

Assessing Attention Deficit Hyperactivity Disorder (ADHD) specific knowledge in educators and identifying demographic predictors pertaining to educators' knowledge of ADHD within the South African context

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ABSTRACT

Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most researched and controversial of all the childhood-onset disorders. It is also one of the most common disorders, with a high diagnosis rate in South Africa. Research over the last two decades shows a diagnosis prevalence rate of between 5 and 10%, thus making it one of the most commonly occurring disorders affecting South African children and adolescents.

Despite its high rate of prevalence, ADHD is a condition that is largely misunderstood amongst parents, educators, and even medical practitioners such as doctors. Research has shown that educators have a basic understanding of ADHD but are not familiar with the more complex details related to its symptoms, treatment and associated features. This raises concern as educators are uniquely placed in the system to perform an instrumental role in the process that leads to ADHD referral and diagnosis. Therefore, this study aimed to measure levels of general knowledge amongst educators in the areas of ADHD associated features, symptoms, diagnosis, and treatment. It also set out to identify if there were any demographic predictors relating to educators' level of ADHD knowledge. Knowledge levels were measured using the KADDS Knowledge of Attention Deficit Disorder Scale (KADDS), which is a questionnaire that measures an educator's level of ADHD knowledge using the categories mentioned above. The KADDS questionnaire was administered along with a demographic questionnaire to 172 educators from primary and secondary schools located in the central Durban area. A demographic questionnaire was also administered to the same sample.

Results from this study demonstrated that South African educators based in Durban had an overall level of knowledge rate of 47.14%. The scores obtained during this study fall within the average range of scores obtained from studies using the KADDS instrument, both nationally and internationally.

The possible relationship between educators' level of ADHD knowledge and their demographic characteristics was investigated using correlational analyses. The variable "sex", which refers to the biological endowment (male/female) was the greatest contributing variable of all the options used in this study. The female sex in this study were found to have greater knowledge of ADHD than their male counterparts. These findings are relevant within the South African context as mental health and the stigma it carries is a barrier to seeking knowledge and being educated on such disorders as ADHD.

The findings from this study contribute to the body of knowledge on levels of knowledge among educators in South Africa. Recommendations arising from this study include educators having increased exposure to pre-service and in-service ADHD related training. Educators also require practical experience and exposure to children suffering from ADHD, which will increase their understanding and knowledge of this disorder. Knowledge of self-efficacy as a variable, and its positive association with ADHD knowledge requires further exploration. Finally, it is recommended that further research is conducted on the role that gender plays in terms of the levels of ADHD knowledge among educators.

DECLARATION

This short dissertation was submitted in partial fulfilment of the requirement for the degree of Master of Social Science in Clinical Psychology (PSYC8CLHO, 96 CP) at the University of KwaZulu-Natal, Durban, South Africa.

I, Gina Sim, declare that the following research project, submitted for the degree of Master of Social Science in Clinical Psychology, is my own intellectual contribution. The contributions of other scholars have been appropriately cited and referenced. No part of this work has been previously submitted at any university.

Student signature:



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2 August 2021

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DEFINITIONS OF KEY CONCEPTS

1. Attention Deficit Hyperactivity Disorder (ADHD)

Attention Deficit Hyperactivity Disorder (ADHD) is the most common neurobehavioral disorder among children. It can profoundly affect the academic achievement, well-being, and social interactions of children (Wolraich et al., 2011). ADHD is defined as a persistent pattern of symptoms of inattention and /or hyperactive and impulsive behaviours that inhibit performance and completion of daily tasks (American Psychiatric Association [APA], 2013). The Diagnostic Statistical Manual (DSM) sets out the criteria which are used by clinicians to inform diagnosis of this disorder. According to the DSM, the diagnosis of ADHD requires the presence of ADHD characteristics before the age of 12. These characteristics must persist 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 settings must be present (APA, 2004).

2. Inclusive education

To address barriers to learning within the education system, South Africa has adopted an inclusive education policy. The framework for this inclusive education is laid out in Education White Paper 6, and the scope of the policy addresses the diverse needs of all learners who experience barriers to learning. The policy is based on the premise that all children have the ability to learn, and all learners who experience barriers to learning should be given the necessary support. Thus ensuring that all children are given the opportunity to reach their full academic potential (Dalton et al., 2012).

3. Knowledge of ADHD

Knowledge of ADHD entails understanding the behaviours exhibited by a learner with ADHD, the treatment used for ADHD and other associated features relating to ADHD. In addition, it encompasses understanding the various educational interventions used for children with ADHD. Knowledge of ADHD was measured using the Knowledge of Attention Deficit Disorder Scale (KADDS), the level of knowledge was determined by using the total score and the subscale scores (Sciutto et al., 2000).

4. Misperceptions

Misperception is defined by IXL Learning (2021) as “a wrong or incorrect understanding or interpretation”. Previous studies have indicated that teachers have incorrect ideas or beliefs about ADHD. An example of a misperception is taken from the study conducted by (Etchells, 2015), which reports that (87%) of educators did not know that there are no physical features which can be identified by doctors in making a definitive diagnosis of ADHD. Thus, making it a misperception. In this study, the term “misperception” is used to demonstrate that the particular belief or point of view teachers may have regarding an aspect of ADHD is incorrect.

5. Primary and secondary schools

School education in South Africa encompasses primary and secondary education. Primary education is spread out over six years. It is split into three phases (Foundation phase: Grade 0 to Grade R, Intermediate phase: Grade 1 to Grade 4, and Senior phase: Grade 6 to Grade 9). Secondary education consists of Grade 10 to Grade 12 (World Education Network, 2021).

The study sample comprised of educators from the Foundation phase through to the Secondary phase, which consists of children aged 6 to 18 years old.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is defined as a persistent pattern of inattention and or hyperactivity-impulsivity that disrupts the ability to complete daily tasks. Consequently, ADHD inhibits academic performance (American Psychiatric Association [APA], 2013). Children may display age appropriate symptoms of hyperactivity, distractibility and impulsivity, yet a child diagnosed with ADHD will present with these behaviours more frequently and persistently in such a way that their ability to function is hindered (APA, 2013). According to the fifth edition of the Diagnostic and Statistical Manual (DSM-5), in order to make a diagnosis of ADHD, the symptoms must have been present in the child before 12 years old and must persist for longer than a six-month period. In addition, the characteristics must be present in at least two settings, for example, home and school. To support the diagnosis, there should also be evidence of functional impairment in academic, social, or occupational domains (APA, 2013).

ADHD is one of the most common conditions of childhood. It is therefore concerning that previous research has shown that educators who are best placed to identify the symptoms of ADHD and are instrumental in the early detection of the disorder have shown limited knowledge and understanding of it.

Previous studies have investigated the assessment, associated issues and perceptions of ADHD (Alkahtani, 2013; Bradshaw & Kamal, 2013; Castenova, 2008; Dilaimi, 2013; Etchells, 2015; Guerra & Brown, 2012; Jaye et al., 2020; Lazarus, 2012; Perold et al., 2010; Scuitto & Feldhamer, 2005; Shroff, Hardikar-Sawant, 2017; Small, 2003; West et al., 2005). However, there is a dearth of studies that have measured the levels of knowledge that educators have on ADHD. This highlights the need to conduct research to understand the extent of this issue within schools. This study sought to identify factors contributing to this lack of knowledge and provide insights into this problem. Gaining this understanding is beneficial to understanding the factors affecting educators' level of knowledge. This will lead to a better understanding of the deficiency and identify educators characterised by low knowledge levels that may need more focused support. Similarly, this may help identify those who may be more knowledgeable, and in a better position to assist ADHD learners more effectively.

1.2 Rationale

ADHD is a controversial topic. Although research studies have been conducted on the topic, there is much that remains unknown or misunderstood about this disorder. The symptoms of ADHD, including inattention, impulsivity and hyperactivity become more apparent in the classroom. This places educators in a vantage position to identify ADHD learners and recommend them for assessment. Thus, parents rely on educators, yet studies have shown that educators often provide inaccurate and inappropriate advice to parents.

Educators have cited the number one obstacle they face in dealing with ADHD children is the lack of knowledge about the disorder. This research is necessary as educators play an important role in multiple stages of the process of helping children with ADHD. Therefore, understanding the level of knowledge educators possess on the disorder is vital to making the necessary recommendations and changes in the training and education that educators receive on ADHD.

1.3 Aims and objectives

The aim of the study was to assess Attention Deficit Hyperactivity Disorder (ADHD) specific knowledge in educators and identifying demographic predictors pertaining to educators' knowledge of ADHD, including knowledge of its features, symptoms and diagnosis within the South African context.

The objectives of the study were:

- 1) To measure the level of knowledge amongst educators based on three areas, which are ADHD associated features, symptoms/diagnosis and treatment of ADHD.
- 2) To identify demographic predictors of educators' knowledge of ADHD.

1.4 Research questions

The research questions were:

- 1) What are educators' level of knowledge of ADHD across the three areas, which are: ADHD associated features, symptoms/diagnosis and treatment of ADHD?
- 2) What are the demographic predictors of educators' knowledge of ADHD?

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is defined as a persistent pattern of inattention and or hyperactivity-impulsivity that disrupts the ability to complete daily tasks and inhibits performance (APA, 2013). Children may display age appropriate symptoms of hyperactivity, distractibility and impulsivity, however, a child diagnosed with ADHD will present with these behaviours more frequently and persistently in such a way that their ability to function is hindered (APA, 2013). According to the fifth edition of the Diagnostic and Statistical Manual (DSM 5), in order to make a diagnosis of ADHD, the symptoms must have been present in the child before they reach 12 years and must persist for longer than a six-month period. In addition, the characteristics must be present in at least two settings, for example, at home and school. To support the diagnosis, there should also be evidence of functional impairment in academic, social, or occupational domains (APA, 2013).

According to Smith (2017), ADHD has been one of the most commonly diagnosed childhood disorders since the 1960s. In the 1950s, children diagnosed with the disorder were often perceived as 'imperfect' and the first description of what we would now call ADHD was called 'hyperkinetic impulse disorder' (Smith, 2017). The information provided also states that behaviours of children diagnosed with the disorder were not different from those of normal children. This aspect could explain why the diagnosis rate of ADHD around the world has increased over time.

ADHD has continued to be the source of research over the years, yet ADHD is still largely misunderstood and surrounded by misconceptions. Alkahtani (2013) stated that research over the recent years has focussed on aetiology, assessment, and treatment of this disorder. Further, very few studies that focussed on the knowledge and misperceptions that educators have relating to ADHD were conducted over the years (Alkahtani, 2013).

Lack of research in this area is concerning because educators are often the ones who are instrumental in the process of providing information that leads to an ADHD diagnosis (Wolraich et al., 2011). Therefore, the classroom is an important place to identify the symptoms of ADHD in children.

This study was designed to assess South African educators' knowledge of ADHD, as well as the relationship between educators' knowledge of ADHD and demographic factors including level of education, teaching experience and gender. This chapter reviews the relevant literature across three main sections. The first section contains general information about ADHD, including a brief history of this disorder, symptoms of ADHD and their complexity, and the characteristics and diagnostic criteria of ADHD.

The second section comprises literature on ADHD and South Africa's education system. The education system was reviewed, including information on the responsibilities of educators working in inclusive settings.

The third section focuses on the findings of local and international studies conducted to ascertain the level of educators' knowledge of ADHD. Literature that seeks to identify individual factors that influence knowledge levels of ADHD, teaching experience, level of study, prior exposure to a learner with ADHD and personal confidence levels about teaching ADHD learners was reviewed.

The final section of the literature review is the theoretical framework for this study, which is Albert Bandura's (1976) Self-efficacy Theory.

2.2 General information on ADHD

2.2.1 The history and diagnostic criteria of ADHD

The concept of ADHD as defined in the DSM-5 (APA, 2013) is fairly recent. An analysis of literature on ADHD, shows that numerous authors have documented that children have been presenting with symptoms of inattention, hyperactivity, and impulsivity over the last 200 years (Lange et al., 2010).

Sir Alexander Crichton, a Scottish physician was the first to document details on a disorder that appeared to be similar to ADHD (Lange et al., 2010). Sir Crichton described the disorder as "incapacity of attending with a necessary degree of constancy to any one object" (Lange et al., 2010, p.242). According to Sir Crichton, the inability to attend could either be innate or caused by nervous disorders. The first treatment for hyperactivity was reported in 1937 by a medical director named Charles Bradley from a hospital in Rhode Island (Lange et al., 2010). These authors assert that the hospital in question treated children hospitalised with neurological

issues, emotional problems, and difficulties in behaviour and learning using stimulants. This discovery of stimulants in improving children's behaviour was based on a chance finding whereby it was originally used to treat headaches caused by necessary medical procedures for hospitalised children. It was concluded that the stimulants did not improve the headaches but caused a dramatic improvement in the children's behaviour and schoolwork (Lange et al., 2010).

Parker (2013) mentions that during the 1960s and thereafter, it became popular that inattentive and hyperactive children became popular subjects for research studies. These studies focused on identifying the characteristics that these children presented with, and the name given to children displaying inattentive and hyperactive characteristics changed throughout the years. Parker (2013) offers a list of names given to ADHD through the years including: Minimal Brain Syndrome (1940), Hyperkinetic Impulse Disorder (1957), Minimal Brain Dysfunction (1960), and Hyperkinetic Reaction of Childhood as stated in the DSMII (1968). In the 1980s the name Attention Deficit Disorder (ADD) emerged.

Smith (2017) remarks that ADHD progressed through the years with it being documented and altered in the various editions of the DSM. During this progression, the fifth edition of the DSM was published in 2013 amongst a haze of controversy and it served as a lens through which psychiatry was viewed. Smith (2017) indicates that a new biological and pharmaceutical age has been entered whereby mental illness is perceived in neurological terms and the treatment of these disorders depended largely on medicine.

Currently, there are three subtypes of ADHD. These are combined, predominantly hyperactive and impulsive, and predominantly inattentive type (APA, 2013). Research shows that the combined type and the predominantly hyperactive impulsive type constitute an estimated two thirds of the children with this disorder, globally (Parker, 2013).

Perold et al. (2010) states that the diagnosis of ADHD is generally made by a psychologist or medical practitioner using the criteria set in the DSM-5. According to Perold et al. (2010), the hyperactive-impulsive or inattentive symptoms should be present in at least two different settings. Examples of such settings are home and school.

2.2.2 Characteristics and core symptoms of ADHD

ADHD is a neurocognitive disorder which typically arises in childhood. Children with this type of disorder often have difficulty paying attention, controlling their impulses and organising themselves in such a way that they can accomplish their goals. The characteristics and symptoms shown by children with ADHD is outlined in the DSM-5 (APA, 2013) under the following three subtypes of ADHD: the combined presentation; predominantly inattentive presentation; predominantly hyperactive/impulsive presentation (Nolen-Hoeksema, 2014). The core symptoms of the three subtypes of ADHD are inattentiveness, impulsivity and hyperactivity.

(i) Inattention

DSM-5 comprises the diagnostic criteria for inattention, which forms part of the diagnosis of ADHD (APA, 2013). According to DSM-5, six or more symptoms of inattention must be present for 6 months and must impact the child's social/occupation and academic activities before a diagnosis can be made. APA (2013) explains inattention as an inability to pay close attention to detail, difficulty sustaining focus, an inability to listen, and follow instructions effectively, and difficulty completing and organising tasks. Further, it often manifests in loss of personal belongings and being easily distracted by external stimuli.

Inattention can be difficult to detect in children as it is not as visible as hyperactivity and impulsivity (Parker, 2013). Symptoms of inattention, which are easier to recognise are forgetfulness and distractibility. Children with inattention are often easily distracted by other stimuli such as noise or movement, and they are also reluctant to engage in activities that require sustained mental effort (Nolen-Hoeksema, 2014). Contrary to what is implied by inattention, children with ADHD are able to attend to tasks or activities that they have an interest in such as video games or watching television.

(ii) Impulsivity

According to the DSM-5, impulsivity is characterised by blurting out answers, inability to wait for their turn, interrupting others while they are talking and talking excessively (APA, 2013). According to Parker (2013), impulsivity refers to the inability to regulate one's emotions and behaviour. For example, children with ADHD act quickly and do not consider the

consequences of their actions or behaviour. This type of impulsivity can impact on friendships as children find their behaviour to be annoying over time, which can affect social relationships children with ADHD may strive to sustain.

(iii) Hyperactivity

According to the DSM-5, hyperactivity is characterised by constant fidgeting and restlessness, an inability to stay seated, running around and climbing when it's inappropriate and constantly on the go as if driven by a motor. Research shows that hyperactivity is often worse in younger children, and they do tend to slow down as they mature (Parker, 2013). Further, preschool children with ADHD are always moving around quickly from one activity to the next, and they are unable to complete a task without supervision. In elementary school, the level of hyperactivity changes from running to restlessness.

2.2.3 Assessment and diagnosis for ADHD

For a diagnosis of ADHD to be made, the following symptoms manifest: (1) inattention and (2) hyperactivity and impulsivity must have been present before the age of 12 and persisted over a period of at least 6 months (APA, 2013). Further, for adolescents and adults (17 years and older), at least 5 symptoms must be present. Children should present with at least six symptoms / behaviours from the list provided from either or both categories (APA, 2013). This list is provided to assist clinicians to identify typical ADHD symptoms. APA (2013) also states that the symptoms must be present in two or more settings for example at home and at school. The criteria for an ADHD diagnosis are attached as Appendix 5.

The diagnosis of ADHD is complicated. Often, it is difficult to make a differential diagnosis, as the symptoms of ADHD and other disorders overlap (Parker & Corkum, 2013). An example would be that when a child has a learning disability and they are faced with a difficult task, they may display inattention, which could be mistaken for ADHD. Pliszka (2008) suggests that clinicians should be aware that during the diagnostic process, they may have to deal with a broad range of psychiatric symptoms while assessing and treating ADHD in children. Parker and Corkum (2013) state that the assessment for ADHD should consist of: information on the child's developmental health, psychoeducational assessment, and clinical interviews with educators, parents, and the child. Although this is recommended it is not always followed (Parker & Corkum, 2013). Research shows that a large portion of clinicians rely on rating scales

for the diagnosis of ADHD and not the above mentioned assessment protocol (Chan et al., 2002). Whilst using standardised rating scales should be completed by the educator and a parent, it is imperative that they are not used by themselves as a diagnostic tool (Parker & Corkum, 2013). The information used on these rating scales relies on the educators and parents' observations and knowledge and then used by the clinician to assess if the behaviour is typical for the child's age and development, and if it is a disorder which prevents a child from functioning daily in multiple settings (Sue et al., 2013).

The goal is not only the diagnosis of ADHD, but that information gathered from assessment and key role players will then be used to formulate appropriate interventions used in treating the child (Perold et al., 2010). These authors confirmed the importance of educators in this process of completing assessments, being part of the screening for the disorder due to their proximity and daily interactions with the child in the classroom setting. This again reiterates the importance of assessing the levels of knowledge that educators possess on ADHD, to understand if they can competently contribute to this process.

2.2.4 Theoretical underpinnings of ADHD

ADHD is a disorder that has generated a large amount of research over the recent years (Soroa et al., 2013). Parker (2013) stated that most experts concede that ADHD is a biological disorder which can have multiple causes. For example, research shows that genetic, neurological, neurochemical, diet, and toxic factors can cause ADHD (Parker, 2013). Further, other factors such as familial functioning, medical conditions, and environmental conditions can also contribute to the developments of ADHD symptoms in some children (Parker, 2013).

Sue et al.(2013) explain that ADHD is a heritable disorder with a large portion of ADHD symptoms being explainable by genetic factors. Although no specific gene has been strongly linked with ADHD, the genes affecting the regulation of the neurotransmitter dopamine has been identified as an important contributing factor (Sue et al., 2013).

There are a few contributing factors which place children at a higher risk of having characteristics of hyperactivity and inattention (Parker, 2013). These factors include the consumption of alcohol during pregnancy. Secondly, prenatal or perinatal stress can result in brain dysfunction. Thirdly premature delivery or complications during pregnancy can also put

children at risk for ADHD. However, Parker (2013) maintains that there is no evidence to suggest that the birth or birth weight impacts children's vulnerability to ADHD.

Nolen-Hoeksema (2014) explains that difficulties in neurological functioning have also been cited as a cause of ADHD. ADHD symptoms of inattention, difficulties with planning and carrying out activities, and impulse control appear to be tied to abnormalities in the brain. For example, the prefrontal cortex is responsible for executive functioning, motivation, and behaviours. The striatum, which is important for memory and planning, may also be affected. Research confirms that the cerebral cortex is smaller in size in ADHD children, and therefore there is less connectivity between the various areas of the brain which influences, motor behaviour, attention, and memory (Nolen-Hoeksema, 2014).

Some research findings suggest that ADHD is triggered by the interaction of the child's biology and the environment, whilst it also indicates that it can be multifactorial disorder (Kern et al., 2015). Further, the disorder can be enhanced by a combination of genes and environmental risk factors, which include stressful life events or emotional disturbances. Environmental factors are relevant when one considers ADHD in the South African context, which has a high incidence of environmental factors such as poverty, crime, poor living conditions, and lead poisoning. Kern et al. (2015) recognise the socio-ecological model, which emphasises the importance of interactions between individuals and the various systems, which may encourage or hinder their development. They note that when this model is applied to ADHD, it highlights that children can not be viewed in isolation but rather as part of a larger system. Kern et al. (2015) state that when applying the eco-systemic model to the learner in a classroom setting, the symptoms of inattention can be attributed to factors that negatively impact the learner such as surrounding noise, teaching style, classroom size, socio-economic status and parenting styles. Given that educators form part of a child's "environment" at school, it is important to understand the educator, their knowledge, attitudes and perceptions that impact the interactions between the educator and child.

2.2.5 Prevalence of ADHD worldwide and within South Africa

According to Thomas et al. (2015), there is still much debate surrounding the diagnosis of ADHD and the claims that the disorder is both over and under diagnosed. These authors estimate that the prevalence of ADHD varies considerably between countries, which fuels further controversy. Numerous reviews and research has been conducted in order to gain an

accurate prevalence rate and to understand the factors that may impact the variations of statistics. The results of such research or these findings are presented below.

Guerra and Brown (2012) conducted a study in middle school educators in South Texas, which compared the level of knowledge educators have on ADHD in the following areas: general knowledge, knowledge of symptoms or diagnosis, and treatment. These authors reported that the prevalence of ADHD was estimated to be between 3 and 7% in the United States of America, predicting that there would be a minimum of one child per classroom with ADHD.

Perold et al. (2010) found that there was no indication of a prevalence rate in South Africa, although the ADHD support group in South Africa had estimated that 10% of school children were suffering from the disorder. Vrba et al. (2016) commented that the risk factors for ADHD in South Africa were highly prevalent as a result of exposure to high risk predisposing factors such as low socio-economic status, low income, lack of education, and lack of family cohesion among others. In addition, ADHD is prevalent but is possibly under diagnosed and undertreated, particularly in low-income settings (Vrba et al., 2016).

Polanczyk et al. (2007) conducted a study to understand the reason behind the various predictions of ADHD prevalence across the world. The study also set out to compute the worldwide prevalence of ADHD. The scope of the study included reviews of research conducted, books and articles from South America, North America, Africa, Asia, Europe, Oceania and the Middle East. The findings showed that the worldwide – pooled prevalence was 5.29% (Polanczyk et al., 2007). In addition, it was reported that geographic location played a limited role in the variation of ADHD prevalence statistics, and that the variability seemed to be explained mostly by the methodology used in the various studies.

The ADHD prevalence rate of 5.29% worldwide has been cited in numerous studies over the years (Danielson et al., 2018). These authors advised that in 2016, a study was conducted in the United States of America to estimate the national prevalence of parent reported ADHD diagnosis and treatment among children aged 2-17 years using the National Survey of Children's Health. An estimated 6.1 million children in the United States of America (2-17 years) had received a diagnosis of ADHD equating to 9.4%. This figure comprised ages 2-5 years (388 000 children), ages 6-11 years (2.4 million children), and ages 12-17 years (3.3 million children). However, the report from previous years had showed an increase from 7.8%

in 2003 to 9.5% in 2007, up to 11% in 2011/2 (Centres for Disease Control and Prevention, 2018).

Thomas et al. (2015) noted that the inconsistent prevalence rates shown in the studies may lead to suspicion about the diagnosis in general, especially considering the high rate of ADHD diagnosis, thus creating a stigma for those with the condition. Guilherme Polanczyk et al. (2007) explained that the wide variation can be explained by the lack of standardisation in assessment and diagnosis as administration and clinical application varies between cultures and even countries.

2.3 Interventions and treatment of ADHD

ADHD is the most widely studied mental disorder found in children and adolescents. However, it is still in the midst of much debate when it comes to its diagnosis and treatment (Dunlop & Newman, 2016). Kern et al. (2015) assert that although there is no quick fix for ADHD, the symptoms of the disorder can be managed by three intervention methods. These are medical interventions, behavioural interventions, and academic interventions.

2.3.1 Medical interventions

Over the years stimulants have been used to treat ADHD symptoms and these medications have received the most evidence based support to demonstrate their effectiveness (Sue et al., 2013). These authors noted that stimulants normalise the neurotransmitter functioning by increasing brain function in the frontal cortex, which increases attention and reduces impulsivity. Nolen-Hoeksema (2014) states that children who take stimulants for ADHD treatment have reported side effects such as reduced appetite, insomnia and feelings of being agitated. Kern et al. (2015) observed that there is conflicting evidence regarding the views educators have on the use of medication. On the one hand, some educators indicated that ADHD could be solely treated with educational interventions. On the other hand, other educators preferred the use of stimulants as medication. Perold et al. (2010) warned that, in the event that stimulation medication is used to treat children with ADHD, the children should be monitored, feedback should be provided, and this process should include the educators. This is vital in determining if the child is responding to the medication and if any side effects are being experienced.

2.3.2 Behavioural interventions

Kern et al. (2015) state the second intervention method is behavioural interventions for ADHD. These falls into two categories: 1) Changing antecedent events, which refers to changing behaviour prior to the specific behaviour that requires change. Examples of this are peer tutoring, altering assignments, or placing the child closer to the educator in the classroom. 2) Cognitive-behavioural approach, which refers to ensuing events that result in positive and negative consequences such as reward charts or removal of privileges or time out.

DuPaul et al. (2011) state that numerous antecedent based interventions have been used to prevent disruptive and inattentive behaviours from occurring. These authors suggest that educators review classroom rules, and it is recommended that the rules should be few in numbers and set out in a positive manner. An example is to set out the rules clearly, and they should be displayed in full view of all the learners. Further, the rules should be explained at the beginning of each year, and at intervals throughout the year. DuPaul et al. (2011) also suggested that educators should praise ADHD learners for following the rules. The other antecedent-based strategy identified by DuPaul et al. (2011) is to reduce task demands by adjusting the length or content of the tasks. These authors state that reducing the length of the task to match the attention span of the student may reduce disruptive behaviour. This strategy is often paired with the educator praising learners upon completion of the task. As learners show that they are able to cope with shorter assignments, the length of the assignments can be increased, thereby shaping tasks related to behaviour to match the other students in the classroom.

Research shows that when students are provided with choice-making they show higher rates of engagement and lower frequency of disruptive behaviours in comparison to when educators give them specific tasks (DuPaul et al., 2011). DuPaul et al. (2011) suggested that another example of an antecedent-based strategy is for the educator to provide the learners with task choices when given assignments. By using choice-making interventions, educators allow students to choose out of two or more presented options. The options given to the learners diagnosed with ADHD should all lead to the same outcomes in the end.

Nolen-Hoeksema (2014) asserts that behavioural therapies encourage goal directed and prosocial behaviours and seek to reduce or eliminate impulsive and hyperactive behaviours. This therapy engages parents or educators and children in obtaining rewards for following instructions or engaging in socially acceptable behaviours. Further, this reward system can

break the cycle of engaging negatively with ADHD children and teaches them to understand the consequences of their behaviours and therefore make less impulsive choices (Nolen-Hoeksema, 2014).

Consequence-based strategies have been an effective alternative, which aims to manipulate environmental events. It follows a specific behaviour, which aims to change the frequency of the behaviour (DuPaul et al., 2011). DuPaul et al. (2011) states the most common behavioural intervention for research particularly found in research literature is the use of contingent positive reinforcement, which takes the form of token reinforcement or educator praise. The program is such that learners will gain a token or praise each time they exhibit target behaviours (e.g., complete a task or display satisfactory behaviours). These tokens (e.g., stickers, points) can be exchanged at a later stage for access to preferred activities (for example, time on the computer or playing a game of their choice).

2.3.3 Academic interventions

Kern et al. (2015) identify the third intervention method as academic intervention that involves guidance from the educator or peer tutor. These authors advise that stimulant medication and behavioural interventions are proven to reduce ADHD symptoms and are also known to improve classroom behaviour, but they do not improve academic performance. It is therefore important that an intervention that improves the learners' academic skills is used. To do this, educators need to be given the skills to assist learners with specific academic strategies such as note taking or test taking.

Danielson et al. (2018) conducted a study exploring treatment methods used for children in the United States aged 2-17 years. These findings were gathered in conjunction with the 2016 National Survey of Children's Health. The study concluded that of children with ADHD, two thirds were being treated with medication and just under half were being treated using behavioural therapy and one fourth had not received either medical or behavioral treatment.

The American Academy of Pediatrics (AAP) (2020), recommends that treatment for ADHD should vary depending on the child's age. They proposed that pre-school children (4-5 years) should be treated with behaviour therapy as the first line of treatment. AAP (2020) suggests that in the event that behaviour therapy is not successful, then methylphenidate may be prescribed. They recommended that elementary school (6-11 years) children should be treated

using a combination of behaviour therapy and approved medications for ADHD. AAP (2020) also recommends that the school environment is considered as part of the treatment plan whereby classroom adaptations are provided. An example would be test modifications and preferred seating. Further, adolescents (12-18 years) should be treated using approved medication and behaviour therapy simultaneously (AAP, 2020).

Vrba et al. (2016) confirmed that based on studies such as the multimodal treatment study of children with ADHD (Hinshaw & Arnold, 2011), the results confirmed that pharmacological intervention using stimulants is more effective in treating the symptoms of severe ADHD than behavioural treatment alone. The same study illustrated that when behavioural therapy is used to supplement treatment, it is beneficial particularly in complex cases where there are comorbidities and/or psychosocial stressors. Behavioural therapy can assist in addressing disruptive behaviour, social skills, and improving academic achievement, and parent-child relations.

The most successful interventions are achieved when services (educational, medical, mental health and social support systems) combine and coordinate services (Sue et al., 2013). In addition, considering each child's unique characteristics as well as family and social circumstances contributes to the success of interventions.

2.3.4 Social relationship interventions

In addition to the most recognised interventions, it is important to assist ADHD children with skills on how to conduct their social relationships. Making and keeping friends is often difficult for children with ADHD, as they often experience obstacles with peer relationships (DuPaul et al., 2011). Children with ADHD respond aggressively to interpersonal problems. DuPaul et al. (2011) noted that due to the frequent association of ADHD with social relationship difficulties, interventions have been designed to address peer issues. These interventions will need to be implemented over an extended period in order to counteract the high risk of a problematic outcome. There is a dearth of studies that relate to interventions pertaining to social relationships with ADHD children especially in school settings. Social skills training has been conducted in outpatient clinics and therefore there is minimal school data beyond the ratings received from educators. The outcome of the interventions in the outpatient clinics showed that interventions are enhanced when strategies include maintenance and generalisation of effect.

2.4 The education system in relation to ADHD

2.4.1 Inclusion

Following the democratic dispensation that was introduced to South Africa in 1994, there has been a shift towards an inclusive society (South African Government, 1997). The White Paper on an Integrated National Disability Strategy issued by the Republic of South Africa stated that exclusion, which dominated the apartheid era, had contributed to the swing towards societal inclusiveness. This swing towards inclusivity has filtered down to Education and in particular special education. This resulted in the “Quality of Education for All” and White Paper on an Integrated National Disability Strategy (South African Government, 1997) being introduced in South Africa and starting a movement towards an inclusive society where all can participate without prejudice. Following this, Consultative Paper No.1 on Special Education (South African Government, 1997) shifted society towards inclusive training and education by stating that inclusive education would be established and although it would not be achieved instantly, the definitive first steps would be taken towards achieving this (Hay et al., 2001). This was the first step to confirm that inclusive education would be implemented and recognised in South Africa as imperative in the growth of the country.

Holz and Lessing (2002), stated that educators are not trained on how to identify or teach learners with ADHD. According to Kern et al. (2015), Education White Paper 6 encourages the inclusion of all learners into mainstream classes. It states that educators are the primary resource to ensure inclusive education for all learners. To achieve this, educators were required to acquire new skills, develop their skills, and expand their knowledge base. Holz and Lessing (2002) remarked that pre-service training programmes for educators do not provide the required skills to successfully implement inclusive education, and to address the needs of learners presenting with ADHD. These authors state that research has concluded that educators’ knowledge of ADHD is increased with exposure to learners with ADHD, whilst pre-service training can only create awareness of ADHD. It is therefore concluded that theoretical exposure is not sufficient to enhance an individual’s knowledge of ADHD. While the research acknowledges that educators are not qualified to diagnose the disorder, they are located at the forefront of recognising the symptoms of ADHD and sending children for further assessment. Kern et al. (2015) state that ADHD symptoms are heightened in the formal schooling environment due to its structure whereby learners are expected to meet the academic demands

of the classroom, the symptoms of hyperactivity and inattention manifest in this controlled environment.

2.4.2 ADHD and the South African context

Topkin et al. (2015) emphasise that educators are a vital source of information for the diagnosis and referral of learners with ADHD. These authors also remarked that educators play an important role in creating a classroom environment that is conducive to the emotional, academic and social success of learners with ADHD. They acknowledge that South Africa continues to face challenges particularly around unemployment, poverty and inequalities in economic and social spheres that include the education sector. Although progress has been made in improving education in South Africa, many schools in the country still have insufficient resources and poorly trained educators (Topkin et al., 2015).

To implement the much-needed changes to the South African education system, the new democratic government crafted policies and guidelines. For example, the Education White Paper 6 (Department of Education, 2001, p.6) states that, “all children and youth can learn and need support and that learners’ individual strengths need to be encouraged”. The aim of these guidelines is to ensure that the education system is inclusive, and therefore working towards a society that is based on social justice (Nel et al., 2013). Based on South Africa’s racial history and injustice, the guidelines in the Education White Paper 6 aim to address the imbalances of the past. One of these reforms would be to address the training of educators in classroom management. Classroom management is of paramount importance when dealing with children who have been diagnosed with ADHD, as this forms part of their treatment regime (Nel et al., 2013). Lopes et al. (2009) state that research conducted in South Africa, the findings show that educators have developed ways of engaging children with ADHD in alternative tasks such as sweeping or taking messages to other staff as a way to manage their classroom, thus giving these children the movement and variation they require. Davies (2010) contends that these activities do not feed into the idea of an inclusive classroom, stating that in the context of an inclusive classroom, educators should ensure that children with ADHD can participate in the classroom activities and the entire curriculum.

ADHD is a neurological disorder for which, the diagnostic criteria includes impulsivity, deficits in attending, and hyperactivity (Picton, 2021). This author advises that children with ADHD often live with co-morbid conditions such as learning disorders, hence, every area of

the child's functioning, especially academic ability, social skills and behaviour is affected. Therefore, such learners are very much in need of inclusive education.

Kern et al. (2015) conducted a study in Gauteng, South Africa on Foundation phase educator's perceptions of learners with ADHD. It was noted that whilst international studies have researched similar aspects of ADHD, these findings could not be used to generalise findings within the South African context due to the role that culture plays in one's perception of ADHD. Kern et al. (2015) observed that culture does not only relate to ethnicity but also to socio-economic status of the learner, which influences the schools they attend. Their hypothesis was that these differences would affect the educator's level of knowledge as it may impact the level of resources available to them in terms of training courses and learning materials. However, the findings of the study stated that "A comparison of the results indicates no significant difference in private and public-school educators' perceptions regarding the cause, interventions or incidence rate of ADHD" (Kern et al., 2015, p.3055).

It is relevant to consider the environmental factors within South Africa which can contribute to the development of ADHD. These contributing factors include poverty, lead poisoning, and inadequate living conditions (Kern et al., 2015). While the etiology and symptoms of ADHD are a distinct entity, it is possible that the stress which results from the high demands of modern day schooling, marital problems, unemployment, neglect from parents and substance abuse can cause children to display the symptoms of inattention in ADHD (Kern et al., 2015). Further, Kern et al. (2015) suggest that if one was to examine the home system or school environment, they may find that the child's behaviour is symptomatic of an issue in their environment and not a neurological disorder. As a result, the authors state that within the South African context, intrinsic and extrinsic factors need to be considered. The more prominent extrinsic factors are socio-economic barriers, lack of support services, rigid curriculum, and lack of parental support and involvement. Intrinsic factors include health difficulties, sensory integration disorder, learning problems, language, communication, and intellectual impairments. The findings indicated that inattention could be related to hearing impairments, which would then result in a child being disruptive and showing gaps in learning. In addition, a child who is visually impaired may produce work which is below the expected standards, and struggle with reading and paying attention. Children who struggle to process their sensory environment may not be able to focus on classroom activities, which exposes them to sights, sounds, and smells that could be distracting and they may appear inattentive.

Perold et al. (2010) explained that in South Africa, inclusive education is a reality and educators must manage a large number of students in one class. In addition, they should accommodate children with diverse needs, including those diagnosed with ADHD. To fully offer inclusive education, an educator should understand ADHD in such a way that they can create a positive learning environment for the children (Perold et al., 2010). According to Perold et al. (2010), this can be achieved by making adaptations to the curriculum, using different teaching styles and strategies, and setting realistic expectations. To achieve this, the educator requires ADHD specific knowledge in order to collaborate with parents and other role players in such a way that benefits the learners.

Topkin et al. (2015) conducted a quantitative study in Cape Town to assess primary school educators' knowledge of symptoms, treatment and managing classroom behaviour. The findings of the study indicated that educator's lack of knowledge of ADHD. This lack of knowledge is concerning as the educators play a pivotal role in the referral system and treatment of the disorder. The finding also showed that educators had little or no training on ADHD itself and also had no training or experience on how to manage the disorder in classroom settings. Educators reported that what they knew about the disorder was learnt through the media, which is often incorrect or not based on scientific research. It was concerning that the information the educators had was based on inaccurate information, which could then result in inaccurate referrals, incorrect advice to parents, and not being able to effectively handle children with ADHD (Topkin et al., 2015).

Sciutto et al. (2015) conducted a study using a multinational sample from nine (n=9) countries, which examined the relationship of prior exposure to ADHD training in relation to educators' misconceptions and knowledge on the disorder. The countries included in the study were Czech Republic, Germany, Greece, Iraq, The Republic of Korea, Saudi Arabia, South Africa, United States, and Vietnam. The limitation that using the same questionnaire cross-nationally as constructs like 'knowledge' can be complex was acknowledged (Sciutto et al., 2015). The study highlighted that there are explanations for differences found in scores across cultural groups, which can be attributed to factors such as media exposure, education, and socialisation. Based on the findings, recommendations that educator training should include content on common misconceptions about ADHD were made (Sciutto et al., 2015). These authors also recommended that training programs should incorporate direct exposure to children with

ADHD, as this experience and knowledge will enable educators to be a resource to parents during the diagnosis and treatment of a child.

2.4.3 Educators and their responsibilities relating to learners with ADHD

While inclusive education is being embraced in South Africa, there are challenges encountered by educators in the course of their work (Perold et al., 2010). For example, crowded classrooms are a reality in South African schools. In addition to the oversized classrooms, educators also need to cater for the diverse needs of all the learners. To embrace inclusive education, educators need to understand the diverse needs of the learners and cater for them. Perold et al. (2010) state that in order to achieve this, educators must be trained to teach learners with diverse needs, including special needs. The knowledge educators have enables them to arrange their classrooms in such a way that they can accommodate these learners with diverse needs. This increased knowledge will also improve the way the educator communicates with the learner, thus creating a positive relationship and avoiding labelling and stereotyping. Further, educators will have realistic expectations of the children, and assist them in feeling accepted and therefore building their self-esteem and confidence.

Alkahtani (2013) states that the focus of ADHD in the classroom should not be the diagnosis itself, the focus should be on the intervention plan used to assist the learner with ADHD. The importance of the educator's role in having accurate knowledge on ADHD, so that they can participate effectively in the intervention required to assist the learner cannot be overemphasised (Alkahtani, 2013). Further, educators play an important role in the assessment of learners with ADHD and provide support to parents.

Sikotane (2016) conducted a study in Mtunzini Circuit, KwaZulu-Natal, South Africa to explore the experiences of educators teaching learners with ADHD. The scope of the study was to determine if there was any training provided to educators relating to ADHD and the intervention strategies to be used by educators to teach classes comprising learners with ADHD. The findings from the study confirmed that educators found it difficult to teach learners with ADHD as their inability to concentrate and focus impacted their performance in the classroom. Educators felt that they did not receive adequate training on ADHD, which could assist them to manage learners with ADHD. Further, educators felt that they were responsible for the poor performance of learners with ADHD, indicating that they would prefer learners with ADHD to go to remedial or specialist schools as opposed to mainstream schools.

2.4.4 Educators' knowledge of ADHD

2.4.4.1 Defining knowledge of ADHD

According to Simpson and Weiner (1989), knowledge refers to the acquisition of information, either by informal experiences or formal instruction and the ways to use it. Perold et al. (2010) assert that having knowledge of ADHD means having skills and information acquired from experience and/or education. According to Alkahtani (2013), educators' level of knowledge on ADHD was related to their training and prior experience with ADHD. In addition, it was noted that there is a correlation between educators who had knowledge of ADHD and their increased confidence in teaching learners with such a condition. According to Soroa et al. (2013), the more knowledge an educator possesses on ADHD, the greater the benefit is to the learner. This benefit of knowledge is not only due to the key role the educator plays in the diagnosis and intervention plan but also the positive attitude they display towards the student based on a better understanding of ADHD.

2.4.4.2 Studies conducted internationally and in South Africa on educators' level of knowledge of ADHD

Funk (2011) expressed concern that since the implementation of the DSM-IV in 1994, only seventeen studies worldwide had attempted to assess educators' level of knowledge on ADHD. Among these, six studies involved United States of America (USA) educators, thus showing that the studies had been few and far between. Funk (2011) expressed concern given that educators were frequently involved in the assessment and treatment of learners with ADHD. In addition, educators also serve as a source of information on ADHD to the parents of ADHD children.

Research suggests that the incidence of ADHD has increased significantly over the past two decades (Youssef et al., 2015). These authors state that over the last 4 years, the majority of research relating to ADHD was conducted in the United States of America, which has led people to believe that the disorder is rooted in social and cultural factors, which may be unique to the United States of America. However, as the body of knowledge increases in this field, it is becoming evident that ADHD is a global concern (Youssef et al., 2015). Outlined below are studies conducted on ADHD in South Africa and internationally.

Sikotane (2016) conducted a study in KwaZulu-Natal on the experiences of educators teaching learners with ADHD. The author also raised concerns about the limited literature on ADHD in South Africa. The findings showed that educators did not have good experiences in teaching children with ADHD, and they cited a lack of knowledge as one of their biggest obstacles.

Perold et al. (2010) conducted a study in Cape Town to assess knowledge and misperceptions of ADHD among primary school educators. The findings showed that the educators had a lack of knowledge regarding ADHD and misperceptions regarding the long-term outcome of ADHD. According to Perold et al. (2010), more than 50% of children with ADHD continue with the disorder well into adolescence and even adulthood. Therefore, holding the view that children will outgrow the disorder may result in educators overlooking the seriousness of the disorder. When educators understand the long-term risks of the disorder, it is highly possible that they can understand the importance of creating the environment required to assist learners with ADHD academically, socially, and emotionally.

A study conducted in the United States of America by Guerra and Brown (2012) found that ADHD training did not form part of the formal training required for one to become an educator. The findings show that educators with continued exposure to learners with ADHD had an increased level of understanding and knowledge on the disorder. In addition, educators who have more knowledge on ADHD are more likely to display a less negative attitude towards learners with ADHD and will also be less likely to label them, consequently. Guerra and Brown (2012) recommend that educator development training should be carried out in schools to improve knowledge and understanding of ADHD, thus improving the experience of learners. In addition, knowledge sharing is recommended whereby more experienced educators can share their knowledge with less experienced educators..

Alkahtani (2013) conducted a study on educators' knowledge and misconceptions of ADHD using a sample of 429 educators in Riyadh, Saudi Arabia. Overall, three major findings emanated from the study. Firstly, the educators' scores were low, which indicates a lack of knowledge regarding ADHD. Secondly, there was a positive correlation between the level of knowledge educators had and their prior training and experience with ADHD. Lastly, the educators' level of knowledge correlated positively with their level of confidence in teaching learners with ADHD.

Sciutto et al. (2015) conducted a study across nine countries examining educators' prior ADHD training experience (workshops, coursework, articles). It focused on the variables, which may contribute to knowledge on ADHD. To measure the training attended, an ordinal response was used to get broad estimates of prior ADHD training. The knowledge scores obtained correlated with prior exposure variables. These variables were: years of teaching experience, personal experience with the ADHD population and professional training. The findings showed that professional training was a predictor of knowledge on ADHD in five of the eight countries. Educators who had prior training in the form of workshops, courses or articles read scored higher on their level of knowledge. In addition, the finding showed that the type of training the educator engaged in also seemed to be a better predictor than others. An example taken from the study is that the United States of America showed that reading professional literature was a substantial predictor of knowledge whereas courses and workshops were not. Further, knowing someone with ADHD was a predictor of greater knowledge in five of the eight countries. Sciutto et al. (2015) also found that years of teaching experience were also a predictor of knowledge in four countries, the United States of America, South Africa and Saudi Arabia and the Republic of Korea was negatively associated with knowledge. Further, educational interventions with educators were confirmed by the modest levels of overall knowledge displayed in the results of this study. The results also indicated that interventions need to be different across countries.

2.4.4.3 The KADDS instrument and the performance across the subscales

The Knowledge of Attention Deficit Disorder Scale (KADDS) instrument was developed by Professor Sciutto in the United States of America (Sciutto et al., 2015). This 36-item questionnaire is designed to measure educators' level of knowledge and misconceptions of ADHD. The questionnaire is divided into three main areas: (1) associated features, (2) symptoms and diagnosis of ADHD and (3) treatment of ADHD. Studies that have utilised KADDS have mostly analysed the findings using these three main areas.

Associated features

Research suggests that the associated features subscale which includes knowledge of the nature, causes and outcomes of ADHD is an area where educators have performed poorly. In studies conducted by Castenova (2008) and Kleynhans (2005), observed the highest portion of 'don't know' and incorrect responses in this portion of the subscale. Lazarus (2012) states that

educators did not know how the diagnosis of ADHD is conducted. For example, findings showed that educators were unaware that there were no physical features that could be identified by medical doctors to arrive at a definite diagnosis. Relevant literature showed sizeable gaps in educators' knowledge on the epidemiology and aetiology of ADHD, which covers the genetic link to the disorder and the factors which could predispose a child to ADHD (Perold et al., 2010).

(i) Symptoms and diagnosis of ADHD

The literature confirms that educators are more knowledgeable on the primary symptoms of ADHD in comparison to knowledge about general features and treatment of ADHD, which is covered in the other sub-scales (Perold et al., 2010; Sciutto et al., 2015; Kleynhans, 2005). Research indicated that higher scores were obtained by educators in this sub-scale, thereby indicating that educators are familiar with the basic symptoms of ADHD, which has been attributed to the educators interacting with the children on a regular basis (Small, 2003; Lazarus, 2012). In a study conducted in South Africa on Foundation phase educator's perceptions of ADHD, it was found that educators were not able to detect the distinction between ADHD and inattention (Kern et al., 2015). Therefore, inattentiveness which could be caused by outside factors is identified by educators as ADHD without considering the other diagnostic criteria (Kern et al., 2015).

Topkin et al. (2015) reported findings which showed that educators were more knowledgeable regarding the associated features of ADHD opposed to the symptoms, diagnosis and treatment of ADHD. The findings also indicated misconceptions about ADHD such as children with ADHD have a higher self-esteem and that a diet high in sugar had an effect on ADHD.

(ii) Treatment of ADHD

Various studies have identified a lack of knowledge in the treatment sub-scale of the KADDS questionnaire (Lazarus, 2012; Sciutto et al., 2015; West et al., 2005). Lazarus (2012) provides an example of this where the findings show that less than 33% of the items relating to the sub-scale were answered correctly. However, findings on whether educators have less knowledge about the treatment of ADHD in comparison with the other two sub-scales (symptoms/diagnosis and associated features) is inconsistent across the various studies reviewed. The findings from the study conducted by Guerra and Brown (2012) showed that

educators scored less on the associated features (47%) sub-scale than the treatment (57%) sub-scale. In studies by West et al. (2015) and Lazarus (2012), educators showed the least knowledge about treatment strategies for ADHD. There were items in this subscale showing that educators were becoming aware of treatment methods that were supported by empirical evidence. An example of this would be that educators are aware that a combined treatment of medication and interventions in the classroom is more effective (Castenova, 2008; Garcia, 2009; Kleynhans, 2005; Lazarus, 2012). Mowbray (2003) suggests that educators favour the medical model when it comes to addressing the symptoms of ADHD due to the quick results they achieve.

2.5 Educators' demographic characteristics and how they predict knowledge of ADHD

Demographic characteristics have been used in a few studies to determine if there are any important factors that may influence the level of knowledge educators have on ADHD. This would assist in providing information on demographic characteristics that predict higher levels of knowledge and therefore put these groups of educators in a better position to assist learners with ADHD (Etchells, 2015).

(i) Years of teaching experience

Guerra and Brown (2012) state that although one might expect that an increase in teaching experience would increase the levels of knowledge educators have on ADHD, this is not necessarily the case. A large portion of research over the years has found that the educators' level of experience does not correlate with their actual level of knowledge (Alamri, 2014; Guerra & Brown, 2012; Kos et al., 2006; Lazarus, 2012; Perold et al., 2010; Kleynhans, 2005; Small, 2003). Sciutto et al.'s (2000) findings show that in contrast to the above, there was a small correlation between the number of years experience and an educators level of knowledge. Sciutto et al. (2015) confirmed that prior exposure to or personal contact with an ADHD learner was a predictor that the educator would possess a higher level of knowledge on ADHD. Further, educators who had taught a child with ADHD showed a higher level of knowledge on the disorder. In addition, it was found that educators who had a family member or close friend who had been diagnosed with ADHD further increased the likelihood of their tendency to have a

higher level of knowledge on ADHD at a personal level regarding the symptoms, diagnosis, and treatment of the condition.

(ii) Level of education obtained

The level of education obtained poses a question on whether an educator with a more advanced level of education will have more knowledge of ADHD. Findings on this aspect have been inconsistent. Previous studies conducted found that there is no association between these variables (Guerra & Brown, 2012; Scuitto et al., 2000; Small, 2003; Etchells, 2015). Other studies have yielded a small but statistically significant positive relationship between educators' level of knowledge on ADHD and their education level (Perold et al., 2010; Ghanizadeh et al., 2006). This variation of results could be due to the quality and content of coursework on ADHD provided by the different institutions (Dilaimi, 2013). In addition, it is suggested that the knowledge that educators gain regarding ADHD is gained during their classroom experience and not through training at college or university (Kos et al., 2004). Scuitto et al. (2000) found that educators who were already teaching had greater levels of knowledge on ADHD when compared with educators who had not yet begun teaching. These authors suggested that as a result of this finding, training or university education was not a guarantee for better knowledge on ADHD.

(iii) Educator self-efficacy

Research has confirmed that an educators' level of knowledge on ADHD is correlated with their self-efficacy with regards to teaching a child with ADHD (Etchells, 2015). Bandura (1986, p.479) described the concept of self-efficacy in his self-efficacy theory as "...concerned with beliefs in one's capabilities to mobilise the motivation, cognitive resources, and of courses of action needed to meet given situational demands". In addition, self-efficacy also includes self-belief, which in turn affects task choice, level of effort and performance. There is a correlation between educators' level of knowledge and their self-efficacy, which is also referred to as self-confidence (Scuitto et al., 2010). These authors studied this by asking educators in a study to rate their confidence levels by using a 7-point Likert scale. It was during this exercise that they found a positive correlation between educators with a high level of knowledge of ADHD and those that had rated themselves as confident to teach learners with ADHD, as opposed to those who lacked knowledge and confidence to teach learners with such a condition.

2.6 Educators' perceptions and misconceptions

Kern et al. (2015) contend that while there have been studies that have specifically focused on educators' perceptions of learners with ADHD, it is vital to note that there are aspects of one's perceptions that are influenced by experience, knowledge and prior learning. Numerous studies confirm that a common misconception that educators have of ADHD is that reducing a learner's intake of sugar or food additives will reduce symptoms of ADHD, which shows that educators incorrectly believe that diet affects ADHD symptoms (Alkahtani, 2013; Perold et al., 2010; Sciutto et al., 2015; Etchells, 2015). The major concern with educators who hold inaccurate knowledge on ADHD is that a person without knowledge is cautious and may seek information, yet a person who holds inaccurate knowledge will not necessarily seek new information and may give incorrect advice (Perold et al., 2010).

Alkahtani (2013) avers that another misconception is that children with ADHD have an inflated sense of self-esteem or grandiosity, hence, a large portion of educators incorrectly believe that children with ADHD have an inflated self-esteem. This misperception displays ADHD children in the wrong light as the characteristic of inflated self-esteem or grandiosity relates to the diagnosable disorder namely Narcissistic Personality Disorder (APA, 2013).

According to Sciutto et al. (2015), another misconception is that a large number of educators responded inaccurately to the statement that children with ADHD display inflexible adherence to nonfictional routines or rituals. These authors stated that this behaviour is more commonly found in children with autism spectrum disorder. There is concern that this belief may result in educators attributing any negative or problematic behaviours to ADHD, thereby increasing and reinforcing the stigma associated with this disorder. This misconception highlights the confusion that educators have between ADHD and autism. It is uncertain if these reflect a stigma or misconception about ADHD and autism, but it is likely that these beliefs will have an impact on the help-seeking process (Sciutto et al., 2015).

Another common misconception is that long-term use of stimulants will lead to possible drug abuse or addiction in adulthood (Sciutto et al., 2015). Although this misconception was relatively high, there was variability across countries. This variance is not surprising when one considers that the idea of taking medication is embedded in cultural worldviews.

2.7 Theoretical framework: Social Cognitive Theory/Self-Efficacy Theory

The Social Cognitive Theory posits that human behaviour is “extensively motivated and regulated by the ongoing exercise of self-influence” (Bandura, 1991, p.248). This theory states that individuals are not autonomous agents; neither are they controlled by environmental stimuli, but that they make casual contributions to their own motivations and actions (Bandura, 1989). The theory suggests that individuals have some control over their feelings, thoughts, motivation and actions, which is called human agency (Bandura, 1977). Schunk and Pajares (2016) state that the Social Cognitive Theory is rooted in the concept of human agency, which implies that individuals that have invested in their own development, can therefore determine the result of their actions. Individuals have certain capabilities and characteristics that define what it means to be human. These primary capabilities and characteristics are the ability to plan alternative strategies, symbolise, self-regulate, self-reflect and learn through experience. Bandura (1991) proposed that the ability to self-reflect is of distinct importance from the lens of the Social Cognitive Theory.

Applying the Social Cognitive Theory to the educators in this study, educators have the ability to self-reflect on their level of knowledge on ADHD and their levels of comfort in dealing with, and teaching children with this disorder. This can also be applied to how they rate their performance as educators of ADHD children and using this information for assessing self-efficacy because these interpretations are tangible indicators of one’s capabilities. If the educator believes he/she is confident and knowledgeable, that should raise self-efficacy and those who do not have the positive attributes, their self-efficacy is likely to be lower than that of their counterparts.

Based on Bandura’s (1977) Self-efficacy Theory, one can assume that the level of confidence an educator has to deal with a learner with ADHD within the learning environment is shaped by the confidence they have in their ability to execute appropriate inclusion strategies. It can also be said that educators with high self-efficacy beliefs regarding their ability will be more confident, and therefore open to accepting learners with ADHD in their classroom. Furthermore, educators who were highly efficacious would be less avoidant when it comes to difficult situations and they would be more inclined to explore various intervention strategies, even if this may be time-consuming. Therefore, having high efficacy levels will influence the development and acquisition of increased levels of knowledge.

There is a complex association between self-efficacy and knowledge, which has been identified. Educators with higher levels of knowledge on ADHD tend to become more confident when teaching or working with ADHD learners. This demonstrates the important relationship of how greater levels of confidence in educators translates to greater levels of knowledge and greater levels of knowledge translates to higher levels of confidence in working with ADHD learners. It is therefore suggested that unless educators have both self-efficacy and knowledge, they are not likely to make the necessary concessions and interventions necessary for learners with ADHD to prosper in the classroom (Etechells, 2015).

2.8 Conclusion

This study was designed to assess educators' levels of knowledge on ADHD, including its features, symptoms and diagnosis within the South African context. In addition, the study aims to identify the demographic predictors of educators' knowledge. As mentioned in this review of extant literature, ADHD is highly prevalent amongst school-aged children, and it continues to be the topic of much discussion and research. Despite this, ADHD remains exceptionally controversial and largely misunderstood.

The literature shows that educators who are the key role players in the detection, referral and treatment of ADHD in school age children show a considerable low level of knowledge on the disorder. This lack of knowledge filters through in the attitudes of the educators when dealing with learners with ADHD in the classroom. It also hinders the educators' ability to identify the symptoms of ADHD in learners and recommend them for assessment. Their lack of knowledge also inhibits their ability to communicate effectively with the parents on the facts of the disorder, thus resulting in parents obtaining incorrect information. There is a risk that early detection is imperative with ADHD in order to ensure that it is treated effectively. Another risk factor regarding educators' low level of knowledge is that learners with ADHD require educators to provide classroom interventions which can assist learners to make progress, academically and socially. Without the relevant knowledge and skills, they are unable to provide the correct environment for learners with ADHD.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter describes the research design and methodology used in this study. For Blanche et al. (2006, p.6), “methodology specifies how researchers may go about practically studying whatever they believe can be known.” The primary purpose of this chapter is not to define methodology but what is important is that the methods and techniques used in the study are described to portray a clear picture of how the data were collected and analysed (Shumba 2018). The research setting and rationale for the study will also be described whilst providing a justification for the research design considered to be best suited for this study.

The chapter will describe the research paradigm and design as well as the methods and techniques used to collate the sample for the study. It also covers the presentation and analysis of the data.

3.2 The study context: South Africa

South Africa is a county situated in the most southern tip of the African continent with a population of approximately 58.56 million (World Bank, 2021). The country is divided into nine provinces and 52 districts. This study was conducted in one of the districts, namely Umlazi district which is situated in Durban, KwaZulu-Natal Province.

The South African context is described to enable the reader to understand the various factors that may impact the participants’ ability to perform optimally in the study. The first consideration is that South Africa has eleven official languages. In addition, the context refers to a country with a deeply traumatic history and a society which has been left fragmented and is still riddled with oppression and discrimination. South Africa also has a high rate of unemployment, with a rising crime rate and many portions of the population remain uneducated and thus come from vastly different socioeconomic backgrounds. In South Africa, nearly 17% of the population lives below the international poverty line, whilst 30% of the population rely on social grants as their primary income (Heitmeyer et al., 2019). All these factors impact the study and need to be considered when disseminating the findings.

3.3 Research paradigm and design

As stated by De Vos (2005), it is of paramount significance that all scientific research is conducted within the confines of a given paradigm. The research paradigm is a set of assumptions and beliefs which serves as a framework that then guides the researcher when conducting the study (Jonker & Pennink, 2009). It is important that the researcher should indicate the specific paradigm chosen for the study and motivate such a choice. Further, the choice of the paradigm will also influence the research methodology (Wahyuni, 2012). The current study uses a quantitative approach and it is located within a positivist paradigm. The positivist paradigm reflects that social research should be undertaken using a rigorous scientific method, which involves the collection of data that is obtained from the direct experience or observation of an objective, value-free and uninvolved knower (Atkinson & Hammersley, 1994). The positivist paradigm is of relevance to the current study as it believes in generalisation but also admits that knowledge is a result of social conditioning (Wahyuni, 2012). The adopted paradigm fits with the study's topic and research questions.

The current study employed a descriptive design. A questionnaire was used to facilitate the collection of data from a sample. The data were analysed using descriptive statistics. The quantitative methodology allows for results to be generalised. This method facilitated the collection of data from many individuals who met the selection criteria for the study and then used the statistics to generalise the results. This method assists in reducing a complex phenomenon to a limited number of variables.

The research design serves as a road map that illustrates the path linking the research question to the implementation of the study. From a quantitative perspective, the researcher uses numerical data, which falls into several categories. These categories are clearly defined in order for other researchers to draw similar results (Wahyuni, 2012). The quantitative research design was primarily determined by the type of questions the study set out to answer. As stated by Carter and Little (2007), "Methodology shapes and is shaped by research objectives, questions, and study design" (p.1316).

3.4 Study sample

The study requires a "sample" of the population, which is representative of the larger population. As the entire population cannot be sampled, a sampling technique must be

employed to select respondents that are representative of the study's target population (Acharya et al., 2013).

This study was conducted using the non-probability, convenience sampling technique. As stated by Acharya (2013), "non-probability samples are those in which the probability that a subject is selected is unknown and results in selection bias in the study" (p.332). Convenience sampling is used in a study based on it being convenient for the researcher. Acharya (2013) states that respondents in this sampling technique are chosen as they are at the right place at the right time and meet the inclusion criteria required for the study (Acharya et al., 2013; Neuman, 2014). Convenience sampling method was used in this study as the researcher required the respondents to be conveniently located, and they met the inclusion criteria. They were educators within a specific geographical location.

During the sample selection process, a list that was obtained from the Department of Education (DoE) comprising government and private schools in the study setting was used. This list was narrowed down to primary and secondary schools located in the Durban metropolitan area and Umgeni north area. This area forms part of the central Durban area, located in the Umlazi district of KwaZulu-Natal. The main factor considered when selecting the schools was accessibility. In addition, no preference was given to any demographic characteristics. For example, willing educators in the participating schools were used. The sample comprised 172 respondents who were educators from primary and secondary schools located in the central Durban area.

3.5 Data collection

The survey method of data collection was used in this study. It is consistent with quantitative approach (Neuman, 2014). This method was chosen as it enabled the researcher to collect the same information or standardised responses from each respondent. It also enabled the researcher to cover a large sample of people at one time and to obtain results which are not influenced by the researcher. Further, survey method was advantageous because the data collection instrument could be administered at school by the principal, which made it a time efficient option.

Research involving schools in South Africa requires approval by the Department of Education (DoE). As part of the research protocol, gatekeeper permission in the form of a letter which

must be presented to the principals of the school prior to the research being conducted must be secured. As such the researcher requested such permission from the DoE. The DoE granted permission to conduct the research (Appendix 4) and ethical clearance was granted by the University of KwaZulu-Natal's Humanities and Social Sciences Research Ethics Committee (Appendix 1).

Equipped with the gatekeeper's letter and the ethical clearance, the researcher began to introduce and present the research plan to the principals of the schools that were selected for inclusion. This marked the first phase of data collection, as the principals of the schools were contacted firstly through electronic mail (email) (Appendix 8) to explain the nature of the research and ascertain whether they would be interested in participating in the study. Upon agreement, a personal visit was made to the school to hand deliver the documents: questionnaires (Appendix 2), information sheet (Appendix 6) and respondents informed consent form (Appendix 7). Detailed information was given verbally and in writing (Appendix 9) to the principal regarding the completion of the questionnaire to ensure uniformity throughout the study. Principals were advised that the researcher was available at any time for assistance during the administration of the research instrument.

Principals were requested to carry out the following procedures when administering the research questionnaire to educators: 1) The principal to sign the informed consent form (Appendix 10) to give permission for the school and its educators to be used in the study; 2) Educators can only participate in the study if they qualified, with the relevant degree/diploma; 3) Each respondent is to be handed an information sheet (Appendix 6) explaining the scope of the study, they should also be given a consent form (Appendix 7) which documented their consent to participate in the study and the KADDS questionnaire (Appendix 2); 4) The questionnaire is to be administered in a controlled environment where no discussion may take place and no resources are permitted; 5) Once completed, the researcher will collect all the documents from the principal.

Data collection occurred during December 2018 and January 2019. There were 40 schools that were approached to partake in the research, but only 5 schools responded giving consent for the study to be conducted. Once the school had given consent, the questionnaires were delivered to the principal. A total number of 172 questionnaires were completed, returned and declared usable.

3.6 Research instrument

This section focuses on the study's research instrument. When using quantitative methods of research, the researcher is required to use a pre-constructed standardised instrument which has pre-determined response categories. The advantage of this method is that it allows the researcher to measure responses from a number of participants to a limited set of questions. This method allows the researcher to obtain broad and generalisable results. This approach uses a deductive approach and therefore does not provide insight into the respondents' personal experiences. The method used for quantitative data collection is to use questionnaires, surveys and systematic measures which involve numeric data (Yilmaz, 2013).

The instrument used in this study to examine the levels of educators knowledge is named "Knowledge of Attention Deficit Disorders Scale" (KADDS), which was developed by Professor Scuitto (Scuitto & Feldhamer, 2005) (Appendix 2). This research instrument was chosen because it was developed and tested to measure and assess important domains of ADHD knowledge amongst educators. The domains of knowledge covered are associated features, symptoms, diagnosis, and treatment. The purpose of the scale was also to distinguish between lack of information about ADHD from incorrect beliefs about the disorder (Scuitto, 2005).

3.6.1 Demographic questionnaire

The demographic details of the sample were deemed important to understand the background and context of the results. Therefore, the questionnaire included the demographic details of each respondent. Given that the study used such a diverse sample, the demographic data was used by the researcher to determine demographic predictors relating to increased/decreased ADHD knowledge. The demographic details requested in this study using the KADDS instrument were sex, race, highest level of education, and teaching experience.

3.6.2 The Knowledge of Attention Deficit Disorders Scale (KADDS)

The "Knowledge of Attention Deficit Disorders Scale" (KADDS) was developed by Professor Scuitto and has been previously administered in numerous international studies (Scuitto & Feldhamer, 2005). In order to understand the relevance of this instrument, a detailed explanation is provided below. KADDS is a 36 item rating scale constructed to assess important domains of ADHD knowledge among educators. The domains of ADHD knowledge covered

in the questionnaire are: symptoms/diagnosis of ADHD, the treatment of ADHD, and associated features. Each KADDS item is phrased by making a statement in relation to ADHD and then it provides true (T), false (F) or don't know (DK) response options. The use of the third option 'don't know' enables the researcher to differentiate between what the educators don't know opposed to what they incorrectly believe. The purpose of the scale was also to distinguish between lack of information about ADHD from incorrect beliefs (misconceptions) about the disorder (Sciutto & Feldhamer, 2005). Permission and authorisation to use the KADDS was granted by Prof Sciutto through email communication (Appendix 3). The scale has not been adapted for use in South Africa but was used in this study as there were no other appropriate, locally developed instrument.

The KADDS was developed to measure knowledge and misconceptions of ADHD in three specific areas. It was designed in this way so that an overview and discussion could take place in these primary areas: 1) associated features (i.e., prognosis, cause and general information about ADHD), 2) symptoms/diagnosis of ADHD, and 3) the treatment of ADHD. These subscales were selected to reflect on content areas, which could be relevant to educational interventions or diagnostic decisions. The items used to make up each subscale was selected through the consensus of 40 doctoral students in Clinical and School Psychology. The item was then only considered for inclusion in the subscale if at least 75% of the sample was in agreement. The first subscale is called Associated Features of ADHD and it includes items: 1, 4, 6, 13, 17, 19, 22, 24, 27, 28, 29, 30, 31, 32, and 33. The second subscale is called Symptoms/Diagnosis: 3, 5, 7, 9, 11, 14, 16, 21, and 26. The third subscale is The treatment of ADHD: 2, 8, 10, 12, 15, 18, 20, 23, 25, 34, 35, and 36 (Sciutto & Feldhamer, 2005).

When choosing an instrument, its reliability must be considered. Reliability refers to the consistency or degree to which a research instrument measures a variable consistently everytime it is used with the same respondents. In a way, reliability refers to the data generated by the research instrument and not the measurement of the instrument (Yilmaz, 2013).

The reliability of the KADDS was verified using five studies that used the KADDS instrument (Sciutto et al., 2000). 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 had moderate levels of internal consistency ($0.52 < \alpha < 0.75$). The instrument was used in a South African study by Perold et al. (2010), where 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 a study conducted in South Africa. In this study, good reliability was found with the KADDS instrument, as the Cronbach alpha was 0.77 (Pallant, 2016).

Another important aspect to consider when choosing an appropriate instrument is validity. The validity of an instrument refers to the accuracy of research data obtained. Research data is considered to be valid if the results of the study measurement process are accurate, in so far as the instrument measures what it is supposed to measure (Yilmaz, 2013).

The validity of the KADDS instrument was examined by Sciutto et al. (2000) who investigated if the results obtained whilst using the instrument correlated with the results one would expect to obtain. The authors proposed that an increase in ADHD knowledge in the areas of associated symptoms, features and interventions is expected to arise from personal interactions with an ADHD child. Therefore, if the KADDS is a valid measure of ADHD knowledge, educators with prior exposure to the disorder should be correlated with the scores obtained on the KADDS instrument.

Sciutto et al. (2000) reported that after conducting several studies, this predicted correlation was found to be true, therefore confirming that the KADDS is a valid measure of ADHD knowledge. Similarly, greater levels of ADHD training have also been found to correlate with higher scores on the KADDS instrument, suggesting the validity of this instrument (Herbert et al., 2004). In addition, during the development of the KADDS, it was intended to include only items relating to ADHD that were empirically supported and well documented (Sciutto et al., 2000). Based on the above findings, the KADDS instrument can be used with confidence, based on the assumption that it has a high chance of producing valid results. Regarding the generalisability of the results, Amod et al. (2013) conducted their research using the KADDS questionnaire, on a sample of 100 educators and the findings produced significant results that could be interpreted and generalised.

However, the results were applied to the wider South African setting with caution (Amod et al., 2013). As the sample was not representative of the broader South African population, the results of this study can be applied to the broader contexts of South Africa but will be done so with caution as the sample may not be fully representative of South Africa's population. This

is because the focus of this research is on primary and secondary schools located in an urban area and is therefore, not generalisable to educators in rural schools. Due to practical constraints and the nature of this research project, it was not possible to draw upon a wider and more diverse sample.

3.7 Piloting the study

The use of a pilot study contributes valuable information which can assist the researcher when conducting their study. In using a pilot study, the researcher has the opportunity to develop and enhance their skills necessary prior to commencing the larger study (Doody & Doody, 2015). As recommended by Hennink et al. (2011), a small number of respondents were used during the pilot phase. Five (n=5) adult respondents who were similar to the study respondents participated in the pilot study. Pilot testing was important in several ways. For example, to establish practical issues, ensuring clarity of the instructions and that the sequence of instructions were logically arranged and well understood. Through the pilot phase, the researcher had the opportunity to re-word instructions and consider the order of instructions required for the head teacher of the participating school.

3.8 Data analysis

Data analysis refers to the process of applying logical techniques to describe and evaluate data. This forms part of the analytic framework considered appropriate for this study. The study produced large volumes of data (172 questionnaires) which was numbered and entered on a Microsoft Excel spreadsheet.

To analyse the data, Statistical Package for the Social Sciences (SPSS) was used. This software was chosen because it is effective for complex statistical data analysis (Pallant, 2016). Prior to commencing the data analysis process, the data set was checked for errors. This was done by running SPSS descriptive statistics tests, on both categorical and continuous variables. The minimum and maximum values were analysed, to confirm that all scores fell within the range of possible scores on that variable. Two errors arose as a result of incorrect data entry, which was identified by the researcher and corrected. Questionnaires which had missing values for certain questions, were included in the analysis. According to Pallant (2016), the best method to deal with missing data is to use the “exclude cases pairwise” option provided in SPSS (p.79).

By doing this, questionnaires are included in all the statistical analysis tests, the only exception being where missing data is actually required for a specific test.

To ensure that assumptions of normality, linearity and homoscedasticity were not violated, preliminary analysis was performed. 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 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 to ascertain whether differences in educators' knowledge levels existed within the different domains of knowledge regarding ADHD.

To investigate the relationships between the dependent variable (knowledge of ADHD) and the independent variables (educators' personal demographic information and confidence ratings), Pearson's product-moment correlation coefficient was calculated. Pearson product-moment correlation coefficient was chosen as the most appropriate way to investigate these relationships, as this method of correlation analysis is the most suitable for interval or continuous variables, such as the variables in this research (Pallant, 2016).

Thereafter, multiple regression was performed to determine if any of the individual factors (age, sex, and 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 (2016), 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.

3.9 Data screening

Data screening refers to the process of screening and cleaning quantitative data. This involves checking data accuracy to ensure data is entered correctly, checking data completeness, and assessing the distribution of the data.

As part of the analysis, the first step was to screen the data. Descriptive statistics and graphic representation were used to analyse the accuracy in which the data had been entered

(Tabachnick & Fidell, 2019). This process included the examination of the frequency distribution of categorical items, and the mean and standard deviation for the numeric variables. In the case of suspicious data, implausible or extreme values, the data were double-checked using the original data against the file data to ensure that it was accurate (Tabachnick & Fidell, 2019). Most respondents responded to items on the KADDS with no missing cases on an individual item. Given the large sample used in this study, case wise deletion was used to address the issue of missing data.

The next step involved using Kolmogorov-Smirnov (K-S) Test to assess skewness, kurtosis, and variance for all groups undergoing inferential testing. Non-parametric tests were used for distributions that violated assumptions of normality. Levene's test of homogeneity of variance was utilised to determine whether the assumptions of potential tests utilised for post-hoc analysis were met.

3.10 Ethical considerations

Research ethics and the consideration thereof refers to the moral principles that guide researchers to engage in research without deception or intention to harm the participants or members of society either intentionally or unintentionally.

To adhere to research ethics as set out by UKZN, the selected schools were only contacted once the permission for the study to be conducted was granted by the University of KwaZulu-Natal's Humanities and Social Sciences Research Ethics Committee and the Department of Education (DoE).

Once permission was granted, school principals were contacted from the list of selected schools by email, outlining the details of the study. It was explained that participation was voluntary and that educators would be required to sign the consent form in order to participate in the study. Once the school principal agreed that the school and educators would like to partake in the study, the questionnaires were delivered to the school. Educators were requested to complete the questionnaire privately and to answer questions as honestly as possible, selecting the "don't know" option to avoid guessing. The contact details of the researcher and her supervisor were provided to the respondents in the event that they had some queries to raise or concerns regarding the questionnaire, the research process, ethical conduct of the study or research findings.

The school principal was notified that all data will be kept securely in the office of the project supervisor at the Psychology Department at UKZN Howard College campus. Only the researcher and the supervisor have access to these documents to maintain confidentiality. The data, documents and questionnaires used will be destroyed five years after the study has been completed. Respondents and school principals were informed that they would be given a copy of the results following completion of the study. Dissemination of results may enhance educators' awareness and understandings of ADHD by drawing their attention to the misperceptions about the disorder and existing gaps in knowledge.

3.11 Conclusion

This chapter has described the study's methodology. It began with an explanation of the quantitative approach, positivist paradigm used in this study. The introductory part covered the research context such as geographic and demographic features which are important to the study. Thereafter, the methods and the procedures followed were described. Details of the research methodology and the procedures used for data collection, and the approach used for analysing data were provided. A description of the data analysis techniques used for analysing the KADDS questionnaire was provided. Finally, a summary of the ethical considerations was discussed. The results of this study will be presented in the next chapter.

CHAPTER 4: RESULTS

4.1 Introduction

This section of the dissertation discusses the results elicited from the study. It covers the results of the socio-demographic characteristics of the sample and the findings that pertain to educators' knowledge of ADHD, particularly knowledge of its features, symptoms and diagnosis within the South African context.

4.2 Socio-demographic characteristics of the sample

As already detailed in Chapter 3, the target population for this study consisted of 172 educators employed in the primary and secondary phase at 5 schools in Durban Central Circuit, in the

Umlazi District. A total of 172 copies of the questionnaire were returned from the respective schools. The demographic data are summarised in Table 1.

Of the 172 participating educators, 138 were females, constituting 80.2% of the participants. A large proportion of the participants had more than twenty years teaching experience (n = 73, 42.4%), while 19.2% of the sample had between one- and five-years teaching experience. A little below half of the sample were qualified educators holding a Bachelor’s Degree in education (n =81, 47.1%), but almost a quarter of the participants were qualified teachers holding an Honours degree in education (n=43, 25%) and a Diploma in education course (n=37, 21.5%). The schools consisted of significantly more private school educators compared to public schools (n=55, 32%).

Table 1: Socio-demographic information of the participants (n = 172):

Characteristics	N	%
Gender		
Females	138	80.2
Males	34	19.8
Race		
Asian	79	45.9
Black African	7	4.1
Coloured	12	7.0
White	70	40.7
Education		
Diploma	37	21.5
Bachelor’s Degree	81	47.1
Honours Degree	43	25.0
Master’s Degree	11	6.4
Years teaching experience		
1-5 years	33	19.2
6-10 years	30	17.4
11-15 years	16	9.3
16-20 years	20	11.6

More than 20 years	73	42.4
School Sector		
Private	117	68
Public	55	55

4.3 Overall knowledge scores

Educators’ overall percentage score of correct responses (items answered correctly) was 47.14%, which reflects that their knowledge of ADHD was below average. The percentage of incorrect responses (items answered incorrectly) was 17.31%, which indicates educators’ misperceptions of ADHD. Regarding, “don’t know” responses (items that educators admitted they just did not know), the percentage obtained was 35.55%. Educators’ overall percentages for “correct”, “incorrect”, and “don’t know” responses are presented in Figure 1.

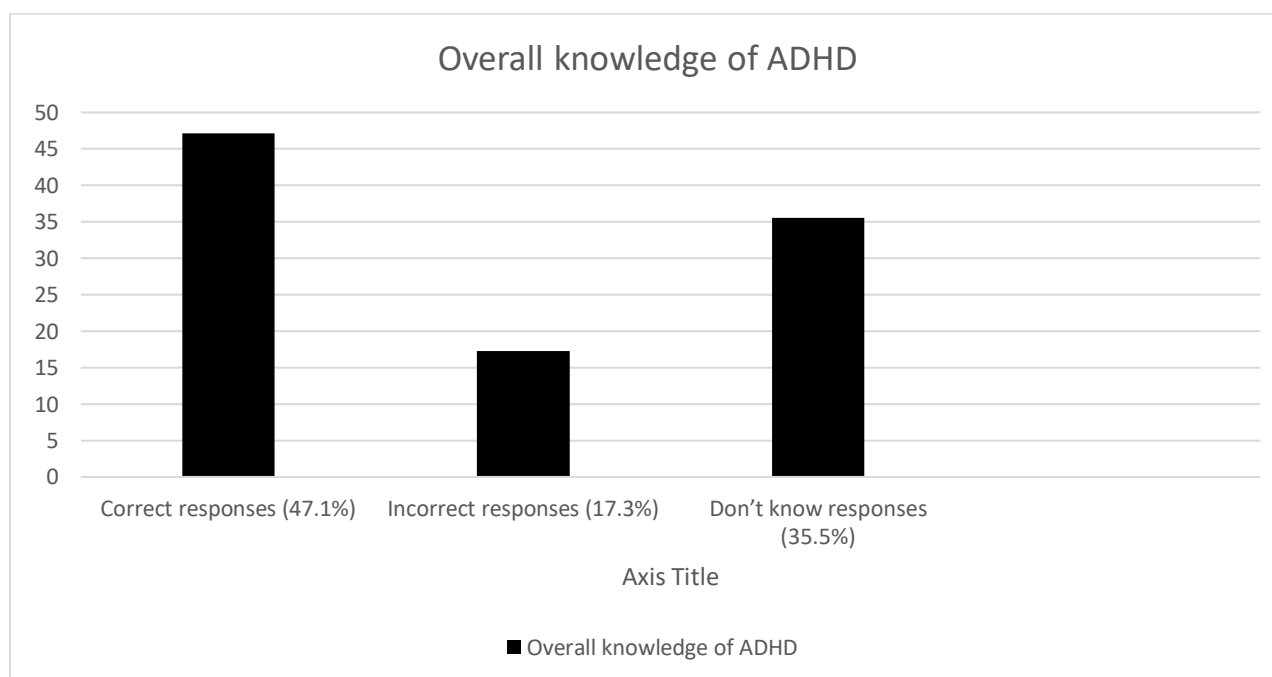


Figure 1: Educators’ overall percentage score of the “correct”, “incorrect”, and “don’t know” responses on the KADDS

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

The results per KADDS sub-scale are shown in Table 2, including the results for the overall KADDS scale and the individual sub-scales (general knowledge of ADHD, knowledge of diagnosis or symptoms and knowledge of treatment). The performance per sub-scale suggests that participants scored higher on the knowledge of diagnosis or symptoms sub-scale (Mean = 5.67, SD = 2.01, 63.05%). There was a moderate difference between performances on the knowledge of diagnosis or symptoms sub-scale and treatment sub-scale (44.23%). However, the performance on the general knowledge sub-scale is marginally lower than the knowledge of diagnosis or symptoms sub-scale (39.53%), suggesting greater lack of knowledge on ADHD and, consequently, misperceptions about ADHD were evident.

Table 2: Descriptive statistics for educators' scores on KADDS total scale and sub-scale

	Mean	Standard deviation	Mean (per scale) expressed as a percentage
General knowledge sub-scale (15 items)	5.93	2.95	39,53%
Diagnosis/symptoms sub-scale (9 items)	5.67	2.01	63.05%
Treatment sub-scale (12 items)	5.31	2.46	44.23%
Total Scale (36 items)	16.91	6.40	46.98%

To further examine educators' knowledge of ADHD within each of the KADDS sub-scales, the responses were grouped into the three sub-scales of the KADDS. Table 3 represents the educators' responses on the first sub-scale (15 items) that assesses educators' general knowledge of the nature, causes and outcome of ADHD. The mean response score on this sub-scale was 5.93 which, when expressed as a percentage, was 39.53%.

The highest proportion of correct responses was noted on items 9 (87.79%) and 13 (87.21%), which signifies that many educators were aware of one of the main symptoms of ADHD, that is, children often fidget or squirm in their seats (item 9) and that adults can also be diagnosed with ADHD (item 13). The lowest proportion of correct responses was identified on item 23

(5.23%), suggesting that a few educators were aware that reducing dietary intake of sugar or food additives does not effectively reduce the symptoms of ADHD.

Table 3: Responses from participants on the first sub-scale of KADDS which includes 15 items relating to general knowledge about the nature, causes and outcome of ADHD (N=172)

Item	CA	Percentage of correct responses		
		✓	DK	✗
1. Most estimates suggest that ADHD occurs in approximately 15% of school age children.	F	6.40	69.77	23.84
4. ADHD children are typically more compliant with their fathers than with their mothers.	T	6.40	62.21	31.40
6. ADHD is more common in the 1st degree biological relatives (that is, mother, father) of children with ADHD than in the general population.	T	20.35	69.77	9.88
13. It is possible for an adult to be diagnosed with ADHD.	T	87.21	11.63	1.16
17. Symptoms of depression are found more frequently in ADHD children than in non-ADHD children.	T	29.65	54.65	15.70
19. Most ADHD children “outgrow” their symptoms by the onset of puberty and subsequently function normally in adulthood.	F	45.93	36.05	18.02
22. If an ADHD child is able to demonstrate sustained attention to video games or television for over an hour, that child is also able to sustain attention for at least an hour of class or homework.	F	63.95	28.49	7.56
24. A diagnosis of ADHD by itself makes a child eligible for placement in special education.	F	62.21	23.84	13.95
27. ADHD children generally experience more problems in novel situations than in familiar ones.	F	15.70	38.95	45.35
28. There are specific physical features that can be identified by medical doctors (for example,	F	37.79	36.05	26.16

paediatrician) in making a definitive diagnosis of ADHD.				
29. The prevalence of ADHD is equivalent in male and female school age children.	F	41.28	51.16	7.56
30. In very young children (less than 4 years old), problem behaviours of ADHD children (for instance, hyperactivity, inattention) are distinctly different from age-appropriate behaviours of non-ADHD children.	F	15.70	53.49	30.81
31. Children with ADHD are more distinguishable from normal children in a classroom setting than in a free-play situation.	T	59.88	22.09	18.02
32. The majority of ADHD children evidence some degree of poor school performance in the elementary school years.	T	64.53	23.84	11.63
33. The symptoms of ADHD are often seen in non-ADHD children who come from inadequate and chaotic home environments.	T	37.21	38.95	23.84

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

Table 3 presents educators' responses on the first sub-scale of KADDS which includes 15 items assessing participants' general knowledge of the nature, causes and outcome of ADHD. The mean response score on this sub-scale was 5.93, which translated to 39.53%. The highest proportion of correct responses (87.21%) was on item 13, which means that most sampled educators were aware of the possibility for an adult to be diagnosed with ADHD. The highest proportion of incorrect responses (45.35%) was on item 27, which indicates educators held the misperception that ADHD children generally experienced more problems in novel situations than in familiar situations.

Table 4: Responses from participants on the second sub-scale of KADDS which includes 9 items relating to the symptoms/diagnosis of ADHD (N=172)

Item	CA	Percentage of correct responses		
		✓	DK	✘
3. ADHD children are frequently distracted by extraneous stimuli.	T	82.56	9.30	8,14
5. In order to be diagnosed with ADHD, the child's symptoms must have been present before age 7.	T	12.21	47.67	40.12
7. One symptom of ADHD children is that they have been physically cruel to other people.	F	69.77	19.19	11.05
9. ADHD children often fidget or squirm in their seats.	T	87.79	6.98	5.23
11. It is common for ADHD children to have an inflated sense of self-esteem or grandiosity	F	48.26	36.63	15.21
14. ADHD children often have a history of stealing or destroying other people's things.	F	59.30	29.07	11.63
16. Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.	T	79.65	20.35	0.00
21. In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).	T	54.07	36.05	9.88
26. ADHD children often have difficulties organising tasks and activities.	T	77.33	8.72	13.95

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

Table 4 presents educators' responses on the second sub-scale of KADDS which comprised 9 items relating to the symptoms or diagnosis of ADHD. The mean response score on this sub-scale was 5.67 which, translated to 63.05%. The highest proportion of correct responses (87.79%) was on item 9, thus, most educators within the sample were aware that one of the hallmark symptoms exhibited by children with ADHD is fidgeting or squirming in their seats. The highest proportion of incorrect responses (40.12%) was on item 5, which indicates

educators' misperceptions that in order to be diagnosed with ADHD, the child's symptoms must have been present before the child turned seven years old.

Table 5: Responses from participants on the third sub-scale of KADDS which includes 12 items relating to treatment of ADHD (N=172)

Item	CA	Percentage of correct responses		
		✓	DK	*
2. Current research suggests that ADHD is largely the result of ineffective parenting skills.	F	66.28	28.49	5.23
8. Antidepressant drugs have been effective in reducing symptoms for many ADHD children.	T	28.49	42.44	29.07
10. Parent and educator training in managing an ADHD child are generally effective when combined with medication treatment.	T	80.81	14.53	4.65
12. When treatment of an ADHD child is terminated, it is rare for the child's symptoms to return.	F	54.07	43.02	2.91
15. Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.	T	69.77	29.91	2.33
18. Individual psychotherapy is usually sufficient for the treatment of most ADHD children.	F	31.98	50.00	18.02
20. In severe cases of ADHD, medication is often used before other behaviour modification techniques are attempted.	T	59.88	29.65	10.47
23. Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.	F	5.23	19.19	75.58
25. Stimulant drugs are the most common type of drug used to treat children with ADHD.	T	33.14	47.09	19.77
34. Behavioural / Psychological interventions for children with ADHD focus primarily on the child's problems with inattention.	F	12.79	38.37	48.84

35. Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD	F	22.09	75.00	2.91
36. Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.	F	67.44	29.07	3.49

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

Table 5 presents educators' responses on the third sub-scale of KADDS, which comprise 12 items relating to the treatment of ADHD in children. The mean response score on this sub-scale was 5.31, representing 44.23%. The highest proportion of correct responses (80.81%) was on item 10; hence, most educators within the sample were aware that parent and teacher training in managing children with ADHD generally worked effectively when combined with medical treatment. The highest proportion of incorrect responses (75.58%) was on item 23, which indicates educators' misperceptions that reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD in children.

4.5 Correlations among the study variables

The Pearson product-moment correlation coefficient was used to investigate the relationship between the educators' knowledge of ADHD and the participant's demographic information, as presented in Table 6.

There is a weak, significant correlation between the performance on the KADDS scale and educators' level of knowledge on ADHD in children and the educators' sex ($r=0.162$, $p<0.05$). This means that knowledge of ADHD correlates with educators' sex, thus being male or female. The female sex showed greater knowledge of ADHD (17.43) than the male sex (14.42) in this study. No other statistically significant correlations were found.

Table 6: Pearson Product-moment correlations of the total KADDS score (knowledge of ADHD) and educators' demographic variables

Variables	S	R	E	YE	S	TK
Sex	-	.108	.044	-.065	-.192*	.162*
Race		-	0.10	0.51	0.298**	-.029
Education			-	-.119	.090	-.068
Years of teaching experience				-	-.057	.054
School					-	-.059
Total knowledge of ADHD						-

n = 172

* p<0.05

4.6 Multiple regression analysis

The standard multiple regression analysis was used to analyse, assess and ascertain whether educators' demographic factors could be used to predict educators' knowledge of ADHD, as shown in Table 7. The total scores for demographic variables (sex, race, education, years of teaching experience, school) and knowledge of ADHD were included in the regression calculation model. The tolerance level obtained for the variables was greater than 0.01, indicating the absence of multi-collinearity difficulty. The results of the regression analysis indicate that the predictors explained 3.8% of the variance, $R^2=0.038$, $F(5, 166) = 1.275$, $p>0.05$. This indicates that only 3.8% of the change or variance in total ADHD score is accounted for by the model, whereas the remaining 96.2% of change is accounted for by other external factors that have not been measured. Educators' sex (male or female) has made the greatest significant contribution to predicting educators' knowledge of ADHD ($\beta=0.175$, $p>0.05$). The female sex in this study was found to have greater knowledge of ADHD than their male counterparts. No other variables were found to significantly contribute to the educators' levels of knowledge of ADHD.

Table 7: Summary of the multiple linear regression model for variables predicting educators' knowledge of ADHD

Variables	B	Std. error	Beta	T	Sig.	Tolerance
Sex	2.797	1.271	.175	2.201	.029	.922
Race	-.216	.357	-.049	-.607	.545	.876
Education	-.524	.591	-.068	-.887	.376	.976
Years of teaching experience	.238	.306	.060	.777	.438	.972
School	-.016	1.134	-.001	-.014	.989	.845

Note: N=172, R²=0.038, F (1.303) =1,275, p>0.05

4.7 Conclusion

The study set out to determine educators' knowledge of ADHD, with a focus on primary and secondary phase educators working in the Durban Central Circuit in KwaZulu-Natal Province. Their knowledge of ADHD was examined in three specific content areas or knowledge domains: associated features (general understanding), symptoms or diagnosis and treatment of ADHD in children. The KADDS results demonstrated that the educators' knowledge of ADHD was below the average correct knowledge rate of 47.18%. Correlation tests were carried out to identify relationships between educator's level of knowledge of ADHD and their demographic characteristics. These results showed that the educators' knowledge of ADHD was significantly related to their sex. The female sex in this study were found to have greater ADHD knowledge than their male counterparts. Chapter 5 summarises the conclusions that can be drawn from these results.

CHAPTER 5: DISCUSSION

5.1 Introduction

This chapter discusses the findings of the study in relations to the objectives that guided this study. The aim of the study was to assess educators' knowledge of Attention Deficit Hyperactivity Disorder (ADHD) and to identify demographic predictors of educators' knowledge of ADHD, including knowledge of the features of the condition, its symptoms and diagnosis within the South African context. The first objective of this study sought to measure educators' levels of general knowledge in the following three knowledge areas: ADHD associated features, symptoms or diagnosis, and treatment of ADHD. The final objective sought to identify the demographic predictors of educators' knowledge of ADHD. This chapter discusses the findings of the study in relation to reviewed literature as well as relevant theoretical underpinnings.

5.2 Educators' knowledge and misperceptions of ADHD

The study examined the primary and secondary phase educators' knowledge and misperceptions of ADHD, as measured by the KADDS scale in three areas: associated features (general understanding), symptoms or diagnosis and treatment of ADHD. The results from the study demonstrate that the knowledge of ADHD exhibited by the South African educators, who constituted the sample for this study (N = 172), was below the average rate of correct knowledge at the rate of 47.14%. This score is higher than what can be expected by chance (33%) and lower than the results obtained by Etchells (2015) who obtained scores of 54.65% in a similar study conducted in South Africa with 104 educators.

The results obtained from this current study fall within the average range of scores obtained from national and international studies that used the KADDS (Sciutto et al., 2000), which were between 31% (Bradshaw & Kamal, 2013) and 63% (Jaye et al., 2020). The current study yielded results similar to those obtained from studies also based on the KADDS, as seen in Table 8.

Table 8: Results of educator’s level of knowledge from international and national studies using the KADDS (in order):

	Researcher	Place	Sample size	Description *	Correct responses
1	Jaye et al. (2020)	South Africa	95	Grade R-3	63%
2	Castenova (2008)	USA	58	Grade 5-9	58.4%
3	Small (2003)	USA	72	Grade 1-5	57%
4	Guerra & Brown (2012)	Texas / USA	107	Grade 6-9	56.7%
5	West et al. (2005)	Australia	131	Grade 1-12	56%
6	Etchells (2015)	South Africa	104	Grade 1-6	54.65%
7	Shroff et al. (2017)	India	106	Grade 5-8	49%
8	Scuitto et al. (2000)	USA	149	Grade 1-5	47.8%
9	Current study	South Africa	172	Grade R-12	47.14%
10	Perold et al. (2010)	South Africa	552	Grade 1-6	42.6%
11	Alamri (2014)	Saudi Arabia	202	Grade 1-6	41%
12	Lazarus (2011)	South Africa	100	Grade 1-6	35%
13	Dilaimi (2013)	New Zealand	84	Grade 1-6	35%
14	Bradshaw & Kamal (2013)	Qatar	233	Grade 1-12	31%
15	Alkahtani (2013)	Saudi Arabia	429	Preschool – Grade 9	17.2%

*South African grade equivalents are mentioned above for ease of comparison.

The studies listed in Table 8 show that in South Africa, educators teaching Grade R-3 had the highest level of knowledge of ADHD (63%) (Jaye et al., 2020). Other studies conducted in

South Africa showed varying results, ranking South Africa the 6th, 9th, 10th, and 12th on educators' level of knowledge of ADHD. The study conducted by Etchells (2015) in South Africa ranked the 6th, which shows that educators had slightly lower level of knowledge of ADHD (54.65%) than that found by Jaye et al. (2020). This could be explained by the demographics of the sample. For instance, Etchells' (2015) sample had a cross-section of government and private schools whereas Jaye et al. (2020) only had educators from independent schools. The current study ranked 9th as it shows marginally lower levels of knowledge (47.14%) of ADHD as exhibited by educators. This could be explained using a larger sample (172) of educators, which could give a more accurate reflection of educators' levels of knowledge. The study conducted by Perold et al. (2010) in South Africa ranked the 10th, showing marginally lower levels of educators' knowledge of ADHD (42.6%), which again could be explained by the larger sample (552) of educators as opposed to a smaller sample of 95 participants used in the study by Jaye et al. (2020). The study conducted by Lazarus (2011) in South Africa ranked 12th, showing the lowest levels (35%) of educators' knowledge of ADHD. This significantly lower score could be accounted for by the location of the sample as the study was conducted with educators teaching at South African schools located in townships. This is significant as the educators in the sample reported not having received any training or workshops related to ADHD.

Four studies conducted in the United States of America ranked 2nd, 3rd, 4th and 8th, with the majority of these studies obtaining higher knowledge scores than the current study, as educators' levels of knowledge of ADHD scored 58.4%, 57%, 56.7% and 47.8%, respectively (Castenova, 2008; Small, 2003; Guerra & Brown, 2012; Scuitto et al., 2000). Australian educators ranked 5th thus demonstrating that they had similar levels of knowledge at 56% (West et al., 2015). In India, educators' level of knowledge of ADHD (49%) scored just under 50% thus ranking the 7th (Shroff et al., 2017). The countries that ranked the lowest were New Zealand (35%) Qatar (31%) and Saudi Arabia (17.2%) thus ranking them the 13th, 14th and 15th, respectively (Dilaimi, 2013; Bradshaw & Kamal, 2013; Alkahtani, 2013).

In comparison with other South African studies, the current study demonstrated average results on the KADDS scale. Jaye et al. (2015), Etchells (2015), Perold et al. (2010), and Lazarus (2011) identified educators' levels of knowledge of ADHD at 63%, 54.65%, 42.6% and 35%, respectively. The results suggest that Johannesburg-based educators had greater levels of knowledge of ADHD than educators in other South African cities particularly Cape Town and

Durban. However, the differences may be indicative of the methodological differences between the five studies. Firstly, the sample sizes for these studies were significantly different. The sample size for the current study comprised 172 educators, compared to the Cape Town sample which consisted of 552 educators and the Johannesburg sample that comprised a sample of 95 educators. Furthermore, the current study made use of private schools (68%) and public schools (32%), whereas the Johannesburg sample (Jaye et al., 2020) was drawn only from private schools and the other Johannesburg sample (Lazarus, 2011) was based on schools situated in a township. Thus, higher scores were attributed to the type of school included in the sample as private schools reportedly had more access to resources and training than schools situated in the township. The current sample also comprised a multi-cultural school whose belief system was rooted in Islam thus posing a barrier to the acceptance of ADHD as a behavioural disorder.

The content of KADDS instructions and questionnaire were presented in the English language because the schools used in the sample used English as a medium of communication and instruction. It was therefore assumed that comprehending the questions was not going to be compromised by any language-related barriers; therefore, the answers realistically indicated the educators' level of knowledge of ADHD at 47.14%. This contrasts sharply with the study conducted by Lazarus (2011), in which the sample consisted of educators whose first language was not English, thus poor results (35%) were obtained. Lazarus' (2011) study sampled educators whose first language was not English, justifying the use of a translator to ensure a more accurate representation of the sample's knowledge levels of ADHD.

The studies listed in Table 8 mainly focused on the primary school phase, which included Grades 1 to 5 or 6. In some countries, the primary school phase includes Grade 6, whilst in others it does not. This is relevant to note as the primary school phase in South Africa is referred to as the Foundation or Intermediate phase which is between Grade 1 and 6; however, Grade 7 is mostly located within the primary school phase although it is considered part of the Senior school phase for which educators need to be qualified as senior school phase educators (Etchells, 2015).

The current study included the Foundation, Intermediate and Senior school phases (Grades 1 to 12). The studies conducted by West et al. (2005) and Bradshaw and Kamal (2013) draw on almost similar samples in terms of the grades taught by the educators. Therefore, the results of these studies were relevant as the educators had similar qualifications and the ages of the

children taught in the samples were similar. The study conducted by West et al. (2005) performed better than the current study. A number of reasons may have influenced the improved performance, with 56%. Firstly, all the educators that participated in the sample were drawn from the metropolitan area of Perth, Western Australia and included the parents of children diagnosed with ADHD and who confirmed having attended an ADHD support group and ADHD-related seminars. Presumably, the parents of children who had ADHD and had attended support groups and workshops had increased knowledge of ADHD, a presumption based on their exposure to such psycho-social support initiatives. The current study performed better than the study conducted by Bradshaw and Kamal (2013), which established 31% level of knowledge. The reason that Bradshaw and Kamal did not perform as well as the current study could be due to the limitations mentioned in the study; for instance, the questionnaire had to be translated from English into Arabic and the meaning could have been distorted during this process. In addition, the educators were given limited time, thus depriving them of enough time to process answers to the best of their ability and complete the questionnaire. The current study included a broad range of schools as it included private and public schools; it also included a range of educational phases and the questionnaire was administered to educators in English, which did not require any translation.

5.3 Performance per sub-scale

5.3.1 Introduction

The KADDS questionnaire is a 36-item rating scale that uses “True”, “False”, and “Don’t know” format to differentiate what educators did not know from what they incorrectly believed (misconceptions). The KADDS was designed to measure educators’ knowledge of and misconceptions about ADHD in three areas: (1) symptoms and diagnosis of ADHD, (2) treatment of ADHD, and (3) associated features.

A total score was obtained for individual items and sub-scales. An analysis of the scores obtained per sub-scale revealed that the educators were more knowledgeable about the symptoms and diagnosis of ADHD (mean = 5.67, SD = 2.01, 63.05%). These findings suggest that the educators who participated in this study were more knowledgeable on items relating to the symptoms and diagnosis of ADHD, which correlates with the criteria found in the DSM 5 (APA, 2013). The treatment sub-scale then followed (mean = 5.31, SD = 2.46, 44.23%) and the lowest results, demonstrating a lack of knowledge in this area was the associated features

sub-scale (mean = 5.93, SD = 2.949, 46.98%). The following section discusses the results per sub-scale, with a focus on educators' levels of knowledge, lack of knowledge of and misperceptions about ADHD.

5.3.2 Symptoms or diagnosis of ADHD sub-scale

The symptoms or diagnosis of ADHD sub-scale was the highest scoring sub-scale, with an average score of 63.05% and a mean score of 5.67%. This suggests that the educators had higher levels of knowledge on the symptoms and diagnosis of ADHD compared to the treatment and associated features of ADHD. Educators' higher levels of knowledge on the symptoms or diagnosis sub-scale were consistent with other studies which yielded similar findings; for instance, Etchells (2015), Perold et al. (2010), Kleynhans (2005), and Sciutto et al. (2000). These results were expected as educators were more likely to observe the symptom-related features of ADHD within their classrooms daily (Lazarus (2011; Small, 2003). In addition, ADHD has generally received much attention in the media, with a focus on the condition's diagnosis and the symptoms, which may have also contributed to educators' greater understanding and knowledge of this area.

An analysis of data has determined that the items scoring the highest in this sub-scale were related to the hallmark ADHD symptoms; thus, the most knowledge (87%) of educators correctly answered that ADHD children fidget or squirm in their seats; 82% correctly answered that ADHD children are frequently distracted by extraneous stimuli; 79% reported the existence of two clusters of symptoms, one comprising inattentiveness and the other one consisting of hyperactivity or impulsivity; 77% correctly answered that ADHD children have difficulty organising tasks and activities.

Despite this sub-scale suggesting higher levels of knowledge of ADHD on the part of the educators, the data also revealed that a large number of educators had misperception and incorrect knowledge about ADHD with regard to the symptoms or diagnosis sub-scale. For example, 47% of the educators did not know that a child's symptoms of ADHD must have been present before the age of seven years and 36% of the respondents did not know that having an inflated sense of the self is not a symptom or trait of ADHD. Although the educators performed well on this sub-scale, it is imperative to note that the educators ought to develop their knowledge with regard to the symptoms and diagnosis of ADHD as the classroom is often the place where the symptoms of ADHD are most evident (Jaye et al., 2020). According to

Snider et al. (2003), educators are the most common initial referral source, as they advise the parent to have their child further assessed in order to establish whether or not an ADHD diagnosis is relevant. As part of the process, the educator is required to provide the health practitioner with significant information on observed behaviours and this information is imperative in establishing the relevance of a diagnosis and a treatment plan (Kern et al., 2015).

Etchells (2015) suggests that having the basic level of knowledge on the symptoms of ADHD does not fully enhance an understanding of the condition and the making of referrals of learners suspected of having ADHD. Research has shown that the symptom “easily distracted”, which is a primary feature of ADHD, has a low predictive power for the presence of ADHD. However, the absence of this symptom indicates the absence of the disorder, thus illustrating the complexity of the disorder and the need for educators to be exposed to the criteria set out in the DSM 5 (American Psychiatric Association, 2013). The DSM 5 outlines important factors such as: the symptoms of ADHD ought to be six or more to necessitate a preliminary diagnosis and these symptoms must also be present in two or more settings. This was another item the current study found, thus 36% of educators did not know that symptoms needed to be present in two or more settings (for example, school and home) before a diagnosis can be made.

5.3.3 Treatment sub-scale

The treatment sub-scale scored an average of 44.23% and yielded a mean score of 5.31. These results corroborate a study conducted by Etchells (2015), whereby educators scored lower on the associated features sub-scale than on the treatment sub-scale (35% and 63%, respectively). These findings are also consistent with the study conducted by Jaye et al. (2020) whereby educators scored lowest on the associated features (50%). These results were not consistent with studies conducted by West et al. (2005) and Lazarus (2011), where educators were the least knowledgeable about treatment strategies for ADHD.

The results from this study indicate that educators were knowledgeable about current research which suggests that parent and educator training in the management of children with ADHD is generally more effective when combined with medication (80% correct response rate). In addition, items scoring well under this section include: the knowledge that side effects of the stimulant drugs used for the treatment of ADHD may include insomnia and reduced appetite (69%); treatment focusing primarily on punishment is not the most effective in reducing symptoms of ADHD (67%) and; that ADHD is not a result of ineffective parenting (66%).

More than half (59%) of the participants correctly acknowledged that in severe cases of ADHD, medication is often used before attempting to apply other behaviour modification techniques. This implies that the other half of the participants demonstrated lack of knowledge about the importance of medication in treating ADHD. These findings are consistent with the finding of a study conducted by Alkahtani (2013) which also demonstrated a lack of knowledge about the importance of medication in treating ADHD. It is therefore concerning that whilst half of the participants may have had the correct knowledge about the importance of medication, the other half held an incorrect view (Perold et al., 2010). Thus, interventions should target educators' level of understanding of ADHD (Kos et al., 2004).

Precisely, the educators scored an average of 44% for this sub-scale, showing educators' lack of knowledge in this domain. This lack of knowledge about the treatment and interventions that are effective in treating children with ADHD will therefore impact the recommendations made to parents about the importance of medical treatment and ultimately impact the treatment such children receive. Therefore, content relating to the treatment of ADHD covered in this sub-scale should be included in educators training.

5.3.4 General knowledge sub-scale (associated features)

The sub-scale on general knowledge of associated features of ADHD scored the lowest (39.53%) of the three sub-scales and yielded a mean score of 5.93. These results are consistent with the findings of studies conducted by Etchells (2015), Kleynhans (2005), Castenova (2008) and Dilaimi (2013). The results show misperceptions regarding some of the items within this sub-scale; for instance, the misperception that children with ADHD generally experience more problems in novel situations than in familiar situations (45%). Perold et al. (2010) avers that it is not uncommon for learners to be given a better rating on their behaviour at the beginning of the year when they have new educators and are in new surroundings.

A large number of "don't know" responses was obtained on various items within this sub-scale. Educators lack knowledge about the prevalence of ADHD. Firstly, over half of the respondents (69%) did not know that ADHD occurs in approximately 15% of school children, which was consistent with the findings in Etchells' (2015) study. Further, 69% of the participants stated that they did not know that ADHD is more common in the first-degree biological relatives of children with ADHD than in the rest of the population. Secondly, 54% of the educators did not know that children with ADHD are typically more compliant with their fathers than with their

mothers. Lastly, 54% of the educators did not know that the symptoms of depression are found more frequently in children with ADHD than in those without the disorder. As educators are often the source of referral for ADHD diagnosis and behaviours, it is concerning that they are unaware of the genetic component of ADHD and the general associations that can lead to an inappropriate referral.

5.4 Educator characteristics related to knowledge of ADHD

It was important to determine if there were any demographic or individual factors that may influence educators' levels of knowledge on ADHD. This would provide deeper insights into the type of educator who may be at risk of having less knowledge of ADHD, thus targeting this demographic to how this could be addressed in future interventions.

5.4.1 General demographic variables

Previous studies have attempted to associate demographic variables, age and education with educators' levels of knowledge of ADHD; however, they have not found such an association (Etchells, 2015; Lazarus, 2012; Perold et al., 2010; Scuitto et al., 2000). Nonetheless, the current study did not measure age as a variable, but used educator's level of education, years of teaching experience, sex and the type of school (private/public).

5.4.1.1 Level of education

The level of education obtained by educators has also been used to determine whether or not there was an association between educators' high levels of knowledge of ADHD and their education. No such association has been found in studies conducted by Etchells (2015), Scuitto et al. (2000) and Small (2003). The current study also found no association between educators' level of knowledge and the level of education obtained. Some studies found a small but positive relationship between educators' overall level of knowledge of ADHD and their level of education (Ghanizadeh et al., 2006; Kleynhans, 2005).

5.4.1.2 Years of teaching experience

The results from other studies are consistent with the findings of this study which found that the years of teaching experience were not related to educators' level of knowledge on ADHD (Almari, 2014; Etchells, 2015; Guerra & Brown, 2012; Lazarus, 2012; Perold et al., 2010;

Small, 2003). In contrast, the study conducted by Sciutto et al. (2000) found that years of teaching experience correlated positively with educators' level of knowledge on ADHD. However, no other research supported these findings. Therefore, educators' years of teaching experience may not necessarily mean that educators have been exposed to a high number of children with ADHD. In addition, it also does not mean that if an educator has been teaching for many years they would have been exposed to workshops and additional training (Etchells, 2015).

5.4.1.3 Sex

The variable "sex", which refers to the gender of the educator (male/female), was used as a demographic variable in the current study. Of all the variables used in this study, sex contributed the most, even though it was not statistically significant. The female sex in this study was found to have greater knowledge of ADHD as compared to their male counterparts. In the studies conducted by Perold et al. (2010), Topkin et al. (2015), Jaye et al. (2020) and Etchells (2015), the questionnaires included the sex of the educator but its demographic results were not reported in the findings. The gender of the educator could impact the level of knowledge educators possess on ADHD as research attests to the stigma related to mental health issues. Educators' cultural and socio-economic status can also impact these engrained beliefs, thus further hindering male educators' ability to engage with issues around ADHD.

5.4.1.4 Type of school

The "type of school" is a variable which refers to a public or private school and it was used as a demographic variable in the current study. The current study found no association between educators' level of knowledge and the level of education they attained. These results are consistent with the findings of a study conducted by Jaye et al. (2020) which established that educators in private and public schools had similar levels of knowledge on ADHD. In the study conducted by Etchells (2015) the sample included educators from private and public schools but these results were not reported as the study findings.

5.5 Conclusion

This study demonstrated using the KADDS instrument that overall, the South African educators, who constituted the sample for this study, had correct knowledge at a rate of 47.14%.

The score obtained from this study falls within the average range of scores obtained from studies conducted both nationally and internationally using the KADDS. The knowledge scores obtained from this study fall below 50% of the scores recorded in previous studies. When comparing the current study with other South African studies, the former scored marginally lower on the KADDS scale. When compared with a study by Etchells (2015) carried out in Durban using the KADDS scale, the current study scored lower on ADHD knowledge scores. This could be explained by methodological differences such as the size and characteristics of the sample. The KADDS questionnaire had three sub-scales (symptoms or diagnosis, treatment and general knowledge of associated features). An analysis of the scores obtained from each sub-scale revealed that the educators obtained the highest scores and were therefore the most knowledgeable about the symptoms and diagnosis of ADHD. These findings indicate that the educators are more knowledgeable on the symptoms and diagnosis of ADHD, which is representative of the criteria presented in the DSM 5 (APA, 2013) and used by clinicians for diagnostic purposes. Such items that scored the highest in this sub-scale and were the hallmark of the ADHD symptoms included the point that children with ADHD fidget or squirm in their seats; children with ADHD are frequently distracted by extraneous stimuli; there are two clusters of symptoms of ADHD - inattentiveness and hyperactivity or impulsivity; children with ADHD have difficulty organising tasks and activities. Educators were depicted as valuable assets in the referral and diagnosis of ADHD in learners. They also create a conducive learning environment for children with ADHD thus influencing their academic, social and emotional success. Educators are often involved in the treatment plan and can be influential when liaising with parents. Correlation tests refuted demographic factors that are significantly related to educators' overall knowledge of ADHD. Sex was a variable that referred to the gender of the educator; hence, it was the greatest contributory variable among all the options used in this study, though it was statistically insignificant. Stigma related to mental health issues significantly impacted on male educators' ability to engage with ADHD.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

Educators are instrumental in providing information that necessitates the diagnosis and referral of ADHD, thus making the classroom an important place where educators can identify the symptoms of ADHD in children. This study sought to assess educators' level of knowledge on Attention Deficit Hyperactivity Disorder (ADHD) and identify the demographic predictors of educators' knowledge of ADHD. Three major findings emerged. First, educators' overall level of knowledge on ADHD was low, with findings showing overall percentage score of correct responses (items answered correctly) at 47.14%. The findings from this study corroborated the results obtained from other studies that used the KADDS, thus falling below 50% of results from other studies. Second, the symptoms or diagnosis of ADHD sub-scale was the highest scoring sub-scale, obtaining an average score of 63.05%. This suggests that educators have higher levels of knowledge relating to the symptoms and diagnosis of ADHD than they have on treatment and associated features of ADHD. Higher levels of knowledge obtained on the symptoms/diagnosis sub-scale is consistent with other studies which have yielded similar findings; these studies include Etchells (2015), Perold et al. (2010), Kleynhans (2005), Sciotto et al. (2000). Third, the variable "sex", which refers to the gender of the educator (male/female), was the greatest contributing variable among all the options used in this study, indicating that the female sex in this study was found to have greater knowledge, even though it was statistically insignificant. In the studies conducted by Perold et al. (2010), Topkin et al., (2015), Jaye et al. (2020) and Etchells (2015), the questionnaire included the sex of the educator; however, these demographic results were not reported in the findings.

6.2 Strengths of the study

This study had a number of methodological strengths, for instance, the use of non-probability sampling reduced selection and conflict bias by randomly selecting schools thus enhancing the generalisability of the study. The study used a large sample consisting of 172 educators, thus increasing the reliability of the results and confidence levels.

The use of the KADDS questionnaire was also a strength as it encapsulated good reliability and external validity (Soroa et al., 2013). The other strength of the instrument is that it is easy to administer with its brief and precise instructions. In addition, the questionnaire's answering format provided three answers: 'True', 'False' or 'Don't Know', as opposed to a dichotomous

response format, thus eliminating participants' guessing if they are uncertain about certain answers. This also distinguished between educators' lack of knowledge and misperceptions about ADHD (Sciutto et al., 2000). Further, the questionnaire was anonymous and could be self-administered, which possibly yielded a high response rate as participants felt that their individual results would not be known.

This study also contributed new knowledge to the field of research regarding the use of sex (male/female) as a variable that predicts educators' level of knowledge on ADHD. In light of this variable the female sex in this study was found to have greater knowledge of ADHD amongst all the options used in this study, notwithstanding its statistical insignificance. Other studies referenced herein did not discuss the possibility of sex influencing the level of educators' knowledge of ADHD.

6.3 Limitations of the study

The sample consisted of 172 educators chosen from primary and secondary schools located in the Central Durban Area. Generalising the findings of the study beyond this population needs to be done with caution, as the results may vary depending on the phase of education being taught and the geographical location of the educators or school, particularly with respect to their urban or rural location. The use of participants selected through convenience sampling was another limitation as it was not representative of the whole population (Etchells, 2015).

Another reason for exercising caution with the use of the KADDS questionnaire is grounded in its origin. The questionnaire was developed by Professor Sciutto in the United States of America; thus, there is no evidence suggesting that the meaning of "knowledge" on ADHD is comparable across countries and that the KADDS questionnaire measures this construct of knowledge in an equivalent way (Sciutto et al., 2015). South Africa's diverse cultural population posed a limitation to this study. Although the design of the questionnaire was arguably one of the strengths of this study within the South African context, the structure of the questionnaire may have been overwhelming to some participants in the sample as they may not have previously been exposed to a survey format thus hindering their performance in the study (Sciutto et al., 2015).

6.4 Recommendations

6.4.1 Introduction

The recommendations from the study are discussed below. The importance of these recommendations is apparent when noting the prevalence rates for South African children diagnosed with ADHD. The research over the past decade shows that the number of children and adolescents diagnosed with ADHD ranges between 5% and 10%, thus making it one of the most prevalent conditions in South Africa (Perold et al., 2010; Polanczyk et al., 2007).

Vrba et al. (2016) asserts that contextually, South Africa is faced with a constellation of systemic risk factors (i.e. vast economic disparity in our society, lack of equitable basic services and resources at a social and scholastic level, high levels of adversity - situational and social) to name a few that places us in a unique situation when determining risks associated with ADHD. The authors add that ADHD is prevalent though it is possibly under-diagnosed and under-treated, particularly in low-income settings.

Despite the risk factors outlined above, ADHD is a commonly misunderstood condition, with a large body of research having endorsed the view that educators are pivotal in the process of identifying and referring children with ADHD as well as forming part of the treatment plan for children with such a condition.

The results of this study confirmed a moderate level of knowledge on ADHD amongst educators and identified misperceptions and incorrect knowledge pertaining to the disorder. Whilst educators showed basic understanding of ADHD, a more in-depth and complex knowledge of symptoms, treatment and features of ADHD remains limited and misunderstood. The recommendations proposed based on the findings of the study is discussed below.

6.4.1.1 Interventions to address the gaps in educators' knowledge on ADHD

The study recommends that educational institutions should provide educators with in-service training to ensure that they are educated on ADHD and that they are updated on new literature on the disorder. The in-service training should address the gaps in knowledge relating to the symptoms, treatment and general features of ADHD. In addition, the training should provide education on behavioural management and academic interventions.

In-service training that focuses on the symptoms, treatment and general features of ADHD will increase educators' ability to identify children with ADHD and therefore recommend them for assessment. This benefits the learner as the earlier the diagnosis of ADHD is made, the sooner the learner can receive the necessary treatment. This also benefits the learner as the educator will have an increased understanding of the difficulties the learner with ADHD faces. This increased knowledge also assists the educator liaise with parents, psychologists and medical practitioners, which depends on knowing the relevant information necessary for the diagnosis of ADHD. Furthermore, an understanding of the disorder also assists educators in liaising with parents thus enabling the educators to provide sufficient information which eliminates misperceptions and misunderstanding with regard to ADHD. In addition, the in-service training initiative should cover behavioural management and academic interventions targeting learners with ADHD. The benefit of acquiring knowledge on ADHD would assist educators in preventing being overwhelmed by the management of learners with ADHD. It can also provide practical tools on how to manage the behaviour of learners and implement academic interventions and support to the learner. This supportive environment will improve the learner's academic performance as the child feels supported and an increased sense of self-worth. The in-service training can also provide a platform for educators to share their experiences with regard to dealing with learners with ADHD and provide an opportunity for the educators to share ideas and stories.

Admittedly, some schools may have limited resources to finance such training, which would require the guidance of a professional such as a psychologist or the relevant training institution. The Department of Education and educators' trade unions should increase the number of training workshops that focus on the areas mentioned above. The educators should be given the necessary support and be encouraged to attend. Further, psychologists serving their community service could be used to provide training in order to reduce the costs incurred by the Department of Education.

Etchells (2015) demonstrated that it cannot be assumed that educators with many years of teaching experience have an increased level of knowledge on ADHD. This implies that the training process is ongoing and should be afforded to all educators regardless of their years of service. Research supports in-service training for educators, as it found significant correlations between educators' attendance of workshops on ADHD and their level of knowledge on the condition (Perold et al., 2010; Vereb & DiPerna, 2004).

6.4.1.2 Pre-service training

The training provided by universities and colleges needs to be examined to ascertain if it encapsulates sufficient content on ADHD as enshrined in the current curriculum. Studies have shown that educators felt that their pre-service training did not sufficiently prepare them to understand learners with ADHD, thus rendering them unprepared or ill-equipped to teach children with such a condition (Bekle, 2004). The study conducted by Kos et al. (2004) found that 99% of the participants reported that they would benefit from receiving additional knowledge on ADHD as they lacked the relevant knowledge due to insufficient training.

It is therefore recommended that further research be conducted on the exposure educators obtain with regard to ADHD in South African learning institutions through learning modules and practical experience. This necessitates the need to develop and implement pre-service training to supplement training in ADHD (symptoms, general associations and treatment) and exposure to children with ADHD in the teaching environment as part of their practical experience. This recommendation is endorsed by the study conducted by Etchells (2015).

6.4.1.3 Stigma of mental health in South Africa

The gender of the educator was used as a demographic variable in the current study and it made the greatest contribution amongst all the options used in this study, even though it was not statistically significant. The female sex in this study was found to have greater knowledge of ADHD than their male counterparts. It is recommended that further research be conducted on the gender of the educator and its possible impact on the level of knowledge educators possess on ADHD. Such a research is important in the South African context as the traditional views and engrained cultural beliefs have cast mental health issues that result in stigma. Further research conducted in the South African context should seek to further understand the obstacle this may provide for male educators and their ability to engage with the topic around ADHD.

6.4.1.4 Self-efficacy enhancement

Self-efficacy refers to the positive beliefs that an individual possesses about their abilities; this positive belief enables an individual to have confidence in themselves (Luthans et al., 2010). The concept of self-efficacy as it applies to this study is supported by the Social Cognitive Theory as developed by Bandura (1977). The theory posits that higher levels of efficacy lead

to task initiation and persistence. On the contrary, weaker self-efficacy results in task avoidance and a lack of persistence. Therefore, self-efficacy increases the likelihood of initiating, seeking and persisting in knowledge exploring activities. These behaviours would in turn increase educators' knowledge levels on ADHD.

According to Bandura et al. (1988), self-efficacy can be developed through learning experience. The three sources of experience are enactive mastery experience; vicarious experience and verbal experience (Bandura et al., 1988). Firstly, enactive mastery refers to "positive experiences" which can include the educator's psychological state, whereby they organise their own set of beliefs. As mentioned earlier, this could be negatively influenced by the educator's preconceived ideas or beliefs about ADHD and the stigma surrounding mental health in the South African context. In addition, it could refer to their personal experiences in learners with ADHD; thus, educators' psychological state and personal experience may increase or decrease their self-efficacy. Secondly, vicarious experience suggests that educators can learn from each other's experiences of learners with ADHD, this includes teaching interventions, behaviour modification approaches, and knowledge around symptoms, associated features and treatment. It is therefore imperative for educators to be encouraged to share their experiences with others and thus learn from each other's success and failures. Thirdly, verbal experience involves the growth of educators through verbal encouragement from colleagues, management and other professionals. Verbal experience should include being encouraged by management to seek more information on an area of specialty, to attend training and to be open-minded and thus embrace diversity and inclusion. Areas of knowledge that are limited should be viewed as in need of growth and not as an area of deficit. Self-efficacy and practical ways of encouraging growth in educators are critical; hence, it is recommended that this area be examined further in future research.

6.5 Future research

The inclusion of gender as a variable was used to determine the findings of this study, thus showing a positive association (although not significant) between female educators and greater levels of knowledge of ADHD. It is recommended that future research be conducted on the role of gender in educators' level of knowledge on ADHD.

The educators' exposure to ADHD during pre-service training in South Africa ought to be investigated further. Therefore, training institutions, universities and colleges should be

examined and critiqued to determine if the necessary ADHD related content is being covered. The findings indicate that suggestions can be made to institutions encouraging them to consider supplementing the modules or curriculum to include more ADHD-related information. The findings from this study could also be used to inform the development of an intervention plan/strategy with specific focus on the concerns outlined in the conclusion. The practical element of the educator's degree or diploma can also be further explored to ascertain if educators have sufficient exposure to a diverse range of students including learners with ADHD. In addition, further in-service training on ADHD may need to be carried out to supplement educators' existing knowledge.

Self-efficacy and its positive association with knowledge on ADHD requires further exploration. An instrument that measures self-efficacy at multiple levels by using various questions should be considered in future research. This will provide deeper insight into the relationship between the three sources of experience (enactive mastery experience; vicarious experience and verbal experience) which impacts on self-efficacy and its relationship with educators' levels of knowledge on ADHD. Further, this understanding would foster growth in educators' levels of self-efficacy thus increasing their levels of knowledge on ADHD.

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Appendix 1: Ethical Clearance Certificate

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



26 October 2018

Ms Gina Dionne Sim (216074003)
School of Applied Human Sciences – Psychology
Howard College Campus

Dear Ms Sim,

Protocol reference number : HSS/0871/018M

Project title: Assessing Attention-Deficit Hyperactivity Disorder (ADHD)-specific knowledge in teachers and identifying demographic predictors pertaining to teachers' knowledge of ADHD within the South African context

Approval Notification – Expedited Application

With regards to your response received on 22 October 2018 to our letter of 27 September 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has 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



.....
Professor Shenuka Singh (Chair)

/ms

cc Supervisor/Project Leader: Professor S Collings
cc Academic Leader Research: Dr Maud Mthembu
cc School Administrator: Ms Ayanda Ntuli

Humanities & Social Sciences Research Ethics Committee

Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbao@ukzn.ac.za / snymanm@ukzn.ac.za / mohuno@ukzn.ac.za

Website: www.ukzn.ac.za



Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

Appendix 2: Research Instrument used in the study

Please complete both Section A and B of the following Questionnaire:

Section A

Please answer the following questions about yourself (where appropriate put an X in one block):

Your sex:

Male Female

Race:

asian black african coloured white other

Education:

Diploma

Batchelor's Degree

Honours Degree

Master's Degree

Years of Teaching Experience:

1 to 5 years

6 to 10 years

11 to 15 years

16 to 20 years

More than 20 years

School:

Private school Public school

Section B

Please answer the following 39 questions regarding Attention-Deficit/Hyperactivity Disorders (ADHD). If you are unsure of an answer, respond Don't Know (DK), DO NOT GUESS.

True (T), False (F), or Don't Know (DK) (**circle one**):

1.	T F DK	Most estimates suggest that ADHD occurs in approximately 15% of school age children.
2.	T F DK	Current research suggests that ADHD is largely the result of ineffective parenting skills.
3.	T F DK	ADHD children are frequently distracted by extraneous stimuli.
4.	T F DK	ADHD children are typically more compliant with their fathers than with their mothers.
5.	T F DK	In order to be diagnosed with ADHD, the child's symptoms must have been present before age 7.
6.	T F DK	ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population.
7.	T F DK	One symptom of ADHD children is that they have been physically cruel to other people.
8.	T F DK	Antidepressant drugs have been effective in reducing symptoms for many ADHD children.
9.	T F DK	ADHD children often fidget or squirm in their seats.
10.	T F DK	Parent and teacher training in managing an ADHD child are generally effective when combined with medication treatment.
11.	T F DK	It is common for ADHD children to have an inflated sense of self-esteem or grandiosity.
12.	T F DK	When treatment of an ADHD child is terminated, it is rare for the child's symptoms to return.
13.	T F DK	It is possible for an adult to be diagnosed with ADHD.
14.	T F DK	ADHD children often have a history of stealing or destroying other people's things.
15.	T F DK	Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.
16.	T F DK	Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.
17.	T F DK	Symptoms of depression are found more frequently in ADHD children than in non-ADHD children.
18.	T F DK	Individual psychotherapy is usually sufficient for the treatment of most ADHD children.

19.	T F DK	Most ADHD children "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.
20.	T F DK	In severe cases of ADHD, medication is often used before other behaviour modification techniques are attempted.
21.	T F DK	In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).
22.	T F DK	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.	T F DK	Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.
24.	T F DK	A diagnosis of ADHD by itself makes a child eligible for placement in special education.
25.	T F DK	Stimulant drugs are the most common type of drug used to treat children with ADHD
26.	T F DK	ADHD children often have difficulties organizing tasks and activities.
27.	T F DK	ADHD children generally experience more problems in novel situations than in familiar situations.
28.	T F DK	There are specific physical features which can be identified by medical doctors (e.g. paediatrician) in making a definitive diagnosis of ADHD.
29.	T F DK	In school age children, the prevalence of ADHD in males and females is equivalent.
30.	T F DK	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.
31.	T F DK	Children with ADHD are more distinguishable from normal children in a classroom setting than in a free play situation.
32.	T F DK	The majority of ADHD children evidence some degree of poor school performance in the elementary school years.
33.	T F DK	Symptoms of ADHD are often seen in non-ADHD children who come from inadequate and chaotic home environments.
34.	T F DK	Behavioural/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention.
35.	T F DK	Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD.
36.	T F DK	Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.
37.	T F DK	Research has shown that prolonged use of stimulant medications leads to increased addiction (i.e., drug alcohol) in adulthood.

38.	T F DK	If a child responds to stimulant medications (e.g., Ritalin), then they probably have ADHD.
39.	T F DK	Children with ADHD generally display an inflexible adherence to specific routines or rituals.

Important:

You have completed the questionnaire (thank you for your participation).

- 1) When returning the completed questionnaire, please also return the signed consent form.
- 2) Once the questionnaires have been analysed a summary of the key findings will be made available to the participants.

References

Sciutto, M. J. (n.d.). The Knowledge of Attention Deficit Disorders Scale (KADDS) Test Manual. United States of America.

Appendix 3: Confirmation email from Prof Schuitto

Sim, Gina

From: Mark Scitutto <markscitutto@muhlenberg.edu>
Sent: 13 March 2018 08:43 PM
To: Sim, Gina
Subject: Re: KADDS (The Knowledge of Attention Deficit Disorders Scale)
Attachments: Scitutto_et_al_2016.pdf; KADDS_Manual.pdf

Dear Gina,

Thank you for your interest in the Knowledge of Attention Deficit Disorders Scale (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 recently finished a cross-cultural study of teacher knowledge in 9 countries. I have attached a copy of that article. If you would like to use the KADDS, I only ask that you forward a copy of the results when available. I also ask that you do not reproduce the scale in its entirety in any published document.

Best regards and good luck with your research!

Best,

Mark

Appendix 4: Permission granted by the Department of Education to conduct this study



education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Enquiries: Phindile Duma

Tel: 033 392 1063

Ref.:2/4/8/1672

Ms GD Sim
20 Mentone Road
Berea
4001

Dear Ms Sim

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct research entitled: **"ASSESSING ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD) SPECIFIC KNOWLEDGE IN TEACHER AND IDENTIFYING DEMOGRAPHIC PREDICTORS PERTAINING TO TEACHERS' KNOWLEDGE OF ADHD WITHIN THE SOUTH AFRICAN CONTEXT"**, 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 22 October 2018 to 01 March 2021.
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 Miss Phindile Duma 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 Office of the HOD, 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.

Umlazi District



Head of Department: Education
Date: 22 October 2018

KWAZULU-NATAL DEPARTMENT OF EDUCATION

Postal Address: Private Bag X9137 • Pietermaritzburg • 3200 • Republic of South Africa

Physical Address: 247 Burger Street • Anton Lembede Building • Pietermaritzburg • 3201

Tel.: +27 33 392 1063 • Fax.: +27 033 392 1203 • Email: Phindile.Duma@kzndoe.gov.za • Web: www.kzndoe.gov.za

Facebook: KZNDOE... Twitter: @DBE_KZN... Instagram: kzn_education... Youtube: kzndoe

..Championing Quality Education - Creating and Securing a Brighter Future

Appendix 5: 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 6: Information Sheet

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

INFORMATION SHEET

You are being invited to participate in a research study which is entitled: "Assessing Attention Deficit/Hyperactivity Disorder (ADHD)-specific knowledge in teachers and identifying demographic predictors pertaining to teachers' knowledge of ADHD within the South African context".

My name is Gina Sim and I am currently enrolled in my Master's at the University of KwaZulu-Natal and am in the process of writing my Masters dissertation. The aim of the study is to identify the level of knowledge that teachers have of the symptoms and effects of ADHD amongst their learners.

Who can participate?

You can participate in the study if you are qualified teacher with the relevant teaching degree/diploma. In order to participate in the study, you need to be at least 18 years old.

What will you be required to do?

If you agree to participate in the study, you will be asked to complete a 3-page questionnaire which will take about 10-15 minutes to complete. The questionnaire contains questions relating to: your demographic details (gender, race, level of education, and school location), knowledge of ADHD associated features, symptoms/diagnosis, and the treatment.

Benefits

Although you will not receive remuneration for participating, your participation will provide important understandings that will contribute towards the development of training programs that can enhance ADHD specific knowledge in teachers. In addition, a summary of the key findings from the research will be made available to the school and shared with participants, and a hard copy will be delivered to the Principal of the participating schools once finalised.

Costs

We don't believe there will be any negative risks to participating in this study. However, if you decide to participate and feel upset or distressed afterwards, you will be provided with free counselling to assist you to deal with your upset/distress (see contact details below).

Confidentiality and anonymity

You will not be required to provide your name or the schools name, or any uniquely identifying information on the questionnaire and all responses will be anonymously returned. Further, all information provided will be treated in the strictest of confidence.

Voluntary participation

Participation in the study is entirely voluntary and students who decide not to participate will not be disadvantaged in any way. Further, participants who decide to participate are free to withdraw from the study at any stage and for any reason.

Contact details

If you have any questions relating to the study: you can e-mail the researcher at: collings@ukzn.ac.za or phone him at 031 260 2414 (during office hours) or contact Gina Sim on 083 2884710 / ginadsim@gmail.com. If you feel you need free counselling: you can contact the researcher (contact details above) or phone the Psychology Clinic (landline: 031 260 7425). If you want to find out more about your rights as a research participant, you can contact the Research Office (office hours: 031 260 3587)

Appendix 7: Declaration of consent

CONSENT DECLARATION

PROJECT TITLE: Assessing Attention-Deficit Hyperactivity Disorder (ADHD)-specific knowledge in teachers and identifying demographic predictors pertaining to teachers' knowledge of ADHD within the South African context".

I hereby confirm that I have read and understood the contents of the information sheet and the nature of the research project, and I consent to participate in the research.

I understand that I am free to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT:

DATE:

Appendix 8: Email to Principal requesting permission to conduct research

The Principal

Dear Sir / Madam,

Permission to conduct research (approved by Department of Education)

I am writing to request permission to conduct research at your school. I am currently enrolled in my Masters at the University of KwaZulu-Natal and in the process of writing my dissertation. The study is entitled “Assessing ADHD-specific knowledge in teachers and identifying demographic predictors pertaining to teachers’ knowledge of ADHD within the South African context”. The aim of the study is to identify the level of knowledge that teachers have of the symptoms and effects of ADHD amongst their learners.

Attached is two letters from The Department of Education and The University of KwaZulu-Natal approving my study in the Umlazi District Area. I would like to assure you of the utmost confidentiality and confirm that all information obtained will be anonymous and generalised into findings.

This email serves as an introduction and to give you background on the study and request an appointment so that I may discuss it further in person.

I would greatly appreciate your response with a possible appointment date.

Thank you for assisting me in this endeavour.

Kind regards

Gina Sim

083-2884710

ginadsim@gmail.com

Appendix 9: Instructions to Principal outlining the steps for administration of the research

Ms Gina Sim
Masters Student, UKZN, Howard College
Tel: 083 288 4710

Date (2018)

Dear Principal,

Thank you for agreeing to assist me with my research entitled: "Assessing Attention Deficit/Hyperactivity Disorder (ADHD)-specific knowledge in teachers and identifying demographic predictors pertaining to teachers' knowledge of ADHD within the South African context".

Please note the attached documents are attached:

- Consent letter for the Principal to sign (1 copy)
- Consent declaration and questionnaire (60 copies)
- Information sheet (60 copies)
- Approval from UKZN and Education Department

Procedure to be followed:

1. Principal to sign the consent form
2. Qualified teachers with relevant degree/ diploma to be used in the sample
3. Each participant is to be handed an Information sheet (explaining the study) and a consent / questionnaire form
4. Please may the questionnaire be given in a controlled environment where teachers do not discuss the answers or use any resources
5. Once completed I will collect them from you

Once again I would like to assure you of the utmost confidentiality, you will not be required to provide your name or the schools name, or any uniquely identifying information on the questionnaire and all responses will be anonymous. Further, all information provided will be treated in the strictest of confidence.

Many thanks for your assistance.

Gina Sim

Appendix 10: Principal's permission to conduct research

Ms Gina Sim
Masters Student
University of KwaZulu-Natal
Howard College Campus
Durban
4041

The Principal

Dear Sir / Madam

Permission to conduct research

As per our discussion, I am writing to request permission to conduct a research study at your school. I am currently enrolled in my Masters at the University of KwaZulu-Natal and am in the process of writing my Masters dissertation. The study is entitled "*Assessing ADHD-specific knowledge in teachers and identifying demographic predictors pertaining to teachers' knowledge of ADHD within the South African context*". The aim of the study is to identify the level of knowledge that teachers have of the symptoms and effects of ADHD amongst their learners.

I hope that the school administration will allow me to administer a questionnaire to willing teachers from the school. The teachers will be required to anonymously complete a questionnaire during a convenient time as arranged, and should take no longer than 15 minutes. The survey results will be pooled for the dissertation and the results will be made available to the school. As mentioned, the survey and the results will be completely anonymous.

Teachers will be given consent forms stating the voluntary nature of the study and their right to withdraw from the study at any time. These forms will need to be signed and returned prior to commencement of the study.

Your approval to conduct this study will be greatly appreciated. Should you have any questions or concerns, please do not hesitate to contact me either by telephone or email.

Thank you for assisting me in this endeavour.

Kind regards

Gina Sim
083 2884710
ginadsim@gmail.com

_____ (permission granted to include in survey)

The Principal