

## *Chapter One*

### **Literature Review**

#### **1.1 Introduction**

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most controversial and contentious of all the childhood-onset disorders, with a number of studies devoted to the understanding of its symptoms, causes as well as the most effective treatment interventions, and their consequent outcome (Nigg, 2001, as cited in Barkley, 2002). Despite the vast amount of literature and information on the condition, “ADHD is frequently misunderstood: “it is a disability plagued by misconceptions and myths” (Gargiulo, 2010, p.241). Parents and professionals often misinterpret the behaviour of a child with ADHD and consider the child as rude, disobedient and unmotivated. Many even question the legitimacy of the condition, believing that it has in fact been created to alleviate parents of the responsibility and blame for their child’s uncharacteristic behaviour (Gargiulo, 2010). Some believe that the condition is caused as a result of organic and biological functions, whereas others believe that the condition is caused by environmental factors, such as the parent-child interaction (Dennis, Davis, Johnson, Brooks & Humbi, 2008, as cited in Sines, Saunders & Forbes-Burford, 2009).

Not only is there misunderstanding and misinterpretation amongst parents and doctors about ADHD, but amongst educators also (Perold, Louw & Kleynhans, 2010). This should elicit great concern due to the vital role that educators play when it comes to the recognition and identification of ADHD symptoms and its subsequent diagnosis, referral and treatment (Perold et al., 2010). It is the responsibility of the South African educator to create a classroom environment that provides learners (with or without ADHD) with the opportunity to succeed and reach optimal potential, taking into account the fact that his/her work becomes much more demanding and time consuming when there are learners with ADHD in the classroom (Nel, 2007). Not only do educators play an important role in educating learners, but they also provide information to parents and doctors for subsequent ADHD diagnoses. They also play a role in the management and treatment of ADHD symptoms (Kern, 2008). Therefore the information that educators have about ADHD will affect the way in which they teach and deal with learners with ADHD. It therefore becomes essential that educators have accurate and adequate knowledge on ADHD in order to be better able to attend and respond to the complexities presented by the condition amongst children.

Despite the crucial role played by educators, an overwhelming theme that has emerged from several studies is the notion that educators do not have an adequate or sufficient understanding of the condition, and in fact provide incorrect and inaccurate advice to parents of children diagnosed with ADHD (DiBattista & Sheperd, 1993). Many educators do not feel competent or confident to recognise and consequently deal with learners as diagnosed with ADHD, which may be due to a lack of training in the area (Kern, 2008; Kos, Richdale & Jackson, 2004)

But what is the situation in South Africa with regards to township educators' knowledge and perceptions regarding ADHD? This study aimed to assess what foundation phase educators in a township in Gauteng know, perceive, or do not know about ADHD. The results and conclusions ascertained from this study have implications for educators, children and professionals, as discussed in the final chapter of the research report.

## **1.2 Attention Deficit Hyperactivity Disorder (ADHD)**

ADHD is defined as a relentless pattern of inattention and /or hyperactive and impulsive behaviours that impede in the execution and completion of daily tasks. Children may display elements of distractibility and destructiveness, yet a child diagnosed with ADHD will display such behaviours more frequently and persistently than is regularly seen in a child at the same developmental level (Efron, Scibberas & Hassell, 2008).

According to Lougy and Rosenthal (2002), ADHD is one of the most researched and most publicised of all childhood-onset disorders, with a number of both local and international studies being devoted to the investigation of its prevalence rates, causes, symptoms and prognosis. Such studies however, have produced differing results, and therefore disagreement exists as to the condition's exact prevalence rates (Green, Wong, Atkins, Taylor, & Feinleib, 1999). In spite of this non- consensus, research suggests that ADHD exists and permeates trans-globally (Faraone, Sergeant, Gillberg & Biederman, 2003).

A study conducted by Moffit and Melchior (2007) ,which has come to be regarded as the most reliable and comprehensive international study on ADHD, revealed a worldwide prevalence rate of 5.29%. According to Hamilton (2011), the prevalence rates of the condition are in fact increasing, as the percentage of children in the USA, ranging from ages 5-17, who were diagnosed with ADHD increased from 7% to 9% between the years 1998-2009. According Zametkin and Ernst (1999), ADHD is a frequently occurring disorder, with

symptoms pervading more often in boys than in girls. Recent research reveals that ADHD is in fact the most persistent and commonly occurring condition affecting South African children today, with 8% to 10% of children receiving this diagnosis (Snyman, 2010; ADHASA, 2010).

ADHD can be described as a universal condition that is non-prejudicial in nature, as it transcends itself across cultural, social, racial, ethnic and economic domains (Hinshaw, 1994). It has been found and documented in countries such as Japan, China, India and South America (Flick, 2010). Evidence is available which reveals that African people are just as affected by the condition as are westernised nations (Meyer & Sagvolden, 2006). A study conducted by Aase, Meyer and Sagvolden (2006) suggested that ADHD is a neurological disorder and is by no means a cultural construct, and is therefore not to be understood in terms of culture and values. This study produced the same set of results in a group of children from Limpopo in South Africa, as were produced in Norway; (children of the same age category were used in both countries).

These findings however have been challenged by researchers who suggest that the incidence of the condition is much higher in urban populations as opposed to rural populations (Krowski, 2009). This higher incidence of ADHD in urban areas may be related to socio-economic factors, which have been linked with ADHD. Interestingly, it has been found that factors such as one's race and ethnicity are associated with greater prevalence rates for the condition (Krowski, 2009).

It can be seen that ADHD is lined with much controversy and complexity and carries with it certain misunderstandings and myths. What can be said without hesitation is the idea that ADHD is a worldwide phenomenon that poses many questions and presents many challenges in the medical, educational and psychological fields of practice.

### **1.3 Definition of the terms 'Knowledge' and 'Perception'**

Knowledge is "the collection of mental units of all kinds that provides us with understanding and insight" (Wiig, 1998, as cited in Firestone, 2003, p.108). Knowledge enables one to take initiative and provides one with the "capacity for effective action" (Firestone, 2003, p.108). According to Perold et al. (2010) knowledge may be defined as an "acquisition of information" and "ways to use it", and may be influenced by experience (p. 460).

Consequently, if one possesses knowledge on a subject, one automatically has the skills to

manage and deal with the subject at hand (Perold et al., 2010). Thus if an educator possesses knowledge on ADHD, it will result in him/her possessing skills and tools to manage it. Information on ADHD may strengthen an educator's ability to recognise and deal more effectively with the consequences of the condition. Researchers argue that knowledge is fluid, and changes as new experiences are integrated into one's schemata (Krowski, 2009). Previous studies have shown that educators generally have a basic familiarity regarding the symptoms of ADHD, yet familiarity does not equate with appropriate and adequate knowledge of the condition (Perold et al., 2010).

The word 'perception' is defined differently by the domains of philosophy, sociology and psychology. However, for purposes of this research report, the word perception will be defined as "the way a person understands something", and is in fact static in nature (Simpson & Weiner, 1989, as cited in Perold et al., 2010). Researchers argue that when making sense of experiences it is an educator's knowledge, rather than his/her beliefs or perceptions that influence his/her thoughts, ideas and decisions (Krowski, 2009). In this study, the word 'misperception' will be used in instances where educators' knowledge and understandings concerning ADHD are incorrect and false.

#### **1.4 Contemporary Views and Etiologies**

Professionals adopting a medical model in respect of ADHD may describe the condition as genetic and biological in nature, and discount the view that ADHD is caused by environmental and cultural factors (Barkley, 2002). Such experts promote and defend the idea that ADHD runs in one's family, and that identical twins have a greater chance of being affected by the condition as do fraternal twins (Barkley, 2002). Neurological and genetic studies reveal that "executive functioning and the neurological structures that govern executive activity" differ for those people who have ADHD compared to those who do not (Gregg & Deshler, 2009, p.58).

This understanding and subsequent explanation of ADHD has been severely criticised as being scientifically false and for labeling ADHD as a neurological disorder. Critics are of the premise that "neither schizophrenia nor ADHD nor any psychological suffering is a brain disorder" (Lloyd, Stead & Cohen, 2006, p.115). Experts adopting this etiological viewpoint believe that to speak of ADHD in terms of genetic and neurobiological factors, in contrast to environmental and social factors, "may seem somewhat sterile" (WHO, 2002, p.87).

According to this viewpoint, ADHD is in fact related to environmental stressors, such as poor and inconsistent parenting styles and “oppressive school and community environments” (Lloyd et al., 2006, p.116). Parental stress, issues of low self-esteem in mothers and the blaming behaviours of fathers may lead to the development of ADHD symptoms in children. On the other hand, these parental behaviours may in fact arise as a reaction to the child’s ADHD (Lloyd et al., 2006).

Both these perspectives are challenged by others who exclaim that “the artificial separation of biological from psychological and social factors has been a formidable obstacle to a true understanding of mental and behavioural disorders”, and explain that disorders are in fact resultant of a complex interplay between these factors (WHO, 2002, p.87). According to Mowbray (2003) ADHD is understood to be “triggered by the interaction between biological and social factors” (p.13). In simple terms, it can be stated that one does not simply play out and mimic his/her genetic programmes, nor is one’s behaviour a direct result of “environmental determinism”, but rather a product of the two (WHO, 2002, p.87).

The diathesis- stress model provides further explanation of this viewpoint. The word diathesis refers to a biological predisposition, and the word stress refers to any external occurrence that interacts with or aggravates this vulnerability. This external event/s may increase the risk for the development and expression of a disorder such as ADHD (Bennett, 2003). From this explanation it can be understood that children with ADHD are considered to have a biological vulnerability to the disorder which becomes exaggerated by environmental stresses (Kendall, 2000). Therefore, according to this model ADHD is caused by an interaction of a child’s inherent biology and his/her environment.

Due to South Africa’s diverse population that consists of individuals and groups of different cultural, religious and racial orientations the traditional and cultural perspective regarding ADHD is critical to understand. According to this perspective, hyperactive, impulsive and immature behaviours are biological in nature, yet the ways in which they are described, classified and made sense of is “a cultural process” (Jacobson, 2002, p. 283). Here, the medical model is severely criticised as it is seen to decontextualise a person’s behaviour, and leads parents and teachers to detach and relieve themselves of the duty to raise well mannered members of society (Timmi & Taylor, 2004).

ADHD is the most widespread psychiatric condition affecting South African children today (Lloyd et al., 2006). The question however arises as to whether this rise in prevalence is a true reflection of a rise in incidence rates in South Africa, or whether it is due to the fact that society's threshold for non-conformist behaviour has reached its peak. Social and cultural factors impact on the degree to which the uncharacteristic and unique behaviour is considered an actual problem/disorder (Timmi & Taylor, 2004). Evidence reveals that certain cultures are more sensitive or conversely more accepting of ADHD-like behaviours than other cultures and societies (Timmi & Taylor, 2004, p.4). What is acceptable and appropriate behaviour in one cultural group may be viewed as inappropriate in another, due to issues such as that culture's tolerance toward the displayed behaviour.

As mentioned, an educator plays a vital role in the identification of ADHD. With this cultural perspective in mind it may be understandable as to why a township educator may have a different attitude and understanding toward ADHD and act differently toward a child who displays symptoms of ADHD compared to an educator who stems from a westernised value system. It therefore becomes essential (according to this perspective) to obtain a multidisciplinary assessment of a child who is seen to be displaying symptoms of ADHD, so that he/she may obtain an unbiased and accurate diagnosis.

## **1.5 Core symptoms of ADHD**

### **1.5.1 Introduction**

ADHD can be defined as a "persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically observed in individuals at a comparable level of development" (American Psychiatric Association, 2000, p. 85). The DSM IV-TR labels three subtypes of ADHD namely; Predominantly Inattentive type (ADHD I), Predominantly Hyperactive-Impulsive type (ADHD H) and a Combined Type, (ADHD C), where an individual displays elements of both inattention and hyperactivity (American Psychiatric Association, 1994). The existence of these three separate categories marks a significant departure from the DSM-III, where ADHD was considered to be a unitary condition (Goldstein and Goldstein, 1998).

### **1.5.2 Predominantly Inattentive Type (ADHD I)**

The Predominantly Inattentive type (ADHD I) is for those individuals who meet criterion (1) as set out in the DSM IV-TR (See Appendix 5). The primary challenge regarding this type of ADHD is that of focusing and sustaining ones attention on a particular stimulus or piece of information without becoming distracted. The individual may find it very challenging to taper his/her attention onto one task/stimulus and experiences difficulty with regards to paying attention and responding effectively to instruction (Mash & Wolfe, 2009). The individual is distracted by external stimuli arising from the environment and by racing thoughts which circulate his/her mind (Economou, 2002, p. 7). It is however incorrect to believe that children with this type of ADHD are unable to concentrate at all, rather, “their mechanisms for concentrating are inefficient and unreliable” (Selikowitz, 2009 p.18).

This type of ADHD may not elicit as much attention as does ADHD Hyperactive Type (ADHD H), as individuals do not display overtly aggressive, impulsive and dominant behaviours. Characteristics such as anxiety, shyness and introversion are features often observed to accompany ADHD of the Inattentive Type (Sue, Sue & Sue, 1994).

Forgetfulness, sluggishness and performing inadequately in schoolwork, due to difficulties in focalisation and concentration, pervade the affected individual’s everyday experiences of life. Interestingly however, when the task at hand involves something that the child is increasingly interested in, such as watching television or playing a video game, the child as diagnosed with ADHD Inattentive Type, will concentrate on the task as effectively as a child without ADHD (Sonna, 2005).

### **1.5.3 Predominantly Hyperactive Type (ADHD H)**

An individual who displays hyperactive and impulsive symptoms, as opposed to inattentive symptoms, is diagnosed with ADHD H (See Appendix 5). Hyperactivity and impulsivity are somewhat synonymous terms, yet their symptoms are described separately in the Diagnostic and Statistical Manual (American Psychiatric Association, 2000). It must be made clear however, that these core features of ADHD are in fact observed and understood as a “single dimension of behaviour” (Mash and Wolfe, 2009, p.123). When hyperactive and impulsive symptoms permeate one’s being, the resultant effect will be that of behavioural impairment and disruption.

All children may squirm and fidget in their classroom seats, or blurt out the occasional statement in the middle of a lesson, yet the child as diagnosed with ADHD Hyperactive Type (ADHD H) may perform these types of uninhibited behaviours in an excessive manner (Sonna, 2005). Such individuals are described as motors that are constantly on the go and are characterised by incessant talking and climbing (Sonna, 2005). Telling a child with ADHD to pause and think about his/her behaviours may become a futile task, as the child often acts on impulse in the presence of minimal encouragement (Selikowitz, 2009). Impairment regarding behavioural inhibition may lead to deficits in verbal and non-verbal working memory and emotional regulation (Prifiteria, Saklofske & Weiss, 2005).

Social relationships for individuals with ADHD may be strained due to the fact that they do not listen to rules or adhere primarily to the needs of others, leading to frustration and agitation in others (Coleman, Butcher & Carson, 1984). These children are viewed in a negative light by friends, and are often set up by other children to perform dangerous and unruly behaviours, and often the only one's caught for their disruptive and naughty actions (Selikowitz, 2009). Despite the outward display of confident behaviours, these individuals in fact struggle with issues of low self esteem, depression and anxiety, which may ultimately result in psychological impairments and challenges (Coleman et al., 1984).

It must be emphasised that children diagnosed with ADHD I, ADHD H, or ADHD C, do not intend to be unfocussed or to have deficits when it comes to concentration. Nor does he/she intend to act in an excessively overt and disruptive manner. It becomes essential that professionals, educators and parents be mindful and cognisant that these behaviours are not purposeful, nor thought through. If such behaviours are viewed as intentional and frustrating, an individual on the other end will develop a negative attitude toward the child, which it will inadvertently lead to the worsening of that child's behaviour.

## **1.6 Assessment and Diagnosis of ADHD**

An ADHD diagnosis requires detailed and comprehensive information to be obtained from a number of parties, such as one's doctor, psychologist, parents and educator. An accurate diagnosis therefore involves and incorporates information from a number of relevant professionals who need to work as a cohesive team, as "no one professional group owns the management of these children" (Wheeler et al., 2008, p. 165). It is essential that the diagnostic and assessment process be carried out by a multi-faceted team that has the ability



to eliminate alternative rival hypotheses and thereby obtain a comprehensive account of the condition (Wilmshurst, 2005). Information should be obtained from a number of different sources in order for an accurate diagnosis to be made and consequently supported. Thus constant communication and feedback between the various parties is essential in order for a correct diagnosis to be made. This however is not always the case, as medical professionals often fail to consider the information that is provided to them by educators and parents (Lougry & Rosenthal, 2002).

The Diagnostic and Statistical Model of Mental disorders (DSM IV – TR) (American Psychiatric Association, 2000) is the primary categorisation and diagnostic tool adopted by South Africa, and a number of other international countries. The manual outlines the exact procedures to be followed when making an ADHD diagnosis, with or without hyperactivity. In line with the DSM IV - TR, symptoms of inattention, hyperactivity and impulsivity must be present for a period of at least six months, and must have occurred in more than one setting; at school and at home. The ADHD symptoms must pervade and permeate in such a way so as to create severe developmental impairment in the child's social, occupational and academic functioning (Dziegielewski, 2010).

Despite the fact that educators are not qualified to make an ADHD diagnosis, the information and feedback that they provide to the child's doctor or psychologist is vital. It is the educator who has firsthand experience with the child in the classroom setting; an environment which requires the child to sit still, pay attention, adhere to instruction and interact with peers in an inhibited and appropriate manner. Thus, if disruption and impairment does not take place in this setting, it is very difficult for an accurate ADHD diagnosis to be made (Naparstek, 2002). Various questionnaires and assessment tools have been developed for teachers in order to screen and test for ADHD symptoms. Some of these tests include the Conners Rating Scales, The Attention Deficit Disorder with Hyperactivity, as well as The Attention Deficit Disorders Rating Scale (DuPaul, Power, Anastopoulos, Reid, McGoey & Ikeda, 1997).

## **1.7 Interventions**

Due to the intricacies and complexities of ADHD, consensus does not exist as to which treatment intervention will effectively meet the needs of all children. It has been proposed that adequate and meaningful interventions, like assessment, require “a combination of

pharmacological, behavioural and educational strategies” (Pliska and the AACAP Working Group on quality Issues, 2007, as cited in Efron et al., 2008, p. 187.)

Pharmacological treatments such as Ritalin, Concerta and Strattera are the most commonly prescribed medications for the treatment of ADHD symptoms (Hauggard, 2008). However, it has been argued that prescription medications are in fact over prescribed, to the extent that the prescription of Ritalin has gained the reputation of a money-making capitalist scheme (Timmi & Taylor, 2004). The fact that there has been a 500% increase in the prescription of Ritalin since 1991, may serve to re-enforce this statement (Lazarus, 2010). Critics of prescribing and using medication to manage and treat ADHD claim that these drugs are in fact addictive and may become subject to abuse, and should therefore be used as a last resort to treatment (WHO, 2002). Conversely, a study conducted by Jensen et al. (1999) revealed that medication for the treatment of ADHD is appropriately prescribed and is therefore not prescribed in an unnecessary and excessive fashion.

Prescription medications may serve to alleviate ADHD symptoms, but it must be made clear that they are not a long-term cure that will serve to permanently eliminate a person’s ADHD symptoms (Brown, 2005). Studies have also shown that these drugs have little impact on overall academic achievement (DuPaul et al., 2006). However Venter (2006) argues that stimulant medications in fact enhance learning and improve one’s long term academic achievement. He states that stimulants have a positive impact and in fact facilitate and even boost “the cognition, vigilance, reaction time, short term memory, learning of verbal and non-verbal material, school- based productivity and accuracy in children with ADHD” ( Venter, 2006, p.145).

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

For purposes of this research report, the role that educators play when it comes to the treatment of the condition must be explored. The rationale behind this is the fact that children with ADHD often present with comorbid learning difficulties, and account for a high percentage of school failures and drop-outs (Silver, 1998). For this reason these children may require additional educational interventions and increased awareness and vigilance on the part of the educator (Silver, 1998). An educator's attitude toward the use of medication is important as it "may affect the course and medical treatment or reduce its usefulness in the school situation" (Robin & Bosco, 1973, p.624).

Importantly, the educator plays an integral role when it comes to the implementation and integrity of academic based interventions (DuPaul et al., 2006). Some academic interventions involve peer tutoring, individualised attention and instructional and task modification (DuPaul & Eckert, 2006). It is also helpful for the educator to create a structured and directed classroom environment that will support and foster the child's development. This may involve acts such as seating the child with ADHD at the front of the classroom. In this way the educator can constantly check up on the child, and help him/her refocus his/her attention (Selikowitz, 2009). Colourful posters and charts may be distracting for the child, and are therefore not recommended (Selikowitz, 2009).

It is interesting to understand and gain increased information on how educators regard different interventions for the treatment of ADHD. A study conducted by Pisecco, Huzinec & Curtis (2001) focused on this very topic. In this study a sample of 159 primary school educators, in both urban and rural areas, were given a vignette that described the typical behaviour and academic performance of a child with ADHD. Subsequently, the educators were given four treatment options that could be administered to a child with ADHD.

The options included a daily report card, a response cost technique, a classroom lottery and lastly, stimulant medication. The daily report card is a technique that requires parents and educators to identify problem behaviours for the child with ADHD to work on. At the end of the school day, the child obtains a score which is dependent on his/her behaviour over the course of the school day. At the end of the day the child is able to take his/her report card home, and loses or gains privileges at home, dependent on the grade obtained. The response cost technique is a classroom intervention where the child earns points for exhibiting positive and desired behaviours or loses points for displaying negative and unruly behaviours. The classroom lottery system is a similar reward technique, but involves the active participation

of the whole classroom, where each child gets the opportunity to obtain points based on his/her behaviours, and is thus not only targeted at the child with ADHD. Lastly, stimulant medication was proposed as a treatment option, specifically Ritalin, as educators are most familiar with it. Overall, the majority of the educators rated the daily report card as the most acceptable intervention, with the classroom lottery intervention receiving the least amount of ratings and support from educators. Despite the frequent prescription and vast use of stimulant medication, both the daily report card and the response cost intervention in this study received significantly higher acceptability ratings as compared to the stimulant medication. Educators did however believe that medication would be more effective for the treatment of ADHD like symptoms in boys as compared to girls. Thus, results from this study convey that educators do not prefer the use of medication for all students with ADHD.

Educators believed that the educational intervention and behavioural modification programme namely, the daily report card would be more successful for the treatment of ADHD than medication. This result is very significant and highlights the importance for educators and relevant professionals to have the correct and appropriate information on the condition. This study however had a major limitation, in that its sample of educators was obtained from a small and narrow geographic region. One cannot assume that these results would be found in other areas and subsequently generalised and applied to other educators within those areas.

A study conducted in South Africa, by Kern and Seabi (2008), revealed contrary results. A primary aim of the study was to investigate what a sample of five educators perceived to be the most effective treatment interventions for ADHD. Educators reported that they were not opposed to the administration of behavioural programmes, home programmes and alteration of diet, but believed that these treatments were severely “ineffective in the classroom situation”, and as a result, many of them revealed that they in fact preferred medication as a way to manage and treat ADHD (Kern & Seabi, 2008, p.643). It is to a degree understandable as to why educators would opt for the use of medication to treat the symptoms of ADHD, as according to the authors, it provides for the short term relief and management of symptoms. Although this study revealed interesting results, the issue of generalisability proved to be a major limitation, as the sample size was very small and only included white educators.

A subsequent study conducted by Kern (2008), whose sample consisted of 130 foundation phase educators both at private and public schools in Gauteng, revealed similar results.

Educators preferred the use of medication, specifically Ritalin to manage and treat the symptoms of ADHD. A minority of educators preferred behavioural interventions to manage the condition and stated that “medication is not a cure for ADHD” and claimed that in some “children it seems to have very little effect” (Kern, 2008, p. 61). However, due to the sample size, and the narrow geographic region that was targeted and subsequently utilised in the study, the results cannot be generalised to the wider educator population.

Educators are under a great deal of pressure to serve all the needs of learners, and may not have the time or the resources to implement behavioural interventions. In the study conducted by Kern (2008), it was revealed that the majority of educators in the sample group indicated that a child who presents with symptoms of ADHD should be referred to a neurologist for assessment and subsequent treatment. The preference for medical treatments displayed by educators in the number of studies mentioned above is of concern as a huge economic disparity exists in South Africa and many learners “don’t have access to treatment” (Venter, 2011, as cited in Graham, 2011). The question must then be asked about what happens with these learners, and research should explore what options they in fact have to manage and deal with their ADHD.

Interestingly, other studies conducted at both an international and local level reveal different results. One international study revealed that educators overwhelmingly prefer the combination of behavioural programmes and medications to manage and treat the symptoms of ADHD (O’Donohue, 2005). This finding was confirmed by a study that was conducted in South Africa by Perold et al. (2010), where 75% of the educators regarded parent and educator training in combination with medication to be the most effective treatment option.

Despite these differing results, an American study that was conducted by Stormont and Stebbins (2001) revealed interesting findings. In this study, 138 foundation phase educators were asked to rate, on a 7 point Likert-type scale, how important certain interventions for ADHD were, and how comfortable they would be to implement these interventions in their classrooms. Overwhelming evidence states that educators do not have an adequate understanding of the condition, yet the majority of educators in this study revealed that most of the interventions were important and that they would consequently feel comfortable to implement them. Importantly, the more knowledge that the educator had about the particular intervention, the more likely that he/she was going to rate the intervention as acceptable, that

is “the more individuals know about a specific treatment, the higher they tend to rate the acceptability of that treatment (Vereb & Diperna, 2004, p.1).

## **1.8 Knowledge and Perceptions of the Educator Regarding ADHD**

“Ideal teachers are those who use themselves as bridges over which they invite their students to cross, then having facilitated their crossing, joyfully collapse, encouraging them to create bridges of their own” (Kazantzakis, 1952). This quote encapsulates the essence of the role and responsibility of the educator in his/ her professional capacity. The educator is the medium through which the subject matter and curriculum is introduced and consequently introjected by the child (Nel, 2007). For some learners however, the guidelines taught by educators may not be adequately processed and subsequently, the learner may not be able to complete the construction of his/her bridge. Thus, when educators are presented with learners who pose challenges, they need to be fully equipped and possess the right tools to enable the child to build his/her bridge, as it is the “responsibility of the teacher to make provision for every learner to succeed” (Nel, 2007, p.2).

As mentioned above, a child who is diagnosed with ADHD may present certain challenges in the classroom setting, and may create an environment that is disruptive and difficult for the educator to manage and control. Thus, an educator needs to have the sufficient knowledge and consequent skills to deal with these learners. If the educator does not fully understand the condition, he/she may become enraged by the child’s distracting and impulsive behaviours, which may result in a punitive approach being adopted in relation to the child. On the other end, an upset child finds him/herself in a position where he/she is bewildered and ends up questioning the educator’s negative response to his/her behaviour. Ultimately a failure in the channels of communication between the educator and child has resulted, which may cause issues such as low self esteem and insecurity in the child (Barkley, 1998). It is therefore vital for an educator to have the correct understandings and perceptions of ADHD, in order to facilitate and promote the child’s academic and social world (Economou, 2002). According to Flick (1998), “a teacher’s knowledge understanding of the behaviours of an ADHD student is probably the most significant factor in how the teacher will deal with that student” (p.53).

Interestingly, one’s attitude toward a certain subject matter may affect that person’s behaviour and response toward it. Thus, it is not only important to understand what educators know, misperceive and do not know about ADHD, but also to gain insight into their attitudes

and personal opinions of the disorder, which ultimately come to affect the way in which they deal and manage learners with ADHD. With this in mind, even if an educator has the accurate knowledge of ADHD, regarding its diagnosis, symptoms and treatment, but has a negative attitude toward it, his/her behaviour toward the child will be negatively affected. Thus it needs to be acknowledged that one's attitude often affects the way in which one deals with, makes sense of and behaves toward certain issues.

Making an ADHD diagnosis is a complicated task, and it is not as simple as looking at an X-ray, or analysing a blood test (Reid & Johnson, 2011). The presence of co-morbid difficulties further complicates the situation (Reid & Johnson, 2011). Thus, educators should not be called upon to make an ADHD diagnosis. However, an educator does provide important collateral information when referring a child to a practitioner for a possible ADHD diagnosis (Kern, 2008). The accuracy of the educator's knowledge on ADHD is an essential aspect, and comes to play an important role in the diagnostic and treatment process.

It has however been found that educators' understandings of ADHD are often based on myths and false understandings. It has been reported that some educators believe that ADHD is a direct cause of the intake of certain food additives and eating too many sweets (Efron et al., 2008). Others are of the idea that ADHD is a biological abnormality (Glass & Wegar, 2000), or caused by bad parenting and a lack of parental supervision (Peacock, 2002). It is essential to understand that if educators have incorrect understandings of ADHD and its causes and symptoms, it may lead educators to "endorse the presence of behaviours symptomatic of ADHD and result in an inaccurate diagnosis" (Reid & Johnson, 2011, p. 50). Educators have to be aware of possibly misperceiving a child who seems to be displaying ADHD-like symptoms, and must be aware and even warned not to confuse it for some other disorder (the halo effect).

In America, a sample of primary school educators watched a video of a student displaying ADHD like behaviours as well as those behaviours that are characteristic and unique to Oppositional Defiant Disorder (ODD). When examined, educators were accurate in their evaluations of ADHD like symptoms such as inattention and hyperactivity. However, when students displayed behaviours that belong solely to the domain of ODD, such as opposition and non-compliance, educators automatically assumed that these behaviours were indicative of ADHD. Thus, educators mistakenly assumed that children who displayed only ODD-like behaviours also exhibited ADHD-like behaviours (Reid & Johnson, 2011). A study

conducted by Kern and Seabi (2008) revealed that educators are actually over identifying children with ADHD, as in the study 11.9% of the learners in the grade had ADHD, while educators identified 15.4% of the learners to have ADHD. A study conducted in Australia revealed that educators often provide parents and professionals with incorrect and “inappropriate” advice and information regarding the child who is displaying ADHD- like symptoms (Efron et al., 2008). Thus, misunderstandings and misperceptions held by educators may only lead to inaccurate information being passed onto professionals, who carry the task of making an actual ADHD diagnosis.

In support of these findings, further evidence reveals that educator knowledge of ADHD tends to be very narrow and limited and even incorrect (Efron et al., 2008). Three studies were conducted in Australia which delved into this topic. From one of the studies, Bekle (2004) revealed that the educators in the selected sample group were able to answer 60.7% of items in a questionnaire on ADHD. In the other study, West et al. (1994) administered the Knowledge of Attention Deficit Disorders Scale (KADDS) to a group of educators; the same instrument that has been used in this research report. It was found in this Australian study that educators knew more about the causes of ADHD, but possessed less information regarding treatment interventions for ADHD (Efron et al., 2008).

Perold et al. (2010) conducted a study on a group of 552 educators situated in the peripheral areas of the Cape Town Metropole in the Western Cape. Their study revealed that within the South African context, educators do not have adequate understandings of ADHD. In this study, educators were required to complete the KADDS scale. An overall score of correct responses of 42.6% was obtained. An overall percentage of 35.4% was gathered for don't know responses, and 22% for incorrect responses (Perold et al., 2010).

These results are consistent with a study conducted by Strous (2000). In this study educators' perceptions of their ability to identify and manage learners diagnosed with ADHD was investigated. Four out of five educators did not consider themselves to be able to adequately deal in the management of ADHD symptoms, and some of the educators misidentified and misunderstood certain ADHD symptoms. In addition, Kern (2008) revealed that educators do not have a sound understanding of the symptoms of ADHD, and the majority of educators in the sample were unable to distinguish between inattention and ADHD. According to Venter (2011, as cited in Graham, 2011), educators from poor black communities that teach at rural schools are the ones who possess the most limited knowledge on the condition.



Consequently, these children are physically and verbally punished as a result of their ADHD behaviours.

Conversely, a South African study conducted by Durbach (2001), which included five schools situated in economically deprived areas and three school situated in economically affluent areas, revealed different results to those yielded by Perold et al.(2010). It was revealed that the majority of educators in this sample group in fact had an in depth knowledge and understanding of ADHD, and were acutely aware of the symptoms of ADHD. The educators believed that their role in the classroom was crucial to the management of the condition. Furthermore, educators in this study were very eager to learn and gain more information on the condition. However, this study consisted of a very small sample group and the results garnered appear to be more of the exception than the rule and stronger evidence exists for the fact that educators generally have a poor understanding and lack of knowledge on the condition (Perold et al., 2010).

It is interesting to know whether older educators and those educators who have had more years of teaching experience have greater knowledge and understandings of ADHD. An Australian study conducted by Kos (2008), where 120 educators completed a survey on what they thought and knew about ADHD, revealed interesting results. In the study, educators with more years of teaching experience perceived themselves to have greater knowledge on the condition than the less experienced teachers. However, the number of years of teaching experience of these educators was not related to their actual levels of knowledge. The age of the educators was also not linked to the educators' level of knowledge and understandings of the condition. These results are confirmed by the findings by Perold et al. (2010).

However Schultz (2008) revealed that one's age is correlated to one's level of knowledge and understanding of ADHD, and in fact younger teachers know more about the condition than older ones, a finding which is confirmed by Scuitto et al. (2000, as cited in Perold et al., 2010). However one explanation for this may be the fact that younger educators notice the condition more in their classroom's compared to older educators "who have developed effective classroom strategies [and thereby] observe fewer disruptive behaviours in their classrooms than do younger teachers" (p.230). Jensen (2004) believes that older educators are much more rigid and set in their ways to the younger educators, who are willing to be open, honest and adaptable to the needs of ADHD learners.

The question arises as to whether an educator, who has obtained a more advanced level of education consequently knows more about ADHD. Stormont and Stebbins (2005) conducted a study in America which aimed to investigate preschool educators' past educational practices, their knowledge and their understandings of ADHD. A criterion referenced test that included demographic information as well as questions that related to knowledge and experience with ADHD in school children, was administered to educators. Results from the questionnaire revealed that those educators that obtained higher levels of academic training, such as a university education, performed on a superior level and obtained higher scores on the administered questionnaire than those educators that only obtained a high school level of education.

The study by Kos (2008) also revealed that having taught a student with ADHD is related to that educator's actual knowledge of the condition. Then the question arises as to whether training and exposure in the area, such as the reading of articles on the topic and the attendance of workshops, contributes to an educator's level of understanding and knowledge on ADHD. A study by Vereb and Diperna (2004), answers this question in the affirmative, and revealed that the attendance of workshops on ADHD has a positive relationship with educator knowledge and understandings of ADHD. In the study by Perold et al. (2010), an educator's exposure to ADHD, which includes the number of workshops attended, the number of articles read was positively correlated to their overall knowledge and understanding of the condition.

In the study by Kos (2008) older educators were more likely to attend workshops and engage in ADHD training than the younger educators. Teaching experience and exposure to ADHD also increased the likelihood of educators attending workshops. The more workshops the educators attended, the more knowledge they had on the disorder, compared to the educators who did not attend workshops. This was confirmed by the South African study conducted by Perold et al., (2010). Educators' confidence levels in the abilities to teach and deal with a child with ADHD was also related to the teacher's overall knowledge (Perold et al., 2010).

Workshops and educator training in the area seems limited and Jerome et al. (1994, as cited in Efron et al., 2008, p.190) revealed interesting results such that "99% of Canadian teachers and 89% of American teachers reported having received no training in the area of ADHD. Contrary to the above findings, other research reveals that even after attending workshops on ADHD, educators are still limited in their abilities to teach learners diagnosed with ADHD.

As every educator will experience at least one learner with ADHD per year, it may become essential for educators to receive pre-service training in the area of ADHD (DuPaul & Stoner, 2003).

There is no record and thus no evidence of a South African study which examines the perceptions of ADHD held by foundation phase educators in a township in Gauteng. This research report will therefore add to the domain of ADHD and the findings can be used as a springboard for further research studies.

## **Research Methodology**

### **2.1 Research Aims and Research Questions**

The overall aim of this research study was to explore and assess the knowledge and perceptions of Attention Deficit Hyperactivity Disorder held by foundation phase educators in a township in Gauteng.

The following are the research questions for this study:

1. What is the educators' general knowledge of the content areas of ADHD in terms of:
  - 1.1) Associated Features
  - 1.2) Symptoms/Diagnosis
  - 1.3) Treatment
  
2. What are educators' specific areas of inadequate knowledge and misconceptions in the content areas of :
  - 2.1) Associated Features
  - 2.2) Symptoms/Diagnosis
  - 2.3) Treatment
  
3. Is educators' general knowledge of the ADHD content areas different by demographic group in terms of:
  - 3.1) Associated Features
  - 3.2) Symptoms/Diagnosis
  - 3.3) Treatment

### **2.2 Research Design**

This research is exploratory in nature, and garners both qualitative and quantitative material. It is however non experimental in nature, as the independent variable was not manipulated, and there was no control group. Non probability, convenience sampling was employed as participation by educators depended on their availability and willingness to respond to the

questionnaire. Therefore, the final sample used in the study was not random in nature (Cottrell & McKenzie, 2005; Gravetter & Forzano, 2006).

### **2.3 Sampling**

#### **Target population and sampling frame:**

The target population for this research was all primary school foundation phase educators in a township in Gauteng. For practical reasons, the township schools in the vicinity of the Alexandra township were approached. Thus the township schools in this area constituted the sampling frame of the study as it was from this experimentally accessible group of schools from which the actual sample of respondents (educators) was drawn.

#### **Sample**

The sample for this study was obtained on a voluntary basis, using a purposive, non probability sample. A total of 100 foundation phase township educators, from nine schools within the vicinity of the Alexandra township participated in the study. Responses to Question 1 of Section A of the questionnaire revealed that 100% of the participants were female, with the majority having reported that they were older than 40 years of age. This sample could be seen in light of the fact that 67% of South African educators are female (Independent newspapers, 2011). Interestingly statistics revealed that 67% of South African educators are over the age of 40, again consistent with the sample utilised in this study (Independent newspapers, 2011). Foundation phase educators were chosen as the sample for this study due to the fact that they play an integral and primary role when it comes to the identification and recognition of ADHD like symptoms (Goldstein & Goldstein, 1998).

### **2.4 Instruments**

Data for this study was obtained by the administration of a questionnaire to the 100 participants (See Appendix 4). The questionnaire was threefold in nature and included; demographic/biographical questions, the Knowledge of Attention Deficit Disorders Scale (KADDS), as well as open ended questions. For clarification purposes, Table 1 is included below. A questionnaire was chosen as the preferred instrument due to the fact that it allowed for administration to a large group of subjects (Gravetter & Forzano, 2006).

Table 1: Sections of the questionnaire corresponding to research questions of the study

Section	Content	Questions	Research Question
A	Demographics	<p>Q1. Gender</p> <p>Q2. Age group</p> <p>Q3. Education level</p> <p>Q4. Years of teaching experience</p> <p>Q5. Number of hours of ADHD training</p> <p>Q6. Number of ADHD evaluations requested</p> <p>Q7. Number of children with ADHD taught</p> <p>Q8. Number of workshops attended</p> <p>Q9. Number of articles read on ADHD</p> <p>Q10. Confidence to teach a child with ADHD</p> <p>Q11: Has feedback been requested regarding a child with ADHD</p>	<p><b>RQ3:</b> Is the educators' general knowledge of the ADHD content areas different by demographic group, in terms of Associated Features, Symptoms/Diagnosis and Treatment</p>
B	Knowledge of Attention Deficit Disorders Scale	Items 1-39	<p><b>RQ1:</b> What is the educators general knowledge in terms of the ADHD content areas in terms of Associated Features, Symptoms/Diagnosis and Treatment.</p> <p><b>RQ2:</b> What are the educators misconceptions in terms of Associated Features, Symptoms/Diagnosis and Treatment</p>
C	Qualitative Questions		Incorporated into <b>RQ1, RQ2</b> and <b>RQ3</b>

As outlined in the table above, the administered questionnaire used in this study was divided into three sections. In the first section educators were asked demographic questions such as their gender, age, educational level and number of years of teaching experience. Educators were also asked to provide the number of hours of ADHD training that they had received (if any), as well as the number of evaluations and assessments that they had requested for children in their classes that they thought may have ADHD. Educators were required to indicate the number of children that they had taught with a medical diagnosis of ADHD, how many workshops that they had attended on the topic as well as the number of articles that they had read on the condition. The educators were also asked to rate their confidence levels to teach a child with ADHD. Lastly, educators were required to indicate whether they had been asked for feedback by a professional, such as a doctor or psychologist, regarding a child in their class with ADHD in order to assess the child's medication. These questions were based on a questionnaire that was administered in a study conducted by Perold et al. (2010).

The second section of the questionnaire consisted of the Knowledge of Attention Deficit Disorder Scale (KADDS). It can be seen that the instrument refers to the condition as ADD (Attention Deficit Disorder), as opposed to ADHD (Attention Deficit Hyperactivity Disorder), however, in this research study, the term ADHD was used and in fact encompassed the term ADD. The KADDS was developed by Scuitto et al. (2000) and was designed and consequently published to assess certain areas implicated in the understanding of ADHD. It is a 39 item rating scale that was designed to elicit true and correct answers (T), false, incorrect and misperceived answers (F) and don't know answers (DK) in relation to ADHD. It was therefore designed in such a way so as to elicit information that would yield discussion in three primary areas; firstly, the teachers' general knowledge, secondly, their incorrect understandings of ADHD, and lastly, their lack of knowledge on the topic of ADHD.

The instrument has been divided into three subscales. The first of the subscales is called Associated Features of ADHD and includes items; 1, 4, 6, 13, 17, 19, 22, 23, 24, 27, 28, 29, 30, 31, 32, 33 & 39. The second subscale is called Symptoms/ Diagnosis of ADHD and includes items; 3, 5, 7, 9, 11, 14, 16, 21, 26 & 38. The final subscale is called Treatment of ADHD and includes items; 2, 8, 10, 12, 15, 18, 20, 23, 25, 34, 35, 36 & 37. It must be mentioned that Scuitto (2000) added three new items to the instrument, namely items 37, 38 & 39 which have recently been classified into the three respective subscales. The areas

covered by these three subscales were selected in order to be consistent with the important areas of “diagnostic decisions and educational interventions” (Scuitto, 2000, p.5). Only items that were “empirically supported” were included for use in the scale (Scuitto, 2000, p.5). Importantly, items included in the KADDS represent positive and negative indicators of ADHD. The intention behind this construction was to measure not only what educators think ADHD is, but also what they think it is not.

Due to the fact that items 37, 38 & 39 have been recently included, the original KADDS manual does not include these items when dealing with the measure’s internal consistency. For purposes of this research, the items were included in the analysis, and the measure’s internal consistency has been discussed under section 3.2.2. Previous research conducted on the internal consistency of the KADDS revealed that the 36 items of the scale had high internal consistency (0.80- 0.90), and the three subscales, as included in the measure, had moderate levels of internal consistency (0.52- 0.75). The coefficient alphas for the individual subscales were reported to be lower than the coefficient alpha for the total scale. This may be due to the fact that fewer items make up each subscale as opposed to the whole of the KADDS measure (Scuitto, 2000, p. 6). In terms of reliability, the test-retest correlations for KADDS were medium to high (0.59- 0.76).

The last section of the questionnaire contained open- ended questions, where participants were given the opportunity to provide any additional comments or ideas that they had regarding ADHD. The information provided was also useful for the researcher, who gained a clear idea of what areas and topics to cover in the workshops that are to be given to the educators on ADHD. The information also served to substantiate and support the quantitative results garnered by the research.

## **2.5 Method of Analysis**

Descriptive and inferential statistics and graphs were used to describe the sample respondents and the measurement scales, and to answer the research questions of the study. The demographic characteristics of the respondents were described using bar graphs. Thereafter, the distributions of scores on the three content areas of the KADDS were plotted and examined for normality using the Kolmogorov-Smirnov, Lilliefors and Shapiro-Wilks tests. To assess the internal consistency reliability of the KADDS subscales or content areas, two measures were used: Cronbach alpha and its standardised equivalent, and the average inter-item correlation for each subscale.



To address the first research question of the study on the general knowledge of the educator respondents, the scale distributions were summarised using the mean and median central tendency measures as well as the 95% confidence interval for the mean, and the standard deviation and skewness measures of variability and shape were calculated for the three content areas of the KADDS.

To address the second research question, summary statistics for the central tendency, variability and shape were computed at the item level of the KADDS subscales. These results were tabulated using a robot- type colour coding scheme whereby higher mean scores were shaded in deep green and shades of yellow through to red were used for relatively lower and low means respectively. Furthermore, the responses to each item were categorised as “don’t know”, incorrect responses or misconceptions, and correct responses, thereby enabling the examination of the extent of educators’ misconceptions versus poor knowledge at the item level of each of the subscales. This analysis was depicted graphically in the form of a stacked bar graph for the items of each subscale of the KADDS.

In order to address the third research question, 1-way Analysis of Variance (ANOVA) was used to compare the mean responses of the respondents across the levels within each demographic variable on the three KADDS subscales. Line graphs were used to portray the differences between means in the case of significant ANOVA comparisons. Furthermore, the post hoc Scheffe test was used to indicate pairwise significances for significant analyses of demographic variables with more than two levels. In view of the non-normality of the score distributions, the parametric ANOVA tests were validated using the non-parametric equivalent Kruskal-Wallis test.

Finally, the Chi squared test was used to compare the demographic characteristics of the respondents who opted versus those who did not opt for a future workshop on ADHD facilitated by the researcher, and profile line graphs were plotted to describe the two groups of these demographic variables. In addition, the t-test was used to compare the mean knowledge scores on the three KADDS subscales of these two groups. These analyses were complemented by the researcher’s thematic analysis of the qualitative responses.

## **2.6 Ethical Considerations**

Ethical permission was first granted by the Gauteng Department of Education. Thereafter permission was granted by the internal ethics committee at the University of the

Witwatersrand. Subsequently, a detailed information sheet regarding the particulars of the study, as well as a letter of consent was distributed to the principals of the schools and their educators (See Appendices 1, 2 and 3). Participants were informed about the issues of anonymity and confidentiality, and were assured that no discrimination would take place should they decide not to participate.

Clear instructions on how to fill out the questionnaire were given, and in addition, the researcher was present at the time that the participants filled out the questionnaire, and was therefore available to help if they did not understand what was required. The details of the researcher and her supervisor were also provided to the research participants in the event that they had any additional queries or concerns regarding the research process or results yielded. Referral possibilities and resources that are accessible and close by were also made known to the participants. The study commenced only after consent was granted from the relevant departments, principals and educators.

In order to enhance educator awareness and understandings of ADHD the researcher intends to hold an educational workshop for all the educators of the selected schools in spite of whether they participated in the study or not. Educators will be given the opportunity to gain increased knowledge of the symptoms, causes and appropriate interventions for ADHD.

## **Chapter Three**

### **Results**

#### **Introduction**

The results of the research are presented in six main sections. The first section (3.1) describes the demographic characteristics of the respondents and their experience with ADHD. In Section 3.2, the distributions and psychometric properties of the KADDS total scale scores and subscale scores are presented. Section 3.3 – 3.5 presents the results that answer the three research questions of the study. Finally, Section 3.6 presents a summary of the qualitative responses of the educator respondents to further training on ADHD.

#### **3.1 Description of respondents**

In this section the demographic characteristics are presented in tabular and graphic form for age and highest education level of the respondents of the study and their familiarity with ADHD in terms of experience and training (3.1.1 – 3.1.6 respectively). All 100 respondents in this study were female.

##### **3.1.1 Age of respondents**

Four educators did not indicate their ages. Of the educators who disclosed their ages, almost two-thirds (64%) were older than 40, with 3% aged 20-25 years, 16% aged 26-35 years and 17% aged 36-40 years.

##### **3.1.2 Education levels of respondents**

Of the 97 educators that disclosed their highest education levels, almost two thirds (65%) had a university level education while college was the highest level of education of the other educators.

Consistent with the age distribution of the educator respondents, the majority (60%), have had more than 11 years of teaching experience, 19% have had 6-10 years teaching experience and 20% have had 5 years or less.

##### **3.1.3 Respondent familiarity with ADHD**

The questionnaire used in the study was constructed in line with the item categories of the study conducted by Perold et al. (2010). As such no allowance was made for the 'none'

category for the items measuring hours of ADHD training received, children taught having been diagnosed as ADHD and number of ADHD educator evaluations made. As two-thirds (66%) of respondents did not complete their hours of ADHD training and over a third (37%) did not complete their number of ADHD children taught, and 21 % did not disclose their number of ADHD evaluations made, these percentages are reflected as none/not disclosed on the corresponding graphs.

### 3.1.4 Confidence to teach children with ADHD

The majority (55%) of respondents expressed no confidence in their ability to teach children with ADHD, with 29% responding as confident or very confident (Figure 1).

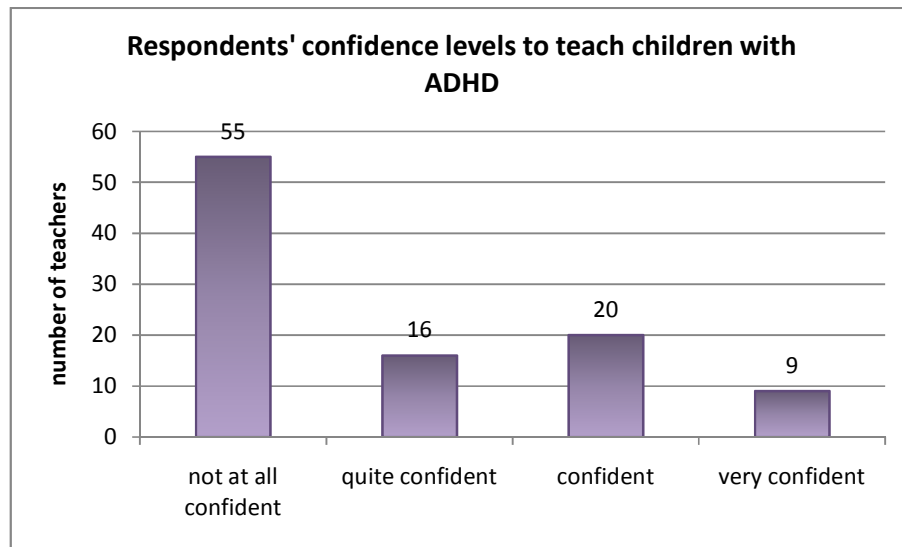


Figure 1: Educators' confidence levels to educate children with ADHD

### 3.1.5 ADHD education and training

Most of the educators (66%) responded that they had received no ADHD training (Figure 2) with most (75%) having attended no workshops (Figure 3) and most (65%) had read no articles on ADHD (Figure 4).

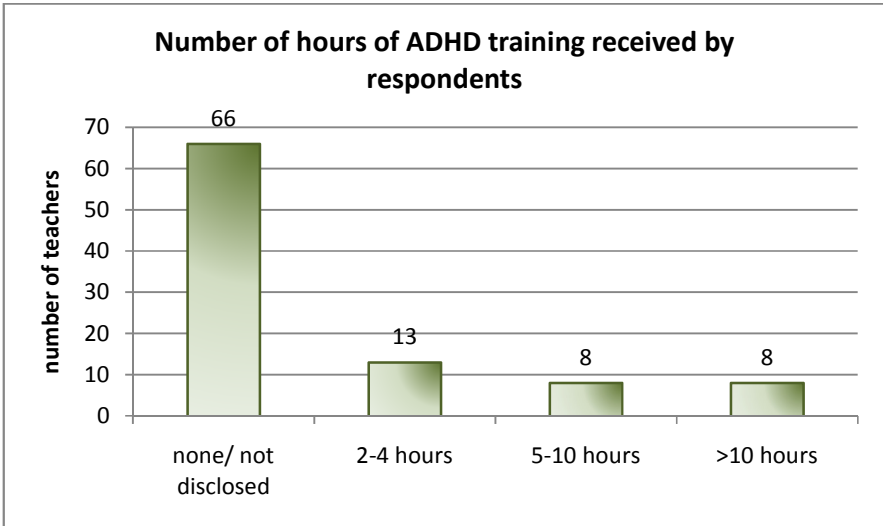


Figure 2: Number of hours of ADHD training received by educators

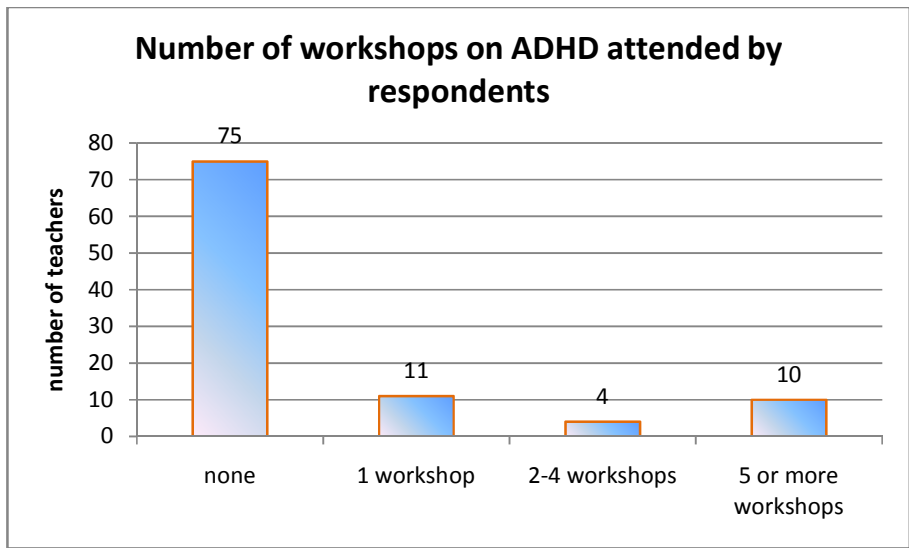


Figure 3: Number of workshops on ADHD attended by educators

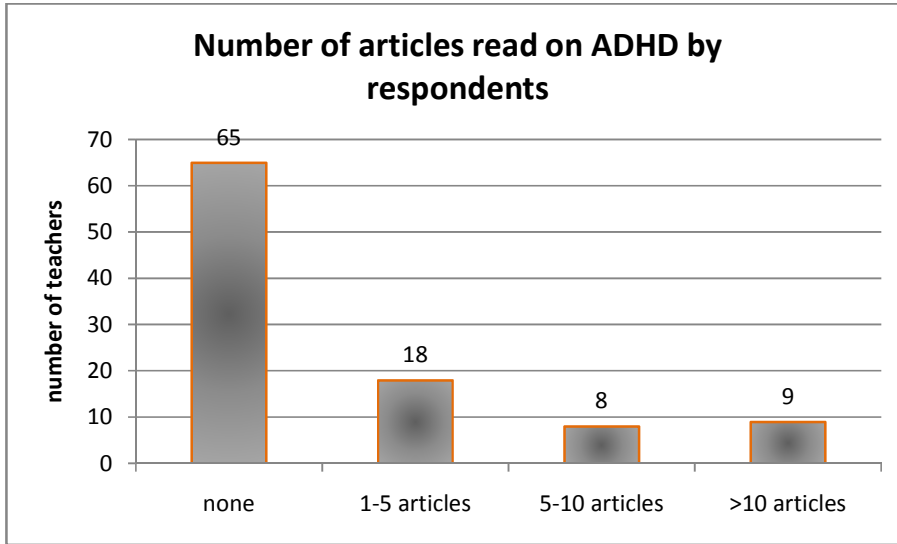


Figure 4: Number of articles read on ADHD by educators

### 3.1.6 ADHD evaluations and diagnosis

Over half (52%) of the respondents claimed that they had taught children diagnosed with ADHD and a large percentage of educators (59%) claimed that they had made ADHD evaluations (Figure 5 and 6). Almost 40% claimed that they had been asked for feedback by a doctor regarding ADHD in their classroom.

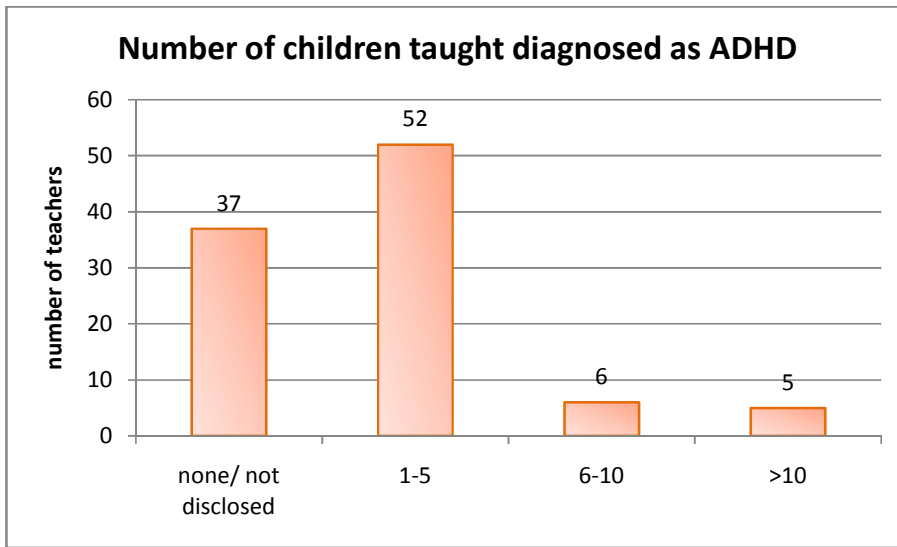


Figure 5: Number of children taught diagnosed as ADHD

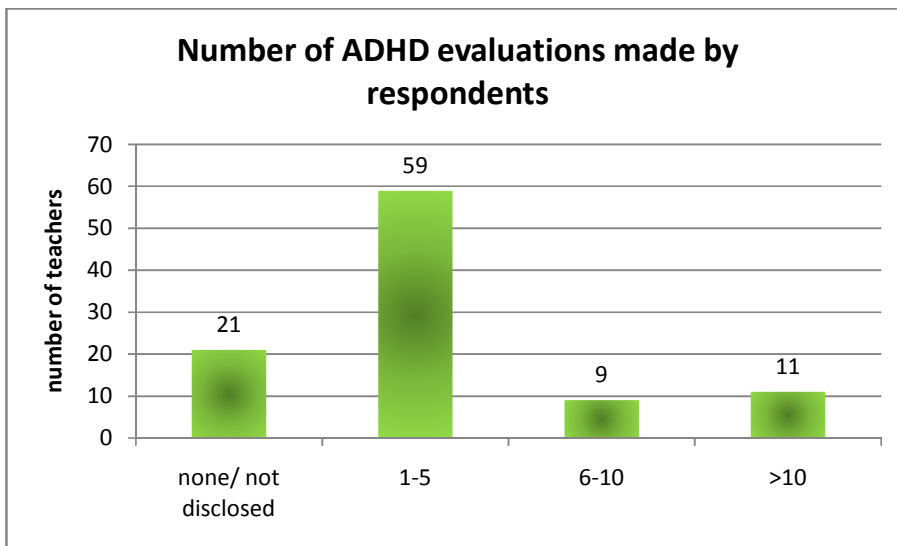


Figure 6: Number of evaluations made by educators

### 3.2. Psychometric properties of the scales

In this section, the distributions of the total scores of the KADDS scale and its subscale scores are examined for normality (3.2.1) and internal consistency reliability (3.2.2) as these measures influence the choice and interpretation of the statistics required to answer the research questions. As the parametric tests used for answering the research questions of the study assume that the responses are normally distributed, the scale and subscale frequency

distributions were plotted, with all distributions reflecting the percentage of correctly answered items. The scoring method used scored 'Don't Know' responses, as wrong.

### **3.2.1 Scale and subscale distributions**

The frequency distributions of the total scores and the scores on the three content areas are presented in Figures A- D (See Appendix 6), together with their tests of normality. These distributions were found to deviate significantly from normality when tested using the Kolmogorov-Smirnov (K-S), Lilliefors and Shapiro-Wilk tests. Accordingly, both parametric tests and their non parametric equivalent tests, which do not assume normality, were used when testing the hypotheses associated with the research questions of the study.

### **3.2.2 Scale statistics and psychometric properties**

Two methods were used to assess the reliability or the degree of consistency between the items of the subscales. The first diagnostic measure used was the reliability coefficient of Cronbach's alpha. This measure assesses the consistency of the entire subscale with the generally agreed lower limit for acceptable internal consistency of 0.70.

As shown in Table 2 the Cronbach's alpha coefficients of the Associated Features, Symptoms/Diagnosis and Treatment Subscales are 0.66, 0.71 and 0.73 respectively. Although the reliability of the Associated Features scale is lower than 0.7 some authors are tolerant of reliabilities of 0.60 and higher in exploratory research (Robinson, Shaver & Wrightsman, 1991, as cited in Hair, Black, Babin & Anderson, 2010).

The second measure of reliability considered was the average inter-item correlation for each subscale. This method is independent of the number of items in the scale. These inter item correlations are required to exceed 0.30 for good internal consistency reliability, however this criterion was not met by the items of the three subscales of the study (Robinson et al., 1991, as cited in Hair et al., 2010).



Table 2: Measures of internal consistency reliability of the three content areas of ADHD

Subscale	Cronbach alpha	Standardised alpha	Average inter-item correlation
Associated features	0.66	0.63	0.10
Symptoms/ Diagnosis	0.71	0.71	0.20
Treatment	0.73	0.72	0.17
Overall	0.88	0.87	0.16

### 3.3 Research Question 1

For ease of presentation, the first research question is restated as follows:

1. What is the educators' general knowledge of the content areas of ADHD in terms of:
  - 1.1) Associated Features
  - 1.2) Symptoms/Diagnosis
  - 1.3) Treatment

Based on the results of Table 3, the overall percentage of correct responses to the 39 KADDS items was 35%, implying that on average a respondent answered 35% of the items correctly. A 95% confidence interval (CI) for the mean (31.3-38.6) is interpreted that there is a probability of 0.95 that this interval incorporates the real percentage correct responses among the educators. This upper bound (38.6) is nonetheless low. Nine of the 100 educator respondents scored zero on all 39 items of the scale.

These summary statistics are presented in Table 3.

Table 3: Summary descriptive statistics of the three content areas of ADHD

	Mean	95% Confidence Interval for mean		Median	Standard deviation	Skew Ness
Associated features	30.4%	27.0%	33.8%	31.3%	17.2%	-0.21
Symptoms/ Diagnosis	47.9%	43.3%	52.5%	50.0%	23.3%	-0.51
Treatment	30.6%	26.5%	34.8%	30.8%	20.9%	0.10
Overall	34.9%	31.3%	38.6%	37.2%	18.2%	-0.33

The results are now discussed for each of the respective subscales.

### **3.3.1 Associated Features of ADHD**

The mean score of 30.4% on the Associated Features subscale was lower than the overall scale score of 34.9%, and based on the median score of 33.8%, half of the respondents answered fewer than 31% of these items correctly (Table 3). The minimum scores of zero on the Associated Features subscale show 10 educators who either did not know and/or who answered all the items of the subscale incorrectly.

### **3.3.2 Symptoms/Diagnosis of ADHD**

Of the three subscales, the highest mean (percentage correctly answered items) is for Symptoms/Diagnosis (47.9%, CI; 43.3%-52.5%). Even on this subscale, the average respondent answered approximately half of the items wrongly, based on this subscale mean of 47.9% and median value of 50 (Table 3). Nine of the 100 educators scored zero on this Symptoms/Diagnosis subscale.

### **3.3.3 Treatment of ADHD**

The mean score of 30.6% on the Treatment subscale is comparably low to the mean score on the Associated Features subscale was lower than the overall scale score of 34.9%, and based on the median score of 30.8%, half of the respondents answered fewer than 31% of these items correctly (Table 3). The minimum scores of zero on this subscale show 15 educators who either did not know and/or who answered all the items of the subscale incorrectly.

## **3.4 Research Question 2**

For ease of presentation, the second research question is restated as follows:

2. What are educators' specific areas of poor knowledge and misconceptions in the content areas of :
  - 2.1) Associated Features
  - 2.2) Symptoms/Diagnosis
  - 2.3) Treatment

In order to determine the specific areas of poor knowledge and misconceptions of the content areas of ADHD, the scores of the educator respondents were examined at the item level for the three KADDS subscales (3.4.1 – 3.4.3 respectively).

### 3.4.1 Associated Features of ADHD

Descriptive statistics of the responses of the educators to the items of the Associated Features subscales are provided in Table 2. The low internal consistency reliability and low average inter-item correlation for this subscale (Table 1) imply that some items of the subscale were answered correctly by educators who answered other items incorrectly, and thus some items would be expected to have vastly different means from others. To reflect the items on which low and poor correct responses were obtained a robot-type colour coding system was used whereby lower means were shaded red and highest means were shaded dark green which shades of orange for items in between.

Item 1, which suggests that ADHD occurs in approximately 15% of school age children, item 27, which states that children with ADHD generally experience more problems in novel situations rather than familiar ones, item 30, which states that the problem behaviours in children with ADHD are distinctly different from the behaviours of non-ADHD children and item 39, which states that children with ADHD display an inflexible adherence to routine, all have very low percentage correct responses with means between 4% and 12%. These percentages are particularly low compared to items 13, which states that it is possible for an adult to have ADHD, item 31, which refers to the idea that children with ADHD are more distinguishable from normal children in a classroom setting as opposed to a free play situation and item 32, which states that the majority of children with ADHD evidence some degree of poor school performance during their early school years, which all have relatively high percentage correct responses with means between 60% and 62%.

Apart from these three items, the mean score on the rest of the items of this subscale were all below 42%, and thus the standard deviations were low on these items and as a result on the whole subscale. This low response variability would have impacted negatively on the internal consistency reliability as Cronbach's alpha was dependent on the variability in the responses.

In order to investigate the low item scores, a distinction was made between misconceptions, i.e., incorrect responses, versus "don't know" responses. This distinction is displayed graphically for the Associated Features items in Figure 7 where bars shaded in blue indicate the percentage of misconceptions and bars shaded in red indicate incorrect responses for each item. The figure shows that educators have the greatest extent of misconception of ADHD on items 27, 1, 39 and 24, which states that a diagnosis of ADHD by itself makes a child eligible for placement in special education. These items arranged in decreasing order of incorrect

responses from 53% to 40% and the least extent on items 31, 13 and 32 (these items similarly arranged in decreasing order of incorrect responses from 14% to 11%).

Table 4: Associated Features item statistics

Items	Mean	Median	Std. Dev	95% Confidence Interval for mean		Skewness
1: Most estimates suggest that ADHD occurs in approximately 15% of school age children.	4%	0%	20%	17%	23%	4.77
4: ADHD children are typically more compliant with their fathers than with their mothers.	22%	0%	42%	37%	48%	1.37
6: ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population.	34%	0%	48%	42%	55%	0.69
13: It is possible for an adult to be diagnosed with ADHD.	62%	100%	49%	43%	57%	-0.50
17: Symptoms of depression are found more frequently in ADHD children than in non- ADHD children.	41%	0%	49%	43%	57%	0.37
19: Most ADHD children "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.	25%	0%	44%	38%	51%	1.17
22: If an ADHD child is able to demonstrate sustained attention to video games or TV for over an hour, that child is also able to sustain attention for at least an hour of class or homework.	32%	0%	47%	41%	54%	0.78
24: A diagnosis of ADHD by itself makes a child eligible for placement in special education.	32%	0%	47%	41%	54%	0.78
27: ADHD children generally experience more problems in novel situations than in familiar situations.	5%	0%	22%	19%	25%	4.19
28: There are specific physical features which can be identified by medical doctors (e.g. pediatrician) in making a definitive diagnosis of ADHD.	20%	0%	40%	35%	47%	1.52
29: In school age children, the prevalence of ADHD in males and females is equivalent.	33%	0%	47%	41%	55%	0.73
30: In very young children (less than 4 years old), the problem behaviors of ADHD children are distinctly different from age-appropriate behaviors of non-ADHD children.	10%	0%	30%	26%	35%	2.71
31: Children with ADHD are more distinguishable from normal children in a classroom setting than in a free play situation.	60%	100%	49%	43%	57%	-0.41
32: The majority of ADHD children evidence some degree of poor school performance in the elementary school years.	66%	100%	48%	42%	55%	-0.69
33: Symptoms of ADHD are often seen in non-ADHD children who come from inadequate and chaotic home environments.	28%	0%	45%	40%	52%	0.99
39: Children with ADHD generally display an inflexible adherence to specific routines or rituals.	12%	0%	33%	29%	38%	2.37

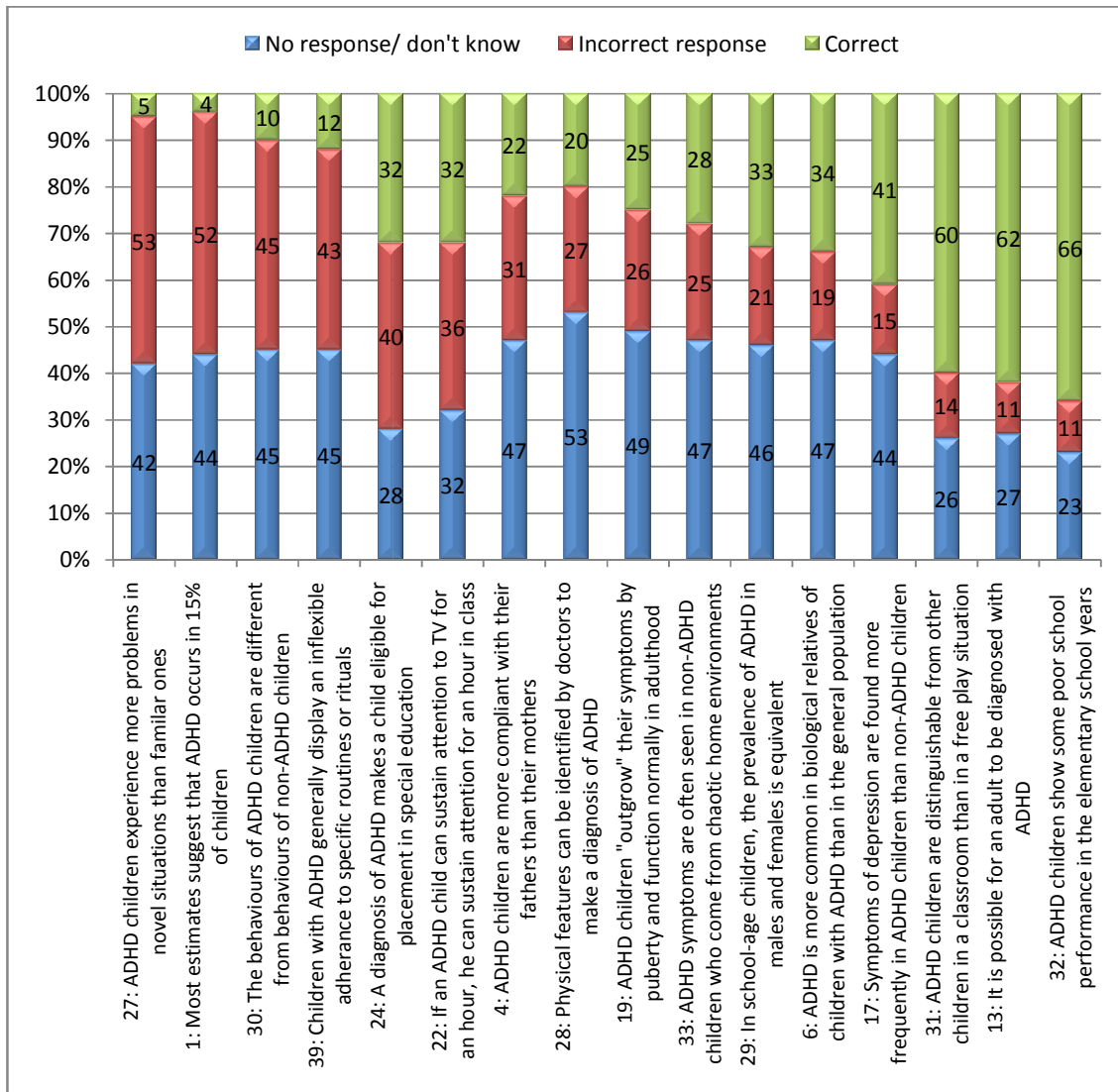


Figure 7: Categorized responses to Associated Features items

### 3.4.2 Symptoms/Diagnosis of ADHD

In line with the relatively higher mean score of this subscale compared to the other subscales (Table 2), the item means presented in Table 4 are generally higher than those of the Associated Features subscale. The items that the educators found most difficult were 11, which states that it is common for ADHD children to have an inflated sense of self-esteem or grandiosity and 38, which states that if a child responds to stimulant medications then they probably have ADHD, as the mean correct responses obtained were 18% and 23%, respectively. More than two-thirds of the educators scored the following items correctly: item 3, which states that ADHD children are frequently distracted by extraneous stimuli; item 9, which states that ADHD children often fidget or squirm in their seats; item 21, which states

that a child must present with symptoms in two or more settings to obtain an ADHD diagnosis and item 26 which states that ADHD children often have difficulties organising tasks and activities.

Once again, in order to investigate the low item scores for Symptoms/Diagnosis, a distinction was made between misconceptions, that is, incorrect responses, versus “don’t know” responses. This distinction is displayed graphically for the Symptoms/Diagnosis items in Figure 8 where bars shaded in blue indicate the percentage of misconceptions and bars shaded in red indicate incorrect responses for each item. The figure shows that educators have the greatest extent of misconceptions of ADHD Symptoms/ Diagnosis on item 7, which states that one of the symptoms displayed by ADHD children is that they are cruel to other people and item 14, which states that ADHD children often have a history of stealing or destroying other peoples’ things (48% and 47% misconceptions respectively). Figure 8 also shows that educators have the least extent of misconceptions on items 21 and 16; which states that two clusters of symptoms exist for ADHD, and items 3, 9 and 26 have between 9% and 5% misconceptions.

Table 5: Symptoms/Diagnosis item statistics

Items	Mean	Median	Std. Dev.	95% Confidence Interval for mean		Skewness
3: ADHD children are frequently distracted by extraneous stimuli.	70%	100%	46%	40%	54%	-0.89
5: In order to be diagnosed with ADHD, the child's symptoms must have been present before age 7.	36%	0%	48%	42%	56%	0.59
7: One symptom of ADHD children is that they have been physically cruel to other people.	31%	0%	46%	41%	54%	0.83
9: ADHD children often fidget or squirm in their seats.	78%	100%	42%	37%	48%	-1.37
11: It is common for ADHD children to have an inflated sense of self-esteem or grandiosity.	18%	0%	39%	34%	45%	1.69
14: ADHD children often have a history of stealing or destroying other people's things	21%	0%	41%	36%	48%	1.45
16: Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.	57%	100%	50%	44%	58%	-0.29
21: In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).	68%	100%	47%	41%	54%	-0.78
26: ADHD children often have difficulties organizing tasks and activities.	77%	100%	42%	37%	49%	-1.30
38: If a child responds to stimulant medications (e.g., Ritalin), then they probably have ADHD.	23%	0%	42%	37%	49%	1.30

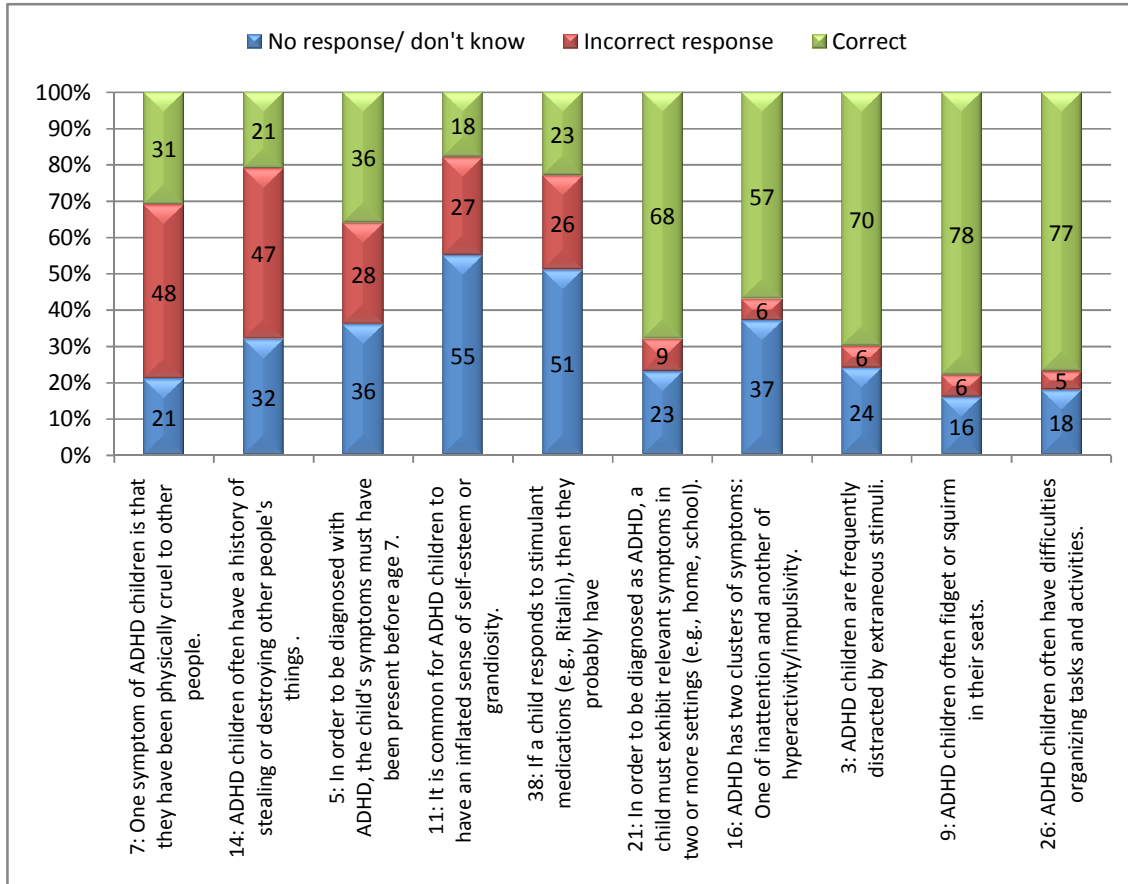


Figure 8: Categorized responses to Symptoms/ Diagnosis items

### 3.4.3 Treatment of ADHD

As for the Associated Features subscale, the knowledge level on the treatment subscale was poor (Table 4), with 14% or fewer of the educators responding correctly to item 23, which states that the reduction of sugar intake leads to the reduction of ADHD symptoms; item 34, which states that behavioural interventions for children with ADHD focus primarily on the child's problems with inattention; item 35, which states that Electroconvulsive Therapy has been found to be an effective treatment for severe cases of ADHD and item 37, which states that research has shown that the prolonged use of medications leads to increased addiction in adulthood. Only on item 10, which states that parent and teacher training in managing an ADHD child are generally effective when combined with medication, did the majority of the educators answer correctly. Once again, the categorised responses of “don't know” versus misconceptions and correct responses are displayed in Figure 3 for Treatment items. This

figure shows greatest misconceptions for items 23 and 34 (53% and 47% incorrect responses respectively) and fewest misconceptions on item 35; item 15, which states that insomnia and appetite reduction are side effects of stimulant drugs used to treat ADHD; item 20, which states that medication is used before other behaviour modification techniques are attempted; item 10, and item 36 which states that treatments which focus primarily on punishment have been the most effective in the reduction of ADHD symptoms, with, between 10% and 6% incorrect responses on these items.

Table 6: Treatment item statistics

Items	Mean	Median	Std. Dev.	95% Confidence Interval for mean		Skewness
2: Current research suggests that ADHD is largely the result of ineffective parenting skills.	37%	0%	49%	43%	56%	0.55
8: Antidepressant drugs have been effective in reducing symptoms for many ADHD	46%	0%	50%	44%	58%	0.16
10: Parent and teacher training in managing an ADHD child are generally effective when combined with medication treatment.	65%	100%	48%	42%	56%	-0.64
12: When treatment of an ADHD child is terminated, it is rare for the child's symptoms to return.	26%	0%	44%	39%	51%	1.11
15: Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.	43%	0%	50%	44%	58%	0.29
18: Individual psychotherapy is usually sufficient for the treatment of most ADHD children.	19%	0%	39%	35%	46%	1.60
20: In severe cases of ADHD, medication is often used before other behavior modification techniques are attempted.	36%	0%	48%	42%	56%	0.59
23: Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.	7%	0%	26%	23%	30%	3.42
25: Stimulant drugs are the most common type of drug used to treat children with ADHD	34%	0%	48%	42%	55%	0.69
34: Behavioral/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention.	12%	0%	33%	29%	38%	2.37
35: Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD.	14%	0%	35%	31%	41%	2.11
36: Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.	47%	0%	50%	44%	58%	0.12
37: Research has shown that prolonged use of stimulant medications leads to increased addiction (i.e., drug, alcohol) in adulthood.	12%	0%	33%	29%	38%	2.37



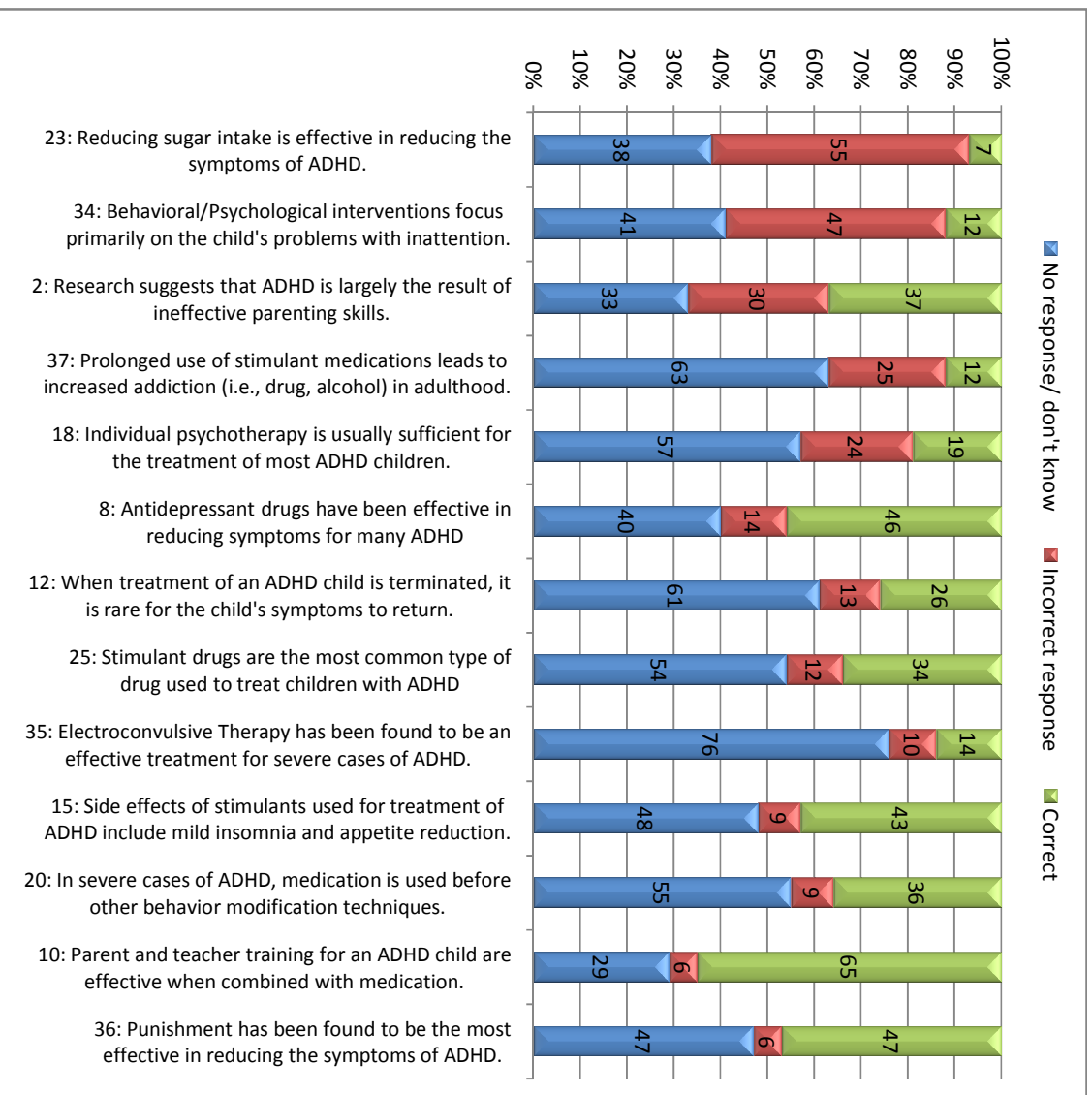


Figure 9: Categorized responses to Treatment items

### 3.5 Research Question 3

For ease of presentation, the third research question is restated as follows:

3. Is educators' general knowledge of ADHD content areas different by demographic group in terms of:
- 3.1) Associated Features
  - 3.2) Symptoms/Diagnosis
  - 3.2) Treatment

The scores of the respondents on the three ADHD content areas were compared across the levels of each of the demographic variables using 1- way Analysis of Variance (ANOVA). These results are provided in Table 6 and supporting graphic representations of means are provided (Figure 10) for the significant comparisons of education level, hours of ADHD training, number of workshops attended on ADHD, number of articles read on ADHD, confidence to teach a child with ADHD, and feedback for a doctor on assessing the medication for a child with ADHD. Education and training is the common theme underlying these items reflecting significant differences on knowledge levels of the three ADHD content areas. Based on the direction of the means in Figure 10 and the Scheffe post hoc tests for the significant ANOVA comparisons, the general trend of the means is that the more educated and trained educators are more knowledgeable in each of the three ADHD content areas than are the less educated and trained educators.

Specifically, educators with a university education score significantly higher than those with a college education ( $F(1;93) = 15.780, p < 0.001$ ;  $F(1; 93) = 13.919, p < 0.001$ ; and  $F(1;93) = 6.409, p < 0.05$ , educators with more than ten hours of ADHD training score higher than educators with none or few hours, ( $F(1; 93) = 9.035, p < 0.001$ ;  $F(1; 93) = 8.521, p < 0.001$ ; and  $F(1; 93) = 15.924, p < 0.05$ . Those educators that have attended ADHD workshops score higher than those who have not ( $F(2; 93) = 11.508, p < 0.001$ ;  $F(2; 93) = 13.928, p < 0.001$ ; and  $F(1; 93) = 20.087, p < 0.05$ . Those educators who have read more than five ADHD articles score higher than those who have not read any ADHD articles ( $F(2; 93) = 6.538, p < 0.001$ ;  $F(2; 93) = 18.290, p < 0.001$ ; and  $F(2; 93) = 20.170, p < 0.05$ . In addition, those educators who have been asked by a doctor to assess medication of a child with ADHD, and those who feel more confident to teach children with ADHD have significantly higher scores on the three ADHD content areas than other educators ( $F(3; 93) = 3.275, p < 0.001$ ;  $F(3; 93) = 8.298, p < 0.001$  and  $F(3; 93) = 5.629, p < 0.05$ ) and ( $F(1; 93) = 12.506, p < 0.001$ ;  $F(1; 93) = 21.961, p < 0.001$  and  $F(1; 93) = 16.809, p < 0.05$ ). Finally, it should be noted for all the significant comparisons of the demographic variables, knowledge levels on the Symptoms/ Diagnosis content area were significantly higher than on the Associated Features and Treatment content areas.

Table 7: ADHD content areas compared across levels of demographic variables

	df	Associated Features – F	Associated Features - p	Symptoms/ Diagnosis - F	Symptoms/ Diagnosis – p	Treatment - F	Treatment – p
2. Age group	2	2.114		2.126		2.674	
3. Education level	1	15.780	***	13.919	***	6.409	*
4. Number of years of teaching experience	2	1.485		1.174		0.092	
5. Hours of ADHD training received	2	9.035	***	8.521	***	15.924	***
6. Evaluations/ assessments of children you thought may be ADHD	1	0.071		0.432		0.059	
7. Number of children taught with a medical diagnosis of ADHD	1	0.347		0.919		1.431	
8. Number of workshops attended on ADHD	1	11.508	**	13.928	***	20.087	***
9. Number of articles read on ADHD	2	6.538	**	18.290	***	20.170	***
10. Confidence to teach a child with ADHD	3	3.275	*	8.298	***	5.629	**
11. Teachers asked by a DR to assess the medication of a child with ADHD	1	12.506	***	21.961	***	16.809	***

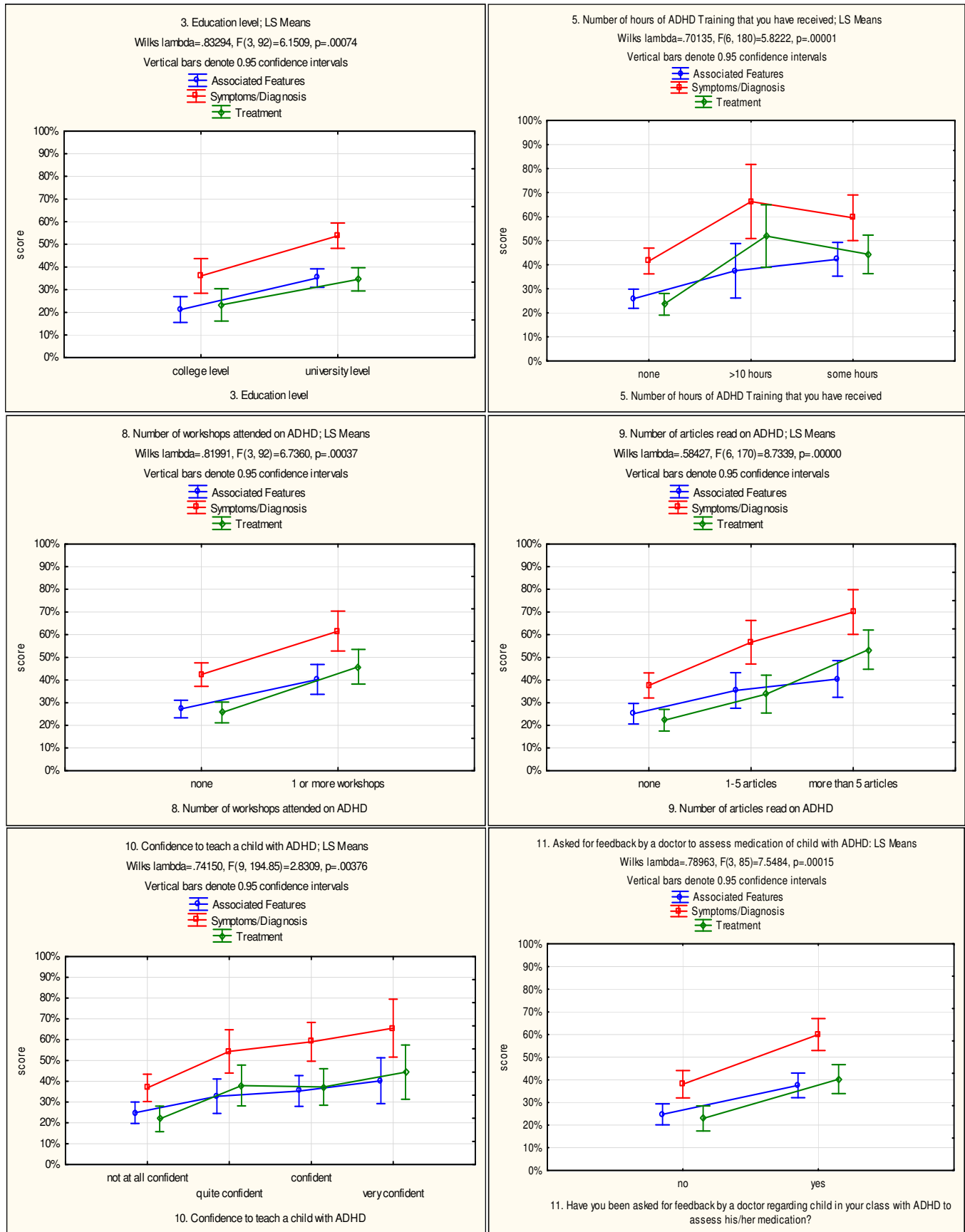


Figure 10: Graphic representation of means of the ADHD content areas by levels of demographic variables for significant ANOVA comparisons

### 3.6 Qualitative Results

Section C of the administered questionnaire (See Appendix 4) was qualitative in nature. The respondents were asked to provide any additional comments that they had on ADHD, whether they were interested in having workshops on this subject, and if so, what topics they would like to cover and learn in the workshops. The information obtained was also used to substantiate the quantitative findings of the study.

Almost three quarters (73%) of the teacher respondents stated that they wanted to attend an ADHD workshop facilitated by the researcher. The 27% of educators who did not opt to attend the workshop tended to be older, less confident (Pearson Chi-square(3) = 6.41,  $p < 0.10$ ), tended to have attended fewer ADHD workshops, read fewer ADHD articles and had been less often asked by a doctor to assess the medication of a child with ADHD (Pearson Chi-square(1) = 5.00,  $p < 0.05$ ). The profiles of the characteristics of the respondents who wanted to attend the workshops, as well as those who did not want to attend the workshops has been presented in Figure 11. However, although the mean scores on the three content areas of ADHD of the respondents who opted for the workshops were marginally higher than those who did not opt to attend, these differences were not significant.

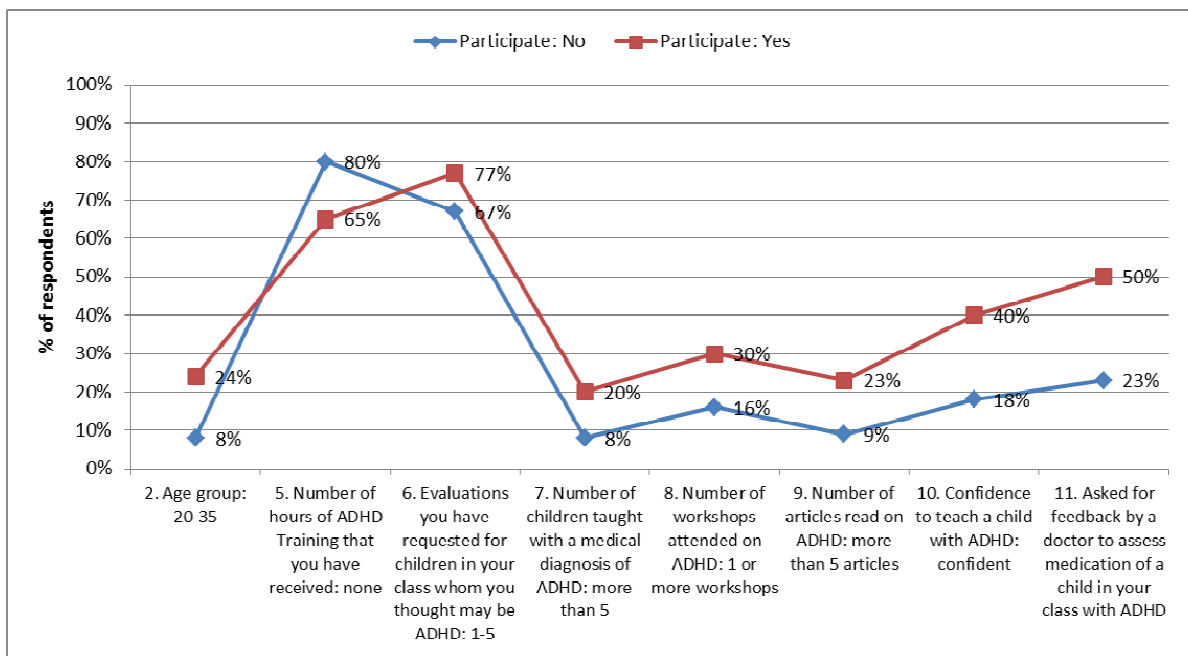


Figure 11: Profile graph of characteristics of educator respondents who want versus do not want to attend an ADHD workshop

From the short questionnaire, the researcher attempted to extract the prominent themes and patterns from the educators' responses. The findings from the data have consequently been grouped under three headings; Firstly, additional comments, secondly, participation in workshops, and thirdly, favourable topics to be covered in the workshops.

### **3.6.1 Additional comments**

The results from the present study confirm the idea that educators' generally lack knowledge and understanding in the area of ADHD as 19 educators in the present study indicated that they did not know anything about ADHD, and requested that more workshops become available to them on the topic. Interestingly, all educators, except for one, who said that they "do not know anything" about ADHD, indicated that they would like to attend workshops on the topic. One teacher made a general comment that "diet and sweet foods affect ADHD". This comment indicated that this particular respondent may have had some knowledge in the area of ADHD. This is unfortunately a minority and many of the educators did not answer item 23 of the KADDS scale correctly; an item which addresses this very area. Interestingly, this educator still indicated that she would like to attend workshops on ADHD to obtain and gain more knowledge in the area.

Four educators commented that there exists a lack of resources at the disposal of educators and that schools should have special classes for children with ADHD, and that schools desperately need a psychologist to help identify the children who are displaying ADHD -like symptoms as soon and early on as possible. Another two educators explained that there is often a misdiagnosis of ADHD; often an overdiagnosis, made by educators specifically. Unfortunately, the overwhelming majority of educators (74 responses), left this question blank, which may be indicative of a lack of motivation on the part of the educators or alternatively that they in fact lack knowledge in the area of ADHD, and therefore were unable to make additional comments on the topic.

### **3.6.2 Participation in workshops on ADHD**

The majority of educators (74%) indicated that they would like to attend workshops in the area of ADHD. The remaining 26% of respondents indicated that they would not like to participate in workshops. Alarming and unfortunately, one educator explained that she had

no knowledge in the area of ADHD and would also not be willing or eager to participate in workshops on the topic.

### **3.6.3 Favourable topics to be covered in the workshops**

Exactly half, (50%) of the educators left this question blank. Of these 50 blank responses, 26 of them came from those educators that conveyed that they would not be interested in participating in workshops. The remaining blank responses came from educators who expressed their willingness to participate in workshops. Their blank responses may indicate that they lack knowledge in the area, and therefore actually do not know what topics should be covered. Others may be interested in covering all topics, and thus show no preference for any specific topic, and would therefore feel comfortable with any topic covered. In support of this claim, 19 % of the educators conveyed that they would be interested to learn about ADHD on a general note, and would thus feel comfortable with any topic chosen by the researcher for the upcoming workshops.

From the quantitative results, it was ascertained that educators lack knowledge and have a poor understanding of possible treatments for ADHD. Interestingly, a number of educators indicated that they would like to gain more knowledge about treatment and classroom interventions for children with ADHD. Other educators were also specific and indicated that they would like to learn more about the ways to identify and assess learners who seem to be displaying ADHD like symptoms. One educator explained that she would like to know more about the causes of ADHD. Another four educators expressed that they would like to know more about the symptoms of the condition. The quantitative results of the study conveyed that educator respondents knew most about the symptoms of ADHD, and thus the fact that only four educators wanted to know more about this area makes sense.

#### **4.1 Discussion**

This research sought to investigate the knowledge and perceptions of Attention Deficit Hyperactivity Disorder held by foundation phase educators in a township in Gauteng. The results of the administered KADDS questionnaire revealed that there exists a substantial lack of knowledge about ADHD among this sample group. Results of the study revealed that the educators overall percentage score of correct responses was 35%, which means that a respondent answered only 35% of all of the 39 KADDS items correctly, with nine out of the one hundred teachers obtaining a score of zero on all 39 scale items. These results were similar to those obtained by Perold et al. (2010), yet in their study, a higher percentage (42.6%) of the items on the KADDS scale were correctly answered by educators situated in the Cape Town Metropole. Similarly, in another study, Scuitto et al. (2000) reported that 47.8% of the items on the KADDS scale were correctly answered by educators. All of these results are lower than those obtained by Kos et al. (2004) who reported that 60.7% of the items on the KADDS scale were answered correctly by educators. A higher percentage of correct responses may have been obtained by educators in the study conducted by Kos et al. (2004), as there may have been more resources and workshops available to the sample of educators in the particular sample group. Overall, these findings are consistent with the body of literature which states that educators lack knowledge and hold certain misconceptions in the area of ADHD (Efron et al., 2008).

On a general note, results from this study revealed that the educators obtained the highest scores, and were thus the most knowledgeable about the symptoms of ADHD. Despite the fact that educators obtained the highest scores on this content area of ADHD, the results reveal that the educators still got half of the KADDS items wrong. The idea that educators have the most knowledge on the symptoms of ADHD however, is supported by the results obtained by Perold et al. (2010) where the educators were “very knowledgeable about the hallmark symptoms of ADHD” (Perold et al., 2010, p. 467). Similar results were found by Durbach (2001), where the perspectives on ADHD were explored in a sample of 70 primary school educators situated in Gauteng. It was found that the majority of educators had a strong awareness and sound understanding of the symptoms of ADHD. A study by Economou (2002) revealed similar results and educators were able to accurately identify both the



hyperactive and inattentive symptoms characteristic of ADHD. In addition, in the study conducted by Kern (2008), the majority of educators were able to identify and understand the symptoms of ADHD.

In the present study, educators were less knowledgeable about the associated features of the condition, than they were about the symptoms, as half of the respondents answered less than 31% of the items on this subscale correctly. However, educators obtained the lowest scores on the treatment subscale, which means that they knew the least about the treatment of ADHD. These results are consistent with those found by West et al. (2005), where educators were the most knowledgeable about the causes of ADHD, less knowledgeable about the characteristics (associated features), and the least knowledgeable about the treatment for the condition.

As referred to in Chapter Three, educators in the current study seemed to lack sufficient knowledge on the associated features of ADHD, and ten educators answered all of the items on this subscale incorrectly. However, there were certain items where there was a high percentage of correct responses. Studies by Murphy and Barkley (1996) and Faraone and Biederman (2005) revealed that ADHD is a legitimate adult diagnostic category that is receiving increased attention in recent times. A large number of educators in the present study were aware of this factor.

As mentioned in the literature review, children with ADHD experience difficulty when it comes to sustaining attention as well as listening to and following through on instruction (Jewell, Jordan, Hupp & Everett, 2009). It is also very difficult for the child to inhibit his/her behavior and consequently sit still and act appropriately (Jewell et al., 2009). These difficulties are more noticeable in a situation which makes demands on the child to act appropriately, such the classroom setting, as opposed to a free play situation, where a child does not have to comply to certain rules and regulations. In line with these ideas, a relatively high percentage of correct responses were obtained for item 31 where teachers seemed to be aware that ADHD will be more distinguishable in a classroom setting as opposed to a free play situation. This was consistent with the results obtained by Perold et al. (2010), where a majority of teachers answered this item correctly.

In line with the literature review, “poor academic performance is among the most prominent features associated with ADHD”, and students with ADHD are at an increased risk for grade retention and school failure (Brock et al., 2009, p. 28). Educators in the present study seemed

to be aware of this, and results revealed a large number of correct responses for the questionnaire item which looked at the idea that the majority of ADHD children evidence some degree of poor school performance in the elementary school years.

Even though some items on the KADDS obtained a high percentage of correct responses from educators, there were some items where this was not the case. Among the sample group, there existed a clear lack of knowledge on the epidemiology of ADHD, as a very low percentage of correct responses was obtained for item 1, which states that most estimates suggest that ADHD occurs in approximately 15% of school age children. Educators also had the greatest extent of misconceptions (wrong answers) on this item. This lack of knowledge and/ or incorrect knowledge is consistent with the results found by Perold et al. (2010), where a substantial number of the educator participants answered this item incorrectly. As conveyed by the study conducted by Reid and Johnson (2011), if educators are unaware of how many students in their classrooms have ADHD, it may lead to the condition being overlooked and unidentified, or conversely, it may lead to the educator attributing many of a child's unruly and uncharacteristic behaviours to ADHD resulting in incorrect referrals (Perold et al., 2010). In the current study, educators were unaware that children with ADHD experience more difficulty in novel situations as opposed to familiar ones and this same finding was reported in the study by Perold et al. (2010) see [6]. Educators were also unaware that the behaviours of ADHD children are distinctly different from age-appropriate behaviours of non-ADHD children and lacked knowledge about the fact that children with ADHD generally display an inflexible adherence to specific routines.

It is interesting to investigate why educators underperformed on some items on the Associated Features subscale as opposed to other items. Some of the items contain words and language, such as "eligible", and "inflexible adherence", which may be difficult for a person whose first language is not English, to understand. Thus, these items, and those alike, may not be picking up on the educators' knowledge or lack thereof, but may be picking up on the educators' ability to understand the item itself. Thus, the items seem to be picking up on method variance rather than trait variance. This idea may be responsible for explaining why the educators in the sample of the present study obtained lower scores on some of the items in the associated features subscale.

As mentioned, educators in the present study knew most about the symptoms of ADHD, with over two thirds of the teachers correctly identifying the symptoms of distractibility, fidgety

behaviour and difficulties with organisation. Many educators were also able to identify that a child with ADHD “must exhibit relevant symptoms in two or more settings (e.g., home, school)”. Item 3, which refers to the distractibility element of the condition, obtained a very high percentage of correct responses, yet a study conducted by Pelham and Evans (1992, as cited in Perold et al., 2010) reported that this symptom has the lowest positive predictive power that a child has ADHD. This is a significant factor as this symptom has to be present and pervasive in order for a child to be diagnosed with ADHD (Sadock & Sadock, 2007). Educators in the sample were also knowledgeable about the fact that children with ADHD struggle to sit still and often fidget and squirm in their seat. However, again Pelham and Evans (1992, as cited in Perold et al., 2010) explained that this symptom has very little predictive power to indicate that a child has ADHD.

Children with ADHD often display difficulty when it comes to organising, prioritising and activating for tasks (Lougy, DeRuvo & Rosenthal, 2009). These children often procrastinate and find it challenging to start and finish a task. As noted in Chapter One, paying attention to detail is also often difficult and tiring (Lougy et al., 2009). Educators in the present study knew about this symptom of ADHD, and thus item 26, which states that ADHD children often have difficulty organising tasks and activities, obtained a high percentage of correct responses. These results are consistent with those produced by Perold et al. (2010), where the educators were also knowledgeable about this hallmark symptom of ADHD. Educators also seemed to be fairly knowledgeable about the subtypes of ADHD, and very few misconceptions were held for item 16, which states that current wisdom about ADHD suggests two clusters of symptoms inattention and hyperactivity. These results are consistent with the results of the study conducted by Perold et al. (2010). It is possible that educators had the most knowledge about these symptoms of ADHD, as it is these that they are exposed to and confront on a daily basis within the classroom setting.

Even though educators obtained the highest percentage of correct responses for the symptoms/diagnosis subscale, there were two specific items which resulted in the greatest extent of misconceptions, and thus “wrong answers” being generated from teachers. These were item 7, which states that one symptom of ADHD is that the child is physically cruel to other people and item 14, which states that ADHD children have a history of stealing and destroying other people’s things. The features and behaviours included in these two items are those that are characteristic of a Conduct Disorder and reminiscent of an Oppositional

Defiant Disorder (Mash & Wolfe, 2009). It is not however uncommon for individuals such as educators to confuse the hyperactive and overt behaviours of children with ADHD, with the behaviours of individual's with Conduct Disorder and Oppositional Defiant Disorder. Despite certain overlaps, it remains clear that the three disorders are separate and distinct in form (Brown, 2005). It is therefore possible that the educators in the present study were unaware that the features contained in the items belonged to Conduct Disorder and Oppositional Defiant Disorder. These findings are consistent with the study that was conducted in America by Reid and Johnson (2011).

Educators in the present study possessed very poor and even incorrect knowledge regarding the treatment of ADHD. In line with what was discussed in the literature review, this is in fact very concerning as educators play an important role in the identification, management and treatment of ADHD (Efron et al., 2008). As discussed in the literature review, and subsequently confirmed by Brown (2005), the most effective treatment for ADHD includes a combination of behavioural programmes and medication. In the present study, the majority of teachers answered item 10 correctly, which states that parent and teacher training in managing an ADHD child are generally effective when combined with medical treatment, and were thus aware that this type of treatment is the most preferable for the treatment of the condition. These results are consistent with those reported by Perold et al. (2010), where 75% of educators answered this item correctly. These results however, are inconsistent with those found by Kern and Seabi (2008) and Pisecco et al. (2001). Despite their knowledge about this important item, it remains concerning that educators do not only lack knowledge in the area, but also have many misconceptions and thus wrong ideas about ADHD.

In line with the results obtained by Perold et al. (2010), the educators in the present study incorrectly believed that the reduction of sugar and food additives are effective measures that will serve to reduce the symptoms of ADHD in a child. These results are also consistent with those reported by Denis et al. (2008), where educators believed that the alteration of one's diet is a helpful and beneficial treatment for ADHD. According to Weyandt (2007), few studies have supported the idea that the alteration of one's diet alleviates symptoms of ADHD, and in fact labels this belief as a common myth. As mentioned, educators play an important role when it comes to the management and treatment of ADHD and it is therefore concerning that the educators in the present study and in that of Perold et al. (2010) believed that the reduction of sugars and food additives would lead to the alleviation of symptoms. This incorrect information may have certain implications and could cause an educator to

recommend to parents that their child's diet should change (Perold et al., 2010). This may give parents "false hope for a quick cure and eventually delay empirically supported treatments that have been proven effective (Mash & Wolfe, 2005, as cited in Perold et al., 2010, p. 469).

Educators also wrongly believed that behavioural/psychological interventions focus on the child's problems with inattention. However, this type of intervention is also used effectively and successfully for problems with hyperactivity and impulsivity (Coleman et al., 1984). Educators also seemed to possess limited and even incorrect knowledge on the after effects of medication, and many educators believed that stimulant medications lead to drug and alcohol addictions in adulthood.

At the same time, some items on this subscale obtained a low percentage of correct responses, which indicates that the educators had some form of knowledge on elements of the treatment process of ADHD. Electroconvulsive therapy (ECT) is a very rare intervention implemented for the treatment of ADHD, and is seldomly implemented for the treatment of ADHD and is only used if one's ADHD is comorbid with some other disorder such as depression (Seligman & Reichenberg, 2011). Educators in the present study seemed to be aware of this, as item 35, which refers to this exact idea, obtained a low percentage of incorrect responses. Educators were also aware of some of the side effects of medication and were also aware that punishment is an ineffective intervention for the treatment of ADHD.

Thus, educators in the present study knew most about the symptoms of ADHD, less about the associated features and the least about treatments for the condition. It thus becomes essential that their lack of knowledge and/or their misperceptions of the condition be addressed and included in training workshops. In line with Perold et al. (2010), it is important that the content of the workshops and interventions be targeted at the educators' level of knowledge and understanding.

When the educators' demographic characteristics were correlated with the KADDS, interesting results were revealed. As indicated in Chapter Three, the educators' overall knowledge of ADHD, was not linked to their ages. This result is consistent with the results obtained by Perold et al. (2010), where the educators' ages were also unrelated to their overall level of ADHD knowledge. However, the educational level of the educators was related to their overall level of knowledge, and the higher their level of education, the more knowledge they possessed. These findings are supported by a study conducted by Christopher

and David (2004), who revealed that when a person is more educated in the area of ADHD, the more knowledge he/she will have on the condition. These findings are also consistent with that of Perold et al. (2010), who found that the educators' overall knowledge of the condition was related to the amount of knowledge that they had on the condition.

Educators' knowledge of ADHD was unrelated to their number of years of teaching experience. This result supported the findings of Perold et al. (2010) and Kos et al. (2004). However, these three findings differ from those found by Scuitto et al. (2000), who found a positive relationship between the educators' overall knowledge of ADHD, and their number of years of teaching experience.

An important finding for future researchers is the result that educators who previously attended training, workshops and were exposed to ADHD by means of articles, all knew more about the condition than those educators with less training and exposure in the area. This finding is consistent with that of Perold et al. (2010) and Kos et al. (2004). Educators who felt more confident to teach a child with ADHD obtained higher scores on the KADDS, and thus knew more about the condition. This finding supports the results of the study conducted by Scuitto et al. (2000) and Perold et al. (2010), where the more confident teachers had more knowledge on the condition. The same was true for those educators who had been asked by a Doctor for feedback on the condition.

It is interesting to note that it was the younger, more confident, more experienced educators who wanted to participate in workshops on ADHD. The educators also suggested that the workshops include a section on treatment, which is an area where knowledge is seemingly lacking. The older, more inexperienced educators were those who were reluctant and disinterested to partake in workshops. One reason for this may be because the older educators are more set in their ways, and are thus more reluctant to engage in and learn new material.

The finding may be related to what Martin Seligman calls learned helplessness. This is once an "individual learns that he or she is not in control, the motivation to seek control may be shut down, even when control later becomes possible (Friedman & Schustack, 1999, p.252). Due to the lack of resources within the townships in Gauteng and the possible lack of options that some of these educators are faced with, they may have come to learn that they are not in control of the situation, and often what they do is to no avail. Thus, when a workshop is offered to them, they may have learned that they are not in control, and consequently they do not believe that the workshop will be of assistance and benefit to them.

## 4.2 Implications of the research

Results of the study imply that South African foundation phase educators' do not have adequate knowledge or sufficient understandings of ADHD. Educators seem to have some information on the symptoms of ADHD, and less on the associated features and treatment for the condition. It is therefore important that training programmes or workshops address these gaps in the educators' knowledge regarding the condition. Overall, the majority of educators in this study were willing to participate in workshops and seem determined to learn about the condition. Educators also indicated that there exists a lack of resources at the township school to aid in the recognition and management of the condition. It is essential that the Department of Education becomes aware of these issues and provides educators with the necessary training and ongoing support to facilitate the learning and schooling experience of children with ADHD.

## 4.3 *Limitations of the study*

The following were some of the limitations of the present research study:

- The sample for the study was obtained on a strict voluntary basis; using a purposive, non probability sampling method. The current sample is not representative of the entire population of foundation phase township educators. Responses to the questionnaire were very much dependent on the educators' availability and willingness to participate in the study. A sample of 100 educators from a specific geographic location was obtained, and there were no male participants. Thus, the sample used in the study was small and narrow. For these reasons, issues with generalisability arose and therefore the ability to draw widespread conclusions from the results of the study was hampered.
- The researcher intended to be accompanied to the schools by an interpreter that would help with the translation of the questionnaire, if necessary. This would have served to aid the educators in the answering of the questionnaire especially as many of them do not have English as their first language. Unfortunately, due to certain practical problems, the researcher administered the questionnaires without an interpreter. It is therefore unknown to what extent the educators' responses to the questionnaire were

hampered by language issues. The construct validity of the measuring instrument used was therefore a possible limitation of the study.

- There is limited local literature and research on ADHD. The researcher drew upon the findings of international studies, which may not be directly representative and applicable to the unique South African context.

#### 4.4 *Recommendations for future research*

The following suggestions are made for future research into the area of ADHD:

- After the implementation of the workshops by the researcher, at the sample group of schools, a follow up study would be of interest which would involve the investigation of whether the ADHD knowledge of the respondents improved. If positive results are found, it could serve as a springboard for future workshops and educational programs to be implemented at schools at a national level. This type of longitudinal carries the benefit of allowing the researcher to examine “changes in various behaviors and related events over time” (Durrant & Menken, 2002, p.9).
- It would also be interesting to be able to draw an educator sample from public, private and township schools, and to compare their levels of knowledge on ADHD.
- It may also be useful to compare foundation phase township educators’ knowledge at a national level, and thus investigate for example, whether educators who teach in townships in Gauteng, have the same level of knowledge as teachers situated at township schools in the Western Cape. The findings from such a study would guide the planning of South African workshops and training programmes on ADHD, for South African educators.
- The majority of educators in this study are willing to participate in workshops and seem determined to learn about ADHD. Future researchers should focus on creating



and providing training programmes that would bridge the gaps in knowledge about ADHD and its causes, symptoms and treatment.

- Future research should focus on creating awareness and gathering resources to aid in the recognition and management of the condition at schools. It is essential that educators receive the necessary training and ongoing support to facilitate the learning and schooling experience of children with ADHD.

#### **4.5 Conclusion**

The primary aim of the study was to investigate the knowledge and perceptions of ADHD held by foundation phase educators in a township in Gauteng. After an in depth analysis of the results, it is clear that overall the educators who participated in the research study lacked knowledge in the area of ADHD and even misperceived certain key aspects of the condition. Educators had the most knowledge on the symptoms of the condition, but lacked sufficient knowledge when it came to understanding the associated features and possible treatment interventions for the condition. This lack of knowledge as well as the misperceptions held needs to be addressed as educators play a vital role in the identification, diagnosis, referral and treatment process of ADHD. Inaccurate information about ADHD can lead to inaccurate referrals, resulting in the incorrect information being relayed to parents and doctors, which in itself has negative effects and consequences for individuals' diagnosed with the condition.

Results revealed that many South African teachers had little or no training in the area of ADHD. However, the teachers that had been exposed to training programmes had more knowledge on the condition, consistent with the findings of Perold et al. (2010). This indicated the need for more workshops and programmes to become available to educators to aid them in the recognition and management of ADHD in their classrooms. Overall, the study highlights the need for more research to be conducted in the area of ADHD, in order for every learner to maximise his or her potential and to succeed within the South African inclusive education classroom environment.

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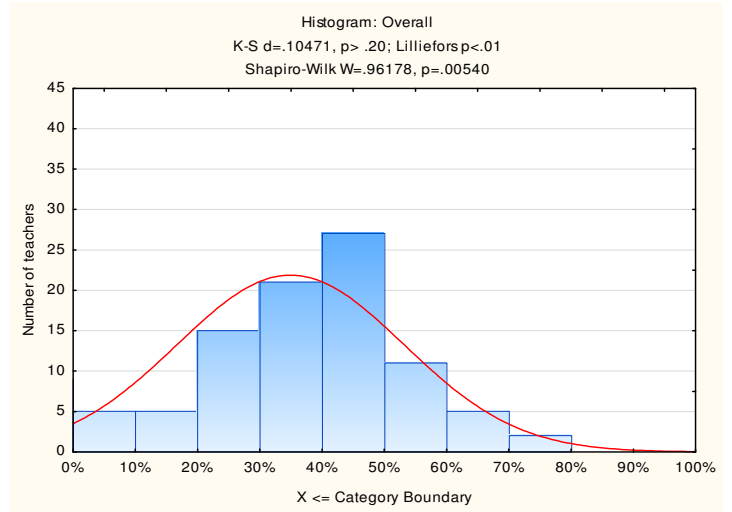
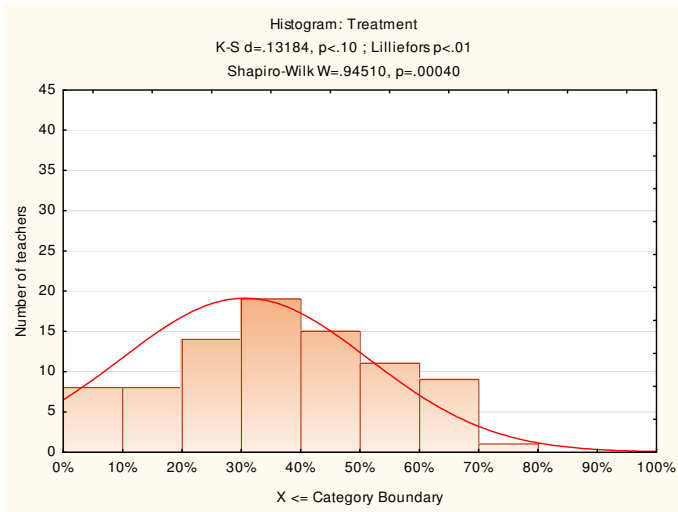
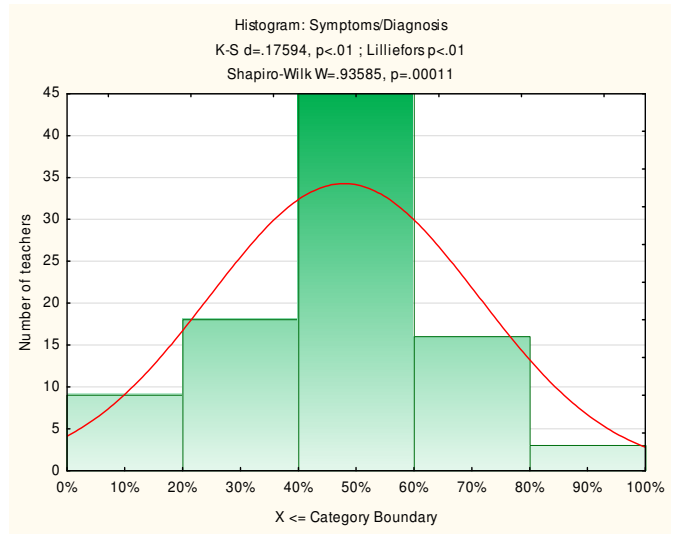
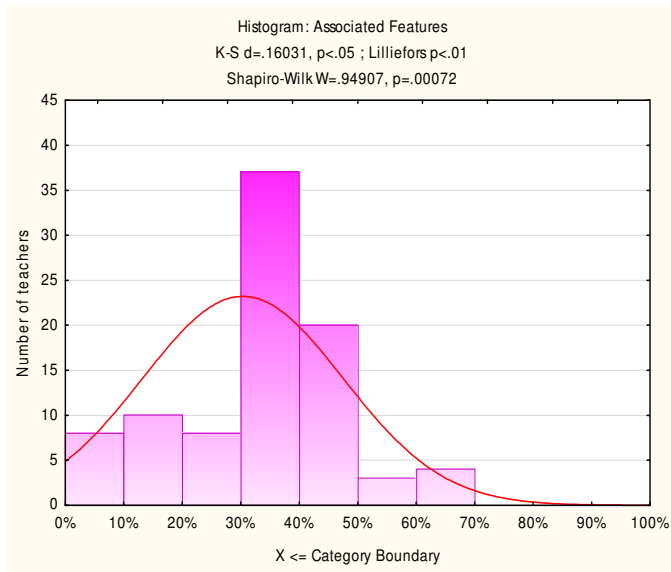
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## Appendix 6



Figures A-D: The frequency distributions of the total scores on the three content areas of ADHD