

Foundation and Intermediate Phase educators' knowledge and beliefs about the features, symptoms and diagnosis of Attention Deficit Hyperactivity Disorder (ADHD).

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ABSTRACT

Attention – Deficit / Hyperactivity Disorder (ADHD) is described as one of the most researched and most common of all childhood-onset disorders, receiving substantial amounts of attention from researchers, the media and members of the general public in the last two decades. Research in the last decade has found prevalence rates for South African children and adolescents diagnosed with ADHD ranging between 5 and 10%, therefore making ADHD one of the persistent and commonly occurring conditions affecting South African children and adolescents today.

Despite this, ADHD is a commonly misunderstood condition, with misinterpretations about ADHD been documented amongst parents and doctors, as well as amongst educators. International studies that have measured educators' level of knowledge regarding ADHD, have found that while educators have a basic understanding of ADHD, more complex knowledge of the symptoms, treatment and features of ADHD is limited. This study therefore aimed to assess the level of knowledge regarding ADHD amongst Foundation/Intermediate phase educators in Durban, South Africa. Knowledge levels were measured using the KADDS (Knowledge of Attention Deficit Disorders Scale), which measures educators' knowledge and misperceptions in three specific areas: Symptoms/diagnosis of ADHD, general knowledge about the nature, causes and outcome of ADHD and possible interventions (treatment) with regard to ADHD. A demographic questionnaire was administered along with the KADDS to 104 educators at selected schools.

The results from this study demonstrated that Durban-based, South African educators had an overall correct knowledge rate of 54.65%. The scores obtained on this study, fall within the average range of scores obtained from international and national studies based on the KADDS. Furthermore, when compared to other South African studies, this current study demonstrated better results on the KADDS scale. This could suggest that Durban based educators possess greater knowledge of ADHD than educators in other cities of South Africa, namely Cape Town and Johannesburg.

Correlation tests were done to identify possible relationships between educators' knowledge of ADHD and their demographic characteristics. These revealed that overall knowledge of

ADHD is significantly related to educators' sense of self-efficacy regarding their ability to teach in an inclusive setting with ADHD learners. Self-efficacy was also identified as a predictive factor for increased knowledge levels. Knowledge of ADHD was also correlated with educators' exposure to ADHD as a childhood disorder (e.g. teaching a learner with ADHD, being involved in the referral process of a possible ADHD diagnosis).

The findings contribute to international and local knowledge around educators' knowledge of ADHD at a time when inclusion is promoted in education. Recommendations arising from this study include: Interventions with in-service educators to address gaps in their knowledge levels, further exploration around training educators' exposure to knowledge of ADHD, as well as self-efficacy enhancement of educators.

DECLARATION

I declare that this thesis is submitted in partial fulfillment of the requirements for the degree of Master of Social Science in Psychology, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

I, Wendy Etchells, declare that

1. The research reported in this thesis, except where otherwise indicated, is my original research.
2. This thesis has not been submitted for any degree or examination at any other university.
3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
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October 2015



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October 2015

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DEFINITION OF KEY CONCEPTS

1. Attention Deficit Hyperactivity Disorder (ADHD)

Attention Deficit Hyperactivity Disorder (ADHD) is defined as a persistent pattern of symptoms of inattention and /or hyperactive and impulsive behaviours that inhibit the performance and completion of daily tasks (American Psychiatric Association [APA], 2013). Children may display age-appropriate symptoms of distractibility, hyperactivity or impulsivity, yet a child diagnosed with ADHD will exhibit such behaviours more frequently and persistently (APA, 2000; Efron, Sciberras, & Hassell, 2008; Sherman, Rasmussen, & Baydala, 2008). According to the fifth edition of the Diagnostic and Statistical Manual (DSM 5, APA, 2013), the diagnosis of ADHD requires the presence of ADHD characteristics before the age of 12 years, persisting for a period of not less than six months. Furthermore, several ADHD characteristics must be present across at least two settings (e.g. home and school) and clear evidence of functional impairment in social, academic, or occupational domains must be present (APA, 2013).

2. Inclusion

According to Rogers (1993, p.1), inclusion is defined as “the commitment to educate each child, to the maximum extent appropriate, in the school and classroom he/she would otherwise attend”. In the South African context, inclusion within the school context is addressed in White Paper 6 (Department of Education, 2001). This document’s primary focus was on “meeting the needs of all learners and actualising the full potential of all learners” (Prinsloo, 2001, p. 344).

3. Knowledge

Knowledge can be described as a collection of mental units of all kinds that provides us with understanding and insight (Firestone, 2003). Being equipped with understanding and insight allows an individual to draw upon their initiative and provides them with the “capacity for effective action” in a given situation (Firestone, 2003, p. 108). Therefore, knowledge goes beyond the acquisition of information but also includes insight into how to use the information that one has gained.

4. Misperceptions

In this study, the term „misperception“ is used to show that a particular educator’s belief or a specific point of view regarding a particular aspect of ADHD is incorrect.

5. Foundation / Intermediate Phase educators

A Foundation / Intermediate Phase educator refers to an educator who is involved in the education of children between Grade R and Grade 6. These children are usually between the ages of 5 and 12 years.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is defined as a persistent pattern of symptoms of inattention and /or hyperactive and impulsive behaviours that inhibit the performance and completion of daily tasks (APA, 2013). Children may display age-appropriate symptoms of distractibility, hyperactivity or impulsivity, yet a child diagnosed with ADHD will exhibit such behaviours more frequently and persistently (APA, 2000; Efron, Sciberras & Hassell, 2008; Sherman, Rasmussen & Baydala, 2008). According to the fifth edition of the Diagnostic and Statistical Manual (DSM 5), the diagnosis of ADHD requires the presence of ADHD characteristics before the age of 12 years, persisting for a period of not less than six months. Furthermore, several ADHD characteristics must be present across at least two settings (e.g. home and school) and clear evidence of functional impairment in social, academic, or occupational domains must be present (APA, 2013).

ADHD is one of the most researched and most publicized of all childhood-onset disorders, with a number of both local and international studies being devoted to the investigation of its prevalence rates, causes, symptoms and prognosis (Barkley, 2001; Funk, 2011; Kauffam & Landrum, 2009; Lougy & Rosenthal, 2002; Nigg, 2001; Scuitto, Terjesen & Bender-Frank, 2000). Despite this, ADHD has been described as being a frequently misunderstood condition (Gargiulo, 2010). Misunderstandings and misinterpretations regarding ADHD have been documented amongst parents and doctors, as well as amongst educators (Perold, Louw & Kleynhans, 2010). Educators are expected to enter classrooms prepared to accommodate the needs of all learners, including those who exhibit ADHD-related behaviours (Alamri, 2014; Amod, Vorster & Lazarus; 2013; Department of Education, 2001). In order to implement successful inclusive practices for ADHD learners, educators need to be knowledgeable about ADHD, as it has been found that educators with average or higher knowledge about ADHD tend to provide more supportive and adaptive experiences for learners compared with educators with weaker knowledge (Ohan, Cormier, Hepp, Visser & Strain; 2008).

Many studies have been conducted that investigate the causes, assessment, associated issues and treatment of ADHD (Barkley, 2001; Funk, 2011; Kauffam & Landrum, 2009; Lougy &

Rosenthal, 2002; Nigg, 2001; Scuitto et al., 2000), but there seem to be comparatively few studies that investigate the knowledge of educators regarding this disorder (Kos, Richdale & Hay 2006). Less than 20 worldwide studies, which assessed educators' knowledge of ADHD, had been reported by the year 2011 (Funk, 2011). However, since 2011, a number of international studies have been published in this area, suggesting a possible increase in research and interest around this topic. On average, such studies reported low to average knowledge levels amongst the samples utilized.

There are a few available studies that investigate educators' knowledge of ADHD in South Africa. Lawson (2004), Pelham and Evans (1992), Perold et al. (2010) and Snider, Busch and Arrowood (2003), questioned the knowledge level of South African educators regarding ADHD and highlighted this as an important area of future study. Two South African studies reported poor knowledge levels of ADHD amongst educators (Lazarus, 2011; Perold et al., 2010) but to the knowledge of the researcher, no other South African studies have been published. Thus, it would seem that the knowledge levels of educators regarding ADHD is an under-researched topic within the South African context. This current study therefore hopes to contribute to and extend the existing body of knowledge pertaining to this topic, on both an international and local level. Furthermore, this study hopes to identify if there are any individual factors that may influence knowledge levels of ADHD, such as educators' level of education, years of teaching experience, prior experience with a child with ADHD and their confidence to teach ADHD learners. This will provide some insight into the type of educator who is at risk for having low knowledge levels and may need more focused support, while highlighting those who may be more knowledgeable and in a position to assist ADHD learners more effectively.

1.2 Rationale

Misperceptions and limited knowledge levels identified amongst educators is of concern due to the significant role that they play in the identification of ADHD symptoms and its subsequent diagnosis, referral and treatment (Perold et al., 2010). Furthermore, according to the White Paper 6, South Africa's system of inclusive education expects educators to educate learners with diverse needs within mainstream classrooms, including those learners diagnosed with ADHD (Department of Education, 2001). Inclusion requires a reconsideration and reformation of school curricula in order to accommodate for all learners,

including those with special educational needs and disabilities (Amod et al., 2013). Educators who are knowledgeable about ADHD will have the necessary skills required to communicate with and teach an ADHD child effectively (Holz & Lessing, 2002; Perold et al., 2010).

Perold et al. (2010) questioned the knowledge level held by South African educators regarding this disorder and suggested ascertaining knowledge levels and possible misperceptions, as an important research area. There is little available research that has focused on South African educators' knowledge level of ADHD (Lawson, 2004; Pelham & Evans, 1992; Perold et al., 2010; Snider et al., 2003). Therefore, this study was designed in order to explore knowledge levels of South African educators, so as to contribute to and extend existing knowledge around this topic. Nur and Kavakci (2010) emphasised the importance of identifying any possible misperceptions educators harbour regarding ADHD, as a means to further help and support these children more effectively in the classrooms. Therefore, findings from this study could inform the development of intervention strategies that hope to develop the knowledge levels of educators, as a means to enhance the learning and support of ADHD children.

1.3 Aims and Objectives

The main aim of this study was to describe and explore Foundation/Intermediate Phase educators' level of knowledge about ADHD, including knowledge of its features, symptoms and diagnosis. ADHD is usually identified by educators during the Foundation / Intermediate phase of schooling, as learners are required to engage in activities that run counter to the core characteristics of the disorder, such as paying attention, following instructions and staying seated (Barkley, 2001; Weiss & Hechtman, 1993). These educators therefore need to be informed about the features, symptoms and treatment of the disorder, so they can be involved in early diagnosis and intervention.

The objectives of the study were:

1. To determine whether individual factors (years of total teaching experience, years of experience in a specific grade, level of their qualification, prior experience of teaching an ADHD child) can predict educators' knowledge levels of ADHD.

2. To investigate whether there are any correlations between educators' knowledge of ADHD and their confidence in their own ability to teach ADHD learners.

1.4 Research Questions

The main question to be answered by this study was:

What is Foundation/Intermediate Phase educators' level of knowledge about ADHD, including knowledge of its features, symptoms and diagnosis?

The following sub-questions were also addressed:

1. Are there any individual factors (years of total teaching experience, years of experience in a specific grade, level of their qualification, prior experience of teaching an ADHD) that can predict educators' knowledge levels about ADHD?

2. Are there correlations between educators' knowledge of ADHD and their confidence about their own ability to teach ADHD learners?

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is defined as a persistent pattern of symptoms of inattention and /or hyperactive and impulsive behaviours that inhibit the performance and completion of daily tasks (APA, 2013). Children may display age-appropriate symptoms of distractibility, hyperactivity or impulsivity, yet a child diagnosed with ADHD will exhibit such behaviours more frequently and persistently (APA, 2000; Efron et al., 2008; Sherman et al., 2008). According to the fifth edition of the Diagnostic and Statistical Manual (DSM 5), the diagnosis of ADHD requires the presence of ADHD characteristics before the age of 12 years, persisting for a period of not less than six months. Furthermore, several ADHD characteristics must be present across at least two settings (e.g. home and school) and clear evidence of functional impairment in social, academic, or occupational domains must be present (APA, 2013).

ADHD is one of the most researched and most publicised of all childhood-onset disorders, with a number of both local and international studies being devoted to the investigation of its prevalence rates, causes, symptoms and prognosis (Barkley, 2001; Funk, 2011; Kauffman & Landrum, 2009; Lougy & Rosenthal, 2002; Nigg, 2001; Scuito et al., 2000). Despite this, ADHD is described as a frequently misunderstood disorder, surrounded by misperceptions (Gargiulo, 2010). Misunderstandings and misinterpretations about ADHD have been documented amongst parents and doctors, as well as amongst educators (Perold et al., 2010). This is of great concern due to the significant role that educators play when it comes to the identification of ADHD symptoms and its subsequent diagnosis, referral and treatment (Perold et al., 2010). Furthermore, as a result of inclusive education, educators are expected to enter classrooms prepared to accommodate the needs of all learners, including those who exhibit ADHD-related behaviours (Almari, 2014; Amod et al., 2013; Department of Education, 2001). Therefore, it is important to ascertain whether South African educators are able to manage diversity in their classes that pertain to the inclusion of ADHD learners (Naiditch, 2010).

This study was designed to explore South African educators' knowledge of ADHD, as well as the relationship between educators' knowledge of ADHD and demographic factors including level of education, years of teaching experience and prior experience with a child

with ADHD. In this chapter, relevant literature will be reviewed across three main sections. In the first section, general information will be provided on ADHD, including a brief history of the changes in how it has been conceptualized, as well as the complexity of the symptoms, characteristics and diagnostic criteria of ADHD. In the second section, literature regarding ADHD and South Africa's education system will be reviewed, including information on the responsibilities of educators who teach within inclusive settings. The third section will focus on the findings of contemporary international and local studies conducted to ascertain the level of educators' knowledge regarding ADHD. Literature will also be reviewed that attempts to identify any individual factors that may influence knowledge levels of ADHD, such as years of teaching experience, level of study, prior exposure to a learner with ADHD and personal confidence levels about teaching ADHD learners. The final section of the literature review will present a theoretical framework for this study, namely Bandura's (1976) self-efficacy theory.

2.2. General information on ADHD

2.2.1 Historical overview of the diagnostic criteria of ADHD

Although ADHD has only been identified recently as a diagnosable disorder, behavioural symptoms parallel with current definitions of ADHD were identified and documented at the start of the twentieth century (Alamri, 2014). In 1902, American physician, George Still, described the hyperactive, inattentive and restless symptoms that had been observed in 20 children and concluded the presence of a behaviour problem that had arisen out of „inhibitory volition“ and „defective moral control“ (Barkley, 2001; Fitzgerald, Bellgrove, & Gill, 2007). It was further noted during the research that these behaviour problems were most commonly observed during childhood years amongst boys (Green & Chee, 1994). Throughout the decades that followed, the characteristics of these children became the focus of extensive research, which resulted in a variety of different medical terms being used to describe the pattern of these symptoms (Parker, 1992). Parker (1992) offers a list of this terminology including: Minimal brain damage syndrome (1940), hyperkinetic impulse disorder (1957), minimal brain dysfunction (1960), and hyperkinetic reaction of childhood (1968). Kleynhans (2005) noted that in the late 1960's, the term “hyperactive child syndrome” came to be used because hyperactivity was then seen as the core feature of ADHD. However, in the 1970s knowledge around the features of ADHD broadened, resulting in attention and impulse control also being recognised as primary characteristics of this disorder (Barkley, 2001; Mash

& Wolfe, 2002). Therefore, in 1980, the term “hyperactive child syndrome” was changed to Attention Deficit Disorder (ADD) in the DSM III, published by the American Psychiatric Association (Green & Chee, 1994). The DSM III defined ADD as a multidimensional disorder characterised by hyperactivity, impulsivity and difficulty in sustaining attention. The disorder was further re-categorised into two subtypes: ADD with and without hyperactivity (Fitzgerald et al., 2007; Kleyhans, 2005).

In the revised edition of the DSM III, the term ADD was changed to Attention Deficit Hyperactivity Disorder (ADHD), due to a lack of experimental evidence to verify the separate two subtypes, namely ADD with and without hyperactivity. As a result, inattention, impulsivity and hyperactivity were combined, and all were listed as criteria for diagnosing ADHD (Cherkes-Julkowski, Sharp, & Stolzenberg, 1997). In the fourth publication of the DSM manual in 1994, as well as in the revised fourth edition in 2000, ADHD was divided into three separate conditions: ADHD Predominantly Hyperactive Impulsive Type; ADHD Predominantly Inattentive Type; and ADHD Combined Type (APA, 2000).

The fifth and most current edition of the DSM (DSM 5), published in May 2013, contains further changes regarding the diagnostic criteria of ADHD. According to DSM 5, the diagnosis of ADHD requires the following criteria: 1) the presence of ADHD characteristics before the age of 12 years (previously seven years), persisting for a period of not less than six months, 2) that several ADHD characteristics be present across at least two settings (e.g., home and school), 3) clear evidence of functional impairment in social, academic, or occupational domains, and 4) absence of other psychotic or mental explanation for the ADHD characteristics (APA, 2013). The DSM 5 categorises ADHD into the following subtypes: Predominantly inattentive, predominantly hyperactive / impulsive and comorbid presentation (if both the criterion for inattention and hyperactivity-impulsivity are met).

2.2.2 Characteristics and core symptoms of ADHD

Children with ADHD usually experience a range of difficulties, which are considered to be the primary characteristics of ADHD (Alamri, 2014). These difficulties include inattentiveness, hyperactivity, and impulsivity.

Inattentiveness

Attention difficulty is one of the most common characteristics of children with ADHD and it involves a difficulty to focus, sustain attention and being easily distracted by external or internal stimuli (Sesalem, 2001). Learners with ADHD often do not pay attention to the educator when spoken to in the classroom. As a result, they typically have problems remembering or following directions. They are also easily distracted by any sign of movement in their environment and have difficulty starting and completing tasks (Rief, 2005). Kutscher, Attwood, and Wolff (2005) indicate that children with ADHD are able to pay attention to any subject for a considerable period of time if they are interested in it; for example, children with ADHD have been observed playing computer games or watching cartoon movies for hours.

Hyperactivity

Hyperactive behaviour includes fidgeting, talking with classmates during lessons, making noises, jiggling legs, drumming fingers, and running around (Lougry, De Ruvo & Rosenthal, 2007; Green & Chee, 1994; Lougry & Rosenthal, 2007; Parker, 1992). At home, these children are often reported to touch everything, play with an excessive amount of noise, and open and close the fridge or doors for no apparent reason (Green & Chee, 1994). Within the school environment, learners are asked to sit quietly, engage in the lesson, and follow their educator's instructions, but many learners who are diagnosed with ADHD may find it difficult to sit still, to read or to listen to the educator for sustained periods of time (Sesalem, 2001). In the classroom, they are often out of their seats, or if they are seated, it will not be for long (Munden & Arcelus, 1999). Parker (1992), however, indicated that not every child with ADHD behaves this way. Girls who are hyperactive tend to act in a less physical manner than boys but are often described as extremely talkative.

Impulsivity

Children with ADHD are reported to experience serious difficulties with impulse control; that is, they seem to act before they think about the consequences (Parker, 1992). At school, children might talk excessively in many situations and blurt out answers before questions have been completed, start an assignment without waiting for the educator's instructions, shift from one task to another without completing what they have started, and make many careless mistakes on an assignment in order to complete it quickly (Lougry & Rosenthal,

2007; Sesalem, 2001). When playing, some children will engage in dangerous behaviours such as jumping from dangerous heights and running excessively (Green & Chee, 1994).

2.2.3 Assessment and diagnosis for ADHD

According to the DSM 5, an ADHD diagnosis can be considered if there is a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development (APA, 2013). Specifically, the DSM 5 diagnostic criteria stipulate that six or more of its listed symptoms of inattention and/or hyperactivity-impulsivity should persist for at least six months, to a degree that is inconsistent with developmental level (APA, 2013). It is further noted that for older adolescents and adults (age 17 and older) at least five symptoms are required. Furthermore, the DSM 5 clarifies that these symptoms may not exclusively be a manifestation of oppositional behaviour, defiance, hostility or failure to understand tasks or instructions (APA, 2013). Several inattentive or hyperactive-impulsive symptoms must have been present prior to the age of 12 years and should be present in two or more settings (e.g., at home, school, or work, with friends or relatives). Furthermore, the DSM 5 diagnostic criteria require that there be clear evidence that the symptoms interfere with, or reduce the quality of, social, academic or occupational functioning. Finally, the symptoms should not be better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal). A list of the DSM-5 symptom criteria can be found in Appendix 1.

The diagnosis of ADHD has been the subject of much debate by sociologists and educators (Alamri, 2014). According to the DSM-IV-TR (2000), there are no laboratory tests, neurological assessments, or attentional assessments that have been established as diagnostic tools in the assessment of ADHD. Instead, a diagnosis is based on observations of a child's behavioural characteristics made by parents and educators who then respond to a checklist of behaviours (Stolzer, 2007). Specifically, parents and educators are asked to fill in a behaviour questionnaire in order to determine if a child „always, often, sometimes or never“ (Whitely, 2010) exhibits behaviour such as fidgeting, talking excessively, losing things or being easily forgetful or distracted. This approach has been criticised because parents and educators are often not given an explanation or definition of the distinction between the words „sometimes“ and „often“(Whitely, 2010). Furthermore, the same holds true for words such as „fidgeting“ and „talking excessively“ (Stolzer, 2007). In addition, Stolzer (2007) has

noted that characteristics of the rater (i.e. the educator or parent), including levels of tolerance, age, gender, education, personality characteristics, recognition of developmental processes and cultural origin, can all have a significant impact on the observations of behaviour recorded. Further complicating the diagnosis are the presence of behaviours that are symptomatic of ADHD but are likely to occur in many children as a part of their natural development and may also occur as symptoms of problems other than ADHD (Brown, 2000; Chu, 2003). For example, many children display inattentive, impulsive and hyperactive behaviour which could have been caused by stressful life events, chronic abuse, mild seizures, middle ear infection and illnesses (Mash & Wolfe, 2002).

2.2.4 Theoretical underpinnings of ADHD

A number of theoretical models can be identified in the literature that attempt to explain the construct and/or diagnostic entity of ADHD. While no direct cause of ADHD is known, considerable research has been done on various factors that may contribute to this disorder.

A large proportion of research points to within child variables, such as neurological and genetic factors, as making the biggest contribution to ADHD (Barkley, 2001; Naglieri, 2005; Ozonoff & Strayer, 1997; Ozonoff, 1998; Willcutt, Doyle, Nigg, Faraone & Pennington 2005). Neuropsychological studies reveal that executive functioning and the neurological structures that control executive functioning differ for those people who have ADHD, compared to those who do not (Gregg & Deshler, 2009). Such differences emerge from a deficit in executive functions that are responsible for specific cognitive abilities (such as planning, organisation, inhibition, working memory and flexibility) which assist a person with their everyday functioning (Naglieri, 2005; Ozonoff & Strayer, 1997; Ozonoff, 1998; Willcutt et al., 2005). However, research has found that weaknesses of executive functions are not necessarily responsible for every single case of ADHD (Willcutt et al., 2005).

Professionals adopting a biological model in respect of ADHD may describe the condition as genetic in nature (Barkley, 2001). Early research on ADHD revealed that a family history of ADHD is four times more common in children that have ADHD than when compared to children without an ADHD diagnosis (Cantwell, 1975). More recent research reported by Frick et al. (1992) found that 80% of ADHD children in their sample had at least one first degree biological relative who had an ADHD diagnosis during childhood. The Consortium

of International Scientists (2002) reported that one gene has been positively associated with ADHD and that the genetic contribution to the ADHD characteristics is found to be among the highest for any psychiatric disorder (70-95%).

This neurological and genetic understanding of ADHD has been severely criticised as being scientifically false and critics are of the premise that environmental and social factors should be examined when determining its aetiological causes (Lloyd, Stead & Cohen, 2006; Timmi & Taylor, 2004). Experts adopting this viewpoint believe that to speak of ADHD in terms of genetic and neurobiological factors, in contrast to environmental and social factors, “may seem somewhat sterile” (World Health Organisation, 2002, p.87). Environmental and social factors have been found to include environmental stressors, such as poor and inconsistent parenting styles and “oppressive school and community environments” (Lloyd et al., 2006, p.116). Parental stress, issues of low self-esteem and the blaming behaviours of parents may lead to the development of ADHD symptoms in children but on the other hand, these parental behaviours may in fact arise as a reaction to the child’s ADHD (Lloyd et al., 2006). Social and cultural factors further impact on the degree to which the characteristics and behaviours of ADHD are considered an actual problem/disorder (Timmi & Taylor, 2004). Evidence reveals that certain cultures are more sensitive or conversely more accepting of ADHD-like behaviours than other cultures and societies (Timmi & Taylor, 2004).

Firmly adopting one aetiological model over another has also been challenged by researchers who claim that such a separation is artificial and is an obstacle to a true and holistic understanding of mental and behavioural disorders (World Health Organisation [WHO], 2002). Such a stance argues that ADHD is a complex interaction between biological and social factors (Mowbray, 2003; WHO, 2002). According to WHO (2002), an individual does not simply play out and mimic his/her genetic programmes, nor is their behaviour a direct result of “environmental determinism”, but rather a product of the two (WHO, 2002, p.87). Kendall (2000) refers to formulating a model whereby the impact of environmental and biological factors on ADHD could be viewed concurrently. In such a model, an individual’s biological predisposition for ADHD would interact with an external occurrence that magnifies this vulnerability and therefore, may increase their risk for the development and expression of ADHD (Kendall, 2000).

2.2.5 Prevalence of ADHD

According to Russell, Rodgers, Ukoumunne and Ford (2014), the knowledge of the number of children identified with ADHD is crucial to enable better planning and support services and to allow for the facilitation of more directed research on the topic. However, globally there seems to be limited information available that provides an estimate of children with a diagnosis of the condition and further, the estimates that are provided seem to vary considerably (Brown et al. 2001; Newschaffer et al. 2007; Polanczyk, de Lima, Horta, Biederman & Rohde; 2007; Russel et al., 2014). In the section that follows, some of the documented prevalence rates are provided and discussed.

Polanczyk et al.'s (2007) systematic review of the worldwide prevalence of ADHD found recorded rates ranging from 1 to 18 % of children. In the USA, 6.3 % of all children aged 5–9 were reported by parents to have an ADHD diagnosis in 2008–2010 (National Centre for Health Statistics, 2012), however according to Hamilton (2011), the prevalence rates were thought to be higher than that and may be closer to between 7% and 9%. The estimated prevalence of ADHD in the UK was found to be 1.5 % (Greene, Beszterczey, Katzenstein, Park & Goring, 2002) but in contrast Polanczyk et al. (2007) found the European prevalence rate to be closer to 6.3%. Within African countries, there is also a wide range of documented prevalence rates, as a recent study among school children coming from the Democratic Republic of Congo documented a prevalence of 6.0%, a prevalence of 8.7% in Nigeria and 1.5% in Ethiopia (Bakare, Ubochi, Ebigbo & Orovwigho; 2010).

In South Africa, there are also inconsistencies in the prevalence rates that have been researched in the last 10 years. In 2006, the ADHD support group in South Africa estimated that 10% of South African children had a diagnosis of ADHD (Lloyd, Stead & Cohen, 2006). However, according to a study one year later, South Africa had an ADHD prevalence rate of about 5% (Polanczyk et al., 2007). However, Flischer, Hatherill, Lund, Funk and Patel (2009) reported that the prevalence of ADHD in South Africa is similar to 6.3% prevalence documented in the United States and Europe (National Centre for Health Statistics, 2012). More recent research revealed that ADHD is in fact the most persistent and commonly occurring condition affecting South African children today, with 8% to 10% of children receiving this diagnosis (Attention Deficit Hyperactivity Disorder of South Africa

(ADHDSA), 2010; Snyman, 2010). Therefore, South Africa, like other countries, is experiencing a similar trend of inconsistencies in the reported prevalence rates of ADHD.

This wide variation has been explained in part due to a lack of standardisation in assessment and diagnosis, as clinical practice varies widely between cultures and even within countries (Polanczyk et al., 2007). Issues of specific research practices used by researchers, including research design, size and type of sample (school or clinic), the age and gender of participants, measurement instruments of ADHD symptoms and the type of informants in the study, have also been cited as reasons for variation across and within countries (Le Fever, Dawson & Morrow, 1999). Other studies have focused on the issue of cross-cultural differences in diagnosis, for example, in South Korea, some researchers have argued under-diagnosis of ADHD and other common childhood disorders, is due to strong stigma attached to the disorder (Grinker, 2008). Furthermore, cultural, social and developmental factors have been thought to elicit differences in the impact and expression of symptoms and behaviours (Caron, Schaaf, Benevides & Gal, 2012; Norbury & Sparks, 2013; Rowland, Lesesne & Abramowitz, 2002; Singh, 2011). Perold et al. (2010) highlighted examples of cultural and social factors when their research into the prevalence of ADHD took into consideration the presence of language difficulties and economically disadvantaged schooling, as conditions that could exacerbate the symptoms of ADHD and lead to over diagnosis. However, in contrast to this belief, Hinshaw (1994) describes ADHD as a universal condition that is non-prejudicial in nature and transcends across cultural, social, racial, ethnic and economic domains equally.

Regardless of discrepancies around prevalence rates, ADHD is still considered to be the most widespread psychiatric condition affecting South African children today (Lloyd et al., 2006; Munshi, 2014). The question asked by Timmi and Taylor (2004) is whether this rise in prevalence is a true reflection of the global and local rise in incidence rates, or whether it is due to the fact that society's threshold for non-conformist behaviour has reached its peak. The interpretation of behaviour varies across different cultures and even within cultures, as the same behaviour can be viewed as normal or disordered according to cultural perceptions (Timmi & Taylor, 2004). Therefore, certain cultures may be more sensitive or conversely more accepting of ADHD-like behaviours than other cultures and societies (Timmi & Taylor, 2004). Timmi and Taylor (2004) therefore conclude that the „epidemic“ of ADHD in the

West today is not necessarily pathological, but rather can be interpreted as a fundamental change in people's cultural expectations of children and their behaviour in a formal classroom.

2.2.6 Intervention and treatment

Due to the intricacies and complexities of ADHD, consensus does not exist within the literature as to which treatment intervention will effectively meet the needs of children with ADHD. Interventions tend to either focus on pharmacological or non-pharmacological treatments but it has been argued that adequate and meaningful interventions require a combination of both of these approaches (Castenova, 2008; Holowenko, 1999). Therefore, a holistic treatment plan should draw upon interventions that focus on pharmacological treatments, behavioural interventions and interventions within the education setting (Faraone & Biederman, 1999).

Pharmacological treatments such as Ritalin, Concerta and Strattera are the most commonly prescribed stimulant medications for the treatment of ADHD symptoms (Hauggard, 2008; Pelham & Evans, 1992). Many studies have documented the successful use of pharmacological treatments to manage ADHD (Barkley & Du Paul, 1991; Du Paul & White, 2006; Evans, Schultz, & Sadler, 2008; Gilmore & Milne, 2001; Pelham & Evans, 1993; Venter, 2006). The findings of these studies have shown that stimulant medications are associated with many desirable outcomes, such as improved concentration, increased attention span, superior accuracy of work, enhanced productivity, reductions in impulsive behaviour and decreased fidgetiness. Venter (2006) argues that stimulant medications in fact enhance learning and improve one's long term academic achievement. Furthermore, stimulants have a positive impact and in fact facilitate "the cognition, vigilance, reaction time, short term memory, learning of verbal and nonverbal material, school- based productivity and accuracy in children with ADHD" (Venter, 2006, p.445).

However, while medications may serve to alleviate ADHD symptoms, it has been argued that they are not a long-term cure and that they merely cover up the underlying difficulties (Brown, 2000; De Grandpre, 2000; Pelham & Evans, 1992). It has further been argued that these medications are in fact over prescribed, a belief which was reinforced by Lazarus (2011), who found that there had been a 500% increase in the prescription of Ritalin since

1991. This has resulted in Ritalin gaining the reputation of a money-making capitalist scheme (Lazarus, 2011; Timmi & Taylor, 2004). It has been further argued by critics of ADHD medication, that these drugs are in fact addictive and may become easily subject to abuse (WHO, 2002).

Non- pharmacological interventions have been also found to serve to alleviate and improve the management of ADHD symptoms. An alteration in diet may be a helpful intervention, as was found in a study conducted in the Netherlands which revealed that when the diet of a group of children with ADHD was altered, 62% of the children showed significant improvement regarding their symptoms (WHO, 2002). A change in diet however does not have long lasting effects and will not be able to eliminate symptoms permanently (WHO, 2002). Behavioural modification programmes and social skills training have been proven to be only partially effective but when medication and behavioural programmes are administered simultaneously, greater improvement will result (Goldstein & Ellison, 2002).

As discussed above, adequate and meaningful ADHD interventions require a combination of pharmacological and non-pharmacological approaches (Castenova, 2008; Holowenko, 1999). Therefore, a holistic treatment plan should draw upon interventions that focus on pharmacological treatments, behavioural interventions and interventions within the education setting (Faraone & Biederman, 1999). Interventions within the education system include the role that educators play in supporting learners with ADHD, as such learners may require additional educational support (Du Paul & White, 2006; Silver, 1998). In section 2.3 of this literature review, the role that educators play in the treatment and intervention strategies of ADHD will be further explored.

2.3 ADHD and the education system

2.3.1 Inclusion

The South African education system is still struggling with the consequences of Apartheid, which allowed exclusion in schools, based on race, gender, class, ethnic background and on disability (Amod et al., 2013). The Apartheid system authorized a dual education system, thereby placing learners who failed to meet the requirements of mainstream education in special education (Naicker, 2000). With the abolition of Apartheid and the birth of the

Constitution of the Republic of South Africa, respect for the rights of all children was promoted, regardless of race, disability, culture and so on (Amod et al., 2013). For this purpose, a new South African Education Policy was created that was entrenched in the philosophy of inclusive education. Its primary focus was on “meeting the needs of all learners and actualising the full potential of all learners” (Prinsloo, 2001, p. 344).

Inclusive education is not uniquely South African and has become an important principle in the education policies of many countries (Dyson, 1999; 2004). The principle of inclusive education emerged as a key international policy after UNESCO’s Salamanca Statement was adopted in 1994, at the World Conference on Special Needs Education in Salamanca, Spain (Engelbrecht & Green, 2011). The key focus of this conference was on the development of an inclusive education system that would cater for all children, regardless of their physical, intellectual, social, emotional, linguistic or other conditions. It was emphasised that such a system should include disabled and gifted children, street and working children, children from remote or nomadic populations, children from linguistic, ethnic, or cultural minorities and children from other disadvantaged or marginalised areas or groups (UNESCO, 1994). Furthermore, it was highlighted that education systems should ensure the quality of education through the development of appropriate curricula and teaching strategies (UNESCO, 1994).

However, inclusion cannot happen without a high level of involvement from key stakeholders in education (Almari, 2014; Roux, Graham & Carrington, 1998). Such involvement includes aspects of planning, designing and funding of suitable resources, creative initiatives, constant energetic management and generosity from parents, teaching staff, educational authorities and the community (Roux et al., 1998). Educators in the classroom in particular are viewed as key elements in the implementation of inclusion (Perold et al., 2010; Subban & Sharma, 2006). To be able to translate inclusive education into practice, an educator should be able to accommodate the unique diversities of the children in class. In order to do this effectively, the educator needs to be fully informed about the nature of these diversities (Decaires-Wagner & Picton, 2009).

2.3.2 The responsibilities educators hold regarding learners with ADHD

In a time when inclusive approaches to education have been widely adopted, educators are expected to enter classrooms prepared to accommodate the needs of all learners, including

those who exhibit ADHD-related behaviours (Alamri, 2014; Amod et al., 2013; Department of Education, 2001). In order to implement successful inclusive practices, educators need to be able to recognise diversity in their classes and to employ inclusive education strategies that accommodate diverse learners and their learning styles (Naiditch, 2010). It has also been found that educators with average or higher knowledge about ADHD tend to provide more supportive and adaptive experiences for learners compared with educators with weaker knowledge (Ohan, et al., 2008). Research has found that learners with ADHD can learn effectively within a regular classroom, if their educators are willing to adapt their instructional practices to meet these learners' learning needs (Parker, 1992). Examples of adapting instructional practices include adapting written work, providing extra space for these learners, reducing the amount of homework, providing assistance with organization skills, being willing and flexible to make accommodations, providing clear directions and structure, working collaboratively with other staff, communicating regularly with learners' families, focusing on learners' strengths, and believing that all learners can be successful in school (Lougry et al., 2007; Rief, 2005). Another accommodation that is recommended is adaptation in the delivery of instruction, such as presenting materials in diverse ways (e.g., verbal as well as visual), as well as providing the opportunity for learners with ADHD to respond to classroom teachings in varied ways. For example, instead of asking the learner to respond in writing, they should be given the opportunity to respond verbally to instructions (Lougry et al., 2007; Mulligan, 2001).

Furthermore, Cooper (2005) suggests that educators should conceptualise ADHD as a particular cognitive style, rather than as a deficit. Cooper (2005) suggests that such a view will help educators of learners with ADHD-related behaviours to start thinking about teaching strategies designed not to inhibit but to exploit ADHD-related behaviours. Many learners with ADHD-related behaviours are regarded as creative, imaginative, humorous (Robbins, 2009); insightful, intuitive (Honos-Webb, 2010); energetic, innovative (Richards, 2003); curious and enthusiastic (Wheeler, 2010). Such positive characteristics need to be emphasized in education. Critical elements of successful instructional techniques and strategies should be considered by educators who work with children with ADHD-related behaviours in order to teach these learners more effectively.

Educators are also involved in the referral and diagnosis stage of intervention, as research has indicated that educators are usually the initial referral source, advising the parent to obtain an assessment for a child (Snider et al., 2003; Vereb & Di Perna, 2004). As part of the referral, the educator is required to provide the health practitioner with significant information on the child, which includes the completion of behaviour-rating scales (Kern, 2008). The behaviour questionnaire involves describing if a child is „always, often, sometimes or never“ exhibiting behaviour such as fidgeting, talking excessively, losing things or being easily forgetful or distracted (Whitely, 2010). Therefore, the accuracy of the information provided by an educator is an essential aspect and plays an important role in the diagnostic and treatment process (Kern, 2008). If it becomes evident during this first stage (screening) that there are significant problems, then the assessment process moves into the second stage where multiple assessment methods are used to determine the functioning of the child in various settings (Du Paul & Stoner, 2003). According to the DSM 5, a diagnosis cannot be reached by drawing on data collected from a single informant (APA, 2013). However, Carey’s (1999) study of 401 primary care paediatricians revealed that more than half of these practitioners relied exclusively on school reports when determining a diagnosis of ADHD. Therefore, as primary informants, educators need to possess a high level of knowledge and accurate information about ADHD (Sciutto et al., 2000).

Educators of ADHD learners are often held responsible for the implementation of recommended treatment plans, as well as the monitoring of the progress made as a result of treatment (Ohan et al., 2008; Tannock & Martinussen, 2001). Once an intervention has been put in place, educators are asked to collect data on a regular basis to assist in the evaluation of the treatment plan (Du Paul & Stoner, 2003; Vereb & Di Perna, 2004). This information is particularly important if the relevant treatment is stimulant medication, as it could be vital in determining the child’s responsiveness to the treatment, as well as minimizing the side effects of the medication (Kauffman & Landrum, 2009). Furthermore, research suggests that parents of children affected by ADHD frequently approach schools for information about ADHD (Bussing, Schoenberg & Perwien, 1998). It is essential that parents receive the most accurate and updated knowledge on the management of this disorder from educators, however there is evidence to suggest that educators often provide incorrect and unsuitable advice to parents (Du Paul & Stoner, 2003). This transmission of inaccurate knowledge from educators to parents highlights the importance and influence of educators’ knowledge about ADHD.

2.4. Educators' knowledge of ADHD

2.4.1 Defining the construct „knowledge of ADHD“

Knowledge refers to the acquisition of information that can be used to provide individuals with understanding (Firestone, 2003). The acquisition of knowledge further gives an individual insight into how to use the information that one has gained. Consequently, if one possesses knowledge on a subject, one also has the skills to manage and deal with the subject at hand (Perold et al., 2010). It has also been suggested that knowledge is a construct that may be influenced by experience (Perold et al., 2010). Therefore, if an educator possesses knowledge about ADHD, it will result in him/her possessing the necessary skills and tools to manage it within the classroom environment. In this way, information on ADHD may strengthen an educator's ability to recognise and deal more effectively with the consequences of the condition. Previous studies have shown that educators generally have a basic familiarity regarding the symptoms of ADHD, yet familiarity does not equate with appropriate and adequate knowledge of the condition (Perold et al., 2010).

2.4.2 International and South African studies conducted on educators' knowledge levels of ADHD

Many studies have been conducted that investigate the causes, assessment, associated issues and treatment of ADHD (Barkley, 2001; Funk, 2011; Kauffman & Landrum, 2009; Lougy and Rosenthal, 2002; Nigg, 2001; Scuitto et al., 2000), but there seem to be comparatively few studies that investigate the knowledge of educators regarding this disorder (Kos et al., 2006). In 1994, Jerome, Gordon and Hustler (2000) expressed their concerns regarding the shortage of available literature which investigated and assessed educators' knowledge of ADHD. Despite this, only 17 additional research studies which assessed educators' knowledge of ADHD had been reported by 2011, translating to an average of one additional study per year (Funk, 2011). The scarcity of research during the late 20th and early 21st century is surprising, considering a lack of educator knowledge about ADHD was often considered one of the biggest challenges facing ADHD children during that time (Jerome et al., 2000; Shapiro & Du Paul, 1993). Since 2011, a number of international studies have been published that focused on the assessment of educators' knowledge of ADHD suggesting a possible increase in research and interest around this topic. (For example: Alkahtani, 2013; Alamri, 2014; Anderson, Watt, Noble & Shanley, 2012; Bradshaw & Kamal, 2013; Canu &

Mancil, 2012; Dilaimi, 2013; Guerra & Brown, 2012; Kurniawati, Minnaert, Mangunsong & Ahmed, 2012; Munshi, 2014; Soroa, Gorostiaga & Balluerka, 2013; Spangler & Slate, 2012; Stampoltzis & Antonopoulou, 2013).

The majority of studies that have measured educators' knowledge of ADHD utilise questionnaires based on the scale developed by Jerome et al. (1994) or the scale developed by Scuitto et al. (2000). Jerome et al.'s (1994) self-report questionnaire (referred to as the Knowledge of ADHD Scale: K-ADHD) includes 20 true-false items and was designed to explore educators' general knowledge of the basic information regarding the diagnosis and treatment of ADHD. Scuitto et al (2000) designed a scale of 36 items (referred to as the Knowledge of Attention Deficit Disorder Scale: KADDS), which utilised a true/false/don't know response, and was designed to examine educators' knowledge related to characteristics/diagnosis of ADHD, general information about the nature, causes, and outcome of ADHD as well as the treatment of ADHD. Average knowledge scores with regards to ADHD, as measured by the proportion of questions answered correctly, have varied across the studies that utilise these scales. Table 1 presents a summary of the studies from around the world that have used these two different scales. In the section that follows, some of the knowledge scores recorded from around the world and South Africa and the differences between scores obtained on the K-ADHD (Jerome et al., 1994) and the KADDS (Scuitto et al., 2000) are discussed.

Table 1:

Summary of results obtained from international and national studies which utilized the KADDS or K-ADHD, sorted by date of publication, from 2000 to 2014

Researchers	Location	Scale used	Sample Size	Grades taught by the sample of educators *	Percentage of correct responses
Sciutto et al. (2000)	USA	KADDS	149	Grade 1-5	47.8%
Small (2003)	USA	KADDS	72	Grade 1-5	57%
Bekle (2004)	Australia	K-ADHD	30	Grade 1-7	82%
Kleynhans (2005)	South Africa	KADDS	552	Grade 1-12	46.2%
West et al. (2005)	Australia	KADDS	131	Grade 1-12	56%
Curtis et al. (2006)	New Zealand	K-ADHD	261	Grade 1-5	76%
Castenova (2008)	USA	KADDS	58	Grade 1-5	58.4%
Ohan et al. (2008)	Australia	K-ADHD	140	Grade 1-5	76%
Yoo et al. (2009)	South Korea	K-ADHD	164	Pre-school	59.3%
Perold et al. (2010)	South Africa	KADDS	552	Grade 1-7	42.6%
Kang et al. (2011)	South Korea	KADDS	204	Grade 1-5	52.3%
Lazarus (2011)	South Africa	KADDS	100	Grade 1-7	35%
Guerra & Brown (2012)	Texas	KADDS	107	Grade 6-9	56.7%
Alkahtani (2013)	Saudi Arabia	KADDS	429	Pre-school – Grade 9	17,2
Bradshaw & Kamal (2013)	Qatar	KADDS	233	Grade 1-12	31%
Dilaimi (2013)	New Zealand	KADSS	84	Grade 1-7	35%
Jerome et al. (2013)	USA	K-ADHD	439	Grade 1-5	77%
Jerome et al. (2013)	Canada	K-ADHD	850	Grade 1-5	78%
Alamri (2014)	Saudi Arabia	KADDS	202	Grade 1-6	41%

*South African grade equivalents have been presented in this table, for the ease of comparison.

As Table 1 indicates, the highest ADHD knowledge scores across the world to date, have been reported in North America, by Jerome et al. (1994) who conducted a comparative study in the United States and Canada to assess educators' knowledge and attitudes concerning ADHD. The overall correct knowledge scores were found to be 77% for the 439 American educators and 78% for the 850 Canadian educators who participated in the study (Jerome et al., 1994). A lower percentage of correct responses were obtained from a sample of 149 primary educators in another US study conducted by Scuitto et al. (2000). Their results indicated that 47.8% of the items on the KADDS (Scuitto et al., 2000) elicited correct responses from the educators. A similar trend of differences between scores obtained on the KADDS (Scuitto et al., 2000) and those obtained on the Jerome et al. (1994) scale occurred in two South Korean studies. In the study conducted by Kang, Kim and Yang (2011), which utilised the KADDS scale amongst 204 primary school educators in Busan, South Korea, a knowledge score of 53.3% was obtained. Whereas in a study by Yoo, Ra, Oh and Kim (2009) a score of 59.3% was recorded after conducting the Jerome et al. (1994) scale on 164 educators in Korea.

As illustrated by the above studies, average knowledge scores with regards to ADHD, as measured by the proportion of questions answered correctly, have varied across the studies that utilise these scales. Studies based on the K-ADHD have indicated that on average, the percentage of scores that educators answered correctly, range from 76% (Ohan et al., 2008) to 82% (Bekle, 2004). In comparison, studies based on the KADDS indicate that the average amount of questions answered correctly ranges from 35% (Lazarus, 2011) to 59.8% (Alkahtani, 2013). The discrepancy in scores between the K-ADHD and the KADDS cannot be attributed to cross-national or cross-cultural differences, because the correct response rate for a sample of American educators in the Jerome et al. (1994) study was 77% but for the Scuitto et al. (2000) study it was a significantly lower amount of 47.8%. This apparent discrepancy in results may be better explained by two main methodological differences between the two scales. Firstly, the K-ADHD is comprised of 20 items, while Scuitto et al. (2000) included 36 items in the KADDS. Scales with more items tap into more detailed aspects of the construct being tested and therefore, may also inflate gaps in educators' knowledge of ADHD (Kos et al., 2006). Secondly, the K-ADHD consists of a dichotomous true/false response format, while the KADDS provides 3 response options: True/false/don't know. Therefore, when administering the K-ADHD to educators, they have no choice but to

guess the answers they do not know and furthermore, have a 50% chance of answering a question correctly by guessing (Soroa, Gorostiaga & Balluerka, 2013). Consequently, educators' knowledge of ADHD may be inflated and furthermore, the results obtained may provide little insight into what educators actually know (Soroa et al., 2013). In contrast, the KADDS allows for a distinction between a lack of knowledge ("don't know" response) and misperceptions ("incorrect" response) about ADHD to be made (Kos et al., 2004; Scuitto et al., 2000).

Several studies have been conducted in Australia and New Zealand, on the topic of educators' knowledge of ADHD. Kos et al (2004) designed a scale to examine ADHD knowledge among educators, which was based on the K-ADHD scale and the KADDS scale. The study included a sample of 120 primary educators from Victoria, Australia, and the overall correct knowledge score was 60.7%. This result is consistent with the findings of West, Taylor, Houghton, and Hudyma's (2005) study, in which the KADDS scale was administered to 131 educators from primary schools located in Perth, Western Australia. The findings indicated that 56% of the items on the knowledge scale elicited correct responses. High scores were found by Ohan et al. (2008) who surveyed 140 Australian primary school educators, utilising the K-ADHD scale to investigate educators' knowledge of ADHD. According to their findings, Australian educators had an overall correct knowledge score of 76%. A very similar high score was reported by Curtis, Pisecco, Hamilton, and Moore (2006), who also employed the K-ADHD scale. Their study involved a sample of 261 primary school educators from New Zealand and found that educators possessed good levels of overall ADHD knowledge (76%).

In terms of more recent research, a Saudi Arabian study (with a sample size of 429 educators) conducted by Alkahtani (2013) found that educators answered an average of 17.2% items correctly on the KADDS scale, while 59.8% of the items were „Don't know“ responses, indicating a lack of knowledge of ADHD by educators in this study. Alamri (2014) conducted a similar study using the KADDS in Saudi Arabia, but with a sample size of 202 educators and found a higher response rate of correctly answered items (41%). Differences between these results may be accounted for by methodological differences, such as sample size, as well as differences in individual characteristics of sample members. For example, in

Alamri's (2014) study, 72.3% of participants had no prior experience of learners with ADHD, which could account for their lower knowledge levels.

There are a few available studies that investigate educators' knowledge of ADHD in Africa. A commonly cited South African study is Perold et al.'s (2010) study, which used the KADDS scale and drew upon the sample collected and previously studied by Kleynhans (2005). A total of 552 primary educators in Cape Town were surveyed in this study and the results showed that educators had poor levels of overall knowledge about ADHD (42.6%). In this study, the overall percentage for „don't know“ responses was 35.4% and 22% for „incorrect responses“ (Perold et al., 2010). Similarly, in a study conducted by Lazarus (2011), 100 foundation phase township educators, from a township in Johannesburg, completed the KADDS and it was found that South African foundation phase educators do not have adequate knowledge or a sufficient understanding of ADHD, as the overall percentage of correct responses was 35%. Fifty-five percent of the respondents communicated that they had no confidence in their ability to teach children with ADHD, with only 29% responding as confident or very confident.

In another study by Hariparsad (2010), 110 primary school educators from the North Coast of KwaZulu Natal were asked, through the use of a questionnaire created by the author, questions regarding their thoughts and perceptions around teaching learners with ADHD. Eighty-four percent of the sample felt that they needed more training to educate ADHD learners, 53% of the respondents agreed that they experienced difficulty identifying ADHD learners, while 71% were in agreement that educators require more relevant knowledge to better teach and understand ADHD learners (Hariparsad, 2010).

In contrast, a qualitative study by Kern (2008), which examined the perceptions of five South African foundation phase educators with regards to ADHD, found that educators had good knowledge on ADHD's symptoms, as well as suitable interventions. Interestingly, their preferred intervention method was that of medication due to its effectiveness in the classroom situation (Kern, 2008). However, this study had a small sample size and therefore the generalizability of the results is limited (Hariparsad, 2010). Similarly, in a qualitative study conducted by Durbach (2001), which included five Johannesburg schools located in economically deprived areas and three schools situated in economically affluent areas, it was

found that educators had an in-depth knowledge and understanding of ADHD, and were extremely aware of the symptoms of ADHD. The educators believed that their role in the classroom was critical to the management of the condition and they were very enthusiastic to gain more information on the condition. However, this study consisted of a very small sample group and according to Perold et al. (2010), the results gathered appear to be more of the exception than the rule, as more evidence exists for the fact that educators generally have a poor understanding and lack of knowledge on the condition.

2.4.3 Performance across subscales of the KADDS

Studies that utilize the KADDS have generally analysed performance on the KADDS for each subscale of the instrument, including symptoms/diagnosis, treatment and associated features/general information about ADHD.

Symptoms / Diagnosis subscale

Consensus exists within the literature that educators are more knowledgeable about the primary symptoms of ADHD, as compared to knowledge about general features and treatment of ADHD which is tested by the other two subscales (Durbach, 2001; Economou, 2002; Kern, 2008; Kleynhans, 2005; Perold et al., 2010; Scuitto et al., 2000). Higher scores within this subscale indicate that educators are familiar with the basic symptoms of ADHD, which has been attributed to the fact that educators interact with these symptoms within the classroom on a daily basis (Lazarus, 2011; Small, 2003). However, evidence has found that a considerable proportion of educators lack knowledge and hold misperceptions about certain aspects of the symptoms and diagnostic criteria of ADHD. For example, Lazarus (2011) revealed that many educators in the sample attributed symptoms of Conduct Disorder and Oppositional Defiant Disorder, such as a history of stealing or destroying other people's things, to ADHD. Furthermore, less than half of the respondents in Kleynhans's (2005) study were aware that the child's symptoms must be present before the age of seven and 19% held a misconception about the diagnostic criteria.

Treatment subscale

With reference to the Treatment Subscale, many studies have identified weak knowledge in this subscale (Lazarus, 2011; Scuitto et al., 2000; West et al., 2005). For example, in the study by Lazarus (2011), less than 33% of the items pertaining to this subscale were

answered correctly. However, evidence on whether educators have less knowledge about the treatment of ADHD compared to both the symptoms / diagnosis and associated features of the disorder, is inconsistent across studies. In the study by Guerra and Brown (2012), educators scored lower on the associated features subscale than the Treatment subscale (47% and 57% respectively). However, in the study by West et al. (2005) and Lazarus (2011), educators were least knowledgeable about treatment strategies for ADHD. Certain items within this subscale demonstrate that educators are becoming more aware of treatments that currently have empirical evidence. For example, there is mounting evidence that educators are becoming increasingly aware that treatment for learners with ADHD that combines medication with parent and educator training, is more effective (Castenova, 2008; Garcia, 2009; Kleynhans, 2005; Krowski, 2009; Lazarus, 2011). However, the amount of educators who have demonstrated this knowledge have varied across studies. For example, in a study conducted by Kleynhans (2005) 76% of South African educators demonstrated that they correctly knew this information, while in a US study by Castenova (2008), 93% of the respondents had correct knowledge on this matter.

Associated features subscale

Regarding the Associated Features Subscale, research has suggested that educators' knowledge of the nature, causes and outcomes of ADHD (associated features) is an area of weakness. Studies conducted by Kleynhans (2005) and Castenova (2008) found the highest proportion of „don't know“ and incorrect responses to be the largest from this subscale. Lazarus (2011) found that educators often lack knowledge about how a diagnosis of ADHD is made. For example, many educators in this sample were unaware that there are no physical features that can be identified by medical doctors to establish a definitive diagnosis of ADHD. According to an American study, the incorrect belief that children with ADHD experience more difficulty in novel situations than familiar situations was the most commonly held misperception about ADHD, with 60% of the sample believing this to be true. Literature that examines knowledge of educators about ADHD highlights sizeable gaps in their knowledge of epidemiology and aetiology, meaning that educators are lacking knowledge of the disorders that frequently coexist with ADHD, the genetic nature of the disorder and the factors that influence prognosis. For example, Small (2003) and Castenova (2008) found that their sample was unsure whether ADHD was more common in first degree biological relatives than in the general population.

2.4.4 Educator characteristics that are related to their knowledge of ADHD

While research is increasingly targeting educators' knowledge of ADHD, few studies have linked knowledge levels to individual characteristics and those that have, have produced inconsistent results (Kos et al., 2006). It is important to determine if there are any factors that may influence knowledge levels of ADHD, as this would provide some insight into the type of educator who is at risk for having low knowledge levels and may need more focused support, while highlighting those who may be more knowledgeable and in a position to assist ADHD learners more effectively.

Years of teaching experience

It might be expected that an increase in teaching experience would convert to an increase in educator knowledge across all areas of education, including knowledge of ADHD (Guerra & Brown, 2012). However, the majority of research has found that years of teaching experience are unrelated to an educator's actual level of knowledge (e.g. Almari, 2014; Guerra & Brown, 2012; Kos et al., 2008; Lazarus, 2011; Perold et al., 2010; Small, 2003). An Australian study conducted by Kos (2008), where 120 educators completed a survey to assess their perceived knowledge and their actual knowledge of ADHD, revealed interesting results. In the study, educators with increased years of teaching experience indicated that they felt they would possess more knowledge on the condition, than less experienced educators. However, the results demonstrated that there is no significant correlation between years of teaching experience and actual levels of knowledge. These results are confirmed by the findings in other studies (Alamri, 2014; Guerra and Brown, 2012; Kos et al., 2008; Lazarus, 2011; Perold et al., 2010; & Small, 2003).

In contrast, Sciutto et al. (2000) reported a small, positive correlation between years of teaching experience and educators' level of knowledge of ADHD. However, a sampling technique was not reported by Sciutto et al. (2000), therefore making it difficult to determine the representativeness of the sample or the generalizability of the results (Johnson & Christensen, 2012).

Level of education obtained

A further question concerns whether an educator who has obtained a more advanced level of education consequently knows more about ADHD. Research on this aspect has produced

inconsistent results. Some studies involving primary school educators found no association between these variables, including the following studies: Guerra and Brown (2012); Scuitto et al. (2000); Small (2003). Other studies have found a small but statistically significant positive relationship between educators' overall level of knowledge of ADHD and their education level (Perold, 2010; Ghanizadeh, Bahredar & Moeinia, 2006). Dilaimi (2013) suggests that these mixed results may be due to a variation in the content and quantity of coursework relating to ADHD provided by the degrees, diplomas or certificates obtained by educators. A further explanation is that knowledge of ADHD develops after educators gain classroom experience through contact with children with ADHD, rather than as a result of their university education (Kos et al., 2006). This idea is supported by Scuitto et al. (2000) and Kos et al. (2004), who found that in-service educators seem to possess better knowledge of ADHD than pre-service educators without experience, thereby suggesting that educational training is not a pre-requisite of better knowledge of ADHD. However, as mentioned in the section above, years of teaching experience have also not been found on average, to positively and significantly relate to better knowledge levels of ADHD.

Research has found that educator training does not provide enough formal instruction regarding ADHD, despite research that has consistently reported that educators desire more education and training about ADHD (Bekle, 2004; Holowenko, 1999; Jerome et al., 1994). For example, two American studies (Barbarisi & Olsen, 1998; Piccolo-Torsky & Waishwell, 1998) found that of the educators who participated in these studies, 83% and 77% respectively reported to have been given no formal teaching on ADHD during their undergraduate education. Bussing, Gary, Leon, Garvan and Reid (2002) surveyed 365 American educators and found that 50% of their sample reported being educated about ADHD during their undergraduate studies, while 65% were provided with limited in-service training about the disorder following graduation. Furthermore, 94% of the sample expressed a desire for more training on the subject of ADHD, which is consistent with the findings of other studies where the majority of the participants expressed such a desire (Barberisi & Olsen, 1998; Piccolo-Torsky & Waishwell, 1998).

Prior experience of teaching a learner with ADHD

Evidence on whether knowledge of ADHD is higher in educators who have taught a learner with ADHD compared to educators who have not, is also inconsistent. Some researchers

(Kleynhans, 2005; Kos et al., 2004; Scuitto et al., 2000) have found that there is a positive correlation between prior teaching experience with learners with ADHD and knowledge of ADHD. Scuitto et al. (2000) reported that just having taught one learner with ADHD resulted in significantly higher scores on the KADDS total. Similar positive findings were identified in the studies by Alkahtani (2013), Bradshaw and Kamal (2013), Dilaimi (2013), Kos et al. (2004) and Kleynhans (2005). However, other studies found no association between these two variables (Alamri, 2014; Lazarus, 2011; Small, 2003).

The discrepancy between these findings may be explained by the following two reasons. Firstly, there were differences in the sampling methods utilised in the above-mentioned studies. For example, Lazarus (2011) utilised a convenience sampling method which restricts the generalizability of results; Kleynhans (2005) used a purposive sampling method; while Scuitto et al. (2000) did not divulge their sampling method in their study. A second factor that may influence the comparability of these results is the type of symptoms exhibited by the learners with ADHD that the participants had been exposed to. According to Small (2003), the nature and severity of symptoms displayed by a learner will influence the knowledge that educators develop. For example, if an educator had been exposed to learners with milder symptoms of ADHD, they may not have had to implement or monitor treatment plans within their classrooms and therefore, may lack knowledge of possible treatment and intervention plans. Small's (2003) theory is supported by Curtis, Pisecco, Hamilton and Moore (2006) who found in their American and New Zealand study, that educators' knowledge of ADHD differed according to their frequency of participation in developing treatment plans for ADHD intervention in their classroom. Thus it seems that while prior experience of teaching a learner with ADHD can influence knowledge development, the severity of ADHD symptoms that the educator is exposed to, is also an important factor to consider.

Educator self-efficacy

Research has found that educators' knowledge of ADHD is related to their self-efficacy concerning teaching a child with ADHD. The concept of self-efficacy was described by Bandura (1986) in his self-efficacy theory, which he defines as pertaining to an individual's judgment of how well she or he can perform certain behaviours in specific situations. Furthermore, self-efficacy is a reflection of self-beliefs that influence task choice, level of effort, persistence and the overall level of performance, as opposed to a personality trait that

characterizes a person's functioning (Haycock, McCarthy & Skay, 1998). A positive association between educators' knowledge of ADHD and their self-efficacy (also referred to as self-confidence in many studies) was identified in a study by Scuito et al. (2000). Scuito et al. (2000) surveyed educators' knowledge levels as measured by the KADDS but also asked educators to rate their confidence levels (which were referred to as self-efficacy levels) regarding teaching learners with ADHD, through a 7 point Likert scale. This positive correlation was supported by Perold et al. (2010), who found that educators with a high knowledge of ADHD rated themselves as being more confident to teach learners with ADHD than those with low knowledge of ADHD.

Ohan et al. (2008) however reported a negative relationship between educators' knowledge of ADHD and their confidence in managing children with ADHD (Ohan et al., 2008). Their study indicated that educators with average and higher knowledge of ADHD rated themselves as being less confident in managing students with ADHD in their classrooms, than educators with low knowledge of ADHD. Ohan et al. (2008) attributed these results to the fact that educators' with higher knowledge levels were more acutely aware that children with ADHD-related behaviours have serious difficulties that require assistance from other professionals, in order to be dealt with effectively. Therefore, these educators feel less confident about their ability to effectively deal with these difficulties associated with ADHD. Inconsistencies between results obtained in these studies may also be due to some researchers utilising the K-ADHD, whilst others used the KADDS scale.

2.5 Theoretical framework: Theory of self-efficacy

Bandura's (1977) social cognitive theory states that human behaviour is "extensively motivated and regulated by the ongoing exercise of self-influence" (Bandura, 1991, p.248). In this approach, individuals are neither autonomous agents nor merely controlled by environmental stimuli, rather they make causal contributions to their own motivations and actions (Bandura, 1989). Thus, individuals are able to apply some control over their thoughts, feelings, motivation and actions, which Bandura label as human agency (Bandura, 1977). In fact, the ability to exercise control over the nature and quality of one's own life is described by Bandura as being "the essence of humanness" (Bandura, 2001, p. 1).

The concept of self-efficacy was first introduced by Bandura (1977) as part of his social cognitive theory. Self-efficacy is described as a person's beliefs about their own capabilities to exercise control over events that affect their lives, which is said to ultimately affect their motivation, effort and perseverance levels when facing a task (Bandura, 1989; Locke, Frederick, Lee & Bobko, 1984; Taylor, Locke, Lee & Gist, 1984). Self-efficacy is believed to be the most important and pervasive mechanism of personal agency, as people's beliefs about themselves influence a large degree control over the determinants of their motivation, affect and action. Various researchers who have studied aspects of social cognitive theory have positively related self-efficacy to levels of confidence, commitment, optimism, perseverance, motivation, effort, resilience and type of goals set (Bandura, 1989; Cervone & Peak, 1986; Feltz & Landers, 1983; Locke et al., 1984; Taylor et al., 1984).

Bandura's view of self-efficacy consists of two key aspects: Efficacy expectations and outcome expectations (Bandura, 1977). Bandura (1977) states that expectations, whether related to efficacy or outcome, will ultimately affect whether or not an individual will perform a particular behaviour. In other words, people's actions are determined by their confidence in an expected outcome, coupled with the confidence they have in their ability to execute the behaviour (Soodak & Podell, 1996). Highly efficacious people tend to approach difficult tasks with feelings of serenity. In contrast, people with low self-efficacy tend to think that situations are more difficult than they really are (Pajares, 1996), and therefore might choose to avoid such difficult situations (Bandura, 1994).

Based on Bandura's (1977) self-efficacy theory, one can assume that an educator's confidence to deal with an ADHD learner within an inclusive environment is determined by their confidence in their ability to execute appropriate inclusion strategies. Therefore, it can be expected that educators with high self-efficacy beliefs regarding their ability, will be more confident and therefore more willing to accept such learners in their classrooms.

Furthermore, highly efficacious educators would demonstrate less avoidance of difficult situations and may be more willing to explore different intervention strategies, even if this is a difficult, time consuming process. In addition, highly efficacious educators may be more inclined to make attempts to grow their knowledge on ADHD and appropriate interventions, through self-study or through the attendance of workshops. Therefore, high efficacy levels influence the acquisition and development of increased knowledge levels.

However, a more complex association between self-efficacy and knowledge has been identified, as educators with higher knowledge levels regarding ADHD, tend to also become more confident in their ability to work with ADHD learners (Reid, Vasa, Maag, & Wright, 1994). Therefore, while greater confidence levels may positively translate to higher knowledge levels, higher knowledge levels also translate to greater confidence levels to teach learners with ADHD. Thus, it has been suggested that unless educators have both knowledge and self-efficacy, they are unlikely to implement suitable interventions and accommodations for these learners within their classrooms in inclusive settings (Schumm et al., 1994).

2.6. Conclusion

As explained and detailed in this literature review, this study was designed to explore South African educators' knowledge of ADHD, as well as the relationships between educators' knowledge of ADHD and demographic factors including level of education, years of teaching experience, prior experience with a child with ADHD and confidence to teach a child with ADHD. As discussed in this review, ADHD is one of the most researched and most publicised of all childhood-onset disorders, with a number of both local and international studies being devoted to the investigation of its prevalence rates, causes, symptoms and prognosis. Despite this, misunderstandings and misinterpretations about ADHD have been documented amongst parents and doctors, as well as amongst educators. This literature review highlighted these misunderstandings and misinterpretations as areas of concern, due to the significant role that educators play when it comes to the identification of ADHD symptoms and its subsequent diagnosis, referral and treatment. As the literature available on this topic has revealed, educators are also in a position to influence the lives of learners with ADHD and reduce or prevent many of their associated academic and social difficulties. However, international and local research has found that educators may not have the necessary knowledge to carry out this responsibility. Perold et al. (2010) specifically questioned the knowledge level held by South African educators regarding this disorder and highlighted that little research had been conducted on their knowledge level of ADHD.

Therefore, the importance of a study that examines knowledge levels of South African educators cannot be overstated, as it will contribute greatly to an under-researched area. Furthermore, it is important to determine if there are any individual factors that may

influence knowledge levels of ADHD, as this would provide some insight into the type of educator who is at risk for having low knowledge levels and may need more focused support, while highlighting those who may be more knowledgeable and in a position to assist ADHD learners more effectively.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

As noted in Chapter One, the purpose of this study was to examine Foundation/Intermediate Phase educators' knowledge of ADHD, in terms of general information about ADHD, its symptoms and treatment practices. In addition, this study aimed to investigate the relationships between educators' knowledge of ADHD and a number of factors including educator age, sex, years of teaching experience, prior experience with a child with attentional problems, prior involvement in the referral process of a suspected ADHD learner and confidence levels to teach an ADHD child. Data to address the aims of the study were collected by means of quantitative questionnaires with KwaZulu-Natal mainstream Foundation/Intermediate Phase educators based in the Durban area.

This chapter outlines the methodology that was undertaken to conduct this study, including an explanation of the research design. The chapter also describes the population studied as well as the approaches used to develop the sample of participants. The research instruments used are described and reliability and validity are discussed. Following which the data collection procedures are outlined, along with a description of the data analysis procedures. Finally, ethical issues underlying this type of research are identified and discussed.

3.2 Research Paradigm and Design

The selection of an appropriate research design should be grounded on the nature of the research problem being addressed, the researcher's personal experiences and the audiences for the study (Creswell, 2009). In addressing the research questions for the current study, a quantitative research methodology was used within a positivist research paradigm.

Quantitative research includes a range of methodological approaches associated with the collection, analysis, interpretation, and presentation of numerical data (Teddlie & Tashakkori, 2009). It is based on a paradigm of positivism, which reflects the perspective that social research should adopt a rigorous scientific method involving the collection of data that is obtained from the direct experience or observation of an objective, value-free, and uninvolved knower (Atkinson & Hammersley, 1994; Wellington, 2000). According to Neuman (2011), a quantitative approach is considered accurate in its ability to assess the

magnitude of a relationship between the variables in a study, and can provide increased confidence in the generalizability of a study's results (Neuman, 2011). Therefore, this study was conducted from a quantitative paradigm as precise and generalizable information regarding the relationships between the variables of this study were required.

In the current study, a questionnaire approach was used to examine educators' knowledge about ADHD and to explore the relationships between knowledge and a number of factors including educator age, years of teaching experience and prior experience with a child with attentional problems. Questionnaire-based research is thought to be the best available method to collect data to quantify attitudes from a population which is too large to observe directly and make descriptive statements about (Babbie & Mouton, 2002). Such an approach also allows test items to be measured in a very standard way, and therefore enables the researcher to perform a wide variety of statistical manipulations (Babbie & Mouton, 2002).

3.3 Sampling Method

3.3.1 Identification of the population

Foundation and Intermediate Phase educators were used as the sample for this study due to the fact that they play a vital role when it comes to the identification and recognition of ADHD-like symptoms (Perold et al., 2010). This is because educators that teach within these age groups are likely to be among the first people to notice ADHD-related behaviours in children (Perold et al., 2010). The educators that were included in the sample were taken from schools located in Durban, within the upper and lower highway areas of Durban. Durban was chosen as a focus area for this study as it was a location that was easily accessible to the researcher. Furthermore, Durban has not yet been a focus area for a study that investigates knowledge of ADHD in educators and therefore, this study will contribute to other studies that have been focused on knowledge of ADHD of educators in other areas of South Africa.

The Durban-based schools were selected from a Department of Education list of government and private schools using a non-probability convenience sampling method. The following factors were taken into account when selecting the specific schools: Ease of access into the school for the researcher and the presence of both a Foundation and Intermediate Phase within the schools

3.3.2 Determination of the sample size

In quantitative studies, large sample sizes are necessary in order to ensure that requisite statistical analyses can be conducted and therefore it was important to estimate the minimum sample size required for the study (Pallant, 2013). Green (1991) suggests focusing on the type of statistical analysis that will be conducted, in order to determine the minimum sample size to make that analysis valid, particularly an analysis such as a regression analysis which is sensitive to sample size. Two general guidelines to calculate minimum sample size for a multiple regression are suggested by Green (1991). In the first method, he suggests a minimum sample size of $50+8k$, where k represents the number of predictor variables, and in the second one a size of $104+ k$ is recommended. There were six predictor variables included in the multiple regression analysis in the present study. Thus, based on Green's (1991) general guidelines, a sample size of approximately 98 to 110 was needed for the current study.

The number of subjects needed for a correlation study can be calculated using power analysis. Because of the complexity to calculate the power by hand (Ellis, 2010; Miles & Shevlin, 2001), many researchers tend to perform the power analysis using computer packages such as G*Power. G*Power is a comprehensive power analysis program for a broad range of statistical techniques widely used in behavioural and social research (Faul, Erdfelder, Buchner, & Lang, 2009). Using G*Power 3, the sample size required in order to conduct Pearson correlations was estimated using a power of 0.50 with an alpha of 0.05. The sample size calculation also included a consideration of medium effect sizes for Pearson correlations ($r = .30$) (Cohen, 1992). As a result, the sample size for Pearson correlations was calculated as 68. However, this result should be viewed with caution, as the power of the test was set at 0.50 and the effect size fell within the medium range. This indicates that while some confidence may be placed in the ability of the suggested sample size to detect statistically significant results, caution must still be exercised as there is still room for error in detecting practical significance.

In calculating a suitable sample size, attention was also paid to sample sizes used in prior research involving levels of ADHD knowledge of educators that yielded reliable and significant results. In a South African study (Amod et al., 2013) using the KADDS questionnaire a sample of 100 educators produced reliable results. Anderson et al. (2012)

found reliable results with a sample of 127, Nur and Kavakci (2010) with 87 educators and Guerra and Brown (2012) with 107 in their sample. Based on these figures, a sample size of 100 was decided upon as a goal for this study.

Based on the information obtained from previous studies and on the power analysis calculations conducted, a sample of 100 educators was thus considered an appropriate sample size for this study.

3.3.3 Sampling method

In the current study, non-probability sampling was used to obtain the sample, as the researcher chose participants who were Foundation/Intermediate Phase educators and were accessible to the researcher (Mc Millan & Schumacher, 2010). The form of non-probability sampling used was convenience sampling, as participation by educators depended on their availability and willingness to complete a questionnaire of this nature (Neuman, 2011).

3.4 Research Instruments

The following research instruments were utilized in this study: (Refer to Appendix 2 for a copy of all instruments)

3.4.1 Demographic Questionnaire:

A demographic questionnaire was used to collect data regarding educators' age, gender, years of total teaching experience, years of experience in the Foundation Phase, years of experience in the Intermediate Phase, total years of combined experience in the Foundation/Intermediate Phase and the highest level of qualification that they had received to date. Respondents also had to specify if they had ever requested an evaluation of a child whom they suspected of having ADHD or if they had ever taught a child whom they knew was diagnosed with ADHD (by a suitable health professional). If they indicated that they had requested an evaluation or that they had taught a diagnosed learner, then they needed to stipulate how many learners this applied to. Finally, to measure self-efficacy / confidence, participants also rated, along a 5-point scale, the extent to which they felt they could effectively teach an ADHD child, where „1“ indicated „no confidence“ and „5“ indicated „very confident“.

3.4.2 The Knowledge of Attention Deficit Disorders Scale (KADDS):

The Knowledge of Attention Deficit Disorders Scale (KADDS) was developed by Sciutto et al. (2000) and contains 36 items that measure educators' knowledge and misperceptions of ADHD in three specific areas: Associated Features of ADHD, symptoms/diagnosis and treatment. Each KADDS item is phrased in terms of a statement about ADHD and uses a true (T), false (F) or don't know (DK) format. The use of the third „don't know' option allows for the differentiation of what educators do not know from an incorrect belief or misperception, which offers greater accuracy than using a „true/false' type of response (Sciutto et al., 2000). Permission was granted via email by the authors of this scale for it to be utilized in this proposed project (Refer to Appendix 3). This scale has not yet been adapted for use in South Africa and was used in this study in the absence of a more appropriate, locally developed, measure.

The KADDS was designed in such a way so as to elicit information that would yield discussion in three primary areas; firstly, the educators' general knowledge, secondly, their incorrect understandings of ADHD, and lastly, their lack of knowledge on the topic of ADHD. The instrument is divided into three subscales. The first of the subscales is called Associated Features of ADHD and includes items; 1, 4, 6, 13, 17, 19, 22, 24, 27, 28, 29, 30, 31, 32 & 33. The second subscale is called Symptoms/Diagnosis of ADHD and includes items; 3, 5, 7, 9, 11, 14, 16, 21 & 26. The final subscale is called Treatment of ADHD and includes items; 2, 8, 10, 12, 15, 18, 20, 23, 25, 34, 35 & 36.

Regarding the reliability of KADDS, Sciutto et al. (2000) investigated five studies that KADDS was used in and on average KADDS had a high internal consistency ($0.80 < \alpha < 0.90$). According to Sciutto et al. (2000), the three subscales within the scale (associated features, symptoms / diagnosis and treatment) all have been found to have moderate levels of internal consistency ($0.52 < \alpha < 0.75$). In the South African study by Perold et al. (2010), good internal reliability for the KADDS was found with a Cronbach alpha of 0.81 for correct responses and even higher for the incorrect responses. Similarly, Amod et al. (2013) reported a Cronbach alpha score of 0.88 for the internal reliability of the KADDS in their South African based study. In this current study, good reliability was found with this instrument, as the Cronbach alpha was 0.77.

The validity of this instrument was examined by Sciutto et al. (2000) through an investigation of whether results obtained during the use of this instrument correlate with what one would expect the results to reflect. Sciutto et al. (2000) proposed that increased knowledge of ADHD is expected to arise from personal interactions with an ADHD child, in the areas of knowledge of associated symptoms, features and interventions of ADHD. Therefore, if the KADDS is a valid measure of ADHD knowledge, participants' prior exposure to the disorder should be correlated with scores on the KADDS. Sciutto et al. (2000) reported that after conducting several studies, this predicted correlation was found to be true, therefore suggesting that the KADDS is a valid measure of ADHD knowledge. Similarly, higher levels of training about ADHD have also been found to correlate with higher scores on the KADDS instrument, therefore also suggesting the preliminary validity of this instrument (Herbert, Crittenden & Dalrymple, 2004). Furthermore, during the construction of the KADDS, effort was made to include only items regarding ADHD that were empirically supported and well documented (Sciutto et al., 2000). Based on the above findings, it would seem that the research instrument utilized in this study has a high chance of producing valid results.

Regarding the generalizability of these results, Amod et al. (2013) conducted their research using the KADDS questionnaire (Sciutto et al., 2000); with a sample of 100 educators and found their results were able to produce significant results that could be interpreted and generalized. However, Amod et al. (2013) applied these results to broader South African settings with caution, as their sample was not fully representative of the broader South African population. Therefore, the findings of this study can be applied to broader contexts of South Africa but will be done with caution, bearing in mind that the sample may not be fully representative of South Africa's population. This is largely because the focus of this research is in urban schools with Foundation/Intermediate educators and is therefore, not generalizable to situations that differ from this, such as to educators in rural schools or high school educators. Due to practical constraints and the nature of this research project, it was not possible to draw upon a wider and more diverse sample.

3.5 Data Collection Procedures

Data collection occurred in two phases, the first phase during May to August 2014 and the second phase during February to March 2015. During the first phase, 15 government schools were included in the sample and a total of 225 questionnaires were distributed. A

total number of 57 questionnaires were returned, which was less than the desired sample size of 100 or more participants. This created difficulties in ensuring the reliability and generalizability of the results and therefore, it was decided to include private schools in Durban in the second phase of data collection, with the hope that a sample size of 100 would be reached. During the second phase of data collection, four private schools in Durban were included in the sample. Fifty questionnaires were distributed within these schools and 47 were returned after two weeks. Therefore, a total number of 104 educators were included in this sample. In the following section, the data collection procedures for each phase of data collection will be explained.

At the start of the first phase of data collection, the Department of Education (DoE) granted permission to conduct research in 15 Durban based government schools (Refer to Appendix 4) and ethical clearance was granted by the University of KwaZulu-Natal's Human and Social Sciences Research Ethics Committee (Refer to Appendix 5). Thereafter, principals of the schools were contacted via telephone to inform them of the nature of the research and to ascertain whether they would consider being a part of this research. Upon their agreement, more information was provided to these principals, explaining in detail the nature and purpose of this research. All of the principals approached agreed to participate in the research but indicated a preference for the researcher to drop the questionnaires off with them, which would allow the educators time to complete them, as they were able. This preference seemed to be related to the generally busy schedules of the educators and their limited availability to arrange a meeting in which data collection could occur with the researcher present. A time period of two weeks was agreed upon with all of the relevant principals and thereafter, questionnaires were delivered to the schools. Detailed instructions were explained, both verbally and in writing, to the principals regarding the procedure for the completion of the questionnaires. Principals were also reminded that the researcher would be available for assistance at any point, during the two week period.

Principals were asked to give each educator an information sheet (Refer to Appendix 6) for a copy of this sheet) which provided details of the nature and purpose of this research, which they were able to keep for their own reference. The information sheet also emphasized the confidentiality of this research and reminded educators not to include their name or their school's name on their response sheet. Thereafter, educators were asked to sign a consent

form (Refer to Appendix 7 for a copy of this form) which documented their consent to participate in this study and acknowledged that they understood the nature and purposes of the research. Based on findings from the similar studies, a response rate of between 30% and 60% was expected (Guerra & Brown, 2012). Therefore, in order to ensure a minimum sample of 100 educators, 225 questionnaires were distributed to Foundation / Intermediate educators from 15 schools in the upper and lower highway of Durban (Anderson, 2012; Guerra & Brown, 2012; Nur & Kavakci, 2010; Sciutto et al., 2000).

Upon collection of the questionnaires in the 15 different schools, it was found that many educators had refused participation in the study. Reasons given for this by principals were that the educators were very busy and did not have sufficient time to complete the questionnaires. It was agreed that each school would be given another week to complete their questionnaires. However, it was found that even with three weeks, limited participation was noted in all of the schools. In total 57 forms were returned to the researcher, indicating a response rate of 25.3%.

During the second phase of data collection, four private schools consented to participation in this study. A total number of 50 questionnaires were distributed and a similar procedure to the first phase of data collection was followed. However, a higher level of contact was maintained with each school during the two week data collection time period. Contact was maintained via email and telephone calls with the principal of each private school in order to monitor the progress of data collection and to provide any support that may have been required. Within each private school, an educator was also placed in charge of collecting questionnaires upon their completion and keeping track of each educator's progress with the questionnaire, in order to ensure that adherence to the two week time allocation would be possible. Contact with this educator within each school, was also maintained. A total number of 47 questionnaires were completed and returned, therefore yielding a 94% return rate. It is assumed that the higher level of contact maintained with an educator and the principal of each school, yielded this higher response rate. Additionally, the time of year that data collection was conducted during the second phase of collection, may have been a less pressured time of the academic year for educators, therefore allowing them more time to complete the questionnaires.

3.6 Data Analysis

All 104 questionnaires were numbered and entered into a Microsoft Excel spreadsheet, which was then imported into SPSS version 21. Before data analysis began, the data set was checked for errors by running SPSS descriptive statistics tests, on both the categorical and continuous variables. The minimum and maximum values were analysed, to ensure that all scores fell within the range of possible scores on that variable. Ten errors that had arisen as a result of incorrect data entry were identified by the researcher and corrected. Questionnaires with missing values for certain questions, were included in the analysis, as according to Pallant (2013), the best method to deal with missing data is to use the „exclude cases pairwise“ option provided in SPSS. By doing this, questionnaires are included in all the statistical analysis tests, except where they have missing data that is actually required for a specific test.

Preliminary analysis was performed to ensure that assumptions of normality, linearity and homoscedasticity were not violated. Descriptive statistics were used to analyse and describe the nature of the data, including the central tendency (mean, mode and standard deviation) of the database. Educators' overall scores for correct, incorrect and don't know responses were calculated and converted to percentages so as to differentiate between the concepts on which there is poor knowledge and on which there are good levels of knowledge. Individual subscale scores of the KADDS questionnaire (features, symptoms and treatment of ADHD), were compared and analysed in order to ascertain whether differences in educator's knowledge levels existed within the different domains of knowledge regarding ADHD.

In order to investigate the relationships between the dependent variable (knowledge of ADHD) and the independent variables (educators' personal demographic information and confidence ratings), a Pearson's product-moment correlation coefficient was calculated. A Pearson product-moment correlation coefficient was chosen as the most appropriate way to investigate these relationships, as this method of correlation analysis is most suitable for interval or continuous variables, such as the variables in this research (Pallant, 2013).

Thereafter, multiple regression was performed to determine if any of the individual factors (age, sex, years of total teaching experience, level of qualification, prior experience of teaching an ADHD learner, prior involvement of referring a suspected ADHD learner for

assessment and confidence levels) were able to predict an educator's level of knowledge of ADHD. According to Pallant (2013) multiple regression is a suitable method to identify a linear combination of independent variables that maximally predict a dependent variable and to further gauge the relative contribution of the variables in the combination.

3.7 Ethical Considerations

Selected schools were not contacted until permission for the study was granted by the University of KwaZulu-Natal's Human and Social Sciences Ethics Committee. Thereafter, school principals were contacted from the list of selected schools and provided with information sheets that outlined the details of the study. Principals and educators were informed about the anonymity and confidentiality of all information collected for this study, including anonymity of educator names and school names. The voluntary nature of participation in this study was emphasised and all educators were aware that they had to sign the consent form in order to participate in the study. Educators were given two weeks to complete the questionnaires and were aware that they could contact the researcher at any time for assistance. Educators were encouraged to complete the questionnaire privately and to answer questions as honestly as possible, selecting the "don't know" option rather than guessing the answer to questions to which they did not know the answers to. The participants were also informed that they need only answer those questions that they feel comfortable about answering.

The researcher and her supervisor's contact details were provided to the research participants in the event that they had any additional queries or concerns regarding the questionnaire, the research process, ethical conduct of the study or research findings. The contact details of the director of Research Ethics were also made available in case participants had concerns about the ethical conduct of this research. All data will be kept in a secure and locked cupboard in the office of the project supervisor in the Psychology Department at Pietermaritzburg Campus. Only the researcher and the supervisor will have access to this safe in order to maintain confidentiality. After five years the data will be destroyed by shredding all the questionnaires that were administered and completed as part of the study.

Participants and school principals were made aware that they would be provided a copy of the results following completion of the study. Dissemination of these findings may enhance

educator awareness and understandings of ADHD by drawing their attention to commonly held misperceptions about the disorder and existing gaps in knowledge.

3.8. Conclusion

This chapter has described and discussed the research methodology as well as procedures for collecting data and the approaches of analysing the data. The chapter began with an explanation for the quantitative, positivist approach of this study. This was followed by details of the sample: A total of 104 Durban based educators. Thereafter, a justification for the data collection methods chosen and a description of the procedures followed were provided. Finally, a description of the data analysis techniques used for analysing the KADDS questionnaire was provided, followed by a discussion about how the ethical issues were addressed. The results of this study will be presented in the following chapter.

CHAPTER 4: RESULTS

4.1. Socio-demographic characteristics

As already detailed in Chapter Three, the target population in this study consisted of 104 educators employed in the Foundation / Intermediate Phase of 20 primary schools in Durban. Of the 275 copies of the questionnaire distributed to the respondents, 104 copies were returned, resulting in an overall response rate of 37.8%. The demographic data are summarized in Table 2.

Of the 104 participant educators, 91 were females with a percentage of 87.5%. A third of the sample were older than 51 years of age ($n = 32$, 30.8%), while 26% were between the ages of 21 and 30. Just over half of the educators ($n = 60$, 57.7%) were currently teaching in the Foundation Phase, while the remaining participants were educators in the Intermediate Phase. Therefore the representation of educators from these two phases was fairly even. Almost half of the sample had spent 21 or more years teaching in total ($n = 42$, 40.4%), while 37.5% of the sample had spent between 0 and 10 years teaching. A little over half of the sample were qualified as educators through a Diploma in teaching ($n = 59$, 56.7%), but almost a quarter of the participants ($n = 25$, 24%) studied teaching as a postgraduate certificate upon completion of a different degree.

Almost half of the sample ($n = 46$, 44.2%) indicated that they had taught between 5 and 20 learners who had been formally diagnosed with ADHD, while 31 participants had only taught between 0 and 5 learners with ADHD (29.8%). Sixty-six educators in the sample had been involved in a referral process for more than five learners where ADHD was being queried (63.5%).

Table 2:
Socio-demographic information of the participants (n = 104)

Characteristics	N	%
Gender		
Males	13	12.5
Females	91	87.5
Age		
20-30	27	26.0
31-40	18	17.3
41-50	27	26.0
51-60	26	25.0
60+	6	5.8
Phase currently teaching in		
Foundation phase	60	57.7
Intermediate phase	44	42.3
Total years spent teaching		
0-10 years	39	37.5
11-20 years	23	22.1
21-30 years	32	30.8
31-40 years	10	9.6
Level of qualification		
Education / teaching diploma	59	56.7
Education / teaching degree	20	19.2
Other degree with a post-graduate diploma in education / teaching	25	24.0
Number of ADHD learners taught		
Between 0 and 5	31	29.8%
Between 5 and 20	46	44.2%
More than 20	27	26%
Number of learners that educators have referred for an ADHD assessment		
Between 0 and 5	38	36.5%
Between 5 and 20	45	43.3%
More than 20	21	20.2%
Confidence in their ability (1 = not confident; 5 = very confident)		
1	4	3.8%
2	5	4.8%
3	37	35.6%
4	41	39.4%
5	17	16.3%

4.2. Overall knowledge scores

Educators' overall percentage score of correct responses (items answered correctly) was 54.65% which reflects moderate knowledge of ADHD. The percentage of incorrect responses (items answered incorrectly) was 26.56% which indicates misperceptions of ADHD. Regarding „don't know" responses (items that educators admitted they just don't know), the percentage obtained was 18.79%, which points to a lack of knowledge.

Educators' overall percentages for correct, incorrect, and don't know responses are presented in Figure 1.

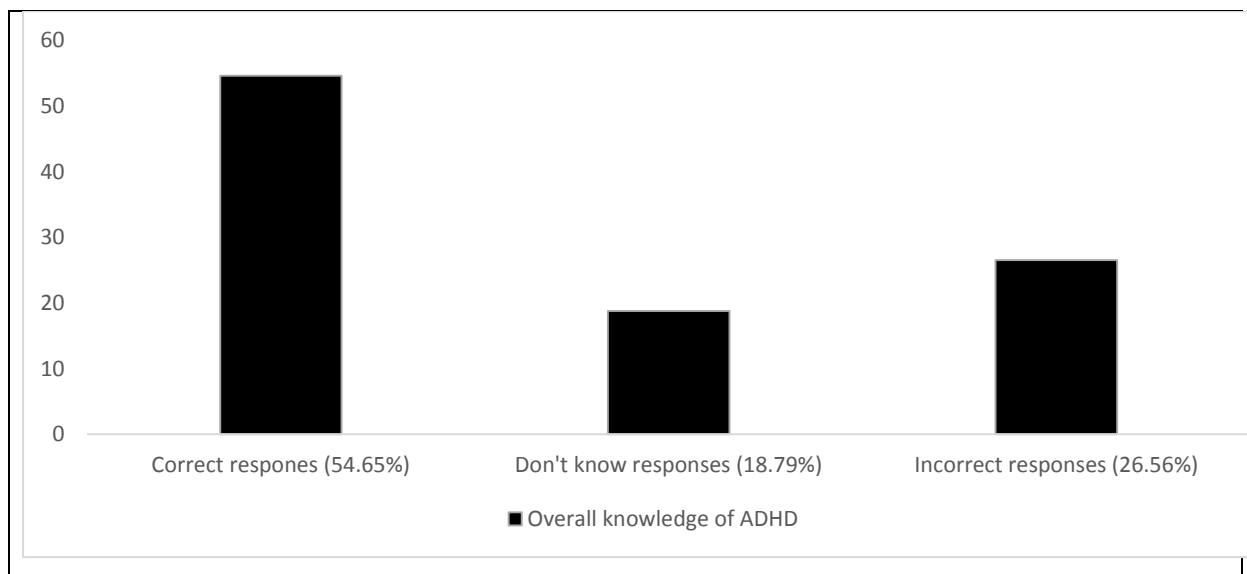


Figure 1: Educators' overall percentage score of the correct, incorrect, and don't know responses on the KADDS.

4.3 Educators' knowledge of ADHD within each of the KADDS subscales

The results per KADDS subscale are shown in Table 3, including results for the overall KADDS scale and the individual subscales (general knowledge of ADHD, knowledge of diagnosis/symptoms and knowledge of treatment). Performance per subscale suggests that participants scored higher scores on the „knowledge of diagnosis/symptoms" subscale (Mean = 6.80, SD = 1.66, 75.56%). There is a small difference between performance on the „knowledge of diagnosis / symptoms" subscale and „treatment" subscale (12.38%). However, performance on the „general knowledge" subscale is poor in comparison to the other two subscales (35.67%), suggesting greater lack of knowledge or misperceptions lie in general knowledge about ADHD.

Table 3:*Descriptive statistics for educators scores on KADDS total scale and subscale*

	Mean	Standard deviation	Mean (per scale) expressed as a percentage
General knowledge subscale (15 items)	5.35	1.87	35.67%
Diagnosis / symptoms subscale (9 items)	6.80	1.66	75.56%
Treatment subscale (12 items)	7.58	1.93	63.18%
Total Scale (36 items)	19.67	4.24	54.63%

In order to further examine educators' knowledge within each of the KADDS subscales, their responses were grouped to represent the three subscales of the KADDS. Table 4 presents educators' responses on the first subscale which include 15 items assessing general knowledge about the nature, causes and outcome of ADHD. The mean response score on this subscale was 5.35, which when expressed as a percentage is 35.67%. The highest proportion of correct responses was noted on items 13 and 24 (88.5%), which signifies that many educators are aware that adults can be diagnosed with ADHD (item 13) and that a diagnosis of ADHD by itself does not make a child eligible for placement in special education. The lowest proportion of correct responses was identified on item 32 (2.9%) which means few educators are aware that the majority of ADHD children experience some degree of poor school performance in the elementary school years. The majority of educators (82.7%) did not get item 28 correct, "There are specific physical features which can be identified by medical doctors (e.g. pediatrician) in making a definitive diagnosis of ADHD", which reveal that more than three-quarters of the educators have misperceptions about the fact that there is no medical examination to confirm the diagnosis of ADHD. The item which demonstrated the greatest area of lack of knowledge was item 31 (Children with ADHD are more distinguishable from normal children in a classroom setting than in a free play situation), which indicates that more than half (54.8%) of educators demonstrated lack of knowledge about ADHD symptoms across tasks and settings.

Table 4:

Participants' responses on the first subscale of KADDS which include 15 items pertaining to general knowledge about the nature, causes and outcome of ADHD (N = 104).

Items	CA	Percentage of correct responses		
		✓	DK	×
1. Most estimates suggest that ADHD occurs in approximately 15% of school age children.	F	5.8	50.0	44.2
4. ADHD children are typically more compliant with their fathers than with their mothers.	T	9.6	46.2	44.2
6. ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population.	T	50.0	35.6	14.4
13. It is possible for an adult to be diagnosed with ADHD.	T	88.5	4.8	6.7
17. Symptoms of depression are found more frequently in ADHD children than in non-ADHD children.	T	49.0	32.7	18.3
19. Most ADHD children "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.	F	61.5	21.2	17.3
22. If an ADHD child is able to demonstrate sustained attention to video games or TV for over an hour, that child is also able to sustain attention for at least an hour of class or homework.	F	83.7	9.6	6.7
24. A diagnosis of ADHD by itself makes a child eligible for placement in special education.	F	88.5	5.8	5.8
27. ADHD children generally experience more problems in novel situations than in familiar situations.	F	18.3	24.0	57.7
28. There are specific physical features which can be identified by medical doctors (e.g. pediatrician) in making a definitive diagnosis of ADHD.	F	7.7	9.6	82.7
29. In school age children, the prevalence of ADHD in males and females is equivalent.	F	24.0	18.3	57.7
30. In very young children (less than 4 years old), the problem behaviours of ADHD children (e.g. hyperactivity, inattention) are distinctly different from age-appropriate behaviours of non-ADHD children.	F	26.0	24.0	50.0
31. Children with ADHD are more distinguishable from normal children in a classroom setting than in a free play situation.	T	6.7	54.8	38.5
32. The majority of ADHD children evidence some degree of poor school performance in the elementary school years.	T	2.9	14.4	82.7
33. Symptoms of ADHD are often seen in non-ADHD children who come from inadequate and chaotic home environments.	T	15.4	33.7	51.0

CA = Correct Answer; T = True; F = False; ✓ = correct; × = incorrect

Table 5 presents educators' responses on the second subscale of KADDS which include 9 items assessing symptoms/diagnosis of ADHD. The mean response score on this subscale was 6.80, which when expressed as a percentage is 75.56%. The highest proportion of correct responses (96.2%) was on item 9, which means that most educators within the sample were aware that ADHD children often have trouble sitting still and tend to fidget or squirm in their seats. The highest proportion of incorrect responses was for item 5 (52.9%) which indicates misperceptions around the ADHD diagnostic criteria which states that in order to be diagnosed with ADHD, the child's symptoms must have been present before age 7. There is evidence of some misperceptions regarding item 14, as 20.2% of the sample incorrectly thought that ADHD children often have a history of stealing or destroying other people's things. A high percentage of educators (85.6%) also were aware that ADHD is currently seen as having two clusters (inattention and hyperactivity / impulsivity).

Table 5:

Participants' responses on the second subscale of KADDS which include 9 items pertaining to symptoms/diagnosis of ADHD (N = 104).

Items	CA	Number of correct responses		
		✓	DK	×
3. ADHD children are frequently distracted by extraneous stimuli.	T	88.5	5.8	5.8
5. In order to be diagnosed with ADHD, the child's symptoms must have been present before age 7.	T	26.0	21.2	52.9
7. One symptom of ADHD children is that they have been physically cruel to other people.	F	79.8	10.6	9.6
9. ADHD children often fidget or squirm in their seats.	T	96.2	1.9	1.9
11. It is common for ADHD children to have an inflated sense of self-esteem or grandiosity.	F	67.3	13.5	19.2
14. ADHD children often have a history of stealing or destroying other people's things.	F	62.5	17.3	20.2
16. Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.	T	85.6	7.7	6.7
21. In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).	T	84.6	4.8	10.6
26. ADHD children often have difficulties organizing tasks and activities.	T	89.4	2.9	7.7

CA = Correct Answer; T = True; F = False; ✓ = correct; × = incorrect

Table 6 presents educators' responses on the third subscale of KADDS, which includes 12 items assessing the treatment of ADHD. The mean response score on this subscale was 7.58, which when expressed as a percentage is 63.18%. Item 15 and 10 scored the highest proportion of correct responses, with 92.3% being scored on both these items. A high score on item 15 indicates that most educators were aware of the common side effects of stimulant drugs used for treatment of ADHD; while a high score on item 10 suggests that high numbers of educators understood that parent and educator ADHD training are more effective when combined with medication treatment. The highest proportion of incorrect responses (54.8%) was on item 23, which shows that more than half of the educators hold a misperception about the effectiveness of the diet on the symptoms of ADHD, as they mistakenly thought that the symptoms of ADHD will reduce with the reduction of sugar and or food additives. The highest proportion of answers that revealed lack of knowledge about ADHD was on item 8, which suggests that there is a lack of knowledge regarding alternative medication interventions for ADHD, in place of stimulant medication.

Table 6:

Participants' responses on the third subscale of KADDS which include 12 items pertaining to the treatment of ADHD (N = 104).

Items	CA	Number of correct responses		
		✓	DK	×
2. Current research suggests that ADHD is largely the result of ineffective parenting skills.	F	80.8	10.6	8.7
8. Antidepressant drugs have been effective in reducing symptoms for many ADHD children.	T	32.7	34.6	32.7
10. Parent and educator training in managing an ADHD child are generally effective when combined with medication treatment.	T	92.3	2.9	4.8
12. When treatment of an ADHD child is terminated, it is rare for the child's symptoms to return.	F	78.8	15.4	5.8
15. Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.	T	92.3	6.7	1.0
18. Individual psychotherapy is usually sufficient for the treatment of most ADHD children.	F	66.3	25.0	8.7
20. In severe cases of ADHD, medication is often used before other behaviour modification techniques are attempted.	T	78.8	13.5	7.7
23. Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.	F	30.8	14.4	54.8

25. Stimulant drugs are the most common type of drug used to treat children with ADHD.	T	52.9	28.8	18.3
34. Behavioural / Psychological interventions for children with ADHD focus primarily on the child's problems with inattention.	F	53.8	18.8	26.9
35. Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD	F	35.6	16.3	48.1
36. Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.	F	54.7	19.2	25.6

CA = Correct Answer; T = True; F = False; ✓ = correct; × = incorrect

4.4 Correlations among the study variables.

The relationship between knowledge of ADHD (as measured by the KADDS scale) and the participants' demographic information was investigated using the Pearson product-moment correlation coefficient and are presented in Table 7.

There was a moderate, significant correlation between performance on the KADDS scale and educators' experience of having taught a learner with ADHD before ($r = 0.43$, $p < 0.01$), with better knowledge of ADHD associated with exposure to ADHD through the teaching of an ADHD learner. Knowledge of ADHD was also positively correlated to the educators' exposure to ADHD through having made a referral to a paediatrician, psychologist or psychiatrist for investigation into possible symptoms of ADHD of a learner as identified by that educator ($r = 0.52$, $p < 0.01$). Furthermore, a moderate positive correlation was noted between educators' knowledge of ADHD and their confidence level for working with learners with ADHD, as indicated by them on a rating scale on which they ranked their confidence level between „no confidence and „very confident ($r = 0.45$, $p < 0.01$). This means that high knowledge levels of ADHD are associated with educators that perceive their confidence levels to be high.

Table 7:

Pearson Product-moment correlations of the total KADDS score (knowledge of ADHD) and educators' demographic variables

Variables	TK	S	A	TY	LT	REF	CON	QUA
Total KADDS score (TK)	-	0.24	0.09	0.18	0.43**	0.52**	0.45**	-0.19
Sex (S)		-	-0.75	0.02	0.06	0.26	0.12	-0.08
Age (A)			-	0.87	0.34	0.38	0.15	-0.38
Total years spent teaching (TY)				-	0.37	0.46	0.16	-0.44
Learners taught with ADHD (LT)					-	0.62	0.37	-0.34
ADHD referrals made (REF)						-	0.38	-0.37
Educators confidence (CON)							-	-0.20
Type of teaching qualification (QUA)								-

n = 104

** p < 0.01

4.5 Multiple regression analysis

Standard multiple regression was used to assess whether educators' personal demographic factors could predict their knowledge of ADHD, as presented in Table 8. Total scores for knowledge of ADHD and demographic variables (age, sex, total years spent teaching, type of teaching qualification obtained, learners taught with ADHD, ADHD referrals made and confidence levels) were included in the regression calculation model. The tolerance level obtained for the entered variables was greater than 0.01, therefore indicating no multicollinearity difficulties. The results of the regression indicated that the predictors explained 42% of the variance, $R^2 = 0.42$; $F(13,103) = 5.03$, $p < 0.01$. However, due to a small sample size, the adjusted R^2 value ($R^2 = 0.34$) may provide a more accurate representation of the variance obtained in the dependent variable, therefore indicating that the predictors entered in the regression model account for 34% of the variance of educators' knowledge of ADHD. Educators' confidence in their ability to teach learners with ADHD made the greatest significant contribution to predicting knowledge of ADHD ($\beta = 0.27$, $t = 2.99$, $p < 0.01$). No other variables were found to make significant contributions to knowledge levels of ADHD.

Table 8:***Summary of multiple linear regression model for variables predicting knowledge of ADHD***

Variable	B	Std. error	Beta	T	Sig.	Tolerance
Sex	1.11	1.2	0.09	0.95	0.35	0.77
Age	-0.85	0.58	-0.25	-1.47	0.14	0.22
Total years spent teaching	0.03	0.94	0.01	0.03	0.97	0.13
Type of teaching qualification	0.23	0.49	0.05	0.47	0.64	0.68
Learners taught with ADHD	1.02	0.54	0.21	1.87	0.07	0.50
ADHD referrals made	0.84	0.68	0.19	1.24	0.22	0.26
Confidence levels	1.22	0.41	0.27	2.99	0.00	0.77

Note: N=104, R² = 0.42; F (13,103) = 5.03, p < 0.01

4.6. Conclusion

In this study the knowledge of primary school educators in Durban, KwaZulu Natal were examined by using the KADDS, which examined knowledge of ADHD within three specific content areas or knowledge domains: Symptoms/diagnosis, general knowledge (e.g., prevalence, course, cause and outcome) and treatment of ADHD. The KADDS results demonstrated that these South African educators had an overall correct knowledge rate of 54.65%. This score is more than can be expected by chance (33%) and very similar to results obtained by Alkahtani (2013) who obtained a score of 59.8% respectively. Correlation tests were done to identify possible relationships between educators' knowledge of ADHD and their demographic characteristics. These revealed that overall knowledge of ADHD is significantly related to educators' sense of self-efficacy regarding their ability to teach in an inclusive setting with ADHD learners. Self-efficacy was also identified as a predictive factor for increased knowledge levels. A correlation was also identified between educators' exposure to ADHD as a childhood disorder (e.g. teaching a learner with ADHD, being involved in the referral process of a possible ADHD diagnosis). In Chapter 5, the conclusions that can be drawn from these results will be summarised.

CHAPTER FIVE: DISCUSSION

This chapter discusses key issues that emerged from an examination of the findings in relation to the aims and objectives of the study. The aim of this current study was to describe and explore Foundation/Intermediate Phase educators' level of knowledge about ADHD, including knowledge of its features, symptoms and diagnosis. The first objective of this study focused on determining whether individual factors (years of total teaching experience, years of experience in a specific grade, level of qualification, prior experience of teaching an ADHD child, confidence to teach an ADHD learner) can predict educators' knowledge levels of ADHD. A final aspect of this study was to investigate whether educators' knowledge of ADHD correlates with their confidence beliefs for teaching learners with ADHD. In this chapter, the findings are discussed in relation to previous empirical studies as well as relevant explanatory theories.

5.1 Educators' knowledge and misperceptions of ADHD

Primary school educators' knowledge and misperceptions of ADHD, as measured by the KADDS scale, were examined in three areas: Symptoms/diagnosis of ADHD, treatment of ADHD and general information about the causes, nature and outcomes of ADHD (which are referred to as associated features). The results from this study demonstrated that this sample of South African educators (N = 104) had an overall correct knowledge rate of 54.65%. This score is more than can be expected by chance (33%) and very similar to results obtained by Alkahtani (2013) who obtained scores of 59.8% in Saudi Arabia, with 429 educators.

The scores obtained on this study, fall within the average range of scores obtained in international and national studies based on the KADDS (Scuitto et al., 2000) which are between 31% (Bradshaw & Kamal, 2013) and 59,8% (Alkahtani, 2013). The current study therefore yielded results similar to other studies based on the KADDS. In contrast, studies based on the K-ADHD (Jerome et al., 1994) indicate that on average, the percentage of scores that educators answer correctly, ranges from 76% (Ohan et al., 2008) to 82% (Bekle, 2004). The scores obtained in the current study are in line with the trend that has been noticed in research in this field globally, where participants have consistently scored lower on the KADDS than on the K-ADHD.

While the knowledge level scores obtained in this study do fall within the average range of scores obtained in previous studies that have utilised the KADDS, a more detailed comparison of scores, as displayed in Table 9, reveals that this study has a rate of correct responses that falls within the upper half of scores when compared to other studies. Five internationally based studies scored higher than this current study, namely Alkahtani (2013), Castenova (2008), Small (2003), Guerra and Brown (2012) and West et al. (2005). There are many studies that have utilised the KADDS that identified lower knowledge level scores than this current study did, including Kang, Kim and Yang (2011), Scuitto et al. (2000), Kleynhans (2005) and Alamri (2014). They differed in their percentage of correct responses as compared to this current study by between 1.35% (West et al., 2005) and 5.15% (Alkahtani, 2013).

Table 9:

Results from international and national studies that have administered the KADDS (in rank order)

Researchers	Location	Sample size	Description of the sample *	Correct responses
Alkahtani (2013)	Saudi Arabia	429	Pre-school - Grade 9	59.8%
Castenova (2008)	USA	58	Grade 5 - 9	58.4%
Small (2003)	USA	72	Grade 1 - 5	57%
Guerra & Brown (2012)	Texas/USA	107	Grade 6 - 9	56.7%
West et al. (2005)	Australia	131	Grade 1 -12	56%
Current study	South Africa	104	Grade 1 - 6	54.65%
Kang, Kim & Yang (2011)	South Korea	204	Grade 1 -5	52.3%
Scuitto et al. (2000)	USA	149	Grade 1 -5	47.8%
Kleynhans (2005)	South Africa	552	Grade 1-12	42.6%
Perold et al. (2010)	South Africa	552	Grade 1 - 6	42.6%
Alamri (2014)	Saudi Arabia	202	Grade 1 - 6	41%
Lazarus (2011)	South Africa	100	Grade 1 - 6	35%
Dilaimi (2013)	New Zealand	84	Grade 1 - 6	35%
Bradshaw & Kamal (2013)	Qatar	233	Grade 1 - 12	31%

*South African grade equivalents have been presented here for ease of comparison

Educators in Saudi Arabia have the highest knowledge level (59.8%) according to Alkhatani's (2013) study but in Alamri's (2014) study, Saudi Arabian educators demonstrated that they had a knowledge level of 41%. Alkhatani's (2013) larger sample size (429 educators) may render the results obtained by his study more reliable than Alamri's (2014) study, whose sample size was almost 50% smaller. Alkhatani (2013) also incorporated educators from pre-school through to Grade 9 level, therefore drawing upon a wider range of educators than Alamri's (2014) study. Three American studies obtained higher knowledge scores than this current study, as these educators achieved correct response rates of 58.4%, 57% and 56.7% respectively (Castenova, 2008; Small, 2003; Guerra & Brown, 2012). Australian educators demonstrated that they had similar knowledge levels to American educators, as they obtained an average score of 56% on the KADDS. Also achieving scores greater than 50%, were educators from South Korea who demonstrated that they could answer 52.3 % of the KADDS correctly. South African educators in this current study also achieved scores above 50% on the KADDS, namely 54.65%, demonstrating a knowledge level on the KADDS similar to educators' results from America, Australia and Saudi Arabia.

When compared to other South African studies, this current study demonstrated better results on the KADDS scale. Kleynhans (2005), Perold et al. (2010) and Lazarus (2011) identified educator knowledge levels of 42.6%, 42.6% and 35% respectively. This could suggest that Durban based educators possess greater knowledge of ADHD than educators in other cities of South Africa, namely Cape Town and Johannesburg. However, differences in results may also be indicative of methodological differences between these studies, as the Cape Town based studies utilised a sample size of 552 educators, while the current study's sample size consisted of 104 educators. Furthermore, this current study was restricted to urban based educators, while the Cape Town based studies drew upon a more diverse sample by drawing on urban and rural based educators. The study situated in Johannesburg was limited to educators within a rural area. Higher scores in this study may be attributed to the type of schools included in the sample, which were all based in urban areas and therefore, more resources and workshops on ADHD may be more easily accessible to the sample of educators.

Furthermore, four private schools (45% of the sample) formed part of this sample, which may be indicative of greater financial resources and therefore, greater opportunities to attend workshops and training on pertinent topics such as ADHD. Furthermore, these four private schools, as well as three of the government schools (i.e. seven out of the total 19 schools in the sample), indicated that they had access to remedial educators and therapists, who assisted in keeping them up to date with knowledge around barriers to learning. The medium of instruction is also important to note, as all of the educators in this sample were part of English medium schools. Thus, it can be assumed that understanding and comprehension of items in the questionnaire (which were in English) were less likely to be compromised by language related difficulties, therefore possibly resulting in higher scores as a result of better comprehension of questions. This is in contrast to Lazarus's (2011) South African study, where it was suspected that language related difficulties impacted on the poor results obtained (35%). Lazarus (2011) acknowledged in his study that the sample consisted of educators whose first language was not English and therefore, a translator should have been made available in order to obtain results that were a more accurate representation of the sample's actual knowledge levels.

Many of the studies summarised in Table 9 focused on educators in the primary phase of schooling, which incorporates Grade 1 to Grade 5 or 6. In some countries, the primary phase of schooling includes Grade 6, while in others it does not. In South Africa, the primary phase of schooling refers to the Foundation / Intermediate phase between Grade 1 and 6. However, while Grade 7 is usually located within a primary school, it is actually considered part of the senior phase of schooling, for which Grade 7 educators need to be qualified as senior phase educators. This current study focused on primary school educators, teaching in Grade R to 6. The studies of Small (2003), Kang et al. (2011), Scuitto et al. (2000), Perold et al. (2000), Alamri (2014), Lazarus (2011) and Dilaimi (2013) therefore draw upon similar samples, in terms of the type of grades taught by these educators. This suggests that these educators have similar specialisations within their teaching qualifications, in terms of the grade and age of learners that they are able to teach. Therefore, the results of these studies are more comparable to the results of this current study, as they draw upon samples with similar characteristics. With the exception of the study conducted by Small (2003), the primary phase educators in this current study performed better than the studies by Scuitto et al. (2000), Perold et al. (2000), Alamri (2014), Lazarus (2011) and Dilaimi (2013). As discussed

above, there are a number of reasons that may have influenced higher scores in this current study's sample, such as the inclusion of four private schools and the use of educators from only urban schools. Both these factors may mean that educators have greater access to training and workshops on ADHD.

5.2 Performance per subscale

The KADDS questionnaire identifies total scores for „correct“, „don't know“ and „incorrect“ responses for individual items, as well as subscales, which therefore enables distinguishing between the concepts on which there is a lack of information („don't know“ answers), as opposed to concepts on which respondents have misperceptions („incorrect“ answers).

An analysis of the scores obtained per subscale (symptoms/diagnosis, treatment and general knowledge of associated features) revealed that the educators were the most knowledgeable about the symptoms/diagnosis of ADHD (Mean = 6.80, SD = 1.66, 75.56%). These findings suggest that educators in this study were most knowledgeable about the items on the symptoms/diagnosis subscale that correlate with the criteria that are presented in the DSM 5 (APA, 2013). With regards to the treatment subscale, a mean score was noted of 6.95, which is equivalent to 63.18%. The subscale on general knowledge of associated features of ADHD obtained the lowest results, demonstrating a lack of knowledge in this area (Mean = 5.35, SD = 1.87, 35.67%). In the section that follows, the results per subscale are discussed, with attention being paid to presence of knowledge, lack of knowledge and misperceptions regarding knowledge levels per subscale.

5.2.1 Symptoms/Diagnosis subscale

Regarding the Symptoms / Diagnosis Subscale, an average score of 75.56% was obtained by this sample, which suggests that educators have higher knowledge levels pertaining to the symptoms of ADHD, than to the treatment and general features of ADHD. Stronger knowledge scores obtained on the Symptoms subscale are consistent with other studies that have demonstrated similar findings, including Kleynhans (2005), Durbach (2001), Lazarus (2011), Kern (2008), Perold et al. (2010), Scuitto et al. (2000). According to Small (2003) and Lazarus (2011) these results are not surprising given that educators are likely to observe the symptom related features of ADHD within their classrooms on a daily basis.

Although scores on this subscale were high, the data also revealed that many educators hold certain misperceptions and incorrect knowledge regarding the Symptoms / Diagnosis Subscale. For example, more than 50% of the respondents did not know that the child's symptoms must have been present before age seven and 20.2% incorrectly believe that oppositional / defiant behaviour forms part of ADHD. Although results from this sample suggest stronger knowledge levels pertaining to this subscale, it is important for educators to continue to develop knowledge regarding symptoms of ADHD, as research has indicated that educators are often the most common initial referral source, advising the parent to obtain an assessment for the child (Snider et al., 2003; Vereb & Di Perna, 2004). As part of the referral, the educator is required to provide the health practitioner with significant information on the child, which includes a description of observed symptoms and therefore, the accuracy of the information pertaining to the symptoms of ADHD that are provided by an educator is an essential aspect and plays an important role in the diagnostic and treatment process (Kern, 2008). According to Pelham et al. (1992), it is important for educators to make reference to detailed and accurate diagnostic criteria and symptoms when making a referral.

Furthermore, a basic knowledge of the symptoms of ADHD may not be enough to understand and make accurate referrals of learners suspected to warrant an ADHD diagnosis. For example, in a study done by Pelham and Evans (1992), it was found that the symptom 'easily distracted', which is a primary feature of ADHD, had a low predictive power for the presence of this disorder. Yet, the absence of this symptom indicates the absence of this disorder. Similarly, the symptom referred to in the KADDS regarding „fidgeting“ also has little predictive power to suggest ADHD as a diagnosis (Pelham & Evans, 1992). Therefore, the presence of some of the well-known symptoms and features of ADHD, is not enough to predict a diagnosis of ADHD, as the disorder is a complex one. Therefore, educators need to be exposed to more complex knowledge regarding diagnostic criteria of ADHD, as can be found in the DSM 5 (APA, 2013). In this way, educators will understand the disorder in a more comprehensive manner, whereby the presence of six or more symptoms of ADHD are needed before making a preliminary diagnosis, along with other key diagnostic criteria, such as manifestations of symptoms in two or more settings.

5.2.2. Treatment subscale

Regarding the Treatment Subscale, a mean score was noted of 7.58, which is equivalent to 63.18%. These results are similar to findings obtained by Guerra and Brown (2012), in which educators scored lower on the Associated Features subscale than the Treatment subscale (47% and 57% respectively). However, these results are not consistent with those found by West et al. (2005) and Lazarus (2011), whose educators were least knowledgeable about treatment strategies for ADHD.

Results in this subscale indicate that educators in this sample were knowledgeable about current research that emphasises that ADHD is not the result of ineffective parenting (80.8% correct response rate) and that there are a variety of side effects of stimulant medication (92.3% correct response rate). The fact that 92.3% of this sample is aware of the possible side effects of stimulant medication is encouraging because educators play a significant role in the monitoring of medication side effects. Furthermore, their observations on side effects are helpful in establishing the correct dosage of medication. A high correct response rate (92.3%) was noted on item 10, indicating that educators were well aware that multifaceted methods should be applied for effective treatment of ADHD, including parent, educator and medication based interventions. In fact, research has found that there is more empirical support for classroom-based behavioural interventions, than for clinic-based parental training (Curtis et al., 2006). Therefore, it is noteworthy that such a high percentage of educators are aware that they have a significant role when it comes to managing ADHD.

More than half of the respondents understood that punishment is not the most effective means of reducing the symptoms of ADHD (54.65%), which is consistent with findings by Lazarus (2011) and Kleynhans (2005). This implies that while half of the sample possesses accurate knowledge in this specific area, the other half of the sample subscribe to incorrect knowledge or have a lack of knowledge regarding the most effective treatments for ADHD. It is important for educators to be made aware that positive feedback and incentives as well as stimulant medication are considered more effective interventions than punishment (Barkley, 2001).

In conclusion, although educators within this sample scored an average score of 63.8% for this subscale, more intense and complex development of the knowledge tested by this

subscale needs to occur. This would allow educators to exhibit better accommodation of the needs of learners who exhibit ADHD-related behaviours, in the form of appropriate treatment interventions. Therefore, knowledge on this subscale should be developed amongst educators, in order to allow inclusive education practices to be more effectively implemented for ADHD learners.

5.2.3 General knowledge subscale for Associated Features of ADHD

The subscale on general knowledge of Associated Features of ADHD obtained the lowest results, demonstrating less developed knowledge in this area as compared to the other two subscales (Mean = 5.35, SD = 1.87, 35.67%). These results are consistent with those obtained by Kleynhans (2005), Castenova (2008) and Dilaimi (2013). There is a high level of misperception regarding many of the items within this subscale (57.7% incorrect responses) including misperceptions around current research that has found that children with ADHD will show fewer behavioural problems in unfamiliar surroundings than in familiar surroundings (Barkley, 2001). The majority of respondents in this study hold onto the misperception that behavioural problems are more frequently experienced in unfamiliar situations, when in fact, ADHD learners are often more compliant in unfamiliar situations. Correct information regarding this area is important, as educators should be aware that as the school year progresses and ADHD children become more familiar with the classroom environment, their behaviour may deteriorate.

An even greater degree of misperception was identified in item 28, which found that 82.7% of respondents incorrectly believed that medical doctors can identify specific physical features which can lead to a definitive diagnosis of ADHD. To the contrary there is no objective medical finding for the diagnosis of ADHD and therefore, educators are placing a disproportionate amount of responsibility on doctors and paediatricians (Accardo et al., 2000). An incorrect response rate of 82.7% was obtained on item 32, therefore suggesting that many educators mistakenly believe that ADHD does not interfere with a learner's academic performance. According to Barkley (2001) and Mash and Wolfe (2002), learners with ADHD often experience difficulty with academic performance and misperceptions around this knowledge, may result in undue pressure being put on ADHD learners by their educators.

There is a clear lack of knowledge around the prevalence of ADHD, as half the respondents indicated that they were unclear as to the answer for item one (Item 1: Most estimates suggest that ADHD occurs in approximately 15% of school age children), while 44.2% incorrectly believed that 15% of school age children have ADHD. Lack of knowledge or misperceptions regarding item one, may mean that educators may attribute many difficult behaviours to ADHD, instead of considering other possible diagnoses or contributing factors. This could further lead to many inappropriate ADHD referrals (Livingstone, 1997). This is concerning in light of the fact that many diagnoses of ADHD are based upon school reports alone (Carey, 1999) and that educators are the most common initial referral source. This finding is consistent with other studies that utilised the KADDS (Dilaimi, 2013; Kleynhans, 2005).

5.3 Educator characteristics related to knowledge of ADHD

It is important to determine if there are any individual factors that may influence knowledge levels of ADHD, as this would provide some insight into the type of educator who is at risk for having low knowledge levels and may need more focused support, while highlighting those who may be more knowledgeable and in a position to assist ADHD learners more effectively.

5.3.1 General demographic variables

Age and educational level are two demographic variables that previous studies have tried to associate with educators' knowledge levels of ADHD. Regarding age, no association has been found with knowledge levels in previous studies (Dilaimi, 2013; Kos, 2008; Lazarus, 2011; Perold et al., 2010; Scuitto et al., 2000). This current study also found no association between age and knowledge levels of ADHD.

Studies that have attempted to identify an association between educators' ADHD knowledge levels and their level of education have yielded inconsistent results. No association between these two variables were found by Guerra and Brown (2012), Perold et al. (2010), Scuitto et al. (2000) and Small (2003). This current study also found no association between these two variables. However, Kleynhans (2005) and Ghanizadeh et al. (2006) found a small but positive relationship between educators' overall knowledge levels and their level of education. Dilaimi (2013) suggested that this discrepancy may be due to variation in

coursework relating to ADHD provided in educator training degrees. In other words, it is possible that some educator training courses do teach and expose educators to knowledge around ADHD, in which case positive associations between knowledge levels and level of education may be noted. However, some educator training courses do not expose training educators to knowledge around ADHD, which may result in lower knowledge awareness around ADHD.

5.3.2 Years of teaching experience

In line with other research in this area, this study found that years of teaching experience are unrelated to an educator's actual level of knowledge of ADHD (Almari, 2014; Guerra & Brown, 2012; Kos et al., 2008; Lazarus, 2011; Perold et al., 2010; Small, 2003). This differs from the findings of Sciutto et al. (2000), who indicated that educators with more years of teaching experience obtained higher scores, than those with less teaching experience. However, no other research has found a positive association between years of teaching experience and knowledge of ADHD. The absence of a correlation between these two variables means that one cannot assume that educators with many years of experience have received adequate exposure to ADHD knowledge because years of experience do not guarantee exposure to ADHD or increased knowledge levels. Thus, all educators, even those with many years of experience, should be afforded learning opportunities regarding ADHD, including attendance of workshops and additional training (Bell, Kellison, Garvan, & Bussing, 2010).

5.3.3 Previous exposure to ADHD, through teaching a learner with ADHD and/or making a referral for a learner who is suspected to have ADHD

In the current study, it was found that both the teaching of a child with ADHD and being involved in the referral process for a suspected ADHD diagnosis, were positively associated with greater ADHD knowledge. These results are not surprising given that prior experience with an ADHD child (whether through teaching or involvement in the referral process) may involve exposure to several key sources of information about the disorder, such as through exposure to the symptoms of ADHD, communication with other professionals regarding ADHD and through the planning and implementations of school-based interventions. Therefore, personal interactions with an ADHD child would lead to increased knowledge of

the characteristics of the disorder, treatment options and general information regarding ADHD. Research conducted by Kleyhans (2005), Kos et al. (2004) and Scitutto et al. (2000) found similar results to this current study regarding the association between educators' knowledge of ADHD and their previous teaching experience with an ADHD learner. However, the work of Lazarus (2011) and Small (2003) found no association between these variables.

Dilaimi (2013) cautioned against drawing conclusions about the positive correlations identified between previous teaching experience and knowledge levels of ADHD, due to the variable nature of the presentation of ADHD. Dilaimi (2013) explains this by highlighting the spectrum of severity that ADHD symptoms fall into, which therefore make it possible for educators to have been exposed to various manifestations and levels of the disorder. Therefore, when identifying correlations between knowledge levels and previous exposure to teaching a learner with ADHD, the severity of the diagnosis (in terms of mild, moderate or severe diagnoses) should be noted if possible, as well as the subtype of ADHD (combined, inattentive or hyperactive/impulsive type) and the type of treatment approach that the educator is exposed to. As this was not determined in the current study, it is not possible to conclude whether the significant correlations were the result of participants in this sample having had greater exposure to more severe diagnoses of ADHD, therefore giving them greater insight and knowledge about ADHD (its features, symptoms and treatment options).

The current study further researched the relationship between educators' ADHD knowledge levels and their previous involvement in a referral process to a medical professional for a possible ADHD diagnosis. This variable does not seem to have been included in other studies involving the KADDS and educators' ADHD knowledge levels. The positive association found between knowledge levels and this kind of involvement may be due to the level of awareness that is required to make a referral, and the subsequent involvement of other professionals. Often this process can provide the educator an opportunity to engage with a professional about ADHD and increase their knowledge on the topic. Therefore, the referral process can be seen as an opportunity to grow in knowledge about ADHD. This question on the demographic questionnaire should be included in future studies of the KADDS to ascertain whether this association is common across settings.

This new finding should encourage educators to make referrals where they feel there is a possibility of ADHD as a referral to a medical practitioner ensures that the diagnosis of ADHD can either be explored or ruled out, therefore, initiating a process whereby appropriate support can be given to the learner. An estimated 2.4 million children meeting the DSM 5 (APA, 2013) criteria for ADHD have either not been diagnosed or are not receiving regular medical treatment (Lee, 2013). Serious consequences may occur when students with ADHD are not diagnosed or treated, including grade retention, expulsion, academic failure, and a higher likelihood of engaging in high-risk social behaviours (Manos, Tom-Revzon, Bukstein, & Crismon, 2007). Lee (2013) identified support from school principals in the referral process as being critical, as without support from school management, educators may be nervous to initiate a referral process. Therefore, school principals should encourage referrals to be made, with the attitude that if the educator is incorrect in their suspected diagnosis, the medical practitioner will be able to provide further insight on how to assist that child.

5.3.4 Educators' self-efficacy levels regarding teaching learners with ADHD

A moderate positive correlation was noted between educators' knowledge of ADHD and their perceived confidence level regarding their ability to teach ADHD learners, in an inclusive model of education. Confidence was measured on a 1-5 rating scale on which they ranked their confidence level between „not confident“ and „very confident“. This means that high knowledge levels of ADHD are associated with educators that feel confident to teach learners with ADHD. This finding suggests that participants with higher levels of ADHD knowledge felt more efficacious in terms of teaching learners with behavioural problems. This finding was consistent with findings by Scuitto et al. (2000) and Perold et al. (2010), who also found that educators with a high knowledge of ADHD rated themselves as being more confident to teach learners with ADHD than those with low knowledge of ADHD. In contrast, Ohan et al.'s (2008) Australian study reported a negative relationship between educators' knowledge of ADHD and their confidence in managing children with ADHD (Ohan et al., 2008). Ohan et al. (2008) attributed these results to the fact that educators' with higher knowledge levels were more acutely aware that children with ADHD-related behaviours have serious problems that require assistance from other professionals, which may detract from their confidence to assist these children appropriately. Other researchers attribute discrepancies between the results of different studies for this question, to the fact that Ohan et al. (2008) utilized the K-ADHD, whilst the other studies used the KADDS (Perold et al., 2010; Scuitto et al., 2000).

In order to further understand this association, a multiple regression analysis was conducted which indicated that higher confidence levels were the best predictor of average to above average knowledge levels. Therefore, one can assume that educators who feel more self-efficacious and confident to teach learners with ADHD, will have greater knowledge about ADHD and how to include such learners appropriately and most effectively within the classroom. This is because self-efficacy gives an individual confidence and conviction in themselves (Luthans, Avey, Avolio, & Peterson, 2010). The strength and predictive value of self-efficacy in this study is supported by Bandura's (1977) social cognitive theory, which found that higher efficacy levels lead to greater task initiation and persistence, while weaker self-efficacy produces task avoidance. Therefore, self-efficacy could give rise to the initiation and persistence of knowledge exploring activities, which would in turn increase knowledge levels. In this way, self-efficacy could be seen as a predictor of increased knowledge levels.

However, greater knowledge levels of ADHD could also be described as a predictor of confidence levels because the presence of knowledge that an educator may possess, could give rise to greater confidence when faced with inclusion. From this perspective, it could be argued that the reason for their confidence is founded on their own awareness of their knowledge basis, therefore giving them a feeling of mastery and capability when it comes to inclusion of ADHD learners. Bandura's (1977) theory further highlights self-efficacy as a mediator between knowledge and action, therefore no amount of self-efficacy is sufficient to perform a competent behaviour if requisite skills and knowledge are lacking (Pajares, 2002). Rather, it is the combination of self-efficacy and knowledge that are a powerful combination for educators who are faced with the task of inclusion of an ADHD learner, as this combination leads to effective action. This finding suggests that the actions required to carry out the practice of inclusion of an ADHD learner are dependent on strong levels of self-efficacy, as well as strong levels of knowledge pertaining to ADHD. The development of these two attributes (knowledge and self-efficacy) should be prioritized in intervention strategies that focus on assisting educators to adopt inclusive education practices pertaining to ADHD learners.

5.4 Conclusion

In this study the knowledge and perceptions of Foundation / Intermediate phase educators in the Durban area, South Africa were examined by using the Knowledge of Attention Deficit Disorders Scale (KADDS). The results from this study demonstrated that these South African educators had an overall correct knowledge rate of 54.65%. The scores obtained on this study, fall within the average range of scores obtained from international and national studies based on the KADDS. This discussion has noted that the knowledge level scores obtained in this study fall within the top 50% of scores recorded in previous studies. Furthermore, when compared to other South African studies, this current study demonstrated better results on the KADDS scale. This could suggest that Durban based educators possess greater knowledge of ADHD than educators in other cities of South Africa, namely Cape Town and Johannesburg. However, differences in results may also be indicative of methodological differences such as sample size and composition, between these studies.

An analysis of the scores obtained per KADDS subscale (symptoms/diagnosis, treatment and general knowledge of associated features) revealed that the educators obtained the highest scores, and were thus the most knowledgeable about the symptoms/diagnosis of ADHD. These findings suggest that educators in this study were most knowledgeable about the items on the Symptoms / Diagnosis subscale that correlate with the criteria that are presented in the DSM 5 (APA, 2013). It was further found that both the teaching of a child with ADHD and being involved in the referral process for a suspected ADHD diagnosis were positively associated with greater ADHD knowledge. Therefore, the discussion highlighted the fact that school principals should encourage referrals to be made by educators, with the attitude that if the educator is incorrect in their suspected diagnosis, the medical practitioner will be able to provide further insight on how to assist that child, while the educator will gain further expertise on ADHD diagnostic criteria.

Correlation tests revealed that overall knowledge of ADHD is significantly related to educators' sense of self-efficacy regarding their ability to teach in an inclusive setting with ADHD learners. Self-efficacy was also identified as a predictive factor for increased knowledge levels. It was noted that the combination of self-efficacy and knowledge, lead to effective action by educators in successfully applying intervention strategies for ADHD learners. It was suggested that the development of these two attributes (knowledge and self-

efficacy) should be prioritized in educator-based intervention strategies, which focus on the assisting educators to adopt inclusive education practices pertaining to ADHD learners.

CHAPTER 6: CONCLUSION

6.1 Conclusion

Educators play a large role in the identification and assessment of learners with ADHD. This study was intended to examine educators' knowledge and misperceptions of ADHD. Three major findings emerged. First, educators' overall percentage score of correct responses (items answered correctly) was 54.65% which reflects moderate knowledge of ADHD. This finding fell within the range of results obtained in other studies that utilised the KADDS, and in fact fell within the top 50% of results from other studies that have utilised the KADDS. Second, educators' level of knowledge of ADHD was positively related to their prior training and experience with ADHD, through having taught a diagnosed ADHD learner, as well as through involvement in the referral process of a suspected ADHD learner. Third, educators' level of knowledge of ADHD correlated positively with their level of confidence/self-efficacy in teaching a learner with ADHD. The overall results from this study concur with the findings of previous studies (Bekle, 2004, 2000; Ghanizadeh et al., 2006; Kos et al., 2004; Jerome et al., 1994; Ohan et al., 2008; Scuitto et al., 2000; Snider et al., 2003; Vereb & Di Perna, 2004; West et al., 2005).

6.2 Strengths of the study

This study has numerous methodological strengths, which are discussed below.

The possibility of selection bias was reduced and conflict bias was avoided by randomly selecting schools, which also enhanced generalizability of results. The use of anonymous self-administered surveys also may have yielded a higher response rate, as participants felt a measure of security that their individual results would not be known. This is supported by evidence which indicates that when addressing health-related issues, participation is more likely when data is collected by means of self-administration than when face-to face interviews are utilised (Perkins & Sanson-Fisher, 1998). The research instrument, the KADDS (Scuitto et al., 2000), is considered to be a superior instrument as it includes three response options (true, false, don't know) as opposed to a dichotomous response format (Soroa et al., 2012). This reduces the possibility of participants guessing and also reduces the likelihood of obtaining the correct answer by chance (from 50% for two responses, to 33.3% for three responses). In this way, participants were able to communicate their stance in a

more precise manner (Soroa et al., 2012) and attainment of more reliable information about educators' knowledge of ADHD was ensured (Kos et al., 2006; Scuitto et al., 2000; Soroa et al., 2012). Furthermore, the true/false/don't know response options also allow for a distinction between an educator's lack of knowledge and misperceptions of ADHD to be made (Scuitto et al., 2000)

This study also made a new contribution to the field of research around educators' knowledge of ADHD, as this study found that the involvement of an educator in the referral process for a learner that is suspected to have ADHD, adds significantly to the knowledge level of ADHD of that educator. This contribution has not been researched before and therefore, the inclusion of this additional item in future studies may add to the research in this field.

6.3 Limitations of the study

The sample consisted of 104 participants, from the Foundation and Intermediate phase in the urban Durban area. Generalizing these findings beyond this population needs to be done with caution, as the results may vary depending on the phase of education taught and the geographical location of the educators, particularly with respect to whether they are based in urban or rural schools. The use of participants selected through convenience sampling is also considered a limitation since convenience samples cannot be representative of the population as a whole (Kolb & Maxwell, 2003).

While the research outlined above highlighted the important influence of knowledge of ADHD on self-efficacy beliefs, this study exhibited some methodological limitations. The study relied on single-item measures of self-efficacy, which may have limited the reliability of the findings. According to Bandura (1997), single-item measures of self-efficacy assess only a single level of task demand and such a narrow scope has the effect of lowering the magnitude of the relationships identified. A further limitation is that this research (as also found in the research of Scuitto et al. (2000) used the terms self-efficacy and confidence synonymously. Bandura (1997) distinguished between the construct of self-efficacy and the term confidence, noting that "confidence is a nondescript term that refers to strength of belief but does not necessarily specify what the certainty is about" (p.382), therefore this term is considered as a catchword rather than a theoretical construct. Taking into account the considerations described above, the inclusion of the variable of self-efficacy in this study was

of an exploratory nature, and its association with knowledge of ADHD suggests the need for further research. An instrument that measures self-efficacy on multiple levels, through more than one question or item of an instrument, should be identified for such a study.

6.4 Implications and recommendations

Research in the last decade has found prevalence rates for South African children and adolescents diagnosed with ADHD ranging between 5 and 10%, therefore making ADHD one of the persistent and commonly occurring conditions affecting South African children and adolescents today (Flischer et al., 2009; National Centre for Health Statistics, 2012; Polanczyk et al., 2007; Snyman, 2010). Despite this, ADHD has been described as a commonly misunderstood condition, with misinterpretations about ADHD been documented amongst parents and doctors, as well as amongst educators (Gargiulo, 2010; Perold et al., 2010). The results of this study identified misinterpretations and misunderstandings around ADHD, as it found that while educators have a basic understanding of ADHD, the more complex, in-depth knowledge of symptoms, treatment and features of ADHD is limited or is misunderstood. While for certain aspects of knowledge around symptoms and treatment of ADHD, good knowledge was found in many of the participants, many areas of knowledge were limited in large numbers of the sample. Higher knowledge levels are positively associated with exposure to an ADHD learner through teaching such a learner or being involved in the referral process of a child with suspected ADHD for further investigation by a professional. This study also demonstrated that self-efficacy has a positive correlation with ADHD knowledge levels. In light of these findings, the following recommendations are suggested:

6.4.1 Interventions to address gaps in the knowledge levels of educators:

Educators should be offered in-service training in ADHD, as well as in behavioural management and academic interventions (curriculum adaptations) with regard to children with ADHD. These training sessions should focus on knowledge of symptoms, treatment and general features of ADHD. The importance of communication between the educator and the psychologist/medical practitioner, including the type and format of information needed by these professional people to make a diagnosis, should also be emphasized. Furthermore,

practical classroom interventions should be examined in training settings and sharing of ideas between educators should be encouraged.

As some schools may have limited resources to finance training taking place at school under the guidance of a professional, the Department of Education and educator trade unions should be encouraged to increase the number of training workshops that focus on the areas mentioned above, while the attendance of educators should be encouraged and facilitated where necessary. This current study also demonstrated that it cannot be assumed that educators with many years of experience have received adequate exposure to ADHD knowledge. Therefore, more experienced educators with varying years of experience should be afforded such learning opportunities as well. The current study did not focus on investigating the correlation between in-service training given to educators and their knowledge levels of ADHD. Studies by Vereb and Di Perna (2004) and Perold et al. (2010) found statistically significant correlations between educators' attendance of workshops on ADHD and their level of knowledge of ADHD. This positive correlation was supported by Kos (2008) who found that the more workshops educators attended, the more knowledge educators had on the disorder, compared to the educators who did not attend workshops. Future studies should further examine this correlation but based on previous studies, it would seem that attendance of workshops should be encouraged amongst educators.

The findings from the present study also imply that opportunities for gaining successful experiences with students with ADHD-related behaviours will increase educators' self-efficacy and knowledge levels regarding ADHD. Therefore, to some extent, educators' growth in ADHD is dependent on their experience and exposure to ADHD. According to Dilaimi (2013) educators can be expected to be exposed to at least one ADHD learner a year, therefore, it can be assumed that educators' confidence and knowledge levels will develop naturally over time. However, appropriate support is required in order for exposure to ADHD to be a positive learning experience and to translate to knowledge and confidence growth. Appropriate support would include being provided with up-to-date knowledge, as educators who have adequate knowledge about learners' characteristics, are more likely to be confident in their capabilities to meet the needs of these ADHD learners (Reid et al., 1994). Therefore, while educators may grow in knowledge levels and confidence as they are

exposed to more ADHD learners, there also needs to be some formal support in the form of training and development in ADHD.

6.4.2 Pre-service training

This study identified varying knowledge levels between the educators within this sample, which in some ways was attributed to different amounts of exposure to ADHD but also to varying amounts of exposure during in-service training, as well as pre-service training. Regarding educator training programmes, other studies reported that educators felt they did not receive adequate professional development opportunities during their undergraduate studies in education (Bell et al., 2010). One study found that 77% of practicing educators reported having no opportunity to learn about ADHD during their formal educator preparation training; and that they would benefit from extra training in ADHD (Bekle, 2004). Bekle (2004) further reported that just over half of the 77% of educators from the sample had received some form of in-service training related to ADHD, although it was reported to be brief. Similarly, Kos and colleagues (2004) found that 99% of their in-service educator participants reported that they would like to receive additional training regarding ADHD, as they felt their knowledge had gaps due to insufficient training during their study years.

Therefore, further study into the amount of exposure educators obtain pertaining to ADHD from tertiary training in South Africa needs to be investigated. Based on the findings of this research, the training of in-service educators should be supplemented with training in ADHD, as well as training in behavioural management and academic intervention (curriculum adaptations) with regard to children with ADHD. Pre-service educators should also be given the opportunity to work with ADHD learners during their practical teaching, so they can apply their newly learned skills and strategies. This recommendation follows from the results that were obtained in this study that educators' actual knowledge is related to exposure of children with ADHD.

6.4.3 Self-efficacy enhancement

Self-efficacy is defined as the positive beliefs that an individual has about their own abilities, which gives an individual confidence and conviction in themselves (Luthans et al., 2010). The strength and predictive value of self-efficacy in this study is supported by Bandura's

(1977) social cognitive theory, which argued that stronger efficacy levels lead to greater task initiation and persistence, while weaker self-efficacy produces task avoidance and less persistence. Therefore, self-efficacy could give rise to the initiation and persistence of knowledge exploring activities, which would in turn increase knowledge levels.

According to Bandura (1986), self-efficacy can be developed persuasion through learning experiences. The determinants of self-efficacy consist of the following sources of experience: 1) enactive mastery experiences, 2) vicarious experience, and 3) verbal (Bandura, 1986). Therefore, personal positive experiences with an ADHD learner may increase the self-efficacy levels of educators. As highlighted above this would depend on how many learners an educator is exposed to in her/his career which were coupled with adequate support. The second determinant, vicarious experience, suggests that educators can learn from each other's experiences of ADHD learners, including the types of interventions applied, teaching approaches, types of behaviour modification, knowledge around symptoms observed and so on. Educators should therefore be encouraged to share their experiences in order to learn from each other's efforts, mistakes and successes. Schools could set up support-group type forums that meet during the year, so as to encourage educators to support each other in this manner. The third determinant, verbal persuasion, involves self-efficacy growth through the verbal encouragement of those that surround educators, such as colleagues, management and outside professionals. In this way, an educator's ability to handle diversity and inclusion should be reinforced and affirmed, and their professional status should be highlighted. Areas of limitation in their knowledge should be viewed as areas of potential growth and not seen as deficits but challenges to further develop their professional status.

Determinants of self-efficacy and practical ways to foster growth in educators' confidence have been briefly examined in this section but it may be worthwhile to investigate this area in more detail, in another research study, given that this study only utilised one measure of self-efficacy.

6.5. Future research

The inclusion of the variable self-efficacy in this study was of an exploratory nature, and its positive association with knowledge of ADHD suggests the need for further research. An instrument that measures self-efficacy on multiple levels, through more than one question or item of an instrument, should be identified for such a study. This will provide more insight into the relationship between self-efficacy and knowledge of ADHD, as well as how to foster and grow educators' self-efficacy and knowledge of ADHD.

The amount of exposure educators obtain pertaining to ADHD during tertiary training in South Africa needs to be investigated. Based on the findings of this research, the training of in-service educators may need to be supplemented with training in ADHD, as well as training in behavioural management and academic intervention (curriculum adaptations) with regard to children with ADHD. However, further study of the different forms of tertiary training offered in South Africa to training educators needs to be examined, compared and critiqued, with the hope of increasing the knowledge of ADHD that training educators are exposed to during their undergraduate study.

Another aspect requiring further exploration is the impact that the school teaching phase and grade specialisation have on the level of knowledge of ADHD. This current study noted that international and national studies that have administered the KADDS have done so on educators from varying phases. To date, no study has compared whether phase or grade of educator influences the results obtained on the KADDS. To determine this, future studies could analyse and compare KADDS results from educators that teach in different phases (e.g., primary phase versus senior phase) to determine if the age and grade of the learners that educators work with, impact the amount and type of knowledge acquired about ADHD.

The current study found a positive relationship between educators' ADHD knowledge levels and their previous involvement in a referral process to a medical professional for a possible ADHD diagnosis. This variable does not seem to have been included in other studies involving the KADDS and therefore should be further investigated in future studies, so as to ascertain whether this association is common across settings.

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Appendix 1

DSM 5 Diagnostic Criteria for ADHD

As taken from: American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5 ed.). Arlington: American Psychiatric Publishing.

A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by (1) and/or (2):

1. Inattention: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely a manifestation of oppositional behaviour, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

- a. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g. overlooks or misses details, work is inaccurate).
- b. Often has difficulty sustaining attention in tasks or play activities (e.g. has difficulty remaining focused during lectures, conversations, or lengthy reading).
- c. Often does not seem to listen when spoken to directly (e.g. mind seems elsewhere, even in the absence of any obvious distraction).
- d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g. starts tasks but quickly loses focus and is easily side-tracked).
- e. Often has difficulty organizing tasks and activities (e.g. difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
- f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g. schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).
- g. Often loses things necessary for tasks or activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).

h. Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).

i. Is often forgetful in daily activities (e.g. doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

2. Hyperactivity and impulsivity: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

note: The symptoms are not solely a manifestation of oppositional behaviour, defiance, hostility, or a failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

a. Often fidgets with or taps hands or feet or squirms in seat.

b. Often leaves seat in situations when remaining seated is expected (e.g. leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).

c. Often runs about or climbs in situations where it is inappropriate. (In adolescents or adults, may be limited to feeling restless.)

d. Often unable to play or engage in leisure activities quietly.

e. Is often “on the go,” acting as if “driven by a motor” (e.g. is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).

f. Often talks excessively.

g. Often blurts out an answer before a question has been completed (e.g. completes people’s sentences; cannot wait for turn in conversation).

h. Often has difficulty waiting his or her turn (e.g. while waiting in line).

i. Often interrupts or intrudes on others (e.g. butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years.

C. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).

D. There is clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication nor withdrawal).

Specify whether:

314.01 (F90.2) Combined presentation: If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6 months.

314.00 (F90.0) Predominantly inattentive presentation: If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months.

314.01 (F90.1) Predominantly hyperactive/impulsive presentation: If Criterion A2 (hyperactivity-impulsivity) is met and Criterion A1 (inattention) is not met for the past 6 months.

Specify if: in partial remission: When full criteria were previously met, fewer than the full criteria have been met for the past 6 months, and the symptoms still result in impairment in social, academic, or occupational functioning.

Specify current severity:

Mild: Few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in no more than minor impairments in social or occupational functioning.

Moderate: Symptoms or functional impairment between “mild” and “severe” are present.

Severe: Many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning.

Appendix 2

Research Instruments utilised in this study

Demographic Questionnaire

Please supply the following information:

1. Sex (tick the relevant block)

Male	Female
<input type="checkbox"/>	<input type="checkbox"/>

2. Age in years (tick the relevant block)

20 -30	<input type="checkbox"/>
31-40	<input type="checkbox"/>
41-50	<input type="checkbox"/>
51-60	<input type="checkbox"/>
60+	<input type="checkbox"/>

3. How many years of total teaching experience do you have as a qualified educator? _____

4. How many years have you taught in the Foundation Phase? _____

5. How many years have you taught in the Intermediate Phase? _____

6. What Phase are you currently teaching in? _____

7. What Grade are you currently teaching? _____

8. List the degree(s) / diploma(s) / postgraduate qualifications that you have obtained:

9. Have you ever requested that a child is evaluated whom you suspected of having ADHD?

YES / NO (Circle the relevant answer)

If **YES**, please indicate approximately how many children you have referred for an evaluation based on your suspicions of them having ADHD?

Less than 5 children	
Between 5 and 20 children	
More than 20 children	

10. Have you ever taught a child who was diagnosed (by a psychologist or psychiatrist) with ADHD?

YES / NO (Circle the relevant answer)

If **YES**, please indicate approximately how many children you have taught who were diagnosed with ADHD.

Less than 5 children	
Between 5 and 20 children	
More than 20 children	

11. Please rate your level of confidence to teach an ADHD child on a 1 to 5 scale, where:

1= I have no confidence at all.

5 = I am very confident.

Place a tick on the line, where you feel your level of confidence is most accurately described by.

1

5

PLEASE TURN OVER THE PAGE TO THE QUESTIONNAIRE

Knowledge of Attention Deficit Disorder Scale (KADDS)

Please answer the following questions regarding Attention-Deficit/Hyperactivity Disorders (ADHD) by placing a tick (✓) in either the TRUE, FALSE or DON'T KNOW column. If you are unsure of an answer, respond "Don't Know" (DK), please do not guess.

		TRUE	FALSE	DON'T KNO
1	Most estimates suggest that ADHD occurs in approximately 15% of school age children.			
2	Current research suggests that ADHD is largely the result of ineffective parenting skills			
3	ADHD children are frequently distracted by extraneous stimuli.			
4	ADHD children are typically more compliant with their fathers than with their mothers			
5	In order to be diagnosed with ADHD, the child's symptoms must have been present before age 7			
6	ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population.			
7	One symptom of ADHD children is that they have been physically cruel to other people.			
8	Antidepressant drugs have been effective in reducing symptoms for many ADHD children.			
9	ADHD children often fidget or squirm in their seats.			
10	Parent and educator training in managing an ADHD child are generally effective when combined with medication treatment.			
11	It is common for ADHD children to have an inflated sense of self-esteem or grandiosity			
12	When treatment of an ADHD child is terminated, it is rare for the child's symptoms to return.			
13	It is possible for an adult to be diagnosed with ADHD			
14	ADHD children often have a history of stealing or destroying other people's things.			

		TRUE	FALSE	DON'T KNOW
15	Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction			
16	Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity			
17	Symptoms of depression are found more frequently in ADHD children than in non-ADHD children			
18	Individual psychotherapy is usually sufficient for the treatment of most ADHD children.			
19	Most ADHD children "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.			
20	In severe cases of ADHD, medication is often used before other behaviour modification			
21	In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).			
22	If an ADHD child is able to demonstrate sustained attention to video games or TV for over an hour, that child is also able to sustain attention for at least an hour of class or homework.			
23	Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.			
24	A diagnosis of ADHD by itself makes a child eligible for placement in special education.			
25	Stimulant drugs are the most common type of drug used to treat children with ADHD			
26	ADHD children often have difficulties organizing tasks and activities.			
27	ADHD children generally experience more problems in novel situations than in familiar situations.			
28	The majority of ADHD children evidence some degree of poor school performance in the elementary school years.			

29	Symptoms of ADHD are often seen in non-ADHD children who come from inadequate and chaotic home environments.			
30	Behavioural/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention			
31	Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD.			
32	Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.			
33	Research has shown that prolonged use of stimulant medications leads to increased addiction (i.e., drug, alcohol) in adulthood.			
34	If a child responds to stimulant medications (e.g., Ritalin), then they probably have ADHD.			
35	Children with ADHD generally display an inflexible adherence to specific routines or rituals.			
36	Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.			

Appendix 3

Permission granted by Professor Mark Scuitto to utilise the KADDS in this current study

21 January 2014

Dear Wendy

Thank you for your interest in the KADDS. I have attached a brief test manual, which contains information on the scale. It is not quite up to date, but it should give you some idea of the properties of the scale. Several recent studies have used the KADDS and we are currently finishing a cross-cultural study of educator knowledge in 9 countries (including South Africa), but we haven't had a chance to incorporate those data yet. If you would like to use the KADDS, I only ask that you send me a brief description of your study,

Best regards,

Mark

Mark J. Scuitto, Ph.D.

Department of Psychology

Muhlenberg College

Allentown, PA 18104

sciutto@muhlenberg.edu

Appendix 4

Permission granted by the Department of Education to conduct this study



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Enquiries: Sibusiso Alwar

Tel: 033 341 8610

Ref.:2/4/81/70

Miss WL Etchells
4 Strelitzia Terrace, Westwood Estate
Westville
3629

Dear Miss Etchells

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct research entitled: "FOUNDATION AND INTERMEDIATE PHASE EDUCATORS (GRADE R-6) KNOWLEDGE AND BELIEFS ABOUT FEATURES, SYMPTOMS AND DIAGNOSIS OF ADHD (ATTENTION DEFICIT HYPERACTIVITY DISORDER)", in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.
4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from 01 February to 30 June 2014.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Mr. Alwar at the contact numbers below.
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report / dissertation / thesis must be submitted to the research office of the Department. Please address it to The Director-Resources Planning, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to schools and institutions in KwaZulu-Natal Department of Education

Nkosinathi S.P. Sishi, PhD
Head of Department: Education
Date: 24 March 2014

KWAZULU-NATAL DEPARTMENT OF EDUCATION

POSTAL: Private Bag X 9137, Pietermaritzburg, 3200, KwaZulu-Natal, Republic of South Africa
PHYSICAL: 247 Burger Street, Anton Lembede House, Pietermaritzburg, 3201. Tel. 033 392 1004
EMAIL ADDRESS: kehlooliie.connie@kzndoe.gov.za; CALL CENTRE: 0860 596 363;
WEBSITE: www.kzneducation.gov.za

Appendix 5

Ethical clearance granted by University of KwaZulu-Natal's Human and Social Sciences Research Ethics Committee



23 April 2014

Ms Wendy Lorraine Etchells (204507457)
School of Applied Human Sciences – Psychology
Pietermaritzburg Campus

Protocol reference number: HSS/0267/014M
Project title: Foundation and Intermediate Phase educators' (Grade R-6) knowledge and beliefs about the features, symptoms and diagnosis of Attention Deficit Hyperactivity Disorder (ADHD)

Dear Ms Etchells,

Full Approval – Expedited

In response to your application dated 04 April 2014, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Dr Shamila Naidoo (Deputy Chair)

/ms

Cc Supervisors: Dr Mary van der Riet and Ms Carol Mitchell
cc Academic Leader Research: Professor Doug Wassenaar
cc School Administrator: Mr Sbonelo Duma

Humanities & Social Sciences Research Ethics Committee

Dr Shanuka Singh (Chair)

Westville Campus, Govan Mbeki Building

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Telephone: +27 (0) 31 260 3687/8350/4657 Facsimile: +27 (0) 31 260 4609 Email: ximbab@ukzn.ac.za / snymam@ukzn.ac.za / mohunn@ukzn.ac.za

Website: www.ukzn.ac.za

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Appendix 6

Information sheet given to school principals and educators regarding the nature of this study



Dear Participant

I am conducting research as part of my Educational Psychology Masters Degree. The study aims to investigate Foundation Phase educators' knowledge levels of ADHD (Attention Deficit Hyperactivity Disorder) and gain insight into what support structures educators consider important in assisting them to teach and better recognize learners with ADHD. You have been identified as a possible participant for the research as you are a Foundation or Intermediate Phase educator in Durban, which is the focus area for the conduction of this research. The findings of this research will be used to inform relevant stakeholders of further support structures that could enable educators to enhance the support they are able to give ADHD learners.

Data Collection Procedure

The data collection involves the single administration of a questionnaire, which should take approximately 15 to 20 minutes to complete. Instructions on how to complete the questionnaire are provided on page 1 of the questionnaire. You will also be required to fill in certain demographic information but this will be used for statistical purposes only.

Important information

Participation in the study is completely voluntary and you are allowed to withdraw from the study at any time. Refusal to participate in the study, or withdrawal from the study, will involve no consequence and for those that do participate, no monetary or material compensation will be provided. You will not be asked to provide your name and all information you do provide will be kept confidential. All completed questionnaires will be kept in a secure and locked cupboard in the office of the project supervisor in the Psychology Department at Pietermaritzburg College Campus, which only the researcher and the supervisor will have access to, in order to maintain confidentiality. After five years the data will be destroyed by shredding all the questionnaires that were administered and completed as part of the study.

The results of this research will be published as a Masters Thesis and made available within the UKZN library, as well as the National Research Fund's (NRF) archives for Masters Dissertations. However, full anonymity of participating educators and their schools will be maintained in all publications. If the findings of this research are published at any stage, through any other oral or written medium, full anonymity and confidentiality of participating educators and their schools will also be protected.

Contact Details

For any further information regarding this project or to discuss issues that may arise as a result of this research, please feel free to also contact the researcher or the project supervisor of the study. If you have any queries about the rights of research respondents please contact Ms. Phumelele Ximba in the Humanities and Social Science Research Ethics Office. For more information about ADHD, information about joining a local ADHD support group or local ADHD workshops that are on offer, the ADHSA website can be consulted (www.adhasadurban.com).

Name	Miss Wendy Etchells	Dr Mary VD Riet	Ms. Phumelele Ximba
Title	Researcher	Project Supervisor	UKZN Ethics Officer
Phone number	079 522 6639	033 260 6163	031 260 3587
Email address	Etchellsw@gmail.com	vanderriet@ukzn.ac.za	XIMBAP@ukzn.ac.za

Thank you for participating in this research, your valued contributions are greatly appreciated.

Kind regards,
Wendy Etchells

Appendix 7

Declaration of Consent

Declaration of Consent

I have been informed about the nature, purpose and procedures for the study-To investigate Foundation / Intermediate Phase educators' knowledge levels of ADHD (Attention Deficit Hyperactivity Disorder) and gain insight into what support structures educators consider important in assisting them to teach and better recognize learners with ADHD.

I have also received, read and understood the details about this study, including that:

- My participation in this study I completely voluntary and I can withdraw at any time, with no consequences.
- I am also aware that all information I provide will be kept confidential and that the data collected will be kept in a safe place to ensure this.
- I am understand that if I have any queries or concerns regarding this study, I have been provided with the details of the relevant people to contact.

Participant:

Signature

Date

Witness/ Research Assistant:

Signature

Date