a degree to get a better job |

Primary Theme 9: Employment

The significant statements and sub-themes classified in Primary Theme 9, Employment, are listed in Table 5.15. Six participants reported that not being able to keep a job was associated with ADHD (e.g., “I’m 61 and can’t even keep a job”; “I voluntarily quit before I was fired and it went downhill from there”; “Four jobs in three years”; “I haven’t been able to find a career that satisfies me” and “I’ve left every real job I’ve had after getting bored with it, and I can’t imagine staying somewhere for more than a few years.”

The reported symptoms of ADHD that made keeping a job difficult included being disorganized (e.g., “If I was able to be more organized and have more energy I would be able to get more accomplished”); rushing (e.g., “I had a lot of issues at work. Maybe because I’m rushing things”); and fear of failure (e.g., “Every day I worry that I will fail or someone will notice a mistake I’ll make and they will fire me” and “Myself

esteem is not great because I always feel like I am failing.” One participant reported that multiple ADHD symptoms hindered their progress at work, stating “I feel that I hit more bumps and have much slower progress than most people due to difficulties with concentration/focus, poor time management skills, etc.” In contrast, three participants suggested that their ADHD did not necessarily hinder their work (e.g., “I am much more attuned to student needs and learning processes, as well as more empathetic to when they react out of frustration”; “My current work is very engaging. I have a whole range of tasks, covering photography, writing, accounting and data analysis. The variation keeps things interesting and full on”; and “My boss is incredibly understanding and the workplace has a motivating environment”).

Table 5.15. Significant Statements Classified in Primary Theme 9: Employment

| Significant statement | Sub- theme |
|--|------------------|
| I'm 61 and can't even keep a job. | Can't keep a job |
| I used to be on National Board of Director's, voted into several national organizations and now I can't remember what people's names are or if I even talked to them before, so I can no longer do my job. I worked in healthcare and because of my behavior I became a danger to my patients ...I voluntarily quit before I was fired and it went downhill from there. I want to make scrapbooks for my grandbabies and everything is sitting in a corner and I can't get started...I've become a procrastinator. | Can't keep a job |
| Four jobs in three years | Can't keep a job |
| For the most part. I have accepted a lot of my symptoms and can now work on them. I have also accepted I will never be interested in one career path | Can't keep a job |
| I'm not sure. I haven't been able to find a career that satisfies me or been able to focus on doing something to change that. | Can't keep a job |
| I can't manage to stay interested in my professional jobs for more than two years or so. I've left every real job I've had after getting bored with it, and I can't imagine staying somewhere for more than a few years. | Can't keep a job |
| I am not capable of doing things to the degree I need to in order to have a decent income. If I was able to be more organized and have more energy I would be able to get more accomplished therefore increasing my income. | Disorganized |

Table 5.15. Significant Statements Classified in Primary Theme 9: Employment (continued)

| | |
|---|---|
| I had a lot of issues at work. May be because I'm rushing things | Rushing |
| I am letting go of my paralyzing fear of failure. | Fear of failure |
| Every day I worry that I will fail or someone will notice a mistake I'll make and they will fire me | Fear of failure |
| My self-esteem is not great because I always feel like I am failing. | Fear of failure |
| I feel that I hit more bumps and have much slower progress than most people due to difficulties with concentration/focus, poor time management skills, etc. | Concentration/focus/ time management |
| I find that with my position as an educator, I am much more attuned to student needs and learning processes, as well as more empathetic to when they react out of frustration. | Attuned |
| My current work is very engaging. I have a whole range of tasks, covering photography, writing, accounting and data analysis. The variation keeps things interesting and full on. | Engaging |

Primary Theme 10: Medication

The significant statements and sub-themes classified in Primary Theme 10, Medication, are listed in Table 5.16. Three participants reported that they self-medicated with drugs, alcohol, or stimulants to counteract the symptoms of ADHD. Five participants complained about the withdrawal symptoms that they experienced after they discontinued medication, including “I had discontinued use of Adderall. I didn't realize that probably contributed to my poor motivation and inability to complete assignments over two years ago”; “I think things will resume to get better as soon as I'm able to go back on my medication”; “Two weeks ago, I began the lowest dose I can of Efexxor, and the withdrawal symptoms have produced significant tension/complications in my relationship and work”; and “I've been off my medication for the last two months and I find daily tasks overwhelming”.

Table 5.16. Significant Statements Classified in Primary Theme 10: Medication

| Significant statement | Sub-theme |
|--|---------------|
| Early alcohol and drug dependence took its toll. | Drugs/Alcohol |
| I self-medicated with drugs and alcohol. | Drugs/Alcohol |
| I have developed addiction to stimulants in the past like coffee, energy drinks, etc. So stimulants helped me counter ADHD to achieve what I want in life but compromising my health like this will have other negative impacts in the future. | Stimulants |
| I had discontinued use of Adderall. I didn't realize that probably contributed to my poor motivation and inability to complete assignments over two years ago | Withdrawal |
| I think things will resume to get better as soon as I'm able to go back on my medication. | Withdrawal |
| These past two weeks have been difficult. Two months ago, I began the process of going off my anti-anxiety medication,. I made this decision after beginning Adderall, and the combination of the meds significantly increased my blood pressure. Two weeks ago, I began the lowest dose I can of Efexxor, and the withdrawal symptoms have produced significant tension/complications in my relationship and work (mostly behavioral based on sudden mood swings -crying mostly). | Withdrawal |
| Mostly bad days, which I logically chalk up much to the withdrawal, but perseverate on the fear that I just can't handle this adult life thing. | Withdrawal |
| I've been off my medication for the last two months and I find daily tasks overwhelming. | Withdrawal |

Triangulation

The quantitative study revealed that the quality of life (QOL) of the participants, based on the wide range of scores, was extremely variable. Statistical evidence was provided in the quantitative study using multiple linear regression analysis to answer Research Question1: What factors are significant predictors of the QOL of adults with ADHD? The answer to this question was that the presentation of ADHD, employment status, anxiety (but not depression) and perceived social support were found to be significant predictors of QOL for adults with ADHD.

The results of the qualitative part of the study similarly revealed that the QOL of participants, based on their wide range of answers (classified from poor to good), to the question “How would you rate the overall quality of your life right now? The results of

the qualitative study also supported the results of the quantitative study with respect to explaining how high levels of anxiety and low levels of social support reduced QOL of persons with ADHD. Relatively few participants in the qualitative part of the study talked about the impact of depression, consistent with the prediction of the quantitative portion of the study that, on average, depression was not associated with a reduced QOL for adults with ADHD.

It was not possible, using the results of the qualitative study, to classify the participants into three levels of presentation of ADHD. In contrast, the quantitative responses to the Attention Deficit Disorders Screening Test for adults based on the DSM-5 criteria reviewed (as per Grohol, 2014) revealed that the sample encompassed all three presentations of ADHD.

The qualitative part of the study provided insights into the QOL among adults with ADHD that were not revealed by the quantitative part of the study, specifically the various ways in which the symptoms of ADHD were associated with (a) a limited ability to achieve goals and get on the right track in life; (b) troubled relationships with friends and family; (c) problems associated with studying and achieving educational qualifications, including dropping out; (d) difficulties in employment, particularly with respect to keeping a job, and (e) medication issues, including withdrawal symptoms.

Both the quantitative and qualitative aspects of the study revealed that not all of the participants were overwhelmed by the symptoms of ADHD, and some had made great efforts to overcome their difficulties. The very wide variability in the responses to the questionnaires and interview questions suggest that it is not possible to derive broad generalizations about QOL for every person with ADHD.

Chapter VI

Discussion

The intent of this study was to contribute to the understanding of quality of life (QOL) as it is experienced by people with ADHD. The research question examined the relationships of ADHD-related and psychosocial variables with QOL. In this section, significant findings related to the research question are discussed. Significant findings based on the additional statistical analyses conducted with data not central to the research question are also discussed.

A mixed methods research design was implemented to address the factors that are significant predictors of the QOL of adults with ADHD. The study was based on the hypothesis that presentation of ADHD, psychosocial variables, including social support, mental health and employment status, are important in their contribution to QOL among persons with ADHD.

A number of psychosocial problems have consistently been found to be more prevalent among adults with ADHD relative to the general population (Biederman et al., 2008). Adults with ADHD are at an increased risk for negative outcomes in various domains, including academic, vocational, social, and psychological health. These relationships were tested using multiple linear regression analyses. The results support the hypothesis that in addition to the presentations of ADHD, employment status, perceived social support, and mental health, they are significantly correlated with QOL. In the language of multiple linear regression analysis, the presentation of ADHD, employment status, anxiety (but not depression), and perceived social support were found to be significant predictors of QOL of adults with ADHD.

The literature is void of research examining the impact of ADHD presentations on QOL. However, there is clear evidence that the symptoms of ADHD with different presentations interfere with or reduce the quality of social, school, or work functioning (American Psychiatric Association, 2015). The present study indicated that participants with the combined type of ADHD reported the poorest QOL, while participants with the predominantly inattentive type of ADHD reported the best QOL. Given these research findings, more research is needed to study the impact of ADHD with different presentations in adults on different life domains.

The relationship between ADHD and employment is one that has received significant attention in the literature. The literature suggests that, as compared to the general population, people with ADHD experience a much higher rate of unemployment (Kupper et al, 2012). In the U.S. labor market, fewer people with ADHD were employed full-time, and the loss of workforce productivity associated with ADHD in 2003 was estimated between \$67 billion and \$116 billion (Biederman, 2006).

The effects of ADHD on a person's ability to attain and maintain employment have also been explored. Nadeau (2005) pointed out that the manifestations of attention deficits in adults are most evident in the workplace environment. Statistically, adults with ADHD are unlikely to maintain consistent and stable employment (Nadeau, 2002). Individuals with ADHD miss significantly more days of work, and are more likely to be fired, change jobs, and have worse job performance evaluations than those without ADHD (Secnik, Swensen, Lage, 2005). Murphy and Barkley (1996) found that in comparison to adults without ADHD, those with the disorder were significantly more likely to have been fired from a job, impulsively quit a job, and have chronic employment difficulties. This is most likely due to the numerous symptoms that can be present with the disorder. Kupper et al. (2012) reviewed the negative effects of ADHD in adulthood on work productivity and occupational health. They found that adults with ADHD who are employed experience workplace impairment and reduced productivity, as well as behavioral issues such as irritability and low frustration tolerance. Performance at work is often affected by ADHD traits. ADHD-related symptoms contributed to, or were responsible for, job loss. These symptoms included tardiness, such as the lack of focus, lack of motivation, boredom, lack of organization, and problems controlling their temper, all of which may contribute to job loss (Bayne, 2007).

While the literature provides findings pertaining to employment and ADHD, a limited number of studies have examined the relationship between employment status and QOL among persons with ADHD. One such study found full-time employment to be a predictor of psychological well-being (Rimmerman, Yurkevich, Birger, & Araten-Bergman, 2005). The finding in the present study supported the association between QOL and employment status. It certainly appears to be the case, as was seen in the review of the qualitative responses in the present study, that employment for a person with ADHD

may add additional stress and cause fear of failure.

The association between ADHD and higher rates of anxiety has been well established. There is a logical assumption regarding the relationship between QOL and mental health; yet, it is one that has seldom been empirically examined in the ADHD literature. This study supports the existence of such a relationship. According to the calculations of Spencer et al. (2002), the most prevalent diagnoses were generalized anxiety disorder (53%), substance abuse (27%-46%), and major depression disorder (24-27%). Shekim et al. (1990) reported that generalized anxiety disorder was the most common comorbid disorder in his study of adults referred for an ADHD evaluation. Schatz and Rostain (2006) reported that ADHD is often comorbid with anxiety disorders with rates approaching 25% in many samples.

Fewer numbers of studies, however, have looked at the relationship between mental health status and QOL among adults with ADHD. One such study reported that the most problematic impairment in adults with ADHD and interference with the QOL is the distress defined by anxiety and depressive symptoms (Safren, Sprich, Cooper-Vince, Knouse, Lerner, 2010). This finding of the present study supported the association of QOL and the level of anxiety, but not depression. However, the qualitative responses in the present study indicated some expressions of depression on the QOL among adults with ADHD.

The levels of social support reported by the participants in the present study were very variable, and having a strong support system leads to higher level of QOL. A number of studies have indicated that people with ADHD experience higher levels of social isolation as compared to the general population (Hoza, 2007; Whalen & Henker, 1992; Wolf, 2000). Mikami (2010) showed that individuals with ADHD might exhibit delinquent and antisocial behaviors during adolescence that persist into adulthood and often experience difficulties in educational performance, occupational functioning, interpersonal relationships, and self-esteem in adulthood. However, few studies have looked specifically at the effects of social support or social function on QOL. Amir et al. (1999) found social support to be strongly associated with QOL. The results of the present study support this association between social support and QOL.

The relationship between the level of education and QOL was assessed in the

present study. Even though the multiple linear regression indicated that the education level was not a statistically significant predictor of QOL, the previous research and the qualitative analysis in the present study indicated some relationship between the level of education and the QOL in people with ADHD. The present study indicated that dropping out of school or college was associated with ADHD, and the symptoms of ADHD interfere with goals of pursuing a good education in which may cause persons to miss good opportunities or gain competitive employment. As discussed in the literature, ADHD is a serious disorder that affects a person's ability to be successful in school and subsequently in a way that can limit success in life (Breslau et al., 2009). Poor academic achievement, school failure, and being less likely to complete with a high school or college education are all risk factors for students with ADHD (DuPaul, Weyandt, O'Dell, & Varejao, 2009). Even though there is evidence of the high rate of dropping out of schools or colleges, 92% of the participants in the present study had at least some college or technical school experience which may be due to the convenient sample used in this study. All of the participants were members or on the mailing list of one of the ADHD associations, and this could explain their access to different education and social resources. Those resources might empower them to overcome the ADHD symptoms and guide them to adapt effectively with ADHD's challenges.

The result of the present study suggested no relationship exists between gender and QOL among adults with ADHD. However, in light of the findings, the gender breakdown of the sample in the present study (15.9% female) suggests that further exploration of the effects of gender on QOL among persons with ADHD is warranted. A literature review showed limited research in relation to some of the demographic variables (e.g. gender, ethnicity, age, etc.). A review of the literature shows that few studies have examined the impact of gender on QOL. Even though males with ADHD were more likely to be seen in clinical settings than females (Biederman et al., 2002), manifestations of ADHD in female and gender differences in ADHD have been neglected in the extensive ADHD research literature (Arnold, 1996).

In light of the findings with regard to race/ethnicity, the breakdown of the sample in the present study (79.7% white non-Hispanic) suggests that further exploration of the effects of both race/ethnicity and gender on QOL among persons with ADHD is needed.

There is a noticeable lack of research regarding ethnicity and ADHD as it relates to research among both children and adults. Even though there is a wealth of information available on ADHD, the vast majority of research on these individuals has been carried out on white, male, middle-class subjects (Gamarrá, 2003; Samuel et al., 1999).

Limitations

Several important limitations should be considered in interpreting the results of this study. First, the researcher used a convenient and limited sample in which the participants are members of one of the ADHD associations. People who are not members of one of the ADHD associations did not have the opportunity to participate in this study. Among the characteristics in which the sample may have been relatively unique compared to other samples of persons with ADHD were ethnic background (90% of the sample was white, (10.6%) was Hispanic, (9.7%) was African American, and none of other ethnicity; gender (84.1%) were male; education (92.9%) had at least some college or technical school experience; employment status (86% were employed at least part-time), and marital status (46.9% had never married). Because ADHD occurs with a frequency of 65% among males and 35% among females (Ramtekkar, Reiersen, Todorov, & Todd, 2010), the fact that the majority (84.1%) of the sample in the present study was male represents a significant limitation in terms of generalizing the results. In light of the findings, the gender breakdown of this sample has implications for future research. These implications are discussed below.

Regarding research design, due to the descriptive and correlational nature of this study, no definitive causal attributions can be made regarding the relationship between the independent variables and QOL. Another limitation of the correlational design was that, although it helped to identify statistically significant or systematic relationships between variables, it did not have the power to explain how and why these relationships existed, or to infer causes and effects. Internal validity was threatened by the selection of independent variables. QOL among adults with ADHD is a broad construct and its prediction may be assessed by other strategies and variables. QOL has been defined as including both subjective and objective components. In the present study, QOL was narrowly defined using only the subjective component of self-reported life satisfaction. A further limitation related to the selection of both the dependent and independent variables

was the significant interrelation between some of these measures. Several of the components of the independent variables are overlapping. In the present study, the researcher just studied the impact of the independent variables on the (QOL), but did not determine the interrelation between the independent variables and how they overlap with each other or the impact of QOL on those variables.

An examination of descriptive statistics for the sample data revealed that, given the relatively high kurtosis of some variables, it might be appropriate to transform these variables prior to analysis. Also, many of the variables were measured at an ordinal rather than an interval level, and some of the scores were restricted in range (e.g., employment status). These characteristics of the data may have influenced the results of the analyses. Attempts should be made to identify better measures to operationalize the variables in future research. In addition, the qualitative part of the present study did not pursue the demographic variables for the 20 participants. Studying these variables will contribute to a better understanding of the impact of the QOL among adults with ADHD, and will be compared to other finding of the quantitative part.

Another limitation is that, because the surveys were made available on the web page, respondents were assumed to be able to read and understand the survey without assistance or the ability to clarify directions. Using a face-to-face interview format would eliminate the need to make this assumption, and would likely provide more valid responses.

An additional limitation was that the questionnaire was not designed to delineate whether the respondents had disabilities other than ADHD. ADHD is a disability that frequently exists with other disabilities, also known as comorbidity. The negative impact of other disabling conditions are likely to contribute to the QOL of those respondents who have more than one disability. Previous studies have reported that almost 80% of adults with ADHD have at least one lifetime psychiatric comorbidity (Adler et al 2006; Kooij, Aeckerline, & Buitelaar, 2001; McGough, 2005). However, the present study did not include the comorbidity as a predictor of QOL among adults with ADHD. However, the qualitative results suggest that at least a minority of the respondents communicated an additional disability. Thus, further research in this area is recommended in future studies.

Implications for Practice and Future Research

Several findings of this study appear to be important for rehabilitation practice and future research. The following section describes the implications of the study relevant to clinical practice and future research. The findings of this study appear to have implications for rehabilitation practice and research. Both the quantitative and the qualitative models supports the importance of considering both presentations of ADHD variables and psychosocial variables as important contributors to self-perceived quality of life (QOL). Through discerning the variables that affect QOL, interventions to improve QOL may be identified and prioritized. Received rehabilitation services had a positive effect on self-perceived QOL. Received rehabilitation services positively impacted both employment and psychosocial adaptations.

Implications for Practice

The results of this study suggest that rehabilitation counselors and other mental health professionals who work with people with ADHD and use QOL as an outcome measure must consider a broad range of variables in both treatment planning and interventions. The results of this study imply that, in addition to any presentation of experienced by a person with ADHD, such variables as employment status, perceived mental health, and perceived social support, are also important factors in QOL. The results of this study are seen as promising for persons with ADHD as well as rehabilitation and other mental health professionals. While the control of symptoms of ADHD's presentation is a variable outside the domain of non-medical professionals, addressing the psychosocial concerns of people with ADHD is not. The results of this study suggest that rehabilitation counselors and other mental health professionals can help to improve the QOL of persons with ADHD by assisting with the attainment of or increase in level of employment or number of vocational activities; assisting with social and community integration; identifying community resources; and providing adjustment and psychological counseling by addressing mental health issues such as anxiety and depression.

The results of the study also imply that the person's perception of the extent to which ADHD presentations interfere with daily function has a direct effect on this perception of life quality. Because this perception of presentation interference is a

subjective rather than objective one, the study further suggests that addressing this perception in a counseling relationship may prove effective. The person's feelings about his or her presentation may, because these feelings are subjective, be amenable to change through counseling or psychotherapeutic intervention. Psychological counseling services should be provided and tailored to the needs of the individual with ADHD as part of rehabilitation counseling. Issues to be explored in counseling should include, but not be limited to: self-management skills, planning and organizing skills, self-esteem, social skills, and other areas that may be of concern to the person with ADHD.

Rehabilitation counselors and other mental health professionals can provide the opportunity for persons with ADHD to develop or improve their self-advocacy skills. Rehabilitation professionals such as rehabilitation counselors are known to provide advocacy for people with disabilities, but helping the rehabilitation consumers to develop and engage in self-advocacy will prove more beneficial in the adaptation to the daily challenges they may encounter. Self-advocacy can include training in assertiveness, counseling on conflict resolution, and can be targeted in rehabilitation by providing self-advocacy training that will increase self-advocacy skills, and adaptation to the challenges posed by their ADHD. By targeting the development of self-advocacy skills and increased psychosocial adaptation, the level of participation in the community will increase.

Early vocational services and intervention should be part of comprehensive community reintegration services. The goal of vocational services and intervention should be to facilitate a return to employment or education if not applicable on specific consumers. Vocational services and intervention could include evaluation of the individual's strengths and identification of vocational interest and options (including education options and transition), vocational counseling and referrals, and follow-up services (such as follow-up after inpatient and outpatient rehabilitation, and referral to OVR).

Implications for Future Research

To date, there is a limited amount of research relevant to QOL and the various psychosocial problems for adults with ADHD (Schott, 2012). Previous research in the area of QOL among persons with ADHD has focused primarily on medical treatment

variables. The results of the present study demonstrate the importance of considering a wider range of psychosocial variables. While this finding has been supported in previous studies that have, in fact, taken into consideration a wider range of variables, few such studies exist. The result of this study gives increased evidence related to the importance of enhancing life quality in the overall population with ADHD, and suggest the importance of increasing positive academic, vocational, social, and psychological outcomes for adults with ADHD.

An immediate concern will be to replicate the findings of this study using a larger, more diverse sample. Using a new set of larger data to cross-validate the models hypothesized in this study may ensure that the results can be generalized to the population of adults with ADHD.

Generally, only few researchers have studied the relationship between ADHD and the effect of demographic variables on ADHD. The influences of the demographic variables on ADHD have important clinical and public health implications. A better understanding of the effects of those demographic variables in ADHD can lead to improved identification of both males and females with different ethnicity and reduce the large gender gap in groups of referred ADHD subjects. Because intervention follows identification, an improved understanding of demographic variables' differences in ADHD can result in improved therapeutic opportunities for people with ADHD, which would have an effect on their overall QOL.

This study was somewhat limited in its use of a statistical technique that allowed examination of the interrelationships of the variables in their overall relation to QOL. Understanding such relationships is particularly important, not only for understanding the dynamics of ADHD, but also for planning efficacious interventions. The results of this study indicate insight into the importance of understanding the way the different variables affect each other. The importance to further such studies is implied. A related limitation of the present study, the high level of interrelationship between the dependent and independent variables, should be addressed in future research.

Conclusion

Attention-Deficit/Hyperactivity Disorder (ADHD) is a highly prevalent, clinically heterogeneous disorder with the potential to affect a wide range of life domains. A

number of psychosocial problems have consistently been found to be more prevalent among adults with ADHD relative to the general population (Biederman et al., 2008). Common psychosocial problems include unemployment or underemployment, social isolation, and psychological distress, including anxiety and depression. ADHD into adulthood can lead to severe impairment of social relations and the ability to match expectations of work performance. The condition of ADHD, as with any other disability, can disrupt participation in valued activities and interests, which can negatively impact QOL and well-being levels (Devin, 1994).

This study adds to the understanding of QOL among persons with ADHD and the way that psychosocial variables commonly associated with ADHD are related to QOL. A major goal of this study was to increase understanding of the factors involved in perceived QOL among persons with ADHD. Such an understanding allows prioritizing and designing interventions that are most likely to be effective toward increasing QOL. The results of the present study suggest that such interventions would be aimed at increasing social support, decreasing anxiety and depression, and helping people with ADHD to find or maintain appropriate employment.

The results of this study emphasize the importance of considering psychosocial variables as important contributors to perceived QOL. The focus of the research on QOL among persons with ADHD has been on the ADHD treatment and controlling the symptoms of different presentations. This is primarily due to the fact that the majority of this research has been conducted within the realm of medicine and medical interventions for ADHD. Rehabilitation counselors and other mental health professionals have the ability to help people with ADHD increase the quality of their lives through interventions directed at the psychosocial concerns held by persons with ADHD.

Appendix A

Quality of Life in Attention Deficit Hyperactivity Disorder (ADHD) Survey

Dear Friends of the ADHD Foundation:

As you know, ADHD can have an impact on a person's life in many ways. In the last few years much has been learned about the ways in which ADHD might affect quality of life. Still, there is much that is not yet known, like how certain activities and feelings might improve or worsen quality of life. The more we know, the more people with ADHD and others can work together to improve quality of life among people with ADHD. I am writing to ask you to participate in a study by completing and returning to me the enclosed questionnaire. The purpose of this study is to increase the understanding of the activities and factors that affect quality of life among people who have ADHD. I would sincerely appreciate your help in completing the questionnaires and providing some general information about yourself. Your participation is very important to the success of this project. It should take only about 30 minutes of your time.

You should not experience any discomfort or risk as a result of participating in this research. In fact, your participation may help you to reflect on a variety of areas important to your life satisfaction. This may be useful to you in making changes or improvements in certain areas of your life. Your participation is voluntary and you are free to discontinue your participation at any time without penalty or loss of benefit.

Information obtained from this study will be confidential. There is no need for you to provide your name. Other individual information you provide on the questionnaire will be seen only by the researcher involved in the study. In addition, only group data will be presented in reports from this study.

This research is being conducted by Amani Kettaneh, a Ph.D. student at the University of Kentucky. If you have any questions regarding this research or what you are being asked to do, please contact Amani Kettaneh at the address provided below or by email at aake222@g.uky.edu

By agreeing to complete the questionnaire and by mailing it back to us you are giving your consent to your participation in this project. A postage paid envelope has been included with the questionnaire so that you can mail it back to me. If you choose not to participate there will be no negative implications and the services you receive from CHADD or AADD will not be compromised. I sincerely hope that you will agree to help with this project, but whether you do or not, I thank you for your consideration.

Sincerely,

Amani A Kettaneh

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Quality of Life in Attention Deficit Hyperactivity Disorder (ADHD) Survey

This survey contains a number of questions about you, your health, your feelings, and your ADHD. It is arranged in five sections. The survey includes questions that require answers in different formats, and some sections might look very much alike but ask you to score your answers differently, so PLEASE READ THE DIRECTIONS FOR EACH SECTION BEFORE YOU BEGIN THE SECTION. In some cases none of the answers may be exactly right, but please answer each question with the answer which is closest to your own situation

SECTION 1: Information about You

In this section please indicate the most appropriate choice by clicking on the circle next to that answer.

1. What is your age?

- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60-69
- 69 or older

2. What is your gender?

- male
- female

3. Which item best describes your race (ethnic group)?

- White (non-Hispanic)
- African American
- Hispanic
- Native American
- Asian or Pacific Islander

4. What is your marital status?

- married
- widowed
- divorced
- separated
- never married

5. Which item below best describes your living arrangement?

- live alone live with spouse/partner
- live with parents
- live with relatives other than parent(s) or spouse
- live with friends
- live with a paid attendant or companion
- live in a group home or nursing home
- other

6. Which of the following best describes your highest level of education?

- 8th grade or less
- Some high school
- High school graduate
- Some college or technical school
- College graduate
- Master's degree or higher

7. Which of the following best describes your current employment status?

- employed full-time (30 hours or more)
- employed part-time (less than 30 hours)
- currently unemployed

8. Are you limited in your work or vocational training opportunities because of lack of transportation?

- Yes
- No

9. What is your approximate monthly household income?

- less than \$ 1,000
- \$1,000- 1,999
- \$2,000-2,999
- \$3,000 or more

10. Compared to most people my age, I am

- more physically active
- about as physically active
- not as physically active

Section 2: About your ADHD

ADHD Screening Test for Adults

Instructions: Continue to answer the questions on how you have behaved and felt during the past 6 months.

1. How often do you have difficulty sustaining your attention while doing something for work, a hobby, or fun activity (e.g., remaining focused during lectures, lengthy reading or conversations)?

- Never
- Rarely
- Sometimes
- Often

2. How often are you easily distracted by external stimuli, like something in your environment or unrelated thoughts?

- Never
- Rarely
- Sometimes
- Often

3. How often do you avoid, dislike, or are reluctant to engage in tasks that require sustained mental effort or thought?

- Never
- Rarely
- Sometimes
- Often

4. How often do you have trouble listening to someone, even when they are speaking directly to you, like your mind is somewhere else?

- Never
- Rarely
- Sometimes
- Often

5. How often do you have difficulty in organizing an activity or task needing to get done (e.g., poor time management, fails to meet deadlines, difficulty managing sequential tasks)?

- Never
- Rarely
- Sometimes

- Often

6. How often do you fail to give close attention to details, or make careless mistakes in things such as at work or during other activities?

- Never
- Rarely
- Sometimes
- Often

7. How often do you forget to do something you do all the time, such as missing an appointment or paying a bill?

- Never
- Rarely
- Sometimes
- Often

8. How often do you lose, misplace or damage something that's necessary in order to get things done (e.g., your phone, eyeglasses, paperwork, wallet, keys, etc.)?

- Never
- Rarely
- Sometimes
- Often

9. How often do you have trouble following through on instructions, or failing to finish schoolwork, chores, or duties in the workplace (e.g., you start a task but quickly lose focus and are easily sidetracked)?

- Never
- Rarely
- Sometimes
- Often

10. How often do you have trouble following through on instructions, or failing to finish schoolwork, chores, or duties in the workplace (e.g., you start a task but quickly lose focus and are easily sidetracked)?

- Never
- Rarely
- Sometimes
- Often

11. How often are you unable to play or engage in leisurely activities quietly?

- Never
- Rarely
- Sometimes
- Often

12. How often do you have difficulty waiting your turn, such as while waiting in line?

- Never
- Rarely
- Sometimes
- Often

13. How often do you feel like you're "on the go," acting as if you're "driven by a motor" (e.g., you're unable to be or uncomfortable being still for an extended period of time, such as in a restaurant or a meeting)?

- Never
- Rarely
- Sometimes
- Often

14. How often do you leave your seat in situations when remaining seated is expected (e.g., leaving your place in the office or workplace)?

- Never
- Rarely
- Sometimes
- Often

15. How often do you blurt out an answer before a question has been completed (e.g., completing another person's sentence or can't wait your turn in a conversation)?

- Never
- Rarely
- Sometimes
- Often

16. How often do you feel restless -- like you want to get out and *do* something?

- Never
- Rarely
- Sometimes
- Often

17. How often do find yourself talking excessively?

- Never
- Rarely
- Sometimes
- Often

18. How often do you interrupt or intrude on others, such as butting into their conversation or taking over what others are doing?

- Never
- Rarely
- Sometimes
- Often

19. Were several of the symptoms present prior to age 12?

- No
- Yes

20. Do the symptoms appear in at least two or more settings (e.g., at home and school)?

- No
- Yes

Section 3

Adult ADHD Quality of Life Questionnaire (AAQoL)

The following questions are about how ADHD has impacted your life over the PAST 2 WEEKS. Please answer each question by circling your response. There are no right or wrong answers.

| 1. During the PAST 2 WEEKS, how difficult has it been for you to: | <i>Not at all</i> | <i>A little</i> | <i>Somewhat</i> | <i>A lot</i> | <i>Extremely</i> |
|---|-------------------|-----------------|-----------------|--------------|------------------|
| Keep the house/apartment clean or uncluttered..... | 1 | 2 | 3 | 4 | 5 |
| Manage your finances (such as cashing checks, balancing your checkbook, paying bills on time) | 1 | 2 | 3 | 4 | 5 |
| Remember important things | 1 | 2 | 3 | 4 | 5 |
| Get your shopping done (such as for food, clothes or household items) | 1 | 2 | 3 | 4 | 5 |
| Pay attention when interacting with others | 1 | 2 | 3 | 4 | 5 |

| 2. During the PAST 2 WEEKS, how often have you felt: | <i>Never</i> | <i>Rarely</i> | <i>Sometimes</i> | <i>Often</i> | <i>Very Often</i> |
|--|--------------|---------------|------------------|--------------|-------------------|
| Overwhelmed | 1 | 2 | 3 | 4 | 5 |
| Anxious | 1 | 2 | 3 | 4 | 5 |
| Depressed | 1 | 2 | 3 | 4 | 5 |
| You have not been able to meet others' expectations of you (either at home or at work) | 1 | 2 | 3 | 4 | 5 |
| You annoyed people..... | 1 | 2 | 3 | 4 | 5 |
| Getting things done requires too much effort | 1 | 2 | 3 | 4 | 5 |
| People are frustrated with you..... | 1 | 2 | 3 | 4 | 5 |
| You have overreacted in difficult or stressful situations | 1 | 2 | 3 | 4 | 5 |
| Your energy is well spent (has positive results) | 1 | 2 | 3 | 4 | 5 |
| Able to enjoy time spent with others. | 1 | 2 | 3 | 4 | 5 |
| You can successfully manage your life..... | 1 | 2 | 3 | 4 | 5 |
| As productive as you would like to be | 1 | 2 | 3 | 4 | 5 |

| 3. During the PAST 2 WEEKS, how much of a problem has it been for you to: | <i>Not at all</i> | <i>A little</i> | <i>Somewhat</i> | <i>A lot</i> | <i>Extremely</i> |
|--|-------------------|-----------------|-----------------|--------------|------------------|
| Balance multiple projects | 1 | 2 | 3 | 4 | 5 |
| Get things done on time | 1 | 2 | 3 | 4 | 5 |
| Keep track of important items (such as keys, wallet) | 1 | 2 | 3 | 4 | 5 |

| 4. During the PAST 2 WEEKS, how troubled have you been by: | <i>Not at all</i> | <i>A little</i> | <i>Somewhat</i> | <i>A lot</i> | <i>Extremely</i> |
|---|-------------------|-----------------|-----------------|--------------|------------------|
| Tension in relationships | 1 | 2 | 3 | 4 | 5 |
| Not having quality time to spend with others | 1 | 2 | 3 | 4 | 5 |

| 5. During the PAST 2 WEEKS, how bothered have you been by: | <i>Not at all</i> | <i>A little</i> | <i>Somewhat</i> | <i>A lot</i> | <i>Extremely</i> |
|---|-------------------|-----------------|-----------------|--------------|------------------|
| Feeling fatigued..... | 1 | 2 | 3 | 4 | 5 |
| Fluctuations (ups and downs) in your emotions | 1 | 2 | 3 | 4 | 5 |

| 6. During the PAST 2 WEEKS, how often have you felt: | <i>Never</i> | <i>Rarely</i> | <i>Sometimes</i> | <i>Often</i> | <i>Very Often</i> | <i>Not Applicable</i> |
|---|--------------|---------------|------------------|--------------|-------------------|--------------------------|
| Good about yourself..... | 1 | 2 | 3 | 4 | 5 | ---- |
| People enjoy spending time with you..... | 1 | 2 | 3 | 4 | 5 | ---- |
| Your intimate relationship is going well emotionally | 1 | 2 | 3 | 4 | 5 | <input type="checkbox"/> |

| 7. During the PAST 2 WEEKS, how much of a problem has it been for you to: | <i>Not at all</i> | <i>A little</i> | <i>Somewhat</i> | <i>A lot</i> | <i>Extremely</i> |
|--|-------------------|-----------------|-----------------|--------------|------------------|
| Complete projects or tasks (either at work or at home) | 1 | 2 | 3 | 4 | 5 |
| Get started with tasks you don't find interesting..... | 1 | 2 | 3 | 4 | 5 |

Section 4

Life Situation Survey

A number of statements which concern different aspects of your present life situation are listed below. Read each statement and indicate the extent to which you agree or disagree with it by checking below the appropriate number in the right margin. You will note that there are six possible ratings: agree very strongly, agree strongly, agree, disagree, disagree strongly, and disagree very strongly. Do not spend too much time on each item, but try to reflect your true feelings. If you have difficulty reading the statements or marking your answers, you may have someone help you; however, only honest answers will provide useful information.

- 1 = AGREE VERY STRONGLY**
- 2 = AGREE STRONGLY**
- 3 = AGREE**
- 4 = DISAGREE**
- 5 = DISAGREE STRONGLY**
- 6 = DISAGREE VERY STRONGLY**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|----------|----------|----------|----------|----------|----------|
| 1. I feel safe and secure | | | | | | |
| 2. My health is good | | | | | | |
| 3. I have too few friends who I can count on | | | | | | |
| 4. I like myself the way I am | | | | | | |
| 5. I am better off than most people in this country | | | | | | |
| 6. I feel constantly under pressure | | | | | | |
| 7. I don't eat very well | | | | | | |
| 8. My future is hopeless | | | | | | |
| 9. I am a happy person | | | | | | |
| 10. There are always people willing to help me when I really need it | | | | | | |
| 11. My income is a constant source of worry | | | | | | |

| | | | | | | |
|---|--|--|--|--|--|--|
| 12. My sleep is restful and refreshing | | | | | | |
| 13. I don't get the love and affection I need | | | | | | |
| 14. I don't have any fun or relaxation | | | | | | |
| 15. Services provided by the government and other public agencies (including, for example, police, health care, welfare, public utilities) meet my needs | | | | | | |
| 16. I am able to go when and where I need to go | | | | | | |
| 17. I am satisfied with my main life role now. (For example, as a worker, student, homemaker, retiree, or patient)..... | | | | | | |
| 18. There is little that I am able to enjoy in my community and surroundings | | | | | | |
| 19. I am exhausted well before the end of the day | | | | | | |
| 20. I have too little control over my life | | | | | | |

Appendix B
Postcard Text

Dear Friend of the Attention Deficit Hyperactivity Disorder (ADHD)

Organization:

As you know, ADHD can affect a person's life in many ways. The more we understand the impact of ADHD in different areas of life, the better people with ADHD and others can work together to improve quality of life among people with ADHD.

I am a Ph.D. student in Rehabilitation Counseling at the University of Kentucky. I am studying quality of life among people with different presentations of ADHD. I hope you will participate in the study by completing a survey for me. If you are interested in helping, please put your return address on the other half of this postage-paid postcard, and return it. Your local ADHD organization will mail a survey to you. Or, if you have internet access you can simply complete the survey on-line.

I appreciate your help with this and I hope to hear from you soon. Please contact me if you have question or concern.

Sincerely,

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Appendix C

Qualitative Interview Questions

The ADHD Impact Module (AIM-A)

Qualitative Interview Questions

How would you rate the overall quality of your life right now?;

Has ADHD and its symptoms limited your ability to achieve what you want in life

Do you feel you are on the right track with your life?; Please explain how and why?


How much do you agree with the following statement: Over the past few weeks, I've had more good days than bad days". Please explain how and why?

Appendix D

Flyer for the Interviews

UNIVERSITY OF KENTUCKY RESEARCH

Participants Needed for Research



To the members of Children and Adults with Attention Deficit/Hyperactivity Disorder (CHAAD)

You are invited to take part in a research study about the quality of life among adults with attention deficit hyperactivity disorder. Your voluntary participation would involve a semi-structured interview in person or via phone lasting 30-45 minutes with the researcher to answer survey questions.

This study may be useful to you in making changes or improvements in certain areas of your life. Your willingness to take part, however, may, in the future, help society as a whole better understand this research topic.

This study was reviewed & approved by the UK Office of Research Integrity.

For more information or to volunteer for this study, please contact the front desk or contact

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References

- Abramowitz, C., Kosson, D., & Seidenberg, M. (2004). The relationship between childhood attention-deficit hyperactivity disorder and conduct problems and adult psychopathy in male inmates. *Personality and Individual Differences, 36*(5), 1031–1047.
- Adler, L. A., Spencer, T., & Faraone, S. V. (2006). Validity of pilot adult ADHD self report scale (ASRS) to rate adult ADHD symptoms. *Annals of Clinical Psychiatry* 18(3), 145–148.
- Adler, L., Sutton, V., Moore, R., Dietrich, A., Reimherr, F., Sangal, B., Allen, A. (2006). Quality of life assessment in adult patients with attention deficit/hyperactivity disorder treated with Atomoxetine. *Journal of Clinical Psychopharmacology, 26*(8), 648-652.
- Aggernæs, A. (1989). *Quality of Life*. Copenhagen: FADL's Publications.
- Agarwal, R., Goldenberg, M., Perry, R., & Ishak, W. (2012). The quality of life of adults with attention deficit hyperactivity disorder. *Innovations in Clinical Neuroscience, 9*(6), 10-21.
- Alpert, J. E., Maddocks, A., Nierenberg, A. A., O'Sullivan, R., Pava, J. A., ... Fava, M. (1996). Attention deficit hyperactivity disorder in childhood among adults with major depression. *Psychiatry Research, 62*(1), 213–219.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th Ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th Ed.). Arlington, VA: American Psychiatric Association.

- American Psychological Association. (2002). APA code of ethics. Retrieved 8/16/2007, from <http://www.apa.org/ethics/code2002.html>.
- Amir, M., Roziner, I., Knoll, A., & Neufeld, M.Y (1999). Self-efficacy and social support as mediators in the relation between disease severity and quality of life in patients with epilepsy. *Epilepsia*, *40*, 216-224.
- Anderson, K. L., & Burckhardt, C.S. (1999). Conceptualization and measurement of quality of life as an outcome variable for health care intervention and research. *Journal of Advanced Nursing*, *29*(2), 298-306.
- Andrews, F., & McKennell, A. (1980). Measures of self-reported well-being: Their affective, cognitive, and other components. *Social Indicators Research*, *8*, 127-158.
- Anderson, K. L., & Burckhardt, C.S. (1999). Conceptualization and measurement of quality of life as an outcome variable for health care intervention and research. *Journal of Advanced Nursing*, *29*(2), 298-306.
- Andrews, F, & Withey, S. (1976). Developing measures of perceived life quality: Results from several national surveys. *Social Indicators Research*, *1*(1), 1-26.
- Angermeyer, M.C., Holziner, A., Kilian, R., & Matschinger, H. (2001). Quality of life as defined by schizophrenic patients and psychiatrists. *International Journal of Social Psychiatry*, *47*(2), 34-43.
- Applegate, B., Lahey, B., Hart, E., Biederman, J., Hynd, G., Barkley, R., . . . Shaffer, D. (1997). Validity of the age-of-onset criterion for ADHD: A report from the DSM-IV field trials. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*(9), 1211–1221.
- Arnold, L.E. (1996). Sex differences in ADHD: Conference summary. *Journal of*

- Abnormal Child Psychology, 24, 555–569.
- Arnold, L. E. , Demeter, C., Mount, K., Frazier, T.W., Youngstrom, E. A., Fristad, M., ...
Axelson, D. (2011). Pediatric bipolar spectrum disorder and ADHD: Comparison
and comorbidity in the LAMS clinical sample. *Bipolar Disorder, 13*(5), 509–521.
- Aronson, K. J. (1997). Quality of life among persons with multiple sclerosis and their
caregivers. *Neurology, 48*(1), 74-80.
- Ayres, L. (2008). Thematic coding and analysis. In L. Given (Eds.), *The SAGE
encyclopedia of qualitative research methods*. Thousand Oaks, CA: Sage
Publications.
- Babinski, L., Hartsough, C., & Lambert, N. (1999). Childhood conduct problems,
hyperactivity-impulsivity, and inattention as predictors of adult criminal activity.
Journal of Child Psychiatry Psychology, 40(3), 347–355.
- Bach, C., & McDaniel, R. (1993). Quality of life in quadriplegic adults: A focus group
study. *Rehabilitation Nursing, 18*(6), 364-367.
- Barkley, R. A. (1998). Attention-deficit hyperactivity disorder: A new theory suggests
the disorder results from a failure in self-control. *Scientific American, 12*, 66-71.
- Barkley, R. A. (2002). Major life activity and health outcomes associated with attention-
Deficit/hyperactivity disorder. *Journal of Clinical Psychiatry, 63*(12), 10–15.
- Barkley, R. A. (2006). *Attention-deficit hyperactivity disorder: A handbook for diagnosis
And treatment* (3rd Ed.). New York: Guilford.
- Barkley, R. A., Anastopoulos, A., Guevremont, D., & Fletcher, K.(1992). Adolescents
with attention deficit hyperactivity disorder: Mother-adolescent interactions,
family beliefs and conflicts, and maternal psychopathology. *Journal of Abnormal
Child Psychology, 20*, 263-288.

- Barkley, R.A., & Cox, D. (2007). A review of driving risks and impairments associated with attention-deficit/hyperactivity disorder and the effects of stimulant medication on driving performance. *Journal of Safety Research*, 38(1), 113-128.
- Barkley, R. A. & Fischer, M. (2010). The unique contribution of emotional Impulsiveness to impairment in major life activities in hyperactive children as adults. *Journal of the American Academy of Child and Adolescent Psychiatry*, 49(5), 503-513.
- Barkley, R. A. & Murphy, K. R. (2010). Deficient emotional self-regulation in adults with ADHD: The relative contributions of emotional impulsiveness and ADHD symptoms to adaptive impairments in major life activities. *Journal of ADHD and Related Disorders*, 1(4), 5-28.
- Barkley, R. A., Murphy, K., & Kwasnik, D. (1996). Psychological adjustment and adaptive impairments in young adults with ADHD. *Journal of Attention Disorders*, 1(1), 41-54.
- Barofsky, I. (2012). *Quality: Its Definition and Measurement As Applied to the Medically Ill* (1st ed.). East Sandwich, MA: Springer.
- Barry, M. M., Crosby, C. & Bogg, J. (1993). Methodological issues in evaluating the quality of life of long-stay psychiatric patients. *Journal of Mental Health*, 2, 43-
- Bateman, L. P. (2011). *Relationships between life satisfaction, symptoms of ADHD, and associated outcomes in middle school students* (Master's thesis). Available from ProQuest Dissertations and Theses database (UMI No.1501985).
- Bayne, H. M. (2007). *The experience of job loss in adults with attention deficit/hyperactivity disorder* (Doctoral dissertation). Available from ProQuest

Dissertations and Theses database. (UMI No. 3246085).

- Bernardi, S., Faraone, S. V., Cortese, S., Kerridge, B. T., Pallanti, S., Wang, S., & Blanco, C. (2011). The lifetime impact of attention deficit hyperactivity disorder: Results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). *Psychology Medecine*, 42(4), 1–13.
- Berzon, R. A., Donnelly, M. A., Simpson, R., Simeon, G., Tilson, H. (1995). Quality of life bibliography and indexes: 1994 update. *Quality of Life Research*, 4, 547-569.
- Biederman, J. (2004). Impact of comorbidity in adults with attention-deficit hyperactivity disorder. *Journal of Clinical Psychiatry*, 65(3), 3–7.
- Biederman, J. (2005). Attention- deficit/hyperactivity disorder: A selective overview. *Biological Psychiatry*, 57(11), 1215–1220.
- Biederman, J. (2006). The effects of attention-deficit/hyperactivity disorder on employment and household income. *Medscape General Medicine*, 8(3), 12-19.
- Biederman, J., Faraone, S. V., Milberger, S., Curtis, S., Chen, L., & Marris, A. (1996): Predictors of persistence and remission of ADHD: Results from a four- year prospective follow-up study of ADHD children. *Journal of American Academy of Child & Adolescent Psychiatry*, 35(3), 343–351.
- Biederman, J., Faraone, S. V., Monuteaux, M. C., Bober, M., Cadogen, E. (2004). Gender effects on attention-deficit/hyperactivity disorder in adults, revisited. *Biological Psychiatry*, 55(7), 692–700.
- Biederman, J., Faraone, S. V., Spencer, T., Wilens, T., Norman, D., & Lapey, K. (1993). Patterns of psychiatric co morbidity, cognition, and psychosocial functioning in adults with Attention Deficit Hyperactivity Disorder. *American Journal of Psychiatry*, 150(12), 1792–1798.

- Biederman, J., Faraone, S. V., Weber, W., Russell, R. L., Rater, M., & Park, K. (1997). Correspondence between DSM-III-R and DSM-IV attention deficit hyperactivity disorder (ADHD). *Journal of the American Academy of Child & Adolescent Psychiatry, 36*(12), 1682–1687.
- Biederman, J., Kwon, A., Aleardi, M., Chouinard, V., Marino, T., Cole, H., . . . Faraone, S. (2005). Absence of gender effects on attention deficit hyperactivity disorder: Findings in nonreferred subjects. *American Journal of Psychiatry, 162*(6), 1083–1089.
- Biederman, J., Mick, E., Faraone, S., Braaten, E., Doyle, A., Spencer, T., . . . Johnson, M. A. (Influence of Gender on Attention Deficit Hyperactivity Disorder in Children Referred to a Psychiatric Clinic. *The American Journal of Psychiatry, 159*(1), 36–42.
- Biederman, J., Petty, C., Fried, R., Doyle, A., Mick, E., Aleardi, M., . . . Faraone, S. V. (2008). Utility of an abbreviated questionnaire to identify individuals with ADHD at risk for functional impairments. *Journal of Psychiatric Research, 42*(4), 304–310.
- Biederman, J., Petty, C., Fried, R., & Kaiser, R (2008). Educational and occupational underattainment in adults with attention-deficit/hyperactivity disorder: A controlled study. *Journal of Clinical Psychiatry, 69*(8),1217-1222.
- Biederman, J., Wozniak, J., Kiely, K., Ablon, S., Faraone, S., Mick, E., . . . Kraus, I. (1995). CBCL clinical scales discriminate prepubertal children with structured interview-derived diagnosis of mania from those with ADHD. *Journal of the American Academy of Child & Adolescent Psychiatry, 34*(4), 464–471.
- Bishop, M. (2000). *The relationship of social, psychological, physical, and seizure-related variables to quality of life in adults with epilepsy* (Doctoral dissertation).

Available from Bell & Howell Information and Learning Company (UMI No. 9981882).

Bishop, M., Berven, N., Hermann, B., & Chan, F. (2002). Quality of life among adults with epilepsy: An Exploratory Model. *Rehabilitation Counseling Bulletin, 45*(2), 87-95.

Bishop, M. (2005). Quality of Life and Psychosocial Adaptation to Chronic Illness and Disability: Preliminary Analysis of a Conceptual and Theoretical Synthesis. *Rehabilitation Counseling Bulletin, 48*(4), 219-231.

Bishop, M., Berven, N., Hermann, B., & Chan, F. (2002). Quality of life among adults with epilepsy: An Exploratory Model. *Rehabilitation Counseling Bulletin, 45*(2), 87-95.

Bishop, M., Chapin, M. H., & Miller, S. (2008). Quality of life assessment in the measurement of rehabilitation outcome. *Journal of Rehabilitation, 74*(2), 45-55.

Bishop, M., & Feist-Price, S. (2001). Quality of life in rehabilitation counseling: Making the philosophical practical. *Rehabilitation Education, 15*(3), 201-212.

Bishop, M., & Feist-Price, S. (2002). Quality of life assessment in the rehabilitation counseling relationship: Strategies and measures. *Journal of Applied Rehabilitation Counseling, 33*(1), 35-41.

Bloom, B., Cohen, R., & Freeman, G. (2011). Summary health statistics for U.S. children: National health interview survey. *Vital and Health Statistics, 10*(254), 1-78.

Bognar, G. (2005). The Concept of Quality of Life. *Social Theory and Practice, 31*(4), 561-580.

Bond, J., & Corner, L. (2004). *Quality of Life and Older People* (1st ed.). Maidenhead,

England: Open University Press.

- Boos, D., & Hughes-Oliver, J.M. (2000). How large does n have to be for Z and t intervals? *The American Statistician*, 54(2), 121-128.
- Boswell, B. & Dawson, M., & Heininger, E. (1998). Quality of life as defined by adults with spinal cord injuries. *The Journal of Rehabilitation*, 64(1), 27-32.
- Brent, D.A. , Perper, J. A., Goldstein, C. E., Kolko, D. J., Allan, M. J., Allman, C. J., & Zelenak, J. P. (1988). Risk factors for adolescent suicide: A comparison of adolescent suicide victims with suicidal inpatients. *Archives of General Psychiatry*, 45(6), 581–588.
- Breslau, J., Breslau, M, E., Bohnert, K., Lucia, V., & Schweitzer, J. (2009). The impact of early behavior disturbances on academic achievement in high school. *Pediatrics*, 123(6), 1472–1476.
- Brod, M., Johnston, J., Able, S., & Swindle, R. (2006). Validation of the adult attention-deficit/hyperactivity disorder quality-of-life scale (AAQoL): A disease-specific quality-of-life measure. *Quality of Life Research*, 15(1), 117–129.
- Brooks, R. & Goldstein, S. (2001). *Raising resilient children: Fostering strength, hope, and optimism in your child*. New York: NY, Contemporary Books.
- Brown, T.E. (2006). Executive functions and attention deficit hyperactivity disorder: Implications of two conflicting views. *International Journal of Disability*, 53(1), 35–46.
- Brown, T. E. (2013). DSM-5 Changes in ADHD Diagnostic Criteria. Retrieved 07/05/2013 from <http://www.drthomasebrown.com/articles/>
- Brown, J., Bowling, A., & Flynn, T. (2004). Models of quality of life: A taxonomy, overview and systematic review of the literature. Retrieved 05/03/2004 by

<https://05aab32c59c1fd7e5849ea3ff5dcc32b0cc086d.googledrive.com/host/0B2o4mUzWs3B->

Ni10cUpsb05IXzQ/4.%20Četvrta%20Godina/Turizam/Savremene%20tendencije%20u%20turizmu/Models%20of%20QoL%20EUForum2004review%20.pdf

Bryman, A. (2008). Why do researchers integrate/combine/mesh/blend/mix/merge/fuse quantitative and qualitative research? In M. M. Bergman (Ed.), *Advances in mixed methods research* (pp.87-100). London: Sage Publications.

Butler, S. F., Arredondo, D. E., & McCloskey, V. (1995). Affective comorbidity in children and adolescents with attention deficit hyperactivity disorder. *Annals of Clinical Psychiatry, 7*(2), 51–55.

Cahill, B., Coolidge, F., Segal, D., Klebe, K., Marle, P., & Overmann, K. (2012). Prevalence of ADHD and its subtypes in male and female adult prison inmates. *Behavioral Sciences and the Law, 30*(2), 154-166.

Campbell, A., Converse, P.E., & Rogers, W.L. (1976). *The quality of American life: Perceptions, evaluations, and satisfaction*. New York: Russell Sage.

Caracelli, V. J., & Greene, J. (1993). Data analysis strategies for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 15*(2), 195-207.

Center of Disease and Control Prevention. (2003). An Estimated 1 in 10 U.S. Adults Report Depression. Retrieved 04/20/2012 from <http://www.cdc.gov/features/dsdepression/>

Chang, Y. W., & Hsiao, S. (2006). Quality of life: Scaling with Maslow's need hierarchy. *Gerontology, 52*, 376-379.

Chatterjee, S., Hadi, A., & Price, B. (2007). *Regression analysis by example*. New York:

Wiley.

- Clarke, L., Ungerer, J., Chahoud, K., Johnson, S., & Stiefel, I. (2002). Attention deficit hyperactivity disorder is associated with attachment insecurity. *Clinical Child Psychology and Psychiatry, 7*(2), 179-198.
- Chubon, R.A. (1995). Manual for the Life Situation Survey (1995 revision). Columbia, SC: University of South Carolina, School of Medicine, Department of Neuropsychiatry and Behavioral Medicine, Rehabilitation Counseling Program.
- Cohen, S., Gottlieb, B., & Underwood, L. (2000). Social relationships and health. In S. Cohen, L. Underwood, & B. Gottlieb (Eds.), *Measuring and intervening in social support* (pp. 3–25). New York: Oxford University Press.
- Constas, M. A. (1992). Qualitative data analysis as a public event: The documentation of category development procedures. *American Educational Research Journal, 29*(2), 253–266.
- Corley, M. C., Elswick, R., Sargeant, C., & Scott, S. (2000). Attitude, self-image, and quality of life of living kidney donors. *Nephrology Nursing, 27*(1), 43-50.
- Cox, D. R., Fitzpatrick, R., Fletcher, A. E., Core, S., Spiegelhalter, D., & Jones, D. (1992). Quality-of-life assessment can we keep it simple. *Journal of the Royal Statistical Society, 155*(3), 353-393.
- Coulter, D.L. (1997). Health-related application of quality of life. In R.L. Schalock (Ed.), *Quality of life volume II: Application to persons with disabilities* (pp.95-103). Washington DC: American Association on Mental Retardation.
- Creswell, J. W. (2009). Mapping the field of mixed methods research. *Journal of Mixed Methods Research, 3*, 95–108.
- Creswell, J., Clark, V., Gutmann, M., & Hanson, W. (2003). Advanced mixed methods

- research design. In A. Tashakkori, & C. Teddie (Eds.), *Handbook of mixed methods in social behavioral research* (pp. 209- 242). Thousands Oak, CA: Sage Publications.
- Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). An expanded typology for classifying mixed methods research into designs. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage Publications.
- Cummins, R. A. (1992c). *Comprehensive quality of life scale* (3rd Ed.). Melbourne: Psychology Research Centre.
- Cummins, R. A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research*, 38(3), 303-328.
- Cummins, R. A. (1997a). Assessing quality of life. In R. I. Brown (Ed.), *Quality of life for people with disabilities: Models, research and practice* (pp. 116–150). Cheltenham, UK: Stanley Thornes.
- Cummins, R. A. (2000). Objective and subjective quality of life: An interactive model. *Social Indicators Research*, 52(1), 55-72.
- Cummins, R. A. (2005). Moving from the quality of life concept to a theory. *Journal of Intellectual Disability Research*, 49(10), 699–706.
- Cummins, R. A., Lau, A., & Stokes, M. (2004). HRQOL and subjective wellbeing: Noncomplementary forms of outcome measurement. *Expert Reviews in Pharmacoeconomics Outcomes Research*, 4(4), 413–20.
- Cumyn, L., French, L., & Hechtman, L. (2009). Comorbidity in adults with attention-deficit hyperactivity disorder. *Canadian Journal of Psychiatry*, 54 (10), 673-683.
- Davern, M. T., & Cummins, R. A. (2005). Is life dissatisfaction the opposite of life

- satisfaction? *Australian Journal of Psychology*, 58, 1–7. □
- Day, H., & Jankey, S. (1996). Lessons from the literature: Toward a holistic model of quality of life. In R. Renwick, I. Brown, & M. Nagler (Eds.), *Quality of life in health promotion and rehabilitation* (pp. 39-52). London: Sage Publications.
- Devins, G. M. (1994). Illness intrusiveness and the psychosocial impact of lifestyle disruptions in chronic life-threatening disease. *Advances in Renal Replacement Therapy*, 1(3), 251–263.
- DeWaal, C. (2001). *On Peirce*. Belmont, CA: Wadsworth/ Thomson Learning.
- Diener, E., & Diener, C. (1996). Most people are happy. *Psychological Science*, 7(3), 181- 185.
- Diener, E., Oishi, S., & Lucas, R. E. (2002). Subjective well-being: The science of happiness and life satisfaction. In C.R. Snyder, & S.J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 63-73). Oxford: Oxford University Press.
- Dilsaver, S., Henderson-Fuller, S., & Akiskal, H. (2003). Occult mood disorders in 104 consecutively presenting children referred for the treatment of attention-deficit/hyperactivity disorder in a community mental health clinic. *Journal of Clinic Psychiatry*, 64(10), 1170–1176.
- Dijkers, M. (2003). Individualization in quality of life measurement: Instruments and approaches. *Archives of Physical Medicine and Rehabilitation*, 84(2), 3–14.
- Douglas, V.I. (1988). Cognitive deficits in children with attention-deficit disorder with hyperactivity. In L.M. Bloomingdale & J.A. Sergeant (Eds.). *Attention deficit disorder: Criteria, cognition, intervention* (pp. 65-82). London: Pergamon.
- Downey, G., Feldman, S., & Ayduk, O. (2000). Rejection sensitivity and male violence

- in romantic relationships. *Personal Relationships*, 7(1), 45-61.
- Downey, K., Stelson, F., Pomerleau, O., & Giordani, B. (1997). Adult attention deficit hyperactivity disorder: Psychological test profiles in a clinical population. *Journal of Nervous & Mental Disease*, 185(1), 32-38.
- DuPaul, G.J. (2007). School-based interventions for students with attention deficit hyperactivity disorder: Current status and future directions. *School Psychology Review*, 36(2), 183-194.
- DuPaul, G., Weyandt, L., O'Dell, S., & Varejao, M. (2009). College students with ADHD: Current status and future directions. *Journal of Attention Disorders*, 13(3), 234-250.
- Eakin, L. (2001). *Psychosocial functioning of families of adults with attention/hyperactivity disorder* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database (UMI No. 612700135).
- Elliott, S., Gresham, F. (1987). Children's social skills: Assessment and classification practice. *Journal of Counseling and Development*, 66(2), 96-99.
- Erikson, R. (1993). Description of inequality: The Swedish approach to welfare research. In M. Nussbaum, & A. Sen (Eds.), *The quality of life* (pp. 67-83). Oxford: Oxford University Press.
- Erikson, R., & Uusitalo, H. (1987). The Scandinavian approach to welfare research. In R. Erikson, E. Hansen, S Ringen, & H. Uusitalo (Eds.), *The Scandinavian model: Welfare states and welfare research* (pp. 177-193). New York: M. E. Sharpe.
- Fabian, E.S. (1991). Using quality of life indicators in rehabilitation program evaluation. *Rehabilitation Counseling Bulletin*, 34(1), 344-356.
- Faraone, S. V. (2004). Genetics of adult attention-deficit/hyperactivity disorder.

Psychiatric Clinics of North American, 27(2), 303–321.

Faraone, S. V. (2006). *ADHD not otherwise specified*. Paper session presented at the 159th Annual Meeting of the American Psychiatric Association, Toronto, Canada.

Faraone, S. V., Biederman, J. (1997). Do attention deficit hyperactivity disorder and major depression share familial risk factors?. *Journal of Nervous and Mental Disease*, 18(5), 533–541.

Faraone, S.V., Biederman, J. (2005). What is the prevalence of adult ADHD? Results of a population screen of 966 adults. *Journal of Attention Disorder*, 9(2), 384 -391

Farone, S., Biederman, J., Lehman, B., Spencer, T., Norman, D., Seidman, L., ...Tsuang, M. (1993). Intellectual performance and school failure in children with attention deficit hyperactivity disorder and in their siblings. *Journal of Abnormal Psychology*, 102(4), 616-623.

Faraone, S. V., Biderman, J., Mennih, D., Wozinak, J., & Spencer, T. (1997). Attention-deficit hyperactivity disorder with bipolar disorder: A familial subtype? *Journal of American Academic Children and Adolescents*, 36(10), 1378-1387.

Faraone, S., Biederman, J., & Wozniak, J. (2012). Examining the comorbidity between attention deficit hyperactivity disorder and bipolar I disorder: □ A Meta-Analysis of family genetic studies. *American Journal of Psychiatry*, 169(12),1256–1266.

Faraone, S. V., Biederman, J., Wozniak, J., Mundy, E., Mennin, D., O'Donnell, D. (1997). Is comorbidity with ADHD a marker for juvenile-onset mania? *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(8), 1046–1055.

- Faraone, S.V., Sergeant, J., Gillberg, C., & Biederman, J. (2003): The world wide prevalence of ADHD: Is it an American condition? *World Psychiatry*, 2(2), 104-113.
- Fauhar, M. (1992). Untitled contribution to the discussion on quality-of-life assessment: Can we keep it simple. *Journal of the Royal Statistical Society*, 155(3), 382-383.
- Fauhar, M. (1995). Definitions of quality of life: A taxonomy. *Journal of Advanced Nursing*, 22, 502-508.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149-1160.
- Field, A.P. (2011). *Discovering statistics using SPSS*. (4thed.). Thousand Oaks, CA: Sage.
- Feinstein, A. R. (1987). The theory and evaluation of sensibility. In A. R. Feinstein (Ed.), *Clinimertics* (pp. 630-656). Westford, MA: Murry Printing.
- Felce, D., & Perry, J. (1995). Quality of life: Its definition and measurement. *Research in Developmental Disabilities*, 16(1), 51-74.
- Ferguson, C.F. (2009). An effect size primer: a guide for clinicians and researchers. *Professional Psychology: Research and Practice*, 40, 532-538.
- Ferrans, C. E. (1990a). Quality of life: Conceptual issues. *Seminars in Oncology Nursing*, 6(4), 248-254.
- Ferrans, C. E. (1990b). Development of a quality of life index for patients with cancer. *Oncology Nursing Forum*, 17(3), 15-19.
- Fischer, A., Bau, C., Grevet, E., Salgado, C., Victor, M., Kalil, K., ... Belmonte-de-

- Abreu, P. (2007). The role of comorbid major depressive disorder in the clinical presentation of adult ADHD. *Journal of Psychiatric Research* 41(12), 991–996.
- Fleury, J. (1993). Preserving qualitative meaning in instrument development. *Journal of Nursing Measurement*, 1(2), 135–144.
- Flory, K., & Lynam, D. R. (2003). The relation between attention deficit hyperactivity disorder and substance abuse: What role does conduct disorder play?. *Clinical Child and Family Psychology Review*, 6(1), 1-16.
- Frank-Stromberg, M. (1988). *Instruments for clinical nursing research*. Norwalk, CT: Appleton & Lange.
- Frazier, T., Youngstrom, E., Glutting, J., & Watkins, M. (2007). ADHD and achievement: Meta-analysis of the child, adolescent, and adult literatures and a concomitant study with college students. *Journal of Learning Disabilities*, 40(1), 40-65.
- Fried, R., Petty, C., Faraone, S. Hyder, L., Day, H., & Biederman, J. (2013). Is ADHD a risk factor for high school dropout? A Controlled Study. *Journal of Attention Disorder*, Advance online publication. doi:10.1177/1087054712473180
- Further, M., Rintala, D., Hart, K., Clearman, R., & Young, M. (1992). Relationship of life satisfaction to impairment, disability, and handicap among persons with spinal cord injury living in the community. *Archives of Physical Medicine and Rehabilitation*, 73(6), 552-557.
- Gamarra, A. (2003). *The relationship between ethnicity and the diagnosis of attention-deficit/hyperactivity disorder in children and adolescents* (Doctoral dissertation). Available from Proquest Database (UMI No. 3089937).

- Giedd, J., (2003). ADHD and substance abuse. *Medscape Psychiatry & Mental Health*, 9(1). Retrieved October 15, 2006, from <http://www.medscape.com/viewarticle/456199print>.
- Gilman, R., & Huebner, E.S. (2006). Characteristics of adolescents who report very high life satisfaction. *Journal of Youth and Adolescence*, 35(3), 311-319.
- Gomez, R., & Sanson, A. (1994). Mother-child interactions and noncompliance in hyperactive boys with and without conduct problems. *Journal of Child Psychology and Psychiatry*, 35(3), 477-490.
- Grant, B. F., & Dawson, D. A. (1997). Age at onset of alcohol use and its association with *DSM-IV* alcohol abuse and dependence: Results from the National Longitudinal Epidemiologic Survey. *Journal of Substance Abuse*, 9, 103–110.
- Green, J., Thorogood, N. (2009). *Qualitative Methods for Health Research* (2nd Ed.). Thousand Oaks, CA: Sage.
- Grevet, E. H., Bau, C., Salgado, C., Fischer, A., Kalil, K., Victor, M., ... Belmonte-de-Abreu, P. (2006). Lack of gender effects on subtype outcomes in adults with attention-deficit/ hyperactivity disorder: Support for the validity of subtypes. *European Archives of Psychiatry and Clinical Neuroscience*, 256(5), 311–319.
- Halperin, J. & Schulz, K.(2006). Revisiting the role of the prefrontal cortex in the pathophysiology of attention-deficit/hyperactivity disorder. *Psychological Bulletin*, 132, 560-581.
- Hanestad, B. R. (1990). Errors of measurement affecting the reliability and validity of data acquired from self-assessed quality of life. *Scandinavian Journal of the Caring Sciences*, 4(1), 29-34.

- Harpin, V. (2005). The effect of ADHD on the life of an individual, their family, and community from preschool to adult life. *Archive of Disabled Children, 90*(1), 12–17.
- Hart, E. L., Lahey, B., Loeber, R., Applegate, B., & Frick, P. J. (1995). Developmental changes in attention-deficit hyperactivity disorder in boys: A four-year longitudinal study, *Journal of Abnormal Child Psychology, 23*(6), 729-749.
- Havighurst, R. (1963). Successful life. In R. H. Williams, C. Tibbits, & Donhue, W (Eds.), *Process of aging social and psychological perceptors* (pp. 299-320). New York, The Atherton Press.
- Heiligenstein, E., Guenther, G., Levy, A., Savino, F., & Fulwiler, J. (1999). Psychological and academic functioning in college students with attention deficit hyperactivity disorder. *Journal of American College Health, 47*, 181-185.
- Hensch, T., Himmerich, H., & Hegerl, U. (2011). ADHD and bipolar disorder: Common causes: Common cure? *Journal of Attention Deficit Disorder, 15*(2), 99–100.
- Hisham M. B. (2008). Detecting outliers. Retrieved from <http://www.hishammb.net/workshopfeb2008/outlierinspss.pdf>
- Holmes, S., & Dickerson, J. (1987). The quality of life design and evaluation of a self-assessment instrument for use with cancer patients. *International Journal of Nursing Studies, 4*(1), 15-24.
- Hoza, B. (2007). Peer functioning in children with ADHD. *Journal of Pediatric Psychology, 7*(1), 101–106.
- Hoza, B., Mrug, S., Gerdes, A. C., Hinshaw, S., Bukowski, W., & Gold, J. (2005). What aspects of peer relationships are impaired in children with Attention Deficit/Hyperactivity Disorder? *Journal of Consulting and Clinical Psychology,*

73(3), 411-423.

Hughes, C., Hwang, B., Kim, J., Eisenman, L.T., & Killian, D.J. (1995). Quality of life in applied research: A review and analysis of empirical measures. *American Journal on Mental Retardation*, 99(6), 623-636.

Jacob, C. P., Romanos, J., Dempfle, A. Heine, M., Windemuth-Kieselbach, C., Kruse, A., ... Lesch, K. P. (2007). Co-morbidity of adult attention-deficit/hyperactivity disorder with focus on personality traits and related disorders in a tertiary referral center. *European Archives of Psychiatry and Clinical Neuroscience*, 257(6), 309–317.

Jaideep, T., Reddy, Y., & Srinath, S. (2006). Comorbidity of attention deficit hyperactivity disorder in juvenile bipolar disorder. *Bipolar Disorder*, 8(2), 182–187.

Jenaro, C., Verdugo, M., Caballo, C., Balboni, Y., Lachapelle, W., . . . Schalock, L. (2005). Cross-cultural study of person-centered quality of life domains and indicators: A replication. *Journal of Intellectual Disability Research*, 49(10), 734-739.

Jensen, P., & Copper, J. (2002). Attention Deficit Hyperactivity Disorder: State of the Science, Best Practices. Kingston, NJ: Civic Research Institute.

Jensen, P., Hinshaw, S., Kraemer, H., Lenora, N., & Newcom, J. H., Abikof, H., . . . Viltillo, B. (2001). ADHD comorbidity findings from the MTA study: comparing comorbid subgroups. *Journal of the American Academy of Child and Adolescent Psychiatry*. 40(2), 147–158.

Johansson, P., Kerr, M., & Andershed, H. (2005). Linking adult psychopathy with childhood hyperactivity-impulsivity-attention problems and conduct problems

- through retrospective self-reports. *Journal of Personality Disorders*, *19*(1), 94–101.
- Jette, A.M., Davies, A., Cleary, P., Calkins D., Rubenstein L., & Fink, A. (1986). The functional status questionnaire: Reliability and validity when used in primary care. *Journal of General Internal Medicine*, *1*(3), 143-149.
- Kalbag, A. S., & Levin, F. R. (2005). Adult ADHD and substance abuse: Diagnostic and treatment issues. *Substance Use & Misuse*, *40*(13), 1955-1981.
- Karam, R., Bau, C., Salgado, C., Kalil, K., Victor, M., . . . Grev, E. (2008). Late-onset ADHD in adults: Milder but still dysfunctional. *Journal of Psychiatry Research*, *43*(7), 697-701.
- Katzman, M., Chokka, P. (2010). Adult ADHD and its comorbidities, with a focus on bipolar disorder. *Journal of Affective Disorders*, *124*(2), 1-8.
- Kearl, M. (2010). No more ADHD? New changes to the guidelines for diagnosing children and adults. Retrieved 02/05/2010 from <http://www.additudemag.com/addnews/70/6914.html>
- Kelley-Gillespie, N. (2009). An integrated conceptual model of quality of life for older adults based on a synthesis of the literature. *Applied Research Quality Life*, *4*(3), 259–282.
- Kessler, R. C., Adler, L., Barkley, R., Biederman, J., Conners, C.K., . . . Zaslavsky, A.M. (2006). The prevalence and correlates of adult ADHD in the United States: Results from the national comorbidity survey replication. *American Journal of Psychiatry*, *163*(4), 716–23.
- Kessler, R., Green, J., Adler, L., Barkley, R., Chatterji, S., . . . Brunt, V. (2010). Structure

and diagnosis of adult attention-deficit/hyperactivity disorder: Analysis of expanded symptom criteria From the adult ADHD clinical diagnostic scale.

Archive of General Psychiatry, 67(11), 1168-1178. doi:10.1001.

Klassen, L. J., Katzman, M. A., & Chokka, P. (2010). Adult ADHD and its comorbidities, with a focus on bipolar disorder. *Journal of Affective Disorders*, 124(2), 1–8.

Klein, R., & Mannuzza, S. (2010). Comorbidity in adult attention-deficit hyperactivity disorder. *Mental Health*, 179(10), 126-143.

Kooij, J. J., Aeckerlin, L.P., Buitelaar, J. K. (2001). Functioning, comorbidity and treatment of 141 adults with attention deficit hyperactivity disorder (ADHD) at a psychiatric outpatient department. *Netherlands Journal of Medicine*, 145(31), 1498–1501.

Kowatch, R., Youngstrom, E., Danielyan, A., Findling, R. L. (2005). Review and meta-analysis of the phenomenology and clinical characteristics of mania in children and adolescents. *Bipolar Disorder*, 7(6), 483–496.

Krippendorff, K. (2004). *Content analysis: an introduction to its methodology*. (2nd ed) Thousand Oaks, CA: Sage.

Kupper, T., Haavik, J., Drexler, H., Ramos-Quiroga, J., Wermelskirchen, D., Prutz, C., & Schauble, B. (2012). The negative impact of attention-deficit/hyperactivity disorder on occupational health in adults and adolescents. *International Archives of Occupational and Environmental Health*, 85(8), 837–847.

- Lahey, B., Carlson, S., & Frick, P. (1997). Attention deficit disorder without hyperactivity. In T.A. Wildger, A.J. Frances, H.A. Pincus, R. Ross, M.B. First, W. Davis (Eds.), *DSM-IV sourcebook* (163-188). Washington, DC: Contemporary Books.
- Landgraf, M. (2007). Monitoring quality of life in adults with ADHD: Reliability and validity of a new measure. *Journal of Attention Disorders, 11*(3), 351-362.
- Lehman, A.F. (1988). A quality of life interview for the chronically mentally ill. *Evaluation & Program Planning, 11*, 51-62.
- Levin, F. R., Evans, S., & Kleber, H. D. (1998). Prevalence of adult attention deficit/hyperactivity disorder among cocaine abusers seeking treatment. *Drug Alcohol Dependency, 52*(1), 15–25.
- Levy, F. (2004). Synaptic Gating and ADHD: A biological theory of comorbidity of ADHD and anxiety. *Neuropsychopharmacology, 29*(9), 1589-1596.
- Lilienfeld, S., & Waldman, I. (1990). The relationship between childhood attention-deficit hyperactivity disorder and adult antisocial behavior reexamined: The problem of heterogeneity. *Clinical Psychology Review, 10*(6), 699–725.
- Livneh, H. (1988). Rehabilitation goals: Their hierarchical and multifaceted nature. *Journal of Applied Rehabilitation Counseling, 19*(3), 12-18.
- Livneh, H. (2001). Psychosocial adaptation to illness and disability: A conceptual framework. *Rehabilitation Counseling Bulletin, 44*(3), 151-161
- Mancini, C., Van Ameringen, M., Oakman, J. M., & Figueiredo, D. (1999). Childhood attention deficit/hyperactivity disorder in adults with anxiety disorders. *Psychological Medicine, 29*(3), 515-525.
- Mannuzza, S., Klein, R., & Bessler A. (1998). Adult psychiatric status of hyperactive

- boys grown up. *American Journal of Psychiatry*, 155(4), 493-498.
- Mannuzza, S., Klein, R. G., Bessler, A., Malloy, P., & Lapadula, M. (1993). Adult outcome of hyperactive boys. Educational achievement, occupational rank, and psychiatric status. *Archives of General Psychiatry*, 50(7), 565-576.
- Mannuzza, S., Klein, R. G., Bonagura, N., Malloy, P., Giampino, T. L., & Addalli, K. A. (1991). Hyperactive boys almost grown up. Replication of psychiatric status. *Archives of General Psychiatry*, 48(1), 77-83.
- March, J., Swanson, J., Arnold, L., Hoza, B., & Conners, C., Hinshaw, P., . . . Phelam, W. (2000). Anxiety as a predictor and outcome variable in the multimodal treatment study of children with ADHD (MTA1). *Journal of Abnormal Child Psychology*, 28(6), 527-541.
- Marks, D. (2004). ADHD in adults: Assessment and treatment considerations. *Journal of Behavioral Health Management*, 24(3), 42-45.
- Marinelli, R. D., & Plummer, O. K. (1999). Healthy aging: beyond exercise. *Activities, Adaptation & Aging*, 23(4), 1-11.
- Martin, F. (2012). Perceptions of links between quality of life area: Implication for measurement and practice. *Social Indicators Research*, 106(1), 95-107.
- Martin, F., Rodham, K., Camfield, L., & Ruta, D. (2010). Reliability and validity of the Thai global person generated index, an individualizes measure of quality of life. *Applied Research in Quality of Life*, 5(3), 219-232.
- Matza, L.S., Van Brunt, D., Cates, C., Murray, L. (2011). Test-retest reliability of two patient-report measures for use in adults with ADHD. *Journal of Attention Disorder*, 15(7), 557-563.
- Mauceri, M., & DiMarco, L. G. (2014). Psychosocial dimensions of Quality of Life

- among elders: A research of the Italian and Spanish elderly. *Social and Behavioral Sciences*, 116, 1651 – 1655.
- McGough, J. J., Smalley, S. L., McCracken, J. T., Yang, M., Del’Homme, M., Lynn, D., & Loo, S. (2005). Psychiatric comorbidity in adult attention deficit hyperactivity disorder: Findings from multiplex families. *American Journal of Psychiatry*, 162(9), 1621–1627.
- Meyer, A., & Sagvolden, T. (2006). Fine motor skills in South African children with symptoms of ADHD: influence of subtype, gender, age, and hand dominance. *Behavioral and Brain Functions*, 9(2), 23-31.
- Mick, E., Biederman, J., Faraone, S., Sayer, J., & Kleinman, S. (2002). Case-Control Study of Attention-Deficit Hyperactivity Disorder and Maternal Smoking, Alcohol Use, and Drug Use During Pregnancy. *Journal of the American Academy of Child & Adolescent Psychiatry*, 41(4), 378-385.
- Mikami, A. Y. (2010). The importance of friendship for youth with attention-deficit/hyperactivity disorder. *Clinical Child and Family Psychology Review*, 13(2), 181–198.
- Milich, R., Balentine, A. C., & Lynam, D. (2001). ADHD combined type and ADHD predominantly inattentive type are distinct and unrelated disorders. *Clinical Psychology: Science and Practice*, 8(4), 463–488.
- Millstein, R.B., Wilens, T. E., Biederman, J., Spencer, T. .J. (1997). Presenting ADHD symptoms and subtypes in clinically referred adults with ADHD. *Journal of Attention Deficit Disorder*, 2(3), 159–166.
- Miranda, A., Soriano, M., Fernandez, I., & Melia, A. (2008). Emotional and behavioral problems in children with attention deficit-hyperactivity disorder: Impact of age

- and learning disabilities. *Learning Disability Quarterly*, 3(4), 171-185.
- Moffitt, T.(1990). Juvenile delinquency and attention deficit disorder: Boys developmental trajectories from age 3 to age 15. *Child Development*, 61, 893-910.
- Molina, B.S., & Pelham, W.E. (2003). Childhood predictors of adolescent substance use in a longitudinal study of children with ADHD. *Journal of Abnormal Psychology*, 112(3), 497-507.
- Monterey, J. (2002). *ADHD management program: A program design for ADHD college students* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3057616).
- Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research*, 40(2), 120–123.
- Murphy, K., & Barkley, R. (1996). Attention deficit hyperactivity disorder adults: Comorbidities and adaptive impairments. *Comprehensive Psychiatry*, 37(6), 393-401.
- Murphy, K., Barkley, R. A., & Bush, T. (2002). Young adults with attention deficit hyperactivity disorder: Subtype differences in comorbidity, educational and clinical history. *Journal of Nervous and Mental Disease*, 190 (3), 147–157.
- Nadeau, K.G. (2002). Is our daughter a daydreamer, tomboy, or “chatty Kathy?” She may have undiagnosed attention deficit hyperactivity disorder. Retrieved 5/29/2003 from <http://www.AD/HD.org/content/women/girls.htm>.
- Nadeau, K. G (2005). Career choices and workplace challenges for individuals with ADHD. *Journal of Clinical Psychology*, 61(5), 549-563.
- National Institutes of Health. (2006). Severe the Psychiatry, childhood ADHD may predict alcohol, substance use problems in teen years. Retrieved 11/ 15/ 2006

from <http://www.nih.gov/news/pr/aug2003/niaaa-17.htm>

Nierenberg, A.A., Miyahara, S., Spencer, T., Wisniewski, S.R., Otto, M.W., Simon, N., ... Sachs, G. (2005). Clinical and diagnostic implications of lifetime attention-deficit/hyperactivity disorder comorbidity in adults with bipolar disorder: data from the first 1000 STEP-BD participants. *Biological Psychiatry*, 57(11), 1467–1473.

Nierenberg, A.A., Miyahara, S., Spencer, T., Wisniewski, S.R., Otto, M.W., Simon, N., ... Sachs, G. (2005). Clinical and diagnostic implications of lifetime attention-deficit/hyperactivity disorder comorbidity in adults with bipolar disorder: data from the first 1000 STEP-BD participants. *Biological Psychiatry*, 57(11), 1467–1473.

Nigg, J. T. (2005). Neuropsychologic theory and findings in attention-deficit/hyperactivity disorder: The state of the field and salient challenges for the coming decade. *Biological Psychiatry*, 57, 1424-1435.

Nilsson, E. (2012). *Aspects of health-related quality of life: Associations with psychosocial and biological factors, and use as patient-reported outcome in routine health care* (Doctoral dissertation). Available from LiU-Tryck Dissertations and Theses database. (ISBN No. 978-91-7519-958-0).

Noll, H. (2002). Towards a European system of social indicators: Theoretical framework and system architecture. *Social Indicators Research*, 58(3), 47-84.

Nordstrom, M., & Lubkin, I. (1990). Quality of life. In L. M. Lubkin (Ed.), *Chronic Illness: Impact and interventions* (pp. 136-154). Boston, MA: Jones & Bartlett.

Norwalk, K., Norvilitis, J. M., & MacLean, M. G. (2009). ADHD symptomatology and its relationship to factors associated with college adjustment. *Journal of Attention*

Disorders, 13(3), 251-258.

Oleske, D., Heinze, S., & Otte, D. (1990). The diary as a means of understanding the quality of life of persons with cancer receiving home nursing care. *Cancer Nursing, 13(3), 158-166.*

Olfson, M. Utilization of neuropsychiatric diagnostic tests for general hospital patients with mental disorders. *American Journal of Psychiatry, 149(12), 1711-1717.*

Onwuegbuzie, A.J., & Teddlie, C. (2003). A framework for analyzing data in mixed methods research. In A. Tashakkori & C. Teddlie's (Ed.) *Handbook of mixed methods in social and behavioral research (pp. 351-383)*. Thousand Oaks, CA: Sage Publications.

Pain, K., Dunn, M., Anderson, G., & Darrah, J., Kratochvil, M. (1998). Quality of Life: What Does It Mean in Rehabilitation? *The Journal of Rehabilitation, 64(2), 5-11.*

Patton, M. Q. (2002). *Qualitative research and evaluation methods (3rd Ed.)*. Thousand Oaks, CA: Sage Publications.

Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological Assessment, 5(2), 164-172.*

Pennington, B. (2005). Toward a new neuropsychological model of attention-deficit/hyperactivity disorder: Subtypes and multiple deficits. *Biological Psychiatry, 57, 1221-1223.*

Pelham, W., Burrows-MacLean, V., Gnagy, E., Fabiano, G., Coles, E., Hoffman, M. (2005). Implementation of a comprehensive school-wide behavioral intervention: the ABC program. *Journal of Attention Deficiency Disorder, 9(1), 248-260.*

Perrin, S., & Last, C. (1996). Relationship between ADHD and anxiety in boys: Results from a family study. *Journal of the American Academy of Child & Adolescent Psychiatry, 35(8), 988-996.*

- Pliszka, S. (1992). Comorbidity of attention-deficit hyperactivity disorder and over anxious disorder. *Journal of the American Academy of Child & Adolescent Psychiatry, 31*(2), 197-203.
- Pliszka, S. (1998). Comorbidity of attention-deficit/hyperactivity disorder: An overview. *Journal of Clinical Psychiatry, 59*(7), 50-58.
- Pliszka, S. R., Carlson, C., & Swanson, J. M. (1999). *ADHD with comorbid disorders: Clinical assessment and management*. New York, NY: Guilford.
- Purdie, V., & Downey, G. (2000). Rejection sensitivity and adolescent girls' vulnerability to relationship-centered difficulties. *Child Maltreatment, 5*(4), 338-350.
- Ramsay, J. R., & Rostain, A. L. (2005). Adapting psychotherapy to the needs of adults with attention-deficit/hyperactivity disorder. *Psychotherapy: Theory, Research, Practice, Training, 42*(1), 72-84.
- Ramtekkar, U. P., Reiersen, A. M., Todorov, A. A., & Todd, R. D. (2010). Sex and age differences in attention-deficit/hyperactivity disorder symptoms and diagnoses: implications for DSM-V and ICD-11. *Journal of the American Academy of Child & Adolescent Psychiatry, 49*(3), 217-228.
- Randall, J. E. & Morton, P. (2003). Quality of life in Saskatoon 1991 and 1996: A geographical perspective. *Urban Geography 24*(8), 691-722.
- Raphael, D., Rukholm, E., Brown, I., Hill-Bailey, P., & Donato, E. (1996). The quality of life profile adolescent version: Background, description, and initial validation. *Journal of Adolescent Health, 19*(5), 366-375.
- Rapley, M. (2003). *Quality of life: A critical introduction* (1st Ed.). Thousands Oaks, CA: Sage publications.
- Ratey, J., Greenberg, M., Bemporad, J., & Lindem, K. (1992). Unrecognized attention-deficit hyperactivity disorder in adults presenting for outpatient psychotherapy.

Journal of Child and Adolescent Psychopharmacology, 2(4), 267–275.

Rimmerman, A., Yurkevich, O., Birger, M., & Araten-Bergman, T. (2005). Quality of life in men and women with borderline intelligence and attention deficit disorders living in community residencies: A comparative study. *Journal of Attention Disorder*, 9(2), 435–443.

Riordan, H., Flashman, L., Saykin, A., Frutiger, S., Carroll, K., & Huey, L. (1999). Neuropsychological correlates of methylphenidate treatment in adult ADHD with and without depression. *Archives of Clinical Neuropsychology*, 14(2), 217-233.

Roessler, R.T. (1990). A quality of life perspective on rehabilitation counseling. *Rehabilitation Counseling Bulletin*, 34, 82-90.

Rooney, M. E. (2010). *Risky behavior in college students with ADHD* (Master's thesis). Available from ProQuest Dissertations and Theses database. (UMI No.1489580).

Roth, R., Wishart, H., Flashman, L., Riordan, H., Huey, L., & Saykin, A. (2004). Contribution of organizational strategy to verbal learning and memory in adults with attention-deficit/ hyperactivity disorder. *Neuropsychology*, 18(1), 78-85.

Rubin, S. E., Chan, F., & Thomas, D. (2003). Assessing changes in life skills and quality of life resulting from rehabilitation services. *Journal of Rehabilitation*, 69(3), 4-9.

Sachs, G. S., Baldassano, C. F., Truman, C. J., Guille, C. (2000). Comorbidity of attention deficit hyperactivity disorder with early- and late-onset bipolar disorder. *American Journal of Psychiatry*, 157(3), 466–468.

Safren, S., Sprich, S. E., Cooper-Vince, C., Knouse, L. E., Lerner, J. A. (2010). Life impairments in adults with medication-treated ADHD. *Journal of Attention Disorder*, 13(5), 524–531.

- Samuel, V. J., George, P., Thornell, A., Curtis, S., Taylor, A., Brome, D. (1999). A pilot controlled family study of DSM-III-R and DSM-IV ADHD in African-American children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38 (1), 34-39.
- Sandelowski, M. (2000). Focus on research methods combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing & Health*, 23, 246–255.
- Schalock, R. L. (2004). The concept of quality of life: What we know and do not know. *Journal of Intellectual Disability Research*, 48(3), 203-216.
- Schalock R. L., Brown I., Brown R., Cummins R. A., Felce D., Matikka L., . . . Parmenter, T. (2002). Conceptualization, measurement, and application of quality of life for persons with intellectual disabilities: Report on an international panel of experts. *Mental Retardation*, 40(6), 457–70.
- Schalock, R., Keith, K. Hoffman, K. and Karan, O. (1989). Quality of life, its measurements and its use. *Mental Retardation*, 27(1), 25-31.
- Schalock, R. L., & Verdugo, M. A. (2002). *Handbook on quality of life for human service practitioners*. Washington, DC: American Association on Mental Retardation.
- Schatz, D., & Rostain, A. (2006). ADHD with comorbid anxiety: A review of the current literature. *Journal of Attention Disorders*, 10(2), 141-149.
- Schott, E. M. (2012). *ADHD identity: A conceptual developmental model* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database (UMI No. 3514305).
- Schubiner, H., Tzelepis, A., Milberger, S., Lockhart, N., Kruger, M., . . . Schoener, E.

- (2000). Prevalence of attention-deficit/hyperactivity disorder and conduct disorder among substance abusers. *Journal of Clinic Psychiatry*, 61(4), 244–251.
- Secnik, K., Swensen, A., & Lage, M. (2005). Comorbidities and costs of adult patients diagnosed with attention-deficit hyperactivity disorder. *Pharmacoeconomics*, 23(1), 93–102.
- Sentissi, O., Navarro, J.C., Oliveira, H.D., Gourion, D., Bourdel, M.C., Baylé, F.J., ... Poirier, M.F. 2008. Bipolar disorders and quality of life: The impact of attention deficit/hyperactivity disorder and substance abuse in euthymic patients. *Psychiatry Research*, 161(1), 36-42.
- Shames, W. & Alden, P. (2005). The impact of short-term study abroad on the identity development of college students with learning disabilities and/or ADHD. *The Interdisciplinary Journal of Study Abroad*, 11(2), 1-31.
- Shekim, W., Asamow, R., Hess, E., Zaucha, K., & Wheeler, N. (1990). A clinical and demographic profile of a sample of adults with attention deficit hyperactivity disorder, residual state. *Comprehensive Psychiatry*. 31(5), 411- 425.
- Shifrin, J., Proctor, B., & Prevatt, F. (2010). Work performance differences between college students with ADHD. *Journal of Attention Disorders*, 13(5), 489-496.
- Shin, D., & Johnson, D. M. (1978). Avowed happiness as an overall assessment of the quality of life. *Social Indicators Research*, 5(4), 475-492.
- Smith, M. L. (1997). Mixing and matching: Methods and models. *New Directions for Evaluation*, 74, 73-86.
- Sobanski, E. (2006). Psychiatric comorbidity in adults with attention deficit/hyperactivity disorder (ADHD). *European Journal of Child and Adolescent Psychiatry*, 25(1), 26-31.

- Sobanski, E., Bruggemann, D., Alm ,B., Kern, S., Philipsen, A., Schmalzrie, H., . . .
Rietschel, M. (2008). Subtype differences in adults with attention deficit/hyperactivity disorder (ADHD) with regard to ADHD-symptoms, psychiatric comorbidity and psychosocial adjustment. *European Psychiatry*, 23(2), 142-149.
- Solomon, G. (1995). Evolution of the measurement of quality of life in migraine. *Neurology*, 48(3), 10-15.
- Spencer, T., Biederman, J., Wilens, T. (2004). Non-stimulant treatment of adult attention-deficit/hyperactivity disorder. *Psychiatric Clinics of North America*, 27, 373–387.
- Spencer, T. J., Biederman, J., Wilens, T. E., & Faraone, S. V. (2002). Overview and neurobiology of attention-deficit/hyperactivity disorder. *Journal of Clinic Psychiatry*. 63(12), 3–9.
- Sprafkin, J., Gadow, K., Weiss, M., Schneider, J., Nolan, E. (2007). Psychiatric comorbidity in ADHD symptom subtypes in clinic and community controls. *Journal of Attention Disorder*, 11(2), 114–124.
- Sonuga-Barke EJ, Daley D, Thompson M. (2002). Does maternal ADHD reduce the effectiveness of parent training for preschool children’s ADHD? *Journal of the American Academy of Child and Adolescent Psychiatry*, 41(6), 696–702.
- Sandelowski, M. (2000). Focus on research methods combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing & Health*, 23, 246–255.
- Suldo, S., & Huebner, E. (2006). Is extremely high life satisfaction during adolescence advantageous? *Social Indicators Research*, 78, 179-203.
- Tamam, L., Karaku, G., Ozpoyraz, N. (2008). Comorbidity of adult attention-deficit

- hyperactivity disorder and bipolar disorder: Prevalence and clinical correlates. *European Archives of Psychiatry and Neurological Sciences*, 258, 385–393.
- Tamam, L., Tuglu, C., Karatas, G., & Ozcan, S. (2006). Adult attention-deficit hyperactivity disorder in patients with bipolar I disorder in remission: Preliminary study. *Psychiatry and Clinical Neurosciences*, 60, 480–485.
- Tannock, R., Ickowicz, A., & Schachar, R. (1995). Differential effects of methylphenidate on working memory in ADHD children with and without comorbid anxiety. *Journal of the American Academy of Child & Adolescent Psychiatry*, 34(7), 886-896.
- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (1st ed.). Thousand Oaks, CA: Sage Publications.
- Tashakkori, A., & Teddlie, C. (2003a). The past and future of mixed methods research: From data triangulation to mixed model designs. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage Publication.
- The World Health Organization Quality of Life Group. (1995). The World Health Organization Quality of life assessment (WHOQOL): Position paper from the World Health Organization. *Social Science Medicine*, 41(10), 1403-1409.
- Torgersen, T., Gjervan, B., & Rasmussen, K. (2006). ADHD in adults: a study of clinical characteristics, impairment and comorbidity. *Nordic Journal of Psychiatry*, 60(1), 38-43.
- Tse, M. (2012). *Social skills and self-esteem of college students with ADHD* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI

No. 3551788).

Tucker, P. (1999). Attention-deficit/hyperactivity disorder in the drug and alcohol clinic.

Drug and Alcohol Review, 18(3), 337-346.

Upadhyaya, H. (2007). Managing attention-deficit/hyperactivity disorder in the presence

of substance use disorder. *Journal of Clinical Psychiatry, 68*(11), 23-30.

Upadhyaya, H., Rose, K., Wang, W., O'Rourke, K., Sullivan, B., Deas, D. (2005).

Attention-deficit/hyperactivity disorder, medication treatment, and substance use patterns among adolescents and young adults. *Journal of Child and Adolescent Psychopharmacology, 15*, 799-809.

Ustun, T. (2005). The prevalence and effects of adult attention

deficit/hyperactivity disorder on work performance in a nationally representative sample of workers. *Journal of Occupational and Environmental Medicine, 47*(6), 565-572.

Vincent, J., Phillipson, C., & Downs, M. (2006). *The future of old age* (1st ed). City

Road, London: Sage Publication Ltd.

Weiss, G., & Hechtman, L. (1993). Treatment of adults with attention

deficit/hyperactivity disorder (2nd ed.). New York: Guilford Press.

Weiss, G., Hechtman, L., Milroy, T., & Perlman, T. (1985). Psychiatric status of

hyperactives as adults: A controlled perspective 15-year follow-up of 63 hyperactive children. *Journal of the American Academy of Child and Adolescent Psychiatry, 24*, 211-220.

Westmoreland, P., Gunter, T., Loveless, P., Allen, J., Sieleni, B., & Black, D. W. (2009).

Attention deficit hyperactivity disorder in men and women newly committed to prison: Clinical characteristics, psychiatric comorbidity, and quality of life.

- International Journal of Offender Therapy and Comparative Criminology*, 54(3), 361-377.
- Weyandt, L.L. & DuPaul, G. (2006). ADHD in college students. *Journal of Attention Disorders*, 10(1), 9-19.
- Whalen, C. K., & Henker, B. (1992). The social profile of attention- deficit hyperactivity disorder: Five fundamental facets. *Child and Adolescent Psychiatric Clinics of North America*, 1, 395–410.
- Wilens, T., Biederman, J., & Spencer, T. (2002). Attention deficit hyperactivity disorder across the lifespan. *Annual Medical Review*, 53, 113-131.
- Wilens, T. E. (2004). Attention-deficit/hyperactivity disorder and the substance use disorders: The nature of the relationship, subtypes at risk, and treatment issues. *Psychiatric Clinic of North America*, 27, 283–301
- Wilens, T. (2006). Attention deficit hyperactivity disorder and substance use disorders. □ *The American Journal of Psychiatry*, 163(12), 2059- 2063.
- Wilens, T., Biederman, J., & Spencer, T. (2002). Attention deficit hyperactivity disorder across the lifespan. *Annual Medical Review*, 53, 113-131.
- Wilens, T. E., Faraone, S. V., Biederman, J., & Gunawardene S. (2003). Does stimulant therapy of attention-deficit/hyperactivity disorder beget later substance abuse? A meta-analytic review of the literature. *Pediatrics*, 111, 179–185.
- Wolf, L. E. (2001), College Students with ADHD and other hidden disabilities. *Annals of the New York Academy of Sciences*, 931, 385–395.
- Wolraich, M., Hannah, J., Pinnock, T., Baumgaertel, A., & Brown, J. (1996). Comparison of diagnostic criteria for attention-deficit hyperactivity disorder in a

county-wide sample. *Journal of American Academy of Child & Adolescent Psychiatry*, 35(3), 319- 324.

Wozniak, J., Biederman, J., Kiely, K., Ablon, J. S., Faraone, S. V., Mundy, E., & Mennin, D. (1995). Mania-like symptoms suggestive of childhood-onset bipolar disorder in clinically referred children. *Journal of American Academy of Child & Adolescent Psychiatry*, 34, 867–876.

Young, S., Gudjonsson, G. H., Wells, J., Asherson, P., Theobald, D., Oliver, B., . . . Mooney, A. (2009). Attention deficit hyperactivity disorder and critical incidents in a Scottish prison population. *Personality and Individual Differences*, 46(4), 265-269.

Young, J., & McNicoll, P. (1998). Against all odds: Positive life experiences of people with advanced amyotrophic lateral sclerosis. *Health Social Work*, 23(1): 35–43.

Youngstrom, E. A., Arnold, L. E., Frazier, T. W. (2010). Bipolar and ADHD comorbidity: Both artifact and outgrowth of shared mechanisms. *Clinical Psychology*, 17, 350–359.

Zametkin, A., & Liebenauer, L., Fitzgerald, G., King, A., Minkunas, D., Herscovitch, P., . . . Cohen, R. (1993). Brain metabolism in teenagers with attention-deficit hyperactivity disorder. *Archives of General Psychiatry*, 50, 333-340.

Vitae
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Manuscripts Published or In Press in Refereed Journals

Kettaneh, A. A. (2015). Substance Abuse Among the Elderly Population: Overview and management. *Journal of Applied Rehabilitation Counseling, 46*(4), 11-17.

Kettaneh, A. A., Kinyanjui, B., Slevin, B., Slevin, J. R. & Harley, D. A. (2015). Inclusion of Aging in Rehabilitation Counseling Journals 2000-2012: A Content Analysis. *Journal of Rehabilitation Research & Policy, 29*(1), 47-87.

Kettaneh, A. A., & Slevin, J. R. (2014). National module for helping individuals with physical disabilities in disaster events. *Journal of Applied Rehabilitation Counseling, 45* (1), 3-10.

Kettaneh, A. A., & Umeasiegbu, V. I. (In press). Specialized Housing Adaptation in Multiple Sclerosis: Relationships to Demographic Variables. *Journal of vocational Rehabilitation*.

Publications- Refereed Journals- Manuscripts In Press or Editorial Review:

Kettaneh, A. A., & Harley, D. A. (In editorial review). Rehabilitation Counselors' Role in Enhancing Work and Quality of Life for Cancer Survivors. *Journal of Rehabilitation*.

Kettaneh, A. A., & Maya, T. M. (In editorial review). The quality of life among adults with attention deficit hyperactivity disorder (ADHD). *Journal of Applied Rehabilitation Counseling*.

Kettaneh, A. A., & Kettaneh, H. A. (In editorial review). The Effectiveness of Token-Economy System On Managing Behaviors and Promoting Learning Process among Students with Attention Deficit Hyperactivity Disorder (ADHD). *Intervention in School and Clinic and Remedial and Special Education*.

Kinyanjui, B., **Kettaneh, A. A.,** Slevin, B., Slevin, J. R. & Harley, D. A. (In editorial review). Analyzing the Inclusion of Autism Spectrum Disorder in Rehabilitation Counseling Journals 2000-2012. *Implications for Service Delivery*.

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Teaster, P. B., Harley, D. A., & **Kettaneh, A. A.** (2014). Aging and mistreatment: Victimization of older adults in the United States. In Vakalahi, H. F. O., Simpson, G., M., & Giunta, N. (Eds), *The collective spirit of aging across cultures* (pp. 41-64). New York: Springer

Monographs and Reports:

McNabb, C., & **Kettaneh, A. A.** (2015). 2015 Comprehensive statewide needs assessment (CSNA) of the blind and visually impaired commonwealth of Kentucky. Prepared for Kentucky Office for Blind

Kettaneh, A. A. (2015). Statewide needs assessment. Prepared for Kentucky Office for Blind.

Kettaneh, A. A. (2015). 2014 State rehabilitation comprehensive statewide needs assessment survey. Prepared for Kentucky Office for Blind.

Kettaneh, A. A. (2015). 2014 Staff Survey Comprehensive Statewide Needs Assessment (Students, family, & caretakers). Prepared for Kentucky Office for Blind.

Kettaneh, A. A. (2015). 2014 Community rehabilitation provider survey. Prepared for Kentucky Office for Blind.

Kettaneh, A. A. (2015). Statewide Needs Assessment Survey for Eye Physicians. Prepared for Kentucky Office for Blind.

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National Council on Rehabilitation Education Spring Conference, Manhattan Beach, CA March 2014. "National Module for Helping Individuals with Physical Disabilities in Disaster Events".

National Council on Rehabilitation Education Spring Conference, Manhattan Beach, CA March 2014. "Substance Abuse among the Elderly Population: Overview and Management".

National Council on Rehabilitation Education Spring Conference, Manhattan Beach, CA March 2014. "Aging in Rehabilitation Counseling Journals and Implications for Rehabilitation Counselor Curricula".

National Council on Rehabilitation Education Spring Conference, Manhattan Beach, CA March 2014. "Analyzing the Inclusion of Autism Spectrum Disorder in Rehabilitation Counseling Journals 2000-2012".

National Council on Rehabilitation Education Spring Conference, Manhattan Beach, CA April 2014. "Analyzing the Inclusion of individuals with X-offenders experiences in Rehabilitation Counseling Journals 2000-2012".

National Council on Rehabilitation Education Spring Conference, San Francisco, CA April 2013. "Helping individuals with Disabilities in Disaster Events".

National Council on Rehabilitation Education Spring Conference, San Francisco, CA April 2013. "Specialized Housing: Needs and Concerns of Individuals with Multiple Sclerosis".

American Psychological Association Annual Conference, Cincinnati, OH, March 2013. "The Effectiveness of Token-Economy System on Managing Behaviors and Promoting: Learning Process among Students with Attention Deficit Hyperactivity Disorder (ADHD)".

HONORS AND SCHOLORSHIP:

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