

**A PRELIMINARY INVESTIGATION OF THE PREVALENCE
OF ATTENTION DEFICIT HYPERACTIVITY DISORDER
AND ITS SYMPTOMS IN SELECTED SCHOOLS IN
LUSAKA URBAN**

BY

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STUDENT DECLARATION

I **TEMBO ABEL** do hereby declare that this dissertation is a product of my individual effort; however, scholarly content obtained from various literatures has been acknowledged. This dissertation has not been submitted previously at this University or indeed any other University for a degree qualification.

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CERTIFICATE OF APPROVAL

This dissertation by TEMBO ABEL has been approved as partial fulfilment of the requirements for the award of the Master of Arts in Child and Adolescent Psychology by the University of Zambia.

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Abstract

Some teachers in primary and secondary schools in Zambia face difficulties handling children who exhibit impulsive, inattentive and hyperactivity symptoms because they may have a condition called Attention Deficit Hyperactivity Disorder (ADHD). Research on ADHD in Zambia is scanty and the magnitude of the problem remains unknown.

The purpose of this study was to determine the prevalence of ADHD and its three composites among grade four pupils and assess the challenges teachers face when using the ADHD scale in eliciting the symptoms of the three composites.

The embedded quantitative and qualitative exploratory and descriptive research design. Seventy four (74) pupils were surveyed using Gilliam's Attention Deficit Hyperactivity Disorder 36-item questionnaire and 20 teachers were interviewed on the challenges of employing the 36 item questionnaire.

Results showed a general tendency to have mild or severe symptoms of hyperactivity, impulsivity and inattentiveness. However, tests of differences in the three ADHD subsets using the Tukey post hoc tests following ANOVA indicated that the mean scores did not differ significantly in the two gender since the p values were > 0.05 . The most prevalent ADHD subtype was hyperactivity. The prevalence of hyperactivity, impulsivity and inattention was 12%, 10.3% and 10.3% in this order. Teachers faced an array of challenges in understanding and applying the ADHD tool and were all in agreement that they understood the concept hyperactivity. However, the construct 'squirm' has far-reaching importance for understanding and scoring children's normal and abnormal development within the subset. The main finding of this study is that several descriptions in the three subsets seem not to be related to the constructs hyperactivity, impulsivity and inattentiveness. Relating to impulsivity and inattentiveness, the two sub sets shed light on their multidimensional nature of meaning. Teachers seemed to give similar meanings of the constructs in a number of instances.

In conclusion, the data from this study using ADHD DSM criteria to assess the prevalence of ADHD in a school going child population suggest that there is a convincing difference between the prevalence of this disorder in the West. Just like there are limited research studies from the continent addressing the epidemiology of ADHD and other childhood neuro-developmental disorders, this Zambian study is significant.

There is need for profiling ADHD symptoms in our schools routinely. If adequate school health service planning is to be put in place on in magnitude and burden of ADHD and other childhood neuro-developmental disorders. Adaptation of the tool into the Zambian concepts can greatly help deal with the vocabulary that is foreign to the teachers and enable the administration of the tool with high validity. Zambia, further studies are required to potentially more accurately reflect the
Inattention and pupils

Key words: Attention Deficit Hyperactivity Disorder, hyperactivity, impulsivity,

Dedication

To my beloved children: Mercy, Precious, Abel, Ester, Elizabeth and Violet Tembo. There is no better investment in the world than to invest your lives in God and education, because the fear of the Lord is the beginning of knowledge. The knowledge you acquire can never be taken away from you. I challenge all of you to emulate me and beat this record, in Jesus Name.

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List of Abbreviations

ADD, Attention Deficit Disorder

ADHD, Attention Deficit Hyperactivity Disorder.

ADHD/C, Attention Deficit Hyperactivity Disorder, Combine.

BD, Behavioural Disorders

CDD, Conduct Developmental Disorder.

DSM, Diagnostic Statistical Manuel

HKD, hyperkinetic disorder

OCD, Oppositional Conduct Disorder

CHAPTER ONE - INTRODUCTION

1.1 Overview

Attention deficit hyperactivity disorder (ADHD) is a complex disorder having multiple causes including genetics as impacted by one's environment. The condition is usually diagnosed in childhood, when difficulties arise during play and school, and it is marked by lack of concentration, short attention span, and physical restlessness (APA 1994; APA 2000). ADHD often is blamed on bad parenting, or a "bad" attitude. However, brain-imaging studies have shown that children with this disorder have an underlying neurological dysfunction, which likely accounts for their behavior (Zametkin, Nordahl and Gross 1990; Lou , Andresen , Steinberg, 1998).). In the simplest terms, the brains of these children have yet to come fully "on-line." It is conjectured that while certain important brain pathways are working normally, cortical regions involved in attention, impulse control, and stimulus integration abilities, have yet to become fully active (Biederman, Gao, Rogers, and Spencer 2006).

ADHD is a widespread affliction that we are just beginning to understand in Zambia since there has been no research done in this country. What research has shown mainly in the West is that people with ADHD suffer from overload (Miller and Blum 2008). That is, they have heightened awareness of incoming stimuli, particularly sight, sound, and touch. They are so bombarded by the normal stimuli in their environment that they cannot filter out the background noise, and they have trouble focusing or concentrating on a problem or a task (Herpertz, Mueller, Wenning, Qunaibi, Lichterfeld, Herpertz-Dahlmann, 2001). Because of their inability to focus, those with ADHD have trouble completing what they start. They have difficulties with making plans and even more difficulty in carrying out plans in an orderly fashion (Wolraich, Hannah, Baumgaertel, Feurer, 1998).

Children with ADHD tend to be disorganized. Children for instance have messy rooms and daily activities tend to be chaotic. Bed rooms are likely to be filled with partly completed tasks and notebooks are messy; desk drawers are likely to be cluttered with unfinished letters or assignments (Cobb, 2007). Pupils with the disorder are highly intelligent, but they tend to be underachievers because they cannot concentrate or sustain interest. As a result, family, friends, and teachers become impatient and expect them to fail (Biederman, Spencer, Newcorn 2007). Children with ADHD also have trouble adapting to change. Their life is so full of tumult that even a minor additional change in their routine can be upsetting or can even create a crisis, for example, a parent goes away on a trip, a new teacher takes over a class, the family moves to a new city, or a pet dies (Herpertz, 2003).

Children with ADHD live under stress so severe that they cannot tolerate frustration, and when they are frustrated, they are likely to become angry. The anger tends to come suddenly and explosively, accompanied by slamming doors, harsh words, tantrums, and leaving important meetings in frenzy. Children get into fights; adults lose jobs and alienate friends (Herpertz, 2003). Afterwards, they may be sorry, but the damage is done. With their high level of frustration, children with ADHD are impatient. They hate to wait in line, and delays of any kind can make them frantic. Whatever is going on – a trip, a movie, a class, a discussion – they want it to go quickly and be finished (Biederman, Spencer, Newcorn, 2007 and Cobb, 2007).

Children with ADHD often go against the limits and boundaries set by their parents, teachers and other authority figures due to their condition. Some of these children consistently participate in problematic behaviours in schools that include, fighting, bullying, stealing, absenteeism, being unruly to authorities and many more. Such behaviours affect their families, academic, social and personal function (Cobb, 2007). Such children present a concern to teachers, parents and the community at large.

Children and adolescents with hyperactivity are found world over and Zambia is not an exception. According to Erik (2012), there was no significant prevalence differences between countries or regions of the world after controlling for differences in the diagnostic algorithms used to define ADHD. These results

provided an important support for the diagnostic validity of ADHD, and argued against the hypothesis that ADHD is a cultural construct that is restricted to the United States or any other specific culture. Additionally, Ross and Ross, (1982) observed that hyperactivity is found in all cultures, although prevalence figures differ. The term ADHD may be new but the children who display overactive and unrestrained behaviour have been around from time immemorial. Important early accounts of the disorder include that of the English physician called George Still who described a group of boys with a 'defect in moral control' as inattentive, impulsive, overactive, lawless, and aggressive, among other things (Barkly, 1996). In the United States, a 1917-1918 encephalitis epidemic aroused interest in the individuals who suffered this brain infection and who were left with similar attributes of hyperactivity. A similar clinical picture was also noted among children who had suffered head injury, birth, trauma and exposure to infections and toxins (Barkly, 1996).

ADHD is also known as hyperkinetic disorder (HKD) a mental disorder which is a highly prevalent childhood developmental disorder (Barkley and Murphy, 1998) characterized by persistent and pervasive symptoms of inattention, impulsivity and hyperactivity or a combination of the two (Thomas, 2011). The prevalence of ADHD is 8 – 10 % in children and 4 – 5 % in adults (Kesler, 2005; Gizer, Ficks, and Waldman, 2009; and Merikangas, He, Burstein, Swendsen, Avenevoli, Case, Georgiades, Heaton, Swanson, Olfson, 2011) twin studies estimate the heritability to be approximately 75% (Waldman and Gizer, 2006). Making the diagnosis of ADHD in children depends entirely on history and clinical assessment. There is currently no diagnostic test in form of psychological analyses that can reliably and accurately determine whether any single individual has ADHD. Further, retrospective determination of ADHD symptoms during childhood is complex (Rösler, Retz, Thome, Schneider, Stieglitz and Falkai, 2006) and subject to recall bias (Johnston, Weiss, Murray, and Miller, 2011) and many adults with ADHD are not adequately diagnosed and/or treated despite the availability of effective pharmacologic and psychosocial approaches (Adler, Barkley, and Newcorn, 2011).

With all these features, the diagnosis of ADHD is based on criteria outlined by the Diagnostic and Statistical Manual of the American Psychiatric Association (APA, 1994). Three ADHD subtypes as ideal types for diagnosis are described in the current DSM-IV (Halperin, Matier, Bedi, Sharma, Newcorn, 1992; Barkley, 1997; Nigg, 2000 and American Psychiatric Association, 2000) and these subtypes of the disorder are: ADHD predominantly inattentive type (ADHD-PI) if six (or more) symptoms of inattention (but fewer than six symptoms of hyperactivity-impulsiveness) have persisted for at least 6 months; ADHD predominantly Hyperactive-Impulsive Type (ADHDHI), if six (or more) symptoms of hyperactivity-impulsiveness (but fewer than six symptoms of inattention) have persisted for at least 6 months; and ADHD combined type (ADHDC), if at least six symptoms of inattention and at least six symptoms of hyperactivity-impulsiveness have persisted for at least 6 months. Some children have both types of ADHD referred to as Attention Deficit Hyperactivity Disorder /Combined (ADHD/C). Children with all types of ADHD face daily challenges with learning and achieving at school, behaving appropriately at home, and participating fully in their communities due to difficulty controlling impulsive behaviour, sustaining attention, and regulating activity levels. None of these three subtypes have been studied in Zambia.

ADHD symptom is one of the most prevalent childhood mental health disorders, affecting an estimated 3-7% of all school-going children (American Psychiatric Association, 2000). Barkly, (1996) pointed out that authorities disagree about the prevalence of ADHD. Shaywitz and Shaywitz (1992) suggest that ADHD affects about 10% -20% of school-age population. Although Ingersoll and Goldstein (1981) estimated that at least 3% to 5% of children under the age of 18 have ADHD. The estimate of 2% to 3% prevalence figure by Barkley (1991) is generally accepted by most professionals. According to Barkly (1996), Males are estimated to outnumber females by about 6 to 1. This could be due to differences in parenting styles which exist between boys and girls.

In the diagnostic criteria for ADHD, the primary symptoms are inattention, impulsivity, and hyperactivity (American Psychiatric Association, 2000). These

primary symptoms may vary in intensity, and other symptoms may coexist with these core symptoms (Gilliam, 1995).

One of the diagnostic criteria of ADHD is onset before the age of seven (7). One subgroup of children with hyperactivity may be diagnosed at a much earlier age (between 2 ½ and 5 years) this subgroup is comprised of children whose most prominent symptom is hyperactivity. These children are reported to demonstrate increased levels of motor activity at birth or early infancy and may display hyperactivity symptoms throughout childhood and adolescence (Wender, 1987). Most children with ADHD are not diagnosed until they enter school (around the age of 5 or 6) (Gilliam, 1995).

Research mainly in the US has shown that the presence of hyperactivity can significantly impair the person's ability to function successfully in a variety of social roles and settings, thereby negatively affecting the individual's and family well-being (Hallowell and Ratey, 1995; Miller and Blum 2008; Herpertz, Wenning, Mueller, Wunaibi, Sass, and Herpertz-Dahlmann 2001). Barkly (2006) and Hallowell and Ratey (1995) for instance, noted that recent children's healthy survey have documented a high prevalence of emotional, developmental, and behavioural problems and their association with family functioning and community. Conduct disorder (CD) and oppositional defiant disorder (ODD) among children with hyperactivity are leading causes of referral for mental health services, whereas CD criteria are related to a consistent pattern of rule breaking and antisocial behaviours, ODD encompasses parenting and anger related problems (Wicks –Nelson and Israel, 2003). Taking care of children with ADHD has a negative impact on the family well-being and these include stress, depression, and grief. These will in turn impact negatively on the child's well-being (Carpiniello et.al, 1995).

In Zambia, the statistics about the number of children with ADHD is not known as there seems to be no empirical studies conducted to ascertain the prevalence of this condition. The Ministry of Education Statistical Bulletins of 2005 and 2009 highlighted that 88,030 and 128 017 pupils required Special Education Needs (SEN) respectively. While this was the case, no category of children and

adolescents with ADHD were included. These were unfortunately categorized under those with specific learning disabilities.

The challenge of not identifying children and adolescents with ADHD in the Educational Statistical Bulletin calls for more attention to focus on the issues facing these children.

1.2 Statement of the Problem

The determination of ADHD in schools in Lusaka could have been done using the 36 item Attention Deficit Hyperactivity Disorder Test by Gilliam (1995) which has been known in the West to be effective and operational at classroom level. According to records at District Education Board Secretary, there is no prevalence data in the education sector on the symptoms of ADHD subtypes as well as that of ADHD even after teachers have been trained to identify symptoms of ADHD. In addition, research has not been done to determine the challenges teachers face when employing the tool. It is hypothesised among teachers that the tool uses typical American concepts and as such, it will be hard for teachers to interpret it.

1.3 Purpose of the Study

The study was designed to determine the prevalence of ADHD among grade four pupils while at the same time assess the challenges teachers faced when using the ADHD scale in eliciting ADHD symptoms.

1.4 Significance of the Study

The present study will help educators, guidance and counselling teachers including psychologist to use the ADHD tool in identifying symptoms of ADHD in children. The earlier the recognition of ADHD, the sooner appropriate interventions, treatments, and counselling can begin to counter the negative effects of family stress, lowered self-esteem, and ensuing learning and social

difficulties which can be as a result of ADHD. The findings of this study may provide policymakers the material necessary for carrying out a countrywide study on the prevalence of ADHD in Zambia.

1.5 Specific Objectives

In order to meet the demands of the research purpose, this study was directed by the following objectives:

- 1) To determine the nature of symptoms in the three ADHD subtypes using Gilliam's ADHD scale.
- 2) To identify using standard scores, the most prevalent ADHD subtype.
- 3) Using the ADHD quotient, to determine the prevalence of Attention Deficit Hyperactivity Disorder.
- 4) Based on the teacher's experiences, to describe the challenges faced when using Gilliam's Attention Deficit Hyperactivity Disorder scale in eliciting the symptoms from their pupils.

1.6 Research questions

The study was seeking answers to the following research questions:

- 1) Using Gilliam's ADHD scale what is the level of symptoms in the three ADHD subtypes?
- 2) Among the three ADHD subtypes, (hyperactivity, inattentive and inattention), what is the most prevalent ADHD subtype?
- 3) What is the prevalence of Attention Deficit Hyperactivity Disorder?
- 4) What challenges would teachers face when using Gilliam's Attention Deficit Hyperactivity Disorder scale in eliciting the symptoms from their pupils?

1.7 Operational Definitions

ADHD scale: it is an assessment tool used to diagnose the ADHD condition in children.

Co-morbid refers to other disorders co-occurring with ADHD in the same person at the same time.

Conduct disorder (CD): A form of disruptive behavior disorder typified by a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms and rules are violated.

Effectiveness: being able to produce desired or intentioned results.

Hyperactivity: a situation where a child is unusually active, restless, and lacking the ability to concentrate for any length of time, especially as a result of attention deficit disorder.

Impairment: refers to interference with normal function or performance.

Intervention: clearly and precisely designed activities addressing oppositional and noncompliant behaviour.

In epidemiology, Rothman (2012) observes that the prevalence or prevalence proportion is the proportion of a population found to have a condition (typically a disease or a risk factor such as smoking or seat-belt use). It is arrived at by comparing the number of people found to have the condition with the total number of people studied, and is usually expressed as a fraction, as a percentage or as the number of cases per 10,000 or 100,000 people.

Rothman (2012) on the other hand looks at point prevalence as the proportion of a population that has the condition at a specific point in time.

Rothman further differentiates all by stating that period prevalence is the proportion of a population that has the condition at some time during a given period ("12-month prevalence", etc.), and includes people who already have the condition at the start of the study period as well as those who acquire it during that period. "Lifetime prevalence" (LTP) is the proportion of a population that at some point in their life (up to the time of assessment) have experienced the condition.

CHAPTER TWO - LITERATURE REVIEW

2.0 Overview

This chapter reviews the literature and empirical studies on hyperactivity among grade four's in selected schools of Lusaka District, Zambia. It will also review literatures on the effect of ADHD on education. The review is organised around the following themes.

- Nature of Hyperactivity
- Diagnoses of ADHD
- Effects of hyperactivity on education
- Epidemiology of ADHD

2.1 Nature of ADHD

ADHD is the most common neuro-behavioral disorder of childhood. Its prevalence is controversial. These children have difficulties in the following areas: learning, behavior, social and emotional (APA, 1994). ADHD will cause lower self-image of the adolescent (Biederman, 1998). The ratio of boys to girls having ADHD is between 3:1 and 6:1 (Weiss and Tokenberg-Hechtman, 1993). Mannuzza et al. (1993) pointed out the relative persistence of ADHD throughout adolescence and its apparent decrease in early adult life. ADHD has many facets and remains one of the most controversial subjects in education to date. There are times when the term hyperactivity among teachers often raises confusion as to whether they are referring to the Attention Deficit Hyperactivity Disorder (ADHD), Attention Deficit Disorder (ADD), conduct developmental Disorder (CDD) or behavioural disorders (BD), Oppositional Conduct Disorder (OCD) or it stands alone as hyper-activity (Wicks –Nelson, and Israel, 2003). According to Parrillo, (2008) ADHD and its diagnosis and treatment have been considered controversial even among professionals since the 1970s. He further observed that the controversies have involved clinicians, teachers, policymakers, parents and the media. It is however, due to issues of co morbidity and similarity of some behaviors in certain conditions like ADHD that are not easy to separate. In this

document hyperactivity, ADHD and ADD will be used interchangeably.

ADHD disorder is a developmental disorder (Zwi et.al, 2000). It is characterized primarily by "the co-existence of attentional problems and hyperactivity, with each behavior occurring infrequently alone" with symptoms starting before seven years of age (Biederman, 1998). According to Rader et.al. (2009), ADHD is the most commonly studied and diagnosed psychiatric disorder in children, affecting about 3 to 5 percent of children globally and diagnosed in about 2 to 16 percent of school-aged children. It is also viewed as a chronic disorder with 30 to 50 percent of those individuals diagnosed in childhood continuing to have symptoms of ADHD into adulthood (Bálint, Czobor, Mészáros, Simon, Bitter, 2008).

ADHD can be described as a physical state in which a person is abnormally active. The term 'hyper' is used to describe someone who is in a hyperactive state (AAP 2001). ADHD is a neurological condition that involves problems with inattention and hyperactivity-impulsivity that are developmentally inconsistent with the age of the child. It has been argued that ADHD is also a function of developmental failure in the brain circuitry that monitors inhibition and self-control. This loss of self-regulation impairs other important brain functions crucial for maintaining attention, including the ability to defer immediate rewards for later gain (Barkley, 1998a).

Behaviours of children with ADHD can also include excessive motor activity. The high energy level and subsequent behaviour are often misperceived as purposeful noncompliance when, in fact, they may be a manifestation of the disorder and require specific interventions. Children with ADHD exhibit a range of symptoms and levels of severity. In addition, many children with ADHD often are of at least average intelligence and have a range of personality characteristics and individual strengths (Wicks –Nelson, and Israel, 2003).

Children with ADHD are typically observed to exhibit behaviour that is classified into two main categories as poor sustained attention and impulsiveness. As a result, three subtypes of the disorder have been proposed by

the American Psychiatric Association in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV): predominantly inattentive, predominantly hyperactive-impulsive, and combined types (Barkley, 1997). A child expressing hyperactivity commonly will appear fidgety, have difficulty staying seated or playing quietly, and act as if driven by a motor in that the child moves and acts very fast, resulting into a number of accidents. Children displaying impulsivity often have difficulty participating in tasks that require taking turns. Other common behaviours may include blurting out answers to questions instead of waiting to be called and flitting or jumping from one task to another without finishing. The inattention component of ADHD affects the educational experience of these children because ADHD causes them to have difficulty in attending to detail in directions, sustaining attention for the duration of the task, and misplacing needed items. These children often fail to give close attention to details, make careless mistakes, and avoid or dislike tasks requiring sustained mental effort (Wicks –Nelson, and Israel, 2003).

Although these behaviours are not in themselves a learning disability, almost one-third of all children with ADHD have learning disabilities (National Institute of Mental Health [NIMH], 1999). Children with Hyperactivity Disorder may also experience difficulty in reading, math, and written communication (Anderson, Williams, McGee, & Silva, 1987; Cantwell and Baker, 1991; Dykman, Akerman, and Raney, 1994; Zentall, 1993). Furthermore, ADHD commonly occurs with other conditions. Current literature indicates that approximately 40–60 percent of children with ADHD have at least one coexisting disability (Barkley, 1990a; Jensen, Hinshaw, Kraemer, Lenora, Newcorn, Abikoff, 2001). Although any disability can coexist with ADHD, certain disabilities seem to be more common than others. These include disruptive behaviour disorders, mood disorders, anxiety disorders, tics and Tourette’s Syndrome, and learning disabilities (Jensen, Hinshaw, Kraemer, Lenora, Newcorn, Abikoff, 2001). In addition, ADHD affects children differently at different ages. In some cases, children initially identified as having hyperactive-impulsive subtype are subsequently identified as having the combined subtype as their attention problems surface.

These characteristics affect not only the academic lives of students with ADHD but may also affect their social lives as well. Children with predominantly hyperactive-impulsive type may show aggressive behaviours, while children of the predominantly inattentive type may be more withdrawn. Also, because they are less disruptive than children with Hyperactivity Disorder who are hyperactive or impulsive, many children who have the inattentive type of Hyperactivity Disorder go unrecognized and unassisted. Both types of children with Hyperactivity Disorder may be less cooperative with others and less willing to wait their turn or play by the rules (NIMH, 1999; Swanson, 1992; Waslick and Greenhill, 1997). Their inability to control their own behaviour may lead to social isolation. Consequently, the children's self-esteem may suffer (Barkley, 1990a). In the United States, an estimated 1.46 to 2.46 million children (3 percent to 5 percent of the student population) have Hyperactivity Disorder (American Psychiatric Association, 1994; Anderson, Williams, McGee, and Silva 1987; Bird, Canino, Rubio-Stipec, Gould, Ribera, Sesman, 1988). Boys are four to nine times more likely to be diagnosed, and the disorder is found in all cultures, although prevalence figures differ (Ross & Ross, 1982).

2.2 Concurrent or Co-morbid Disorders

Half to two thirds of school children identified with ADHD also have concurrent psychiatric and developmental disorders, including oppositional and aggressive behaviours, anxiety, low self-esteem, tic disorders, motor problems, and learning or language disabilities (Fliers et al., 2009; Biederman, Newcorn, Sprich 1991). Sleep difficulties, including enuresis (bed-wetting), are common, with sleep-disordered breathing, a potentially correctable reason for increased inattention (Corkum, Tannock and Moldofsky. 1998) Global impairment in children with ADHD increases with increasing numbers of concurrent disorders (Owens, Maxim, Nobile, McGuinn and Msall 2000; Biederman et al., 1995). The concurrent conditions also increase the likelihood of additional difficulties developing as children become adolescents and young adults (Barkley, 1990). Neurocognitive difficulties are an important source of impairment in children with ADHD. Areas of executive functioning and working memory as well as specific language and learning disorders are common in clinical groups.

Approximately a third of children referred for psychiatric, often have behaviour problems, or may have previously unrecognized language difficulties (Cohen, Cohen and Kasen 1993). Whenever possible the potential for cognitive problems requires evaluation so that appropriate academic interventions can be implemented.

Research has shown that though ADHD exists with other disorders and in most instances, it is a solitary pathologic condition. What makes it not possible to show comorbidity is the use of Gilliam (1995) test. The tool that is mostly used by teachers in schools in the West to profile prevalence does not have factors to measure other disorders.

2.3 Epidemiology and ADHD Prevalence

Research in Africa on ADHD is scanty and evidence of research cites studies in South Africa, Congo D.R, Nigeria and Kenya only. There is no empirical evidence relating to ADHD in Zambia. The prevalence of ADHD among school children according to studies conducted in Africa ranges between 5.4% and 8.7%. (Meyer, 1998; Meyer , Eilertsen, Sundet, Tshifularo, Sagvolden., 2004; Kashala, Tylleskar, Elgen, Kayembe, and Sommerfelt, 2005; Adewuya and Famuyiwa, 2007).The studies coming from South Africa documented a prevalence of about five percent, which concurred with the finding of a prevalence of about five percent in the meta-analysis study of world-wide prevalence of ADHD by Polanczyk, De Lima, Horta, Biederman and Rhode (2007). The only epidemiological study among school children coming from the Democratic Republic of Congo documented a prevalence of 6.0%, while the only epidemiological study coming from Nigeria among school children revealed a prevalence of 8.7%.

However, a debate exists as to whether attention deficit hyperactivity disorder (ADHD) might be a cultural construct and if it is prevalent in Africa (Anderson, 1996; Bird, 2002; Faraone, Sergeant, Gillberg, Biederman 2003; Timimi and Taylor , 2004; Rappley, 2005). The opinion that geographical location may have some influence on epidemiology of ADHD and Attention Deficit Hyperactivity

Symptoms remains unresolved (Anderson, 1996; Bird, 2002; Faraone, Sergeant, Gillberg, Biederman 2003) despite a few studies having concluded, with some level of caution however, that culture and geographical location may have little or no influence on the epidemiology of ADHD world-wide (Timimi and Taylor , 2004; Rappley, 2005). In their systematic review of literature on the world-wide prevalence of ADHD, Polanczyk et al. (2007) found a prevalence of about five percent. However, they cautioned against generalization of their findings, especially in geographical regions of Africa and Middle East because these regions contributed very few studies to their meta-analysis (Faraone, Sergeant, Gillberg, Biederman, 2003). Most of the research on ADHD is from the West and South east Asia. For instance, in the UK, a survey of 10,438 children between the ages of 5 and 15 years found that 3.62% of boys and 0.85% of girls had ADHD (Ford, Goodman, and Meltzer, 2003). This survey was founded on careful assessment and included impairment in the diagnosis. The more restricted diagnosis of hyperkinetic disorder in ICD-10, representing a severe sub-group of DSM-IV-TR combined type ADHD, is naturally less common; prevalence estimates are around 1.5% for boys in the primary school years.

At one extreme, in Colombia, the prevalence rates were estimated to be 19.8% and 12.3% for boys and girls respectively (Pineda, Lopera, and Palacio, 2001). Such a wide range in prevalence estimates is unlikely to reflect true differences in the numbers of individuals with ADHD in various populations. Polanczyk and colleagues (2007) made a systematic review of prevalence studies and concluded that the great majority of variability derived from the methods used, such as the way symptoms were measured and the exact definitions used. There were relatively minor differences in different parts of the world and the review's summary of rates was around 5.3%.

The variation in the methods that are used to determine prevalence rates highlights the difficulties in making direct comparisons between. This is further compounded by the fact that ADHD symptoms are continuously distributed throughout the population with no natural threshold between affected and unaffected individuals (Taylor, Sandberg, Thorley and Giles., 1991). This

particular problem can be successfully resolved by the application of strictly applied operational diagnostic criteria such as the DSM-IV-TR definition for ADHD or the research ICD-10 criteria for hyperkinetic disorder. However, even where the same diagnostic definitions are applied, there may still be differences in the thresholds applied for individual symptoms, which are rarely operationalised. For example, how severe should be avoidance of tasks requiring sustained attention or levels of fidgetiness before they are considered to be clinically significant? Key criteria when defining ADHD is not only the presence of sufficient numbers of ADHD symptoms but also, importantly, their association with clinical and social impairments at home, school and in other settings. Surveys that include strict definitions of impairment alongside the symptom count find that prevalence of the syndrome (without evidence of impairment) is around twice the prevalence of the disorder when the syndrome is associated with impairment (Canino et al., 2004). In the UK, a survey in Newcastle found that prevalence was 11% for the syndrome with no impairment, 6.7% when associated with moderately low impairment, 4.2% for moderate impairment and 1.4% for severe pervasive impairment (McArdle et al., 2002).

Taking into account the differences in investigator training and measures used across studies it is not possible to draw firm conclusions from the large variation in prevalence rates cited in the literature. Having said that, small differences are likely to exist. One study from the US using the same diagnostic procedures reported small but significant differences in prevalence rates between African-Americans (5.65%), Hispanics (3.06%) and whites (4.33%) (Cuffe, Moore, Mckeown., 2005); such differences might, however, be explained by different cultural tolerances for the symptoms of ADHD.

2.4 Diagnoses of ADHD

ADHD is diagnosed two to four times more frequently in boys than in girls though studies suggest this discrepancy may be partially due to subjective bias of referring teachers. A diagnosis of ADHD is multifaceted and includes behavioural, medical, and educational data gathering. One component of the

diagnosis includes an examination of the child's history through comprehensive interviews with parents, teachers, and health care professionals. Interviewing these individuals determines the child's specific behaviour characteristics, when the behaviour began, duration of symptoms, whether the child displays the behaviour in various settings, and coexisting conditions. The American Academy of Paediatrics (AAP) stresses that since a variety of psychological and developmental disorders frequently coexist in children who are being evaluated for ADHD, a thorough examination for any such coexisting condition should be an integral part of any evaluation (AAP, 2000).

According to AAP (2000), ADHD has three subtypes and these are:

- a) **Predominantly hyperactive-impulsive:** Most symptoms (six or more) are in the hyperactivity-impulsivity categories. Fewer than six symptoms of inattention are present, although inattention may still be present to some degree.
- b) **Predominantly inattentive:** The majority of symptoms (six or more) are in the inattention category and fewer than six symptoms of hyperactivity-impulsivity are present, although hyperactivity-impulsivity may still be present to some degree. Children with this subtype are less likely to act out or have difficulties getting along with other children. They may sit quietly, but they are not paying attention to what they are doing. Therefore, the child may be overlooked, and parents and teachers may not notice that he or she has ADHD.
- c) **Combined hyperactive-impulsive and inattentive:** Six or more symptoms of inattention and six or more symptoms of hyperactivity-impulsivity are present. Most children have the combined type.

2.5 Changes with age

The problems associated with ADHD appear in different ways at different ages, as the individual matures and as the environmental requirements for sustained self-control increase (Sonuga-Barke, 1998). ADHD in a pre-school child may involve incessant (persistent) and demanding extremes of activity and these manifest in many ways. For instance, research has shown that during the school

years an affected child may (i) make excess movements during situations where calm is expected rather than on every occasion and (ii) during adolescence, hyperactivity present as excessive fidgetiness rather than whole body movement. Inattention too within ADHD may diminish in absolute terms, and attention span will usually increase with age; but it tends to lag behind that of unaffected people (Biederman et al., 1995).

2.6 Course of the disorder

The core behaviours of ADHD are typically present from before the age of 7 years, but at all ages presentation as a problem is very variable (Sayal et al., 2002). Mannuzza et al., (1998) observed that Mild forms of ADHD need not be impairing at all. Extreme forms are considered to be harmful to the individual's development in most cultures, but there are cultural differences in the level of activity and inattention that is regarded as a problem (Sonuga-Barke Germano, Meleleo, and Montorfano., 1993). While both teachers and parents can find it hard to deal with or live with a hyperactive child, their tolerance and ability to cope may determine whether the hyperactivity is presented as a problem or not. Children with hyperactivity rarely ask for help. Inattention without hyperactivity often is not present as a problem even though an inattentive child may have a marked cognitive impairment. The presentation to the clinician therefore depends on a complex blend of the skills and tolerance of adults surrounding the child and the qualities of the children themselves (Sonuga-Barke Germano, Meleleo, and Montorfano., 1993).

2.7 Effects of ADHD on Education

Research has shown that almost one-third of all children with ADHD have learning disabilities (National Institute of Mental Health, 1999). For instance, children with ADHD may have trouble in reading, math, and written communication (Anderson, Williams, McGee, & Silva, 1987; Cantwell and Baker, 1991; Dykman, Akerman, and Raney, 1994; Zentall, 1993). Furthermore, ADHD commonly occurs with other conditions. Current literature indicates that approximately 40–60 percent of children with ADHD have at least one coexisting

disability (Barkley, 1990a; Jensen, Hinshaw, Kraemer., 2001; Jensen, Martin, & Cantwell, 1997). Although any disability can coexist with ADHD, certain disabilities seem to be more common than others (Jensen, et al., 2001). These include disruptive behaviour disorders, mood disorders, anxiety disorders, tics and Tourette's Syndrome learning (Jensen, et al., 2001). In addition, ADHD affects children differently at different ages. In some cases, children initially identified as having hyperactive-impulsive subtype are subsequently identified as having the combined subtype as their attention problems surface (Barkley, 1990).

2.8 Social life of children with ADHD

These characteristics affect not only the academic lives of students with ADHD; they may affect their social lives as well. Children with ADHD may show aggressive behaviours, less cooperative with others and less willing to wait for their turn or play by the rules (NIMH, 1999). Their inability to control their own behaviour may lead to social isolation. Consequently, the children's self-esteem may suffer (Barkly, 1990). In the United States, an estimated 1.46 to 2.46 million children (3 percent to 5 percent of the student population) have ADHD (American Psychiatric Association, 1994; Anderson, Williams, McGee, and Silva, 1987; Bird, Canino, Rubio-Stipec, Gould, Ribera, and Sesman., 1988; Esser, Schmidt, and Woemer, 1990; Pastor and Reuben, 2002). Boys are four to nine times more likely to be diagnosed, and the disorder is found in all cultures, although prevalence figures differ (Ross and Ross, 1982).

ADHD is diagnosed via a paediatric or psychiatric assessment of the person's childhood behavioural and cognitive development symptoms; this assessment includes ruling out the effects of drugs, medications and other medical or psychiatric disorders as possible explanations for the signs and symptoms (NIHCE, 2000).

In North America, the DSM-IV criteria are often the basis for a diagnosis, while European countries usually use the ICD-10. If the DSM-IV criteria are used, rather than the ICD-10, a diagnosis of ADHD is 3–4 times more likely (Singh,

2008; 19–27). Factors other than those within the DSM or ICD, however, have been found to affect the diagnosis in clinical practice. For example, the youngest children in a class are much more likely to be diagnosed as having ADHD compared to their older counterparts in the same year. This is because these children may behave more hyperactively, not because they have ADHD, but because they are younger and developmentally behind their classmates.

2.9 Summary

The literature shows many gaps concerning the disorder. There are no studies showing that ADHD has been done in Zambia and yet the determination of ADHD in schools in Lusaka could have been done using the 36-item Attention Deficit Hyperactivity Disorder Test by Gilliam (1995). Studies above have shown that the 36-item Attention Deficit Hyperactivity Disorder Test by Gilliam is effective and operational at classroom level.

CHAPTER THREE - METHODOLOGY

3.0 Overview

This chapter focuses on the research methods that include; research design, target population, sample size, and sampling procedures research instruments, data collection procedure, and data analysis.

3.1 Research Design

Since the purpose of this study was twofold: to determine the prevalence of ADHD and its three composites among grade four pupils while at the same time assess the challenges teachers faced when using the ADHD scale in eliciting ADHD symptoms, an appropriate research design according Blaikie (2000) that was appropriate then, was a mixed methods research design. This embraced both qualitative and quantitative methods of data collection. Such a design will be explorative and descriptive in nature. According to Leedy and Ormrod (2010), a combination of two methods in an exploratory and descriptive study provides a better understanding of the variables.

Quantitative (nomothetic) and qualitative (idiographic) data was collected for different purposes, being generalization vs. in-depth description, respectively. The justification in this study of using mixed methods was based on the search for what is not known about ADHD from nomothetic assumptions of Gilliam's ADHD norm reference test (Gilliam, 1995) and the constructivist /interpretivist thinking of teachers on the test. This approach seeks to weigh equally each of the methods used (Foss and Ellefsen, 2002). Indeed it is argued that integration or synthesis is only possible where methods, and hence data, are treated equally.

3.2 Target Population and Sample Size

An inclusion and exclusion criteria were set priori to determine the population and eligible units of analysis.

Inclusion criteria for this sample

The inclusion criteria for sample were as follows:

- Only boys and girls in the fourth grade identified by their teachers as having ‘emotional or behavioural difficulties’ (EBD) or ‘social, emotional and behavioural difficulties’ (SEBD) which were agreed to embrace : Emotional and behavioural difficulties ranging from social maladaptation to abnormal emotional stresses, apparent through symptoms like withdrawn, passive, aggressive or self-injurious tendencies.
- Only teachers with special education were eligible for inclusion in the study.

Exclusion criteria for this sample

The exclusion criteria for sample were as follows:

- Pupils who do not have ‘emotional or behavioural difficulties’ (EBD) or ‘social, emotional and behavioural difficulties’ (SEBD).
- Ordinary teachers.

The primary target population of the study comprised fourth grade children with ‘emotional or behavioural difficulties’ (EBD) or ‘social, emotional and behavioural difficulties’ (SEBD) and teachers from selected schools in Lusaka Urban who were specialised in special education.

The target population consisted of 20 teachers and 600 pupils in fourth grade aged 10 - 13.

In order to enlist eligible children in the study, a multistage sampling technique was used to select the sample elements. In the first stage, five schools were selected out of 13 government schools using availability because these were believed to have teachers who have had done special education and would be in a position to identify pupils who could have the disorder. In the second stage, six classes were selected from each of the five schools comprising fourth grade using simple random sampling in order to screen pupils who exhibited behavioural problems.

First Stage

In the first stage five schools were selected out of 13 government schools using systematic random sampling technique. The names of the thirteen government schools in Lusaka's Emasdale zone were written on pieces of paper and put in a box. After shaking the box the first five papers drawn were picked as schools for the sample. The schools included Old Kabanana, Chazanga, New Kabanana, Mandevu and Chipata Basic School.

Second stage

In the second stage six classes were selected from each school comprising fourth grade pupils who met the inclusion criteria using simple random sampling. In the second stage, the researcher with the assistance of the class teachers created a sampling criterion of pupils with behavioural problems.

Stage three

In stage three, an ideal sample size was then determined using Yamane formula.

$$n = \frac{N}{1 + N(e)^2}$$

This is a formula used to determine an adequate sample size once the population size is known. Given that the population of pupils was 600, an ideal sample size was 240. Out 240 pupils only 74 were identified by teachers to have emotional or behavioural difficulties' (EBD) or 'social, emotional and behavioural difficulties' (SEBD). This kind of sampling fits a naturalistic study where study units are studied according to their natural compositions.

3.3 Instrumentation and measures

The researcher went to the selected institutions with an introductory letter from the University of Zambia to request for permission from administrators to conduct research in their institutions. Appointments to meet teachers and select the respondents were done. The researcher explained in details the aim of the study to the respondents and got consent from them.

At their own time, the teachers were requested to complete the ADHD Test tool for each of the selected children. The teachers completed the Attention Deficit Hyperactivity Disorder Test (ADHDT; Gilliam, 1995), which is a 36-item norm test based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994) criteria. Teachers' ratings are usually regarded as an accurate measure of assessment (American Academy of Paediatrics, 2004). This is used within the Ages: 2 through 23. The Testing Time ranges from 5 to 10 minutes.

The Attention-Deficit/Hyperactivity Disorder Test (ADHDT) is an effective instrument for identifying and evaluating attention-deficit disorders. It is designed for use in schools and clinics; the test is easily completed by teachers, parents, and others who are knowledgeable about the referred individual. Based on the diagnostic criteria for Attention-Deficit/Hyperactivity Disorder of the DSMIV, the ADHDT contains 36 items that describe characteristic behaviors of persons with Attention-Deficit/Hyperactivity Disorder. These items comprise three subtests representing the core symptoms necessary for the diagnosis of ADHD: hyperactivity, impulsivity, and inattention.

The tool was normed in 1993 and 1994 on a representative national sample of more than 1,200 persons who were diagnosed with attention-deficit disorders; these results constitute the most current norms available (Gilliam, 1995).

The ADHDT is a potentially valuable tool for screening pupils or students with ADHD and monitoring treatment effects. The forms are easy to complete and respondents comprising the norm sample were diverse with respect to their relationships with the examinee. While the scale items are well defined and have face validity when compared to DSM-IV criteria (Gilliam, 1995). The ADHDT appears most useful when used to screen individuals ages 3-23 for symptoms related to ADHD. The subscales appear highly related to other tests purporting to measure similar constructs and somewhat useful in discriminating individuals with AD/HD from individuals with other behavioural disorders.

Upon completion and administering of the tool, an in-depth interview on the wording of the tool was conducted in order to assess the teachers' understanding and challenges they encountered in administering it.

3.4 Data analysis

Before the data was coded into the SPSS computer programme to generate univariate and bivariate statistics as well as key or relevant statistical tests, individual subset raw answers for each pupil were scored on individualised scoring forms called response forms (see Appendix D section V Response Form). The scores were then converted into individualised sum or raw scores for each subtype.

From the raw scores, which are the individual's original numerical values that are associated with the subject's tests performance, it was possible then to code and key these into the SPSS programme. In order to determine the most prevalent ADHD subtype among the three (hyperactivity, inactivity and inattention), the researcher computed the standard scores and the range of standard scores according to Gilliam's method of computing reference norms (see Appendix D tables A and B). This involved computing the simple sum of raw scores for each subtest, entering each in the appropriate box. The scores were then transferred to the front of the summary form to be converted into standard scores ($M = 10$, $SD = 3$ for subscales and $M = 100$, $SD = 15$ for the ADHD Quotient) and percentile ranks. Each derived score was plotted on the front of the summary form to graphically display the subtest and total test results.

The resultant values were then coded into SPSS and cleaned. After data, cleaning the researcher scored each test item. The process of scoring followed the guidelines and tables described in the ADHD Test booklet (An examiner's manual dated 1995) (see Appendix D). Univariate and bivariate analyses were done to generate the data that is presented in chapter four.

3.5 Ethical considerations

Approval to conduct this research was obtained from the Research Ethics committee of the University of Zambia and other relevant institutions. The aim of seeking approval according to Kombo and Tromp (2009) is to protect respondents physically and psychologically. The respondents' consent was sought from their parents to be part of the study sample. The respondents were informed about the nature and purpose of the study. Respondents were also assured of high level of confidentiality and that information gathered would be purely for academic purposes. Participants' autonomy was upheld by informing participants that they were free to withdraw from the study without giving any reasons.

CHAPTER FOUR - RESEARCH FINDINGS

4.0 Overview

This chapter focuses on the research findings that include demographic characteristics, diagnosis of ADHD, confirmation of ADHD, and the challenges of using the ADHD Test.

4.1 Demographic Characteristics

Out of the population of 600 pupils in five selected schools that were enlisted, 74 pupils who were found to exhibit suggestive signs and symptoms of ADHD subtypes were evaluated by the researcher for a professional assessment using Gilliam's test between November 2012 and February 2013. In the sample of typically developing children, gender was not evenly distributed n = 64 (86.5%) were boys and n = 10 (13.5%) were girls.

4.2 Level of symptomatology of ADHD subtypes

The assessment of levels of affect in terms of symptoms of the three subtypes was based on James Gilliam's criteria. This was informed by DSM-IV-TR. The researcher used a 36 item scale on 600 pupils developed by James Gilliam's and assessed the pupils objectively in the three subsets: thirteen from the hyperactivity subset, ten from the impulsivity subset and thirteen from the inattentive subset.

4.2.1 Hyperactivity Subset

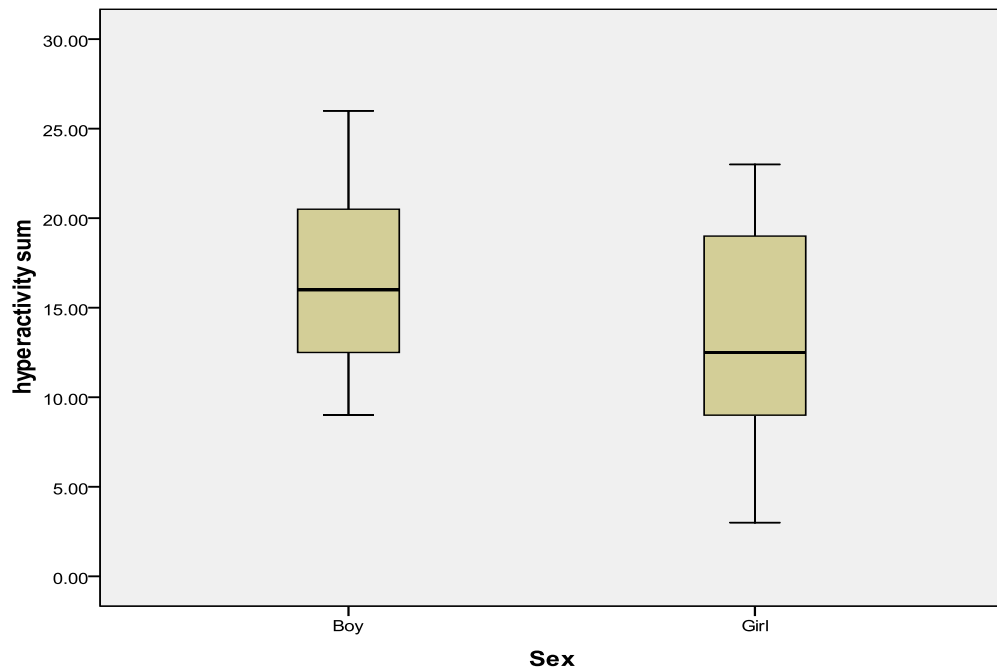
Referring to the hyperactivity ADHD subtype, the detailed profiles of the scores of the participants are presented in table 4.2.1. There is a general tendency in the sample to have mild or severe symptoms of hyperactivity.

Table 4.2.1.1 Hyperactivity subset

<i>ADHD Symptom</i>		<i>Not a problem</i>	<i>Mild problem</i>	<i>Severe problem</i>
	1) Loud	15	28	31
	2) Constantly on the go	9	19	46
s	3) Excessive running, jumping, climbing	17	26	31
c	4) Twisting and wiggling in seat	12	30	32
	5) Easily excited	12	30	32
o	6) Grabs objects	16	33	25
r	7) Excessive talking	12	23	39
	8) Difficultly remaining seated	11	27	36
e	9) Constantly manipulating objects	12	40	22
s	10) Inability to play quietly	8	33	33
	11) Fidgets	16	24	34
	12) Restless	9	33	32
i	13) Squirms	22	29	23
	Total	171	375	416

An examination of measures of central tendency shows that the mean scores were 16 and recognising that the mode is not equal to the median value, the samples distribution of hyperactivity scores is not normally distributed. A test of difference using the Tukey post hoc tests following ANOVA was performed and the test results indicated that the mean scores in the hyperactivity subtype for boys was 16 and for girls was 13. F tests showed that the mean scores in the two genders did not differ significantly ($p > 0.05$ (0.68) (see the box plot figure 4.2.1.1).

Figure 4.2.1.1 Figure showing the mean scores between boys and girls



The box plot above shows the shape and spread of the hyperactivity data. The lower edge of the box is the first quartile, Q_1 , which is the median of the data values below the median. The upper edge of the box is the third quartile, Q_3 , which is the median of the data values above the median. The segments extending from the “box” or “whiskers” are not uniformly placed. The shape of the box plots show that the data are not evenly distributed relative to the position of the measure of central tendency (the bold line). There is a skew upwards than downwards in hyperactivity in both boys and girls.

4.2.2 Impulsivity Subset

Referring to the impulsivity ADHD subtype, the detailed profiles of the scores of the participants are presented in Tables 4.2.2.1. There is a general tendency in the sample to have mild or severe symptoms of impulsivity.

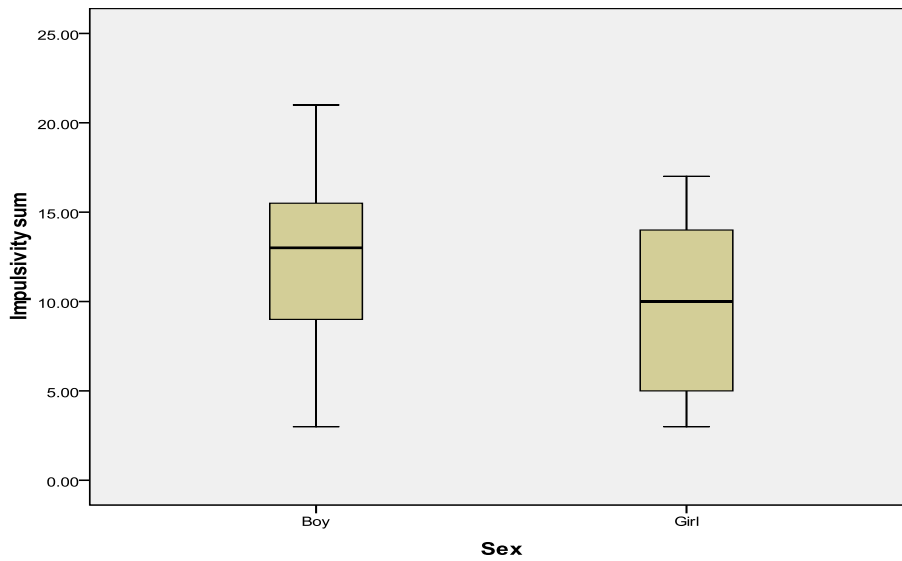
Table 4.2.2.1 Impulsivity subset

<i>ADHD Symptom</i>	<i>Not a problem</i>	<i>Mild problem</i>	<i>Severe problem</i>
1. Acts before thinking	17	23	34
2. Shifts from one activity to another	13	30	31
3. Fails to wait for one's turn	16	38	30
4. Difficultly waiting turn	19	36	19
5. Blurts out answers	31	15	28
6. Impulsive	21	33	25
7. Interrupt conversations	15	30	29
8. Intrudes on others	9	30	35
9. Does not wait for directions	7	38	29
10. Fails to rules for the games	9	34	31
Total	157	307	291

An examination of measures of central tendency shows that the mean scores were 12 and recognising that the mode, is not equal to the median value, the samples distribution of hyperactivity scores is not normally distributed.

A test of difference using the Tukey post hoc tests following ANOVA was performed and the test results indicated that the mean scores in the impulsivity subtype for boys was 12.5 and for girls was 10.0. F tests showed that the mean scores in the two gender did not differ significantly ($p >$ was more than 0.05 (0.116)).

Figure 4.2.2.1 Impulsivity Role Scores by gender



The box plot above shows the shape and spread of the impulsivity data. The lower edge of the box is the first quartile, $Q1$, which is the median of the data values below the median. The upper edge of the box is the third quartile, $Q3$, which is the median of the data values above the median. The segments extending from the “box” or “whiskers” are not uniformly placed. The shape of the box plots show that the data are not evenly distributed relative to the position of the measure of central tendency (the bold line). There is a skew upwards than downwards in hyperactivity in both boys and girls.

4.2.3 Inattentive Subset

Referring to the inattentive ADHD subtype, the detailed profiles of the scores of the participants are presented in Tables 4.2.3.1. There is a general tendency in the sample to have mild or severe symptoms of impulsivity.

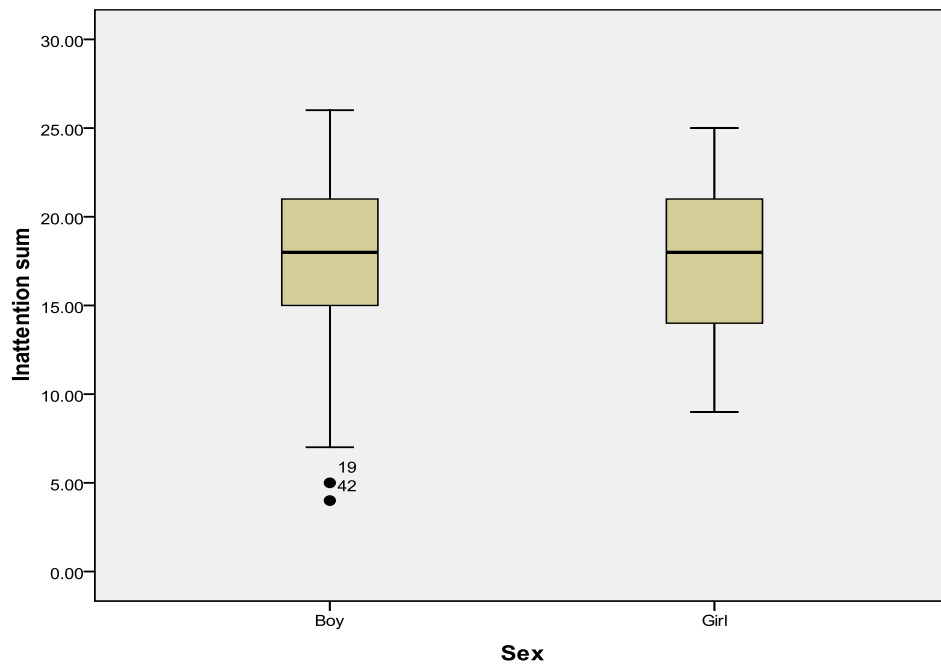
Table 4.2.3.1 Inattentive subset

<i>ADHD Symptom</i>	<i>Not a problem</i>	<i>Mild problem</i>	<i>Severe problem</i>
1) Poor concentration	4	25	45
2) Fails to finish project	9	23	42
3) Disorganised	10	24	40
4) Poor planning ability	4	36	34
5) Absentminded	13	36	25
6) Inattentive	5	33	36
7) Difficultly following directions	3	41	30
8) Short attention span	2	38	34
9) Easily distracted	2	33	39
10) Difficultly sustaining attention	4	36	34
11) Difficultly staying on the task	6	34	34
12) Difficultly completing task	8	27	39
13) Frequently loses things	19	42	13
Total	89	428	445

An examination of measures of central tendency shows that the mean scores were 18 and recognising that the mode and median values were equal, the samples distribution of inattentiveness scores are normally distributed.

A test of difference using the Tukey post hoc tests following ANOVA was performed and the test results indicated that the mean scores in the impulsivity subtype for boys was 17.8 and for girls was 17.7. F tests showed that the mean scores in the two gender did not differ significantly ($p > 0.05$ (0.251)). If we take the lower 25% of the group who had normal scores, they are represented by everything below lower "whisker" and dots and these are respondents 19 and 42 (figure 4.2.3.1).

Figure 4.2.3.1 Inattentive sum



The box plot above shows the shape and spread of the inattention data. The lower edge of the box is the first quartile, Q_1 , which is the median of the data values below the median. The upper edge of the box is the third quartile, Q_3 , which is the median of the data values above the median. The segments extending from the “box” or “whiskers” are uniformly placed. The shape of the box plots show that the data are evenly distributed relative to the position of the measure of central tendency (the bold line). There are three outliers among boys those that did not have a problem.

4.3 Predominant ADHD subtype

The most prevalent ADHD subtype among the three (hyperactivity, inattentive and inattention), was assessed using Gilliam’s method of computing reference norms (see Appendix D tables A and B). Looking at table 4.2.1 ADHD subtype Standard Scores, the most predominant subtype that yielded the most emotional or behavioural difficulties’ (EBD) or ‘social, emotional and behavioural difficulties’ (SEBD) was the hyperactivity subtype. This is because out of 74 pupils, $n = 72$ scored average or more (that is more than seven).

Table 4.3.1 ADHD subtype Standard Scores

Subtest Standard scores	Hyperactivity standard score	Impulsivity standard score	Inattentive standard score	
17-19	0	0	0	Very high
15-16	7	4	4	High
13-14	6	5	5	Above average
8-12	59	53	53	Average
6-7	2	11	11	Below average
4-5	0	1	1	Low
1-3	0	0	0	Very low

The prevalence of hyperactivity, impulsivity and inattention in this population was 72, 62 and 62 out of 600 respectively. In percentage terms, it therefore follows that prevalence of hyperactivity, impulsivity and inattention was 12%, 10.3% and 10.3% in this order.

A further assessment shows that each subtype's mean standard score was higher than the lowest threshold to label a child to have a subtype disorder. The threshold is set to be seven according to Gilliam. The scores in this sample across the three ADHD subtypes did not exhibit a Gaussian distribution as shown by slight right skew or positive skew (see table 4.2.1)

Table 4.3.2 Standard score distributions of ADHD Subtypes

Statistic	Hyperactivity sub Type Standard Score n = 74	Impulsivity sub Type Standard Score n = 74	Inattentive sub Type Standard Score n = 74
Mean	10.66	9.87	9.71
Median	10.00	10.00	9.50
Mode	9.00	11.00	9.00
Std. Deviation	2.17	2.33	2.30
Minimum	6.00	4.00	4.00
Maximum	16.00	15.00	19.00
Skewness	0.72	0.11	0.59

This skewness is almost normal suggesting that under mild conditions, the mean of many random variables independently drawn from the same distribution is distributed approximately normally, irrespective of the form of the original distribution.

4.4 Confirmation of ADHD and Prevalence of ADHD

In order to determine the presence or likelihood of ADHD in a child, the ADHD quotient was computed to generate standard scores that could be used to classify each child based on severity. James Gilliam’s criteria were used for diagnosis (see table 4.4.1). The table shows the standard score, ADHD quotient and percentile rank, percentage of normative sample and probability of ADHD.

Table 4.4.1 James Gilliam’s ADHD Quotient

<i>Subset standard score</i>	<i>ADHD Quotient</i>	<i>Percentile rank</i>	<i>% normative sample</i>	<i>Probability of ADHD</i>
17-19	131+	99+	2	Very high
15-16	121 -130	92-98	7	High
13-14	111-120	76-91	16	Above average
8-12	90-110	25-75	50	Average
6-7	80-89	9-24	16	Below average
4-5	70-79	2-8	7	Low
1-3	≤69	.1-1	2	Very low

In order to profile the severity of ADHD which could be of concern to the school authorities, the researcher considered the ADHD quotient of all cases scoring above average to be highly pathologic. The ADHD quotient gives data to the clinician or teacher about the core symptoms of attention deficit hyperactivity disorder embracing the three subtypes: hyperactivity, impulsivity, and inattention. The arrow in table 4.4.2 shows that the lower down one move, the more severe the disorder of ADHD was. The threshold to determine the presence of ADHD was set from average to very high ADHD quotient. Therefore, in this study, 55 (74.3%) of the pupils who were earlier found to have signs and symptoms suggestive of hyperactivity, inattentiveness and impulsiveness had ADHD (see table 4.4.2). Since there were 55 children out of 600 who had suggestive symptoms of ADHD, the prevalence, which is the proportion of a population that has the condition at a specific point in time in the general population is 55/600 which is 9.1%.

Table 4.4.2 ADHD Quotient

<i>Score</i>	<i>Frequency</i>	<i>%</i>	<i>Degree of disorder</i>
69 less	0	0	Normal
72.00	1	1.4	Low
76.00	1	1.4	
79.00	1	1.4	
Sub Total	3	4.4	
81.00	1	1.4	Below average
83.00	3	4.1	
85.00	4	5.4	
87.00	5	6.8	
89.00	3	4.1	
Sub Total	6	21.8	
91.00	7	9.5	Average
94.00	3	4.1	
96.00	3	4.1	
98.00	3	4.1	
100.00	5	6.8	
102.00	3	4.1	
104.00	10	13.5	
106.00	5	6.8	
109.00	4	5.4	
Sub Total	43	58.4	
111.00	2	2.7	Above average
113.00	2	2.7	
115.00	2	2.7	
117.00	1	1.4	
119.00	1	1.4	
Sub Total	8	6.9	
124.00	1	1.4	High
126.00	1	1.4	
130.00	1	1.4	Very high
Sub Total	3	4.2	
143.00	1	1.4	
Total	74	100.0	100.0

4.5 Challenges of Using the ADHD

The data from the interview with teachers was presented using the three main themes of ADHD.

Using in-depth interviews, teachers were asked to assess whether or not they faced challenges in using James Gilliam’s criteria of diagnosing ADHD. The data from the field narratives were comprehensive and a range of themes based on scale emerged. In presenting the findings, the researcher takes a naturalistic point of view. As a model of qualitative inquiry, naturalism focuses on the factual characteristics of the object under study (Guba and Lincoln, 1994; Pearce, 1971;

Wolcott, 1994). These authors advise naturalistic researchers to present what they see and hear.

An array of challenges in understanding and applying the ADHD tool is presented below. Teachers had challenges in employing the following concepts within the three subsets.

Hyperactivity subset

All teachers were in agreement that they understood the concept hyperactivity. One of the problems that had beset the study of hyperactivity is that different teachers had adopted different meanings. The meanings were imprecise and had serious challenges with the word squirms. Some of the critical views are presented below.

I do not understand the meaning of this word. By the way it sounds American is that correct?

I am able to apply the rest of the tool but I have a challenge with the word squirms. I do not seem to know it any way.

I think this means noise making

Can this mean a child who is restless?

Looking at the presentations above, the construct 'squirm' has far-reaching importance for understanding and scoring children's normal and abnormal development within the subset. The main finding of this study is that several hyperactivity descriptions seem not to be related to the construct.

Impulsivity subset (act without thinking)

This sub set sheds light on the multidimensional nature of impulsivity by confirming the importance of the re use of the construct impulsive. The reuse seems to suggest that the construct is not independent from other sub-dimensions of impulsivity. Teachers seemed to give similar meanings of the constructs in a number of instances. This is what they experienced in this domain.

Impulsive

'Impulsivity' to me signifies premature and thoughtless actions

These are actions, which can cause a person to do dangerous or unwise things without thinking about the consequences. But what about this other word then? (Meaning impulsivity?)

This means inclined to speak on impulse rather than thought.

These are people who may insult or disagree on the spot...unable to curb their immediate reactions or think before they act. As a result, they may blurt out answers to questions or inappropriate comments, or run into the street without looking.

Blurts out

Blurt out inappropriate comments, show their emotions without restraint, and act without regard for consequences.

This is being impulsive. It's a child who finds it difficult to wait for things they want or to take their turn in games.

This means a child whose actions are spontaneous. Say... grabbing a toy from another child or hit when they are upset.

This may mean saying something on impulse.

Inattentiveness

This subset just like the impulsivity subset sheds light on the multidimensional nature of inattentiveness. The construct is re used in the tool. Teachers seemed to give similar meanings of the constructs in a number of instances.

'Inattention' to me is a disorganised person

No focus

This actually means often making careless mistakes.

Difficulty keeping attention when doing boring or repetitive work.

Difficulty concentrating on what people say to you...even when speaking to someone directly?

CHAPTER FIVE - DISCUSSION OF THE RESULTS

5.0 Overview

This chapter serves to consider the findings of the study outlined in chapter four. It presents the discussion of the findings based on the research questions to clearly show what the research outputs are in relation to the problem we had at the onset. A global context is used to situate the findings and to try as much as possible to outline what is similar and dissimilar. The chapter outlines the limitations and strengths while at the same time offers implications based on the findings. The implications are policy based and research based (called as recommendations by Blaikie (2000)).

5.1 Meeting the Research Demands

Modern researchers are occupied with answering research questions and objectives. They argue that answers related to research questions ought to be shown (Yin, 2008; Creswell, 2005) since they act as the guiding plan for the investigation (Mertler and Vannatta, 2001). In general, research questions are “specific questions that researchers seek to answer” (Creswell, 2005: 117). According to Maxwell (2005:69), “research questions state what you want to learn”. Therefore, the answers to the four research questions are set as follows:

Research question one: Using Gilliam’s ADHD scale what is the level of symptoms in the three ADHD subtypes?

The answer to this research question is as follows: Referring to the three ADHD subtype, there is a general tendency in the sample to have mild or severe symptoms of hyperactivity. However, tests of differences using the Tukey post hoc tests following ANOVA was performed and the test results indicated that the mean scores in the two gender did not differ significantly since the p values were > 0.05 .

Research question two: Among the three ADHD subtypes, (hyperactivity, impassivity and inattention), what is the most prevalent ADHD subtype? The answer to this research question is as follows:

The most prevalent ADHD subtype among the three using Gilliam's method of computing reference norms that yielded the most emotional or behavioural difficulties' (EBD) or 'social, emotional and behavioural difficulties' (SEBD) was the hyperactivity subtype. This is because the prevalence of hyperactivity, impassivity and inattention in this population was 72, 62 and 62 out of 600 respectively. In percentage terms, the prevalence of hyperactivity, impassivity and inattention was 12%, 10.3% and 10.3% in this order.

Research question three: What is the prevalence of Attention Deficit Hyperactivity Disorder?

There were 55 (74.3%) out of 600 who had suggestive symptoms of ADHD, and therefore the prevalence, which is the proportion of a population that has the condition at a specific point in time in the general population is 55/600 which is 9.1%.

Research question four: What challenges would teachers face when using Gilliam's Attention Deficit Hyperactivity Disorder scale in eliciting the symptoms from their pupils? The answer to this research question is as follows:

Teachers faced an array of challenges in understanding and applying the ADHD tool. Teachers were all in agreement that they understood the concept hyperactivity. One of the problems that had beset the study of hyperactivity is that different teachers had adopted different meanings and without precise but they seemed to have challenges with the word squirms. The construct 'squirm' has far-reaching importance for understanding and scoring children's normal and abnormal development within the subset. The main finding of this study is that several hyperactivity descriptions seem not to be related to the construct. Relating to impulsivity and inattentiveness, the two sub sets shed light on their

multidimensional nature of meaning. Teachers seemed to give similar meanings of the constructs in a number of instances.

According to the estimated prevalence of DSM-IV ADHD 9.1% is not in accordance with reported prevalence among school age children from other parts of the world (Scahill and Schwab-Stone, 2000) it can safely be deduced that in terms of prevalence, it is rather high at 9.1% in this cross section study. This study is almost consistent with a Nigerian study by Egbochuku and Abikwi, (2007) in which the prevalence of ADHD was 8.7%. Contrary to this study, one study in Ethiopia reported a prevalence of 1.5% (Ashenafi, 2000).

Gadow, Sprafkin, Carlson, Schneider, Nolan, Mattison, Rundberg-rivera., (2000) reported on the prevalence of ADHD symptoms in a sample of 600 Ukrainian children and an age-matched sample of 443 US children. Our study reported a very low prevalence of ADHD symptoms 9% compared with the Ukrainian study, which was 19.8%. However, in the US sample, the prevalence was 9.7%. It is unclear why the prevalence of ADHD symptoms should be so much higher in the sample of Ukrainian. It is possible for instance to argue that the higher Ukrainian prevalence reflects the environmental adversity and psychosocial dislocation associated with the Chernobyl disaster, but we can draw no firm conclusions in the absence of an appropriate Ukrainian control group.

While the prevalence in our setting shows the value to be high, it is critical to contrast it with other studies with low rates. Iceland, Australia, Italy, and Sweden have been reported to have low rates, but this cannot be concluded based on the available data in our setting. The sample was only a sub locality in the City of Lusaka. However, direct comparisons between the aforementioned and other populations are required to truly assess the relative prevalence of ADHD symptoms in different cultures and countries at national level.

Even if girls are more often considered to be less overactive than boys, and are more likely to be underestimated, the findings of this study do not point to what other studies have documented. This study has indicated no significant difference between boys and girls. This may be attributed to ADHD combined subtype, both the hyperactivity/impulsivity and inattention was present and the chance to be

identified may be similar for boys and girls. The study established what Biederman, Mike, Faraona, Braaten, Doyle, Spencer, Wilens, Frazier, and Johnson., (2002) found in the risk for ADHD is the same for boys and girls and this is similar with this study.

Although the Ministry Of Education does not capture the existence of ADHD in its Education Bulletin, though the sample is small, the study has shown that this disorder exists in the pupils.

While the populations studied in this dissertation are not necessarily representative of all child populations, they are sufficient to demonstrate that ADHD is not purely a Western disorder and that the prevalence of this behavioural disorder within the pupil population may invoke serious difficulties for the school authorities to put up with delinquency.

It is critical to pay more attention to scholars in order to identify those externalizing behaviours, distinguishing features, and interactions that are reliable predictors for a future ADHD diagnosis. The needs are present when children are young. By delaying this process, problems exacerbate and undesirable behaviours become learned. The earlier the recognition of a problem, the sooner appropriate interventions, treatments, and counselling can begin to counter the negative effects of family stress, lowered self-esteem, and ensuing learning and social difficulties.

5.2 Limitations

This study was limited by the use of teacher based report measures where only teachers reported on the behaviours of children. In addition, a small sample size was used which lacked power to control potentially relevant factors in children's environment, including other psychological symptoms. The statistically insignificant finding in this study implies that there is need for future studies with larger, representative samples and comprehensive measurement of symptoms and trauma history. To effectively diagnose and treat ADHD in maltreated children, we must know the average age of onset, symptom profiles and rule-out disorders. Rigorous research into these issues is urgently needed.

One other limitation of the literature we reviewed is the reliance of many studies on rating scale measures rather than interviews with patients and parents. Unlike rating scale methods, interview-based procedures come close to reproducing the results one might expect from a clinical evaluation and are better able to incorporate the impairment and pervasiveness criteria of the ADHD diagnosis. However, this limitation was partially overcome by introducing interview-based questions. In addition, this research needs to be followed up into clinical practice, with a better awareness of this disorder and its burden on the individual and the school as a whole.

Given these limitations, the study outcomes can only be localised to the pupils in the schools that were studied.

CHAPTER SIX - CONCLUSION AND RECOMMENDATIONS

6.0 Overview

In conclusion, the data from this study using ADHD DSM criteria to assess the prevalence of ADHD in a school going child population showed a general prevalence of 9.1% and a tendency of mild or severe symptoms of hyperactivity, impulsivity and inattentiveness. However, tests of differences in the three ADHD subsets using the Tukey post hoc tests following ANOVA indicated that the mean scores did not differ significantly in the two genders since the p values were > 0.05 . The most prevalent ADHD subtype was hyperactivity. The prevalence of hyperactivity, impulsivity and inattention was 12%, 10.3% and 10.3% in this order. Teachers faced an array of challenges in understanding and applying the ADHD tool and were all in agreement that they understood the concept hyperactivity. However, the construct 'squirm' has far-reaching importance for understanding and scoring children's normal and abnormal development within the subset. The main finding of this study is that several descriptions in the three subsets seem not to be related to the constructs hyperactivity, impulsivity and inattentiveness. Relating to impulsivity and inattentiveness, the two sub sets shed light on their multidimensional nature of meaning. Teachers seemed to give similar meanings of the constructs in a number of instances.

In the Zambian context, there is lack of national wide prevalence data of ADHD, this study though with a very small sample and only among the fourth grade children, it can be indicated that ADHD is prevalent in schools and the current study provides preliminary results suggesting that ADHD is possibly a big problem in schools. This Zambian study is significant by generating data though at a small scale in spite the fact that there are limited research studies on the continent addressing the epidemiology of ADHD and other childhood neuro-developmental disorders,

6.1 Recommendations

There are critical recommendations worth making from this study.

Exploratory studies like this one are essential for formulating policy on intervention and healthcare service delivery. The study has shown a further reflection of less attention paid to issues of childhood neuro-developmental disorders by Governments of the countries in Africa. This calls for profiling ADHD symptoms in our schools routinely.

If adequate school health service planning is to be put in place on in Zambia, further studies are required to potentially more accurately reflect the magnitude and burden of ADHD and other childhood neuro-developmental disorders.

Teachers claimed to have understood the concepts hyperactivity and yet they had challenges with certain words. Different teachers had adopted different meanings and without precise understanding of some concepts. They seemed to have challenges with the words: squirms, blurting out, impulsive and inattention. Generally the tool was understood by the teachers because teachers were familiar with about 91% of the concepts in the ADHD tool. Adaptation of the tool into the Zambian concepts can greatly help deal with the vocabulary that is foreign to the teachers and enable the administration of the tool with high validity.

To effectively diagnose and treat ADHD in maltreated children, we must know the average age of onset, symptom profiles and rule-out disorders and as such, rigorous research into these issues is urgently needed.

The assessment of behavioural disorders, such as ADHD, must be guided by research on the classification and core features of the disorder. Multiple sources and multiple varieties of information are necessary because the level of agreement among sources and between types of information is relatively low (Forbes, 1998). The current research strongly suggests that an optimal assessment

protocol ought to rely upon several methods, utilizing several different sources of information obtained from different settings and informants (Barkley, 1997).

ADHD diagnosis is increasingly common if only assessment is very well done. Furthermore, the assessment results obtained in this study should be used to design school based intervention strategies.

While the ADHD tool is reliable, the researcher is recommending the diagnostic task in the classification of ADHD in ruling out alternative causes or establishing the primary problem (e.g., head injuries, metabolic or endocrine disorders, learning disabilities, substance abuse, and giftedness). Secondly, the situational variation of problems directs that multiple sources of information be obtained from the different domains of the child's life (e.g., home, school). Thirdly, it is necessary to consider developmental issues (e.g., age of the child, maturity). Given these observations, the researcher is recommending the application of various assessment methods. These methods of assessment include: Interviews, standardized child behaviour rating scales, peer-referenced assessment, laboratory measures, and direct observation.

It is also recommended that teachers need to be oriented in the use of the ADHD tool to reduce unnecessary referrals.

Adaptation of the tool into the Zambian context to be done in order to deal with the vocabulary that is foreign to the teachers.

REFERENCES

- Abramowitz, A. J., Eckstrand, D., O’Leary, S. G., and Dulcan, M. K. (1992). ADHD children’s responses to stimulant medication and two intensities of a behavioral intervention. *Behavior Modification*, 16, 193-203.
- Adewuya, A. O., Famuyiwa O. O (2007). Attention deficit hyperactivity disorder among Nigerian primary school children: Prevalence and co-morbid conditions. *Eur Child Adolesc Psychiatry*. 16: 10 – 15.
- Adler, L. A., Barkley, R. A., and Newcorn, J. H., (2011) Performance improvement CME: adult ADHD. *J Clin Psychiatry*. 72(4): p. e15
- American Academy of Pediatrics (2000). Clinical practice guideline: Diagnosis and evaluation of the child with attention-deficit/hyperactivity disorder. *Pediatrics*, 105: 5, 1158-1170.
- American Academy of Pediatrics. (2001). Clinical practice guideline: Treatment of the school-aged child with attention deficit/hyperactivity disorder. *Pediatrics*, 108, 1033-1044.
- American Psychiatric Association. (2000). Diagnostic and statistical manual of the American Psychiatric Association. Washington, DC: *American Psychiatric Association*.
- American Psychiatric Association. (1994). Diagnostic and Statistical Manual of Mental Disorders (4th ed.). Washington, DC: *American Psychiatric Association*.
- Anderson, J. C. (1996) Is childhood hyperactivity the product of Western culture? *Lancet*. 348: 73 – 74.
- Anderson, J. C., Williams, S. C., McGee, R., and Silva, P. A. (1987). DSM-III disorders in preadolescent children: Prevalence in a large sample from the general population. *Archives of General Psychiatry*, 44, 69-76.
- Ashenafi, Y., Kebede, D., Desta, M., Alem, A. (2000). Socio-demographic correlates of mental and behavioural disorders of children in southern Ethiopia. *East Afr Med J*.;77(10): 565–569.
- Bakare, M, O., Ubochi, V.N., Ebigbo, P. O., Orovwigho, A. O. (2010) Problem and pro-social behavior among Nigerian children with intellectual disability: the implication for developing policy for school based mental health programs. *Italian Journal of Pediatrics*.; 36: 37.

Bálint, S., Czobor, P., Mészáros A., Simon, V., Bitter, I (2008). "[Neuropsychological impairments in adult attention deficit hyperactivity disorder: a literature review]" (in Hungarian). *Psychiatric Hung* 23 (5): 324–35.

Barkley, R. A (1997) ADHD and the nature of self-control. New Jersey: Guilford.

Barkley, R. A (1996). The North American perspective on Attention Deficit Hyperactivity Disorder. *The Australian Educational and Developmental Psychologist*, 13 (1), 2-23.

Barkley, R. A. (1990a). Attention Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment. New York: Guilford Press.

Barkley, R. A. (1990b). Comprehensive evaluation of attention deficit disorder with and without hyperactivity as defined by research criteria. *Journal of Consulting and Clinical Psychology*, 58, 775-789.

Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. *Psychological Bulletin*, 121:1, 65-94.

Barkley, R. A. (1998b). Handbook of Attention Deficit Hyperactivity Disorder (2nd ed.). New York: Guilford Press.

Barkley, R. A. (2006). Attention Deficit Hyperactivity Disorder: A handbook for diagnosis and treatment. New York: Guilford Publications.

Barkley, R. A. (September, 1998a). Attention-deficit hyperactivity disorder. *Scientific American*, 279: 3.

Barkley, R. A., Murphy, K. R. (1998). Attention-deficit hyperactivity disorder: A clinical workbook (2nd ed.). New York: Guilford.

Barkley, R. A., and Russell, A. (2007). "ADHD in Adults: History, Diagnosis, and impairments". ContinuingEdCourses.net.

Biederman, J., Gao, H., Rogers, A. K., Spencer, T.J. (2006). Comparison of parent and teacher reports of attention-deficit/hyperactivity disorder symptoms from two placebo-controlled studies of atomoxetine in children. *Biol Psychiatry*, 60:1106–10.

Biederman, J., Spencer, T. J., Newcorn, J. H. (2007). Effect of comorbid symptoms of oppositional defiant disorder on responses to atomoxetine in children with ADHD: a meta-analysis of controlled clinical trial data. *Psychopharmacology (Berl)*, 190:31–41.

Biederman, J., Faraone, S. V., Braaten, E., Doyle, A., Spencer, T., Wilens, T. E., Frazier, E., Johnson, M.A., (2002). Influence of gender on attention deficit hyperactivity disorder in children referred to a psychiatric clinic. *Am J Psychiatry*. 159(1):36–42.

Biederman, J., Newcorn, J., Sprich, S., (1991). Comorbidity of Attention Deficit Hyperactivity Disorder with conduct, depressive, anxiety, and other disorders. *Am. J. Psychiatry* 148, 564–577.

Bird, H. R. (2002) The diagnostic classification, epidemiology and cross-cultural

Bird, H. R., Canino, G., Rubio-Stipec, M., Gould, M. S., Ribera, J., Sesman, M., (1988). Estimates of the prevalence of childhood maladjustment in a community survey in Puerto Rico. The use of combined measures. *Archives of General Psychiatry*, 45, 1120-1126.

Blanchard, T. L., Gurka, M. J and Blackman, A. J. (2003). “Emotional, Developmental, and Behavioral Health of American Children and Their Families: A Report from the National Survey of Children’s Health,” *Pediatrics* 117, no. 6 .

Burton, J. L (2002). An interactive approach to writing essays and research reports in psychology. Milton: John Wiley and Sons Australia, Ltd.

Canino, G., Shrout, P. E., and Rubio-Stipec, M, (2004). The DSM-IV rates of child and adolescent disorders in Puerto Rico: Prevalence, correlates, service use, and the effects of impairment. *Arch Gen Psychiatry*.;61:85-93.

Cantwell, D. P., & Baker, L. (1991). Association between attention deficit-hyperactivity disorder and learning disorders. *Journal of Learning Disabilities*, 24, 88-95.

Carlson, C. L., Pelham, W. E., Jr., Milich, R., and Dixon, J. (1992). Single and combined effects of methylphenidate and behavior therapy on the classroom performance of children with attention-deficit hyperactivity disorder. *Journal of Abnormal Child Psychology*, 20, 213-232.

Carpiniello, M. G., Carta, C. M., Pariante, N., Rudas, M. A. and Reda (1995). The Italian DAS as a screening instrument for depression in the elderly. *British Journal of Clinical Psychology*. Child & Adolescent Psychiatry 1998;37(6):637-646.

Cobb, N. J. (2007). Adolescence: Continuity, Change, and Diversity. Boston, McGraw Hill.

Cohen, P., Cohen, J., Kasen, S. (1993) An epidemiological study of disorders in late childhood and adolescence: I. Age and gender-specific prevalence. *J Child Psychol Psychiatry* 34:851–867.

Cooper, P (2000). Understanding and supporting children with Emotional and Behaviour Difficulties. London: Jessica Kingsley Publishers.

Corkum, P., Tannock, R., Moldofsky, H. (1998) Sleep disturbances in children with attention-deficit/hyperactivity disorder. *Journal of the American Academy of sleep in children with attention-deficit/hyperactivity disorder*.

Cuffe, S. P., Moore, C. G and Mckeown, R. E (2005) Prevalence and correlates of ADHD symptoms in the national health interview survey. *J Atten Disord*. 9(2):392-401.

Dulcan, M (1997). Practice parameters for the assessment and treatment of children, adolescents, and adults with attention-deficit/hyperactivity disorder. American Academy of Child and Adolescent Psychiatry". *Journal of the American Academy of Child and Adolescent Psychiatry* 36 (10 Suppl): 85S–121S.

Dykman, R. A., Akerman, P. T., & Raney, T. J. (1994). Assessment and Characteristics of Children with Attention Deficit Disorder. Prepared for the Office of Special Education Programs, Office of Special Education and Rehabilitative Services, U.S. Department of Education.

Egbochuku, O .E and Abikwi, I. M (2007). The Prevalence of Attention Deficit/Hyperactivity Disorder (ADHD) among Primary School Pupils of Benin Metropolis,. *Department of Educational Psychology and Curriculum*. Nigeria.

Erik, G. W (2012). The prevalence of DSM-IV attention-deficit/hyperactivity disorder: A meta-analytic review .University of Colorado, Boulder.

Esser, G., Schmidt, M. H., and Woemer, W. (1990). Epidemiology and course of psychiatric disorders in school-age children: Results of a longitudinal study. *Journal of Child Psychology and Psychiatry*, 31, 243-263.

Faraone, S. V., Sergeant, J., Gillberg, C., Biederman, J. (2003)The worldwide prevalence of ADHD: is it an American condition? *World Psychiatry*. 2: 104 .

Ford, T., Goodman, R., Meltzer, H. (2003) The British Child and Adolescent

Foss, C. and Ellefsen, B. (2002) The Value of Combining Qualitative and Quantitative Approaches in Nursing Research By Means of Method Triangulation. *Journal of Advanced Nursing* 40(2):242-248.

Gadow, K. D, Sprafkin, J., Carlson., G. A., Schneider, J., Nolan, E. E., Mattison, R. E., Rundberg-rivera, V. (2000)ADMS-IV Referenced Adolescent Self Report rating Scale, Jun; 41(6)671-9.

Gilliam, E. J (1995). Attention-Deficit Hyperactivity Disorder Test: A Method for Identifying Individuals with ADHD; Pro.ed an international publication .Taxes.

Gizer, I. R., Ficks, C. and. Waldman, I. D (2009) Candidate gene studies of ADHD: a meta-analytic review.Hum Genet. 126(1): p. 51-90.

Graetz, B. W., Sawyer, M. G., Hazell, P. L., Arney, F., Baghurst, P. (2001). Validity of DSM-IVADHD subtypes in a nationally representative sample of Australian children and adolescents. *J Am Acad Child Adolesc Psychiatry*;40(12):1410–1417.

Hallowell, E. M., and Ratey, J. J. (1995). *Driven to distraction: Recognizing and coping with attention deficit disorder from childhood through adulthood*. New York: Simon & Schuster.

Halperin, J. M., Matier, K., Bedi, G., Sharma, V., Newcorn, J. H., 1992). Specificity of inattention, impulsivity, and hyperactivity to the diagnosis of attention-deficit hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry* 31(2), 190-196.

Herpertz, S. C., Mueller, B., Wenning, B., Qunaibi, M., Lichterfeld, C., Herpertz-Dahlmann, B., (2003). Autonomic responses in boys with externalizing disorders. *Journal of Neural Transmission* 110(10), 1181-1195.

Herpertz, S. C., Wenning, B., Mueller, B., Wunaibi, M., Sass, H., Herpertz-Dahlmann, B., (2001). Psychophysiological responses in ADHD boys with and without conduct disorder: Implications for adult antisocial behavior. *Journal of the American Academy of Child and Adolescent Psychiatry* 40(10), 1222-1230.

Hoza, B., Pelham, Waschbusch, D. A., Kipp, H., Owens, J. s., and (2001) Academic task performance of normal achieving ADHD and control boys: performance, self-evaluations , and attributions. *Journal of Consulting and Clinical Psychology*, 69, 271-283.

Jensen, P. S., Hinshaw, S. P., Kraemer, H. C., Lenora, N., Newcorn, J. H., Abikoff, H. B. (2001). ADHD Comorbidity findings from the MTA Study: Comparing Comorbid Subgroups. *Journal of the American Academy of Child Adolescent Psychiatry*, 40(2), 147-158.

Jensen, P. S., Martin, D., and Cantwell, D. P. (1997). Comorbidity in ADHD: Implications for research, practice, and DSM-V. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36, 1065–1079.

Johnston, C., Weiss, M., Murray C., Miller, N. (2011) The effects of instructions on mothers' ratings of child attention-deficit/hyperactivity disorder symptoms. *J Abnorm Child Psychol*. 39(8): p. 1099-110.

Kashala, E., Tylleskar, T. I., Elgen, I., Kayembe, T. K., and Sommerfelt, K (2005). Attention deficit and hyperactivity disorder among school children in Kinshasa, Democratic Republic of Congo. *Afr Health Sci*. 5(3): 172–181.

Kessler, R.C., Adler, L., and Ames, M. (2005). "The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population". *Psychological Medicine* 35 (2): 245–56.

- Kombo, K. D. and Tromp, A. L. D. (2009). Proposal and Thesis writing. An Introduction. Lusaka. Paulines Publications Africa.
- Leedy, D. P. and Ormrod, E. J. (2001). Practical Research Planning and Designing. (7TH ED) New Jersey. Merrill Prentice Hall.
- Lou, H. C, Andresen, J, Steinberg, B. (1998). The striatum in a putative cerebral network activated by verbal awareness in normals and in ADHD children. *Eur J Neurol*, 5:67–74.
- Mannuzza, S, Klein, R. G., Bessler, A., Malloy, P., LaPadula, M. (1993) Adult outcome of hyperactive boys. Educational achievement occupation rank and psychiatric status. *Arch Gen Psychiat*. 50:565–76.
- Mannuzza, S., Klein, R. G, Bessler, A., Malloy, P. and LaPadula, M. (1998) Adult Psychiatric Status of boys grown up. *American Journal of psychiatry*, 155, 493-498.
- McArdle, P., Obrien, G., Kolvin. I (2002) Hyperactivity and conduct disorder: background factors. *Ir J Psychol Med* 19 (2): 42-47.
- Mental Health Survey (1999): The Prevalence of DSM-IV Disorders. *J Am Acad.Child Adolesc Psychiatry* 42(10):1203–1211.
- Meyer, A., Eilertsen, D. E., Sundet, J. M., Tshifularo, J. G., Sagvolden, T (2004). Cross cultural similarities in ADHD-like behavior amongst South African primary school children. *South African Journal of Psychology*. 34: 123 – 139.
- Meyer, A. (1998)Attention Deficit/Hyperactivity Disorder among North Sotho speaking primary school children in South Africa: Prevalence and sex ratios. *Journal of Psychology in Africa*. 8: 186 – 195.
- Miller, D., Blum, K. (2008). Overload: Attention deficit disorder and the addictive brain. Salt Lake City, Utah: Woodland Publishing Company.
- MOE. (2005). Educational Statistical Bulletin. Lusaka. Golden Touch Printers.
- National Institute of Mental Health (NIMH). (1999). Questions and answers. NIMH Multimodal Treatment Study of Children with ADHD. Bethesda, MD: NIMH.
- Owens, J. A, Maxim, R., Nobile, C., McGuinn, M., Msall, M. (2000) Parental and self-report of Pediatrics and Adolescent Medicine.154(6):549-555.
- Parrillo, V. (2008). Encyclopedia of Social Problems. SAGE. p. 63.
- Pastor, P. N., and Reuben, C. A. (2002). Attention deficit disorder and learning disability: United States, 1997-98. *National Center for Health Statistics. Vital Health Stat*, 10(206).

- Pelham, W. E., Jr., Gnagy, E. M., Greenslade, K. E., and Milich, R. (1992). Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 210-218.
- Pelham, W. E., Wheeler, T., and Chronis, A. (1998). Empirically supported psychosocial treatments for attention deficit hyperactivity disorder. *Journal of Clinical Child Psychology*, 27, 190-205.
- Pineda, D. A. Lopera, F. Henao, G. C. (2001). Confirmation of the high prevalence of attention deficit disorder in a Colombian community. *Rev Neurol.*;32:217–222.
- Polanczyk, G, De Lima., M. S., Horta, B. L., Biederman, J., Rhode, L. A. (2007)The worldwide prevalence of ADHD: A systematic review and metaregression analysis. *Am J Psychiatry*. 6; 164: 942 – 948.
- Rader, R., McCauley, L., Callen, E. C (April 2009). "Current strategies in the diagnosis and treatment of childhood attention-deficit/hyperactivity disorder". *Am Fam Physician* 79 (8): 657–65.
- Rappley, M. D. (2005) Attention deficit-hyperactivity disorder. *N Engl J Med* . 352: 165 – 173.
- Rösler, M., Retz, W., Thome, J., Schneider, M., Stieglitz, R. D., Falkai, P. (2006) Psychopathological rating scales for diagnostic use in adults with attention-deficit/hyperactivity disorder (ADHD). *Eur Arch Psychiatry Clin Neurosci*. 256 Suppl 1: p. i3-11.
- Ross, D. M., and Ross, S. A. (1982). *Hyperactivity: Current Issues, Research, and Theory*. New York: Wiley.
- Rothman, K. J. (2012). *Epidemiology: An Introduction*. Oxford University Press. p. 53.
- Sayal, K., Taylor, E., Beecham, J. (2002) Pathways to care in children at risk of Attention Deficit Hyperactivity Disorder. *British Journal of Psychiatry*.181, 43-48.
- Scahill, L., Schwab-Stone, M. (2000). Epidemiology of ADHD in school-age children. *Child Adolesc Psychiatr Clin N Am.*;9(3):541–555.
- Shaywitz, A . B and Shaywitz, E. S. (1992). *Attention Deficit Disorder Comes of Age: Toward the Twenty-First Century*.
- Singh, I. (2008). "Beyond polemics: science and ethics of ADHD". *Nature Reviews. Neuroscience* 9 (12): 957–64.

Skinner, B. F. (1975). The steep and thorny road to the science of behaviour, *American psychologist*, 30, 42- 49.

Sonuga-Barke, E. J. S. (1998) Categorical model in child psychopathology: a conceptual and empirical analysis. *The Journal of Child Psychology and Psychiatry*, 39, 115–133.

Sonuga-Barke, E. J. S., Germano, M., Meleleo, D., and Montorfano, G. (1993) Nonpharmacological intervention for ADHD. *Journal of Abnormal Child Psychology*. 21 (5): 581-96.

Swanson, J. M. (1992). School-Based Assessments and Interventions for ADHD Students. Irvine, CA: K. C. Publishing.

Taylor, E., Sandberg, S., Thorley, G., Giles, S (1991). The Epidemiology of Childhood Hyperactivity. Oxford University Press : New York.

Timimi, S., Taylor, E. (2004) ADHD is best understood as a cultural construct. *Br J Psychiatry*. 184: 8 – 9.

U.S. Department of Health and Human Services (DHHS). (1999). Mental Health: A Report of the Surgeon General. Washington, DC: DHHS.

Waslick, B., and Greenhill, L. (1997). Attention-deficit/hyperactivity disorder. In J. M. Weiner (Ed.), *Textbook of child and adolescent psychiatry* (2nd Ed.). Washington, DC: *American Academy of Child and Adolescent Psychiatry*, American Psychiatric Press, 389-410.

Weiss, G., Tokenberg-Hechtman, L. (1993) *Hyperactive Children Grown Up*. 2nd ed. New York: Guilford Press.

Wicks –Nelson, R and Isreal, C. A. (2003). *Behavior Disorders of Childhood*. 5TH edn. Upper Saddle River, NJ: Prentice Hall.

Williams, V. I., and Cartledge, G. (1997). Passing notes to parents. *Teaching Exceptional Children*, 30, 30-34.

Wolf, R. M. (1988) Questionnaire. In Keeves, J. P (ED) *Educational Research, Methodology and Measurement: An International Handbook*. New York, Pergamon Press.

Wolraich, M. L., Hannah, J. N., Baumgaertel, A., Feurer, I. D. (1998). Examination of DSM-IV criteria for attention deficit/hyperactivity disorder in a county-wide sample. *J Dev Behav Pediatr*, 19:162–8.

Zametkin, A. J., Nordahl, T. E., Gross, M. (1990). Cerebral glucose metabolism in adults with hyperactivity of childhood onset. *N Engl J Med*, 323:1361–1366.

Zentall, S. S. (1993). Research on the educational implications of attention deficit hyperactivity disorder. *Exceptional Children*, 60, 143-153.

Zwi, M., Ramchandani, P., Joughin, C. (2000). 'Evidence and belief in ADHD. *BMJ* 321 (7267): 975–6.

APPENDIX A

INTRODUCTORY LETTER

THE UNIVERSITY OF ZAMBIA

Post Graduate Studies

SCHOOL OF HUMANITIES & SOCIAL SCIENCES

DEPARTMENT OF PSYCHOLOGY

Dear respondent,

I am a student at the University of Zambia currently pursuing my masters' degree in child and adolescent psychology and I am carrying out a research on "Effectiveness of behavioural management strategies in hyperactive children enrolled in grade four (4) in selected Lusaka urban schools." In order for me to achieve the objectives of my research, it is my kind request that you participate in this study by responding to this questionnaire/taking part in the intervention programme. Kindly note that by responding to this questionnaire, you will not only be making valuable contribution to this research but also provide valuable information that can contribute towards improving the intervention strategies for children and adolescents with ADHD and enhancement of their well-being. The response to this questionnaire will be held in high confidentiality and will only be used for academic purposes of this particular study, as such your responses will be considered as valued and accurate information.

Thank you for your time and cooperation in responding to the questionnaire.

Yours faithfully,

Tembo Abel

(Researcher)

APPENDEX B
CONSENT FORM

Please tick to confirm

- I confirm that I have read and understand the information sheet
- I have had enough opportunity to consider the information , ask questions and have had these answered satisfactorily
- I understand that my participation is voluntary and that iam free to with draw at any time, without giving any reasons
- I fully understand that data collected during this study, may be looked at by responsible Individuals at University of Zambia or educational authorities. I give permission to these individuals to have access to my records.
- I agree to take part in the above research study

Name of parent/Guardian

Signature

Date _____

APPENDIX C

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) RATING FORM

Child's name..... Sex Age Grade

		Not a problem	Mild problem	Severe problem
1.	Loud	0	1	2
2.	Constantly "on-the-go"	0	1	2
3.	Excessive running, jumping, climbing	0	1	2
4.	Twisting and wiggling in seat	0	1	2
5.	Easily excited	0	1	2
6.	Grabs objects	0	1	2
7.	Excessive talking	0	1	2
8.	Difficulty remaining seated	0	1	2
9.	Constantly manipulating objects	0	1	2
10.	Inability to play quietly	0	1	2
11.	Fidgets	0	1	2
12.	Restless	0	1	2
13.	Squirms	0	1	2
	Hyperactivity Sum			
	Impulsivity subset			
14.	Acts before thinking	0	1	2
15.	Shifts from one activity to the next	0	1	2
16.	Fails to wait for one's turn	0	1	2
17.	Difficulty waiting turn	0	1	2
18.	Blurts out answers	0	1	2
19.	Impulsive	0	1	2
20.	Interrupts conversations	0	1	2
21.	Intrudes on others	0	1	2
22.	Does not wait for directions	0	1	2
23.	Fails to follow rules for games	0	1	2
	Impulsivity Sum			
	Inattention Subset			
24.	Poor concentration	0	1	2
25.	Fails to finish project	0	1	2
26.	Disorganised	0	1	2
27.	Poor planning ability	0	1	2
28.	Absentminded	0	1	2
29.	Inattentive	0	1	2
30.	Difficulty following directions	0	1	2
31.	Short attention span	0	1	2
32.	Easily distracted	0	1	2
33.	Difficulty sustaining attention	0	1	2
34.	Difficulty staying on task	0	1	2
35.	Difficulty completing tasks	0	1	2
36.	Frequently loses things	0	1	2
	Inattention Sum			


Key questions

1. Does the person demonstrate six or more symptoms of inattention, six or more symptoms of hyperactivity, six or more symptoms of impulsivity?
2. Does the person exhibit the behavioural problems in a variety of environment?
3. Does the person demonstrate the behaviours considerably more frequent than do most people of the same mental age?
4. Has the person demonstrated the behaviour for at least six month?
5. Did the person first demonstrate the behaviour before age seven?
6. Is the person's functioning (at school, home, and work) significantly impaired?
7. Are there other conditions that could possibly be causing the behaviour problem? If yes what are the condition?
8. Who has previously evaluated this person and what were the results?
9. What specific intervention have been attempted to treat the person's problem?
10. Want additional information needs to be collected?

11. Response Form Score Summary

12. Subtests	Raw scores	SS	%	SEm
13. Hyperactivity	_____	___	___	1
14. Impulsivity	_____	___	___	1
15. Inattention	_____	___	___	1
16. Sum of Standard Scores		___		
17. ADHD Quotient		___	___	3

18. Interpretation Guide

Subtest Standard Scores	ADHD Quotient	Degree of severity	Probability of ADHD
17-19	133+	High	very high
15-16	121-130		high
13-14	111-120		above average
8-12	90-110		average
6-7	80-89		below average
4-5	70-79		low
1-3	≤69	Low	very low

APPENDIX D

NORMATIVE TABLES

Table A
Converting roll scores to Standard scores and percentiles
(Males)

Standard score	Hyperactivity		Impulsivity	Inattention	Percentiles
	Ages 3-7	Ages 8-23	Ages 3-7	Ages 3-23	
1					
2				0	<1
3	0			1-2	1
4	1	0	0	3-5	2
5	2-3	1	1	6-7	5
6	4-7	2-3	2-4	6-10	9
7	8-10	4-7	5-7	11-12	16
8	11-13	8-10	8-9	13-15	25
9	14-16	11-13	10-11	16-18	37
10	17-20	14-16	12-13	19-21	50
11	21-22	17-20	14-15	22	63
12	23	21-22	16-17	23-24	75
13	24	23	18	25	84
14	25	24	19	26	91
15	26	25	20	-	95
16	-	26	-	-	98
17	-	-	-	-	99
18	-	-	-	-	>99
19	-	-	-	-	-
20	-	-	-	-	-

Table B
Converting roll scores to Standard scores and percentiles
(Females)

Standard score	Hyperactivity		Impulsivity	Inattention	Percentiles
	Ages 3-7	Ages 8-23	Ages 3-7	Ages 3-23	
1					
2				0	<1
3	0			1-2	1
4	1	0	0	3-4	2
5	2-4	1	1	5-6	5
6	5-7	2-4	2-4	7-9	9
7	8-9	5-7	5-6	10-11	16
8	10-12	8-9	7-8	12-13	25
9	13-15	10-12	9-10	14-16	37
10	16-18	13-15	11-12	17-19	50
11	19-20	16-18	13-15	20-21	63
12	21-22	19-20	16-17	22-23	75
13	23-24	21-22	18	24	84
14	25	223-24	19	25	91
15	26	25	20	26	95
16	-	26	-	-	98
17	-	-	-	-	99
18	-	-	-	-	>99
19	-	-	-	-	-
20	-	-	-	-	-

Table C
Converting sum of Standard scores to ADHD Quotient and Percentile Rank

ADHD Quotient	Sum of Subtests Standard scores	Percentile Rank
165	62	>99
164		>99
163	61	>99
162		>99
161	60	>99
160		>99
159	59	>99
158		>99
157	58	>99
156		>99
155	57	>99
154		>99
153	56	>99
152		>99
151	55	>99
150		>99
149	54	>99
148		>99
147	53	>99
146		>99
145	52	>99
144		>99
143	51	>99
142		>99
141	50	>99
140		>99
139	49	>99
138		>99
137	48	>99
136		>99
135	47	99
134		99
133	46	99
132		99
131	45	99
130		88
129	44	97
128		97
127	43	97
126		96
125	42	95
124		95
123	41	94
122		93
121	40	92
120		91
119	39	90
118		89
117	38	87
116		86
115	37	84
114		82
113	36	81

112	-	79
111	35	77
110	-	75
109	34	73
108	-	70
107	-	68
106	33	65
105	-	63
104	32	61
103	-	58
102	31	55
101	-	53
100	30	50
99	-	47
98	29	45
97	-	42
96	28	39
95	-	37
94	27	35
93	-	32
92	-	30
91	26	27
90	-	25
89	25	23
88	-	21
87	24	19
86	-	18
85	23	16
84	-	14
83	22	13
82	-	12
81	21	10
80	-	9
79	20	8
78	-	7
77	-	6
76	19	5
75	-	5
74	18	4
73	-	3
72	17	3
71	-	3
70	16	2
69	-	2
68	15	1
67	-	1
66	14	1
65	-	1
64	13	<1
63	-	<1
62	-	<1
61	12	<1
60	-	<1
59	11	<1
58	-	<1
57	10	<1
56	-	<1
55	9	<1
54	-	<1
53	8	<1
52	-	<1
51	7	<1
50	-	<1
49	6	<1
48	-	<1

47	-	<1
46	5	<1
45	-	<1
44	4	<1
43	-	<1
42	3	<1
41	-	<1
40	-	<1
39	-	<1
38	-	<1
37	-	<1
36	-	<1
35	-	<1

APPENDIX E

INTERVIEW SCHEDULE FOR TEACHERS

Read the test tool carefully and answer the questions that follow:

Which words in the ADHD test tool seem difficult to you in each category.

- 1) Please describe for me a child who is hyperactive.
- 2) What do you understand by the following words in the impulsivity category
 - a. Impulsivity,
 - b. Blurts out,
1. What do you understand by the following word in the in attention category
 - b. Inattention
2. What do you say about the administration of the ADHD tool?
3. What makes you think that this tool is easy or difficult to administer?

