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Primary school teachers' knowledge and misperceptions of attention deficit hyperactivity disorder (ADHD)

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Putting inclusive education into practice and within diverse classrooms, teachers have to support and teach according to a variety of needs and preferences of learners, among them learners with ADHD. Teachers are seen as some of the most valuable sources of information with regard to referral and diagnosis of this disorder. They are also responsible for creating an environment that is conducive to academic, social and emotional success for children with ADHD. However, since there is some doubt as to whether teachers have the appropriate knowledge of ADHD to fulfill this important role, we aimed at assessing the knowledge and misperceptions of primary school teachers in towns on the periphery of the Cape Town Metropole. A quantitative study using a survey was conducted. The measuring scale used was the KADDS (Knowledge of Attention Deficit Disorders Scale), which measures teachers' knowledge and misperceptions in three specific areas: symptoms/diagnosis of ADHD, general knowledge about the nature, causes and outcome of ADHD and possible interventions with regard to ADHD. The data were statistically analysed. Overall knowledge of ADHD was poor. The results suggest that teachers are most knowledgeable about symptoms/diagnosis, scoring lower on treatment and general knowledge subscales.

Keywords: ADHD; attention deficit hyperactivity disorder; inclusive education; primary school teachers; teacher training; teaching

Introduction

Children spend most of their time in classrooms and other school settings. Here they are expected to follow rules, behave in socially appropriate ways, participate in academic activities and refrain from disrupting the learning process or activities of others. Teachers do not only have to teach learners the skills and knowledge that form part of the curriculum but they also have to teach them to behave in a manner that meets organizational, cultural and social expectations. However, the work of the teacher becomes much more demanding when there are learners in the classroom that have Attention Deficit Hyperactivity Disorder (ADHD). Their problems with attention span, impulse control and activity level frequently interfere with both classroom and social activities (Barkley, Murphy & Fischer, 2008; DuPaul & Stoner, 2003).

Background

ADHD is the most commonly diagnosed psychiatric children's disorder (American Psychiatric Association, 2000; NIH Consensus Statement, 1998). The prevalence rate in the USA is estimated to be 5% to 8% (Spencer, Biederman & Mick, 2007). Rowland, Lesesne and Abramowitz (2002) hold that prevalence

estimates of between 2% and 18% vary due to race/ethnicity, sex, age and socio-economic factors. Although the prevalence rate in South Africa has not yet been determined officially, the ADHD support group in this country estimates that 10% of South African children experience symptoms associated with ADHD (Muthukrishna, in Lloyd, Stead & Cohen, 2006). Flischer, Hatherill, Lund, Funk and Patel (2009) state that the prevalence of ADHD in South Africa corresponds with that of the United States and Europe.

The literature on the history of ADHD highlights the continuous change in this field, as well as the complexity, the controversies and many myths about this disorder (Mash & Wolfe, 2005). Apart from the three primary problems of inattention, impulsivity and hyperactivity at the core of ADHD, numerous studies have shown that most children diagnosed with ADHD are of normal overall intelligence or brighter, yet they experience difficulty in applying their intelligence to everyday situations. It is also more likely that they will have learning disabilities that can result in poor academic performance, while 30% to 60% of them have speech and language problems, they talk more, shift often in conversations, interrupt other people's conversations and start a conversation inappropriately (Barkley *et al.*, 2008; Spencer *et al.*, 2007; Zentall, 2006; Mash & Wolfe, 2005). Children diagnosed with ADHD often also experience interpersonal problems with family members, teachers and peers. Their behaviour can be unpredictable, hostile and confrontational and it seems they do not learn from their past mistakes (Mash & Wolfe, 2005; DuPaul & Stoner, 2003). They show a great variability in their symptom severity and performance in different situations and across tasks (Mash & Wolfe, 2005; Barkley, 1998). Situational factors (e.g. the complexity of the task and requirements for organization, amount and level of stimulation and immediacy or feedback of consequences) also influence the performance of children diagnosed with ADHD (Barkley, in Mash & Wolfe, 2005). Co-morbid psychiatric disorders, which often predict the development of even more serious problems and a poor outcome in adolescence and adulthood, may also be diagnosed (Mash & Wolfe, 2005).

A diagnosis of ADHD is normally made by a psychologist or a medical practitioner. The diagnostic criteria in the Diagnostic and Statistical Manual for Mental Disorders IV TR (DSM IV TR) (American Psychiatric Association, 2000) require that the hyperactive-impulsive or inattentive symptoms should be present in two or more settings (e.g. at school and at home). This requirement emphasizes the prominence of teacher information in making the diagnosis (Wolraich, Lambert, Baumgaertel, Garcia-Tornel, Feurer, Bickman & Doffing, 2003). The goal of diagnosis is not just the diagnosis itself, but also, based upon the information gathered, to plan interventions that are likely to succeed (DuPaul & Stoner, 2003). The teacher is most often the first person to make a referral for assessment for ADHD, because the structured school environment means children with problems of inattention, hyperactivity and impulsivity exhibit behaviours with which the other children and their teachers cannot cope. Teachers also play an important role in the as-

sessment process, providing information on academic history and performance, social relations and general everyday functioning, thus playing a very important part in the screening for ADHD (Zentall, 2006; Lawson, 2004; Snider, Busch & Arrowood, 2003; Sciutto, Terjesen & Bender Frank, 2000).

Based on findings in the literature, "treatment of choice" for ADHD is psychostimulant medication, educational interventions, behaviour modification procedures, as well as diet manipulation and supplements (Banaschewski, 2009; Venter, 2009; Cohen, in Lloyd *et al.*, 2006; Zentall, 2006; Kollins, Barkley & DuPaul, 2001; Pelham, Wheeler & Chronis, 1998; DuPaul & Eckert, 1997; Pelham & Gnagy, 1999). Performance effects on these intervention strategies require close monitoring and feedback to all relevant role players to improve the child's behaviour (Zentall, 2006; DuPaul & Stoner, 2003). When stimulation medication forms part of the treatment, teachers should be asked to give regular feedback to the medical practitioner. This information could be vital in determining the child's responsiveness to the medication and optimizing the efficacy and minimizing the side effects of the medication (MTA Cooperative Group, 1999).

Inclusive education is becoming a reality in South Africa (Department of Education, 2001). Teachers have to cope with more learners in their classes and with more learners with diverse needs, such as those who have ADHD. To be able to put inclusive education into practice a teacher needs to accommodate and recognize the unique diversities of the children in class. To do this effectively the teacher needs to be fully informed about these diversities (Decaires-Wagner & Picton, 2009). In creating welcoming and accommodating classrooms for all learners, it is important for teachers to organise their environments according to the diversity of needs of the learners in the class. Therefore the knowledge teachers have about ADHD may also influence how they communicate with and teach children diagnosed with ADHD. Having a better understanding may prevent them from developing negative views of these learners or labelling them (Holz & Lessing, 2002). Understanding ADHD will thus enable teachers to change their classroom management, to adapt the curriculum, to have realistic expectations and to use a variety of teaching strategies in order to create a positive learning environment that are conducive to the academic, social and emotional success of learners diagnosed with ADHD (Zentall, 2006; DuPaul & Stoner, 2003; Holz & Lessing, 2002). Collaborating with and advising parents and other role players effectively also demand extensive knowledge on the teacher's part (Louw, 2009a; DiBattista & Shepherd, in Kos, Richdale & Jackson, 2004).

But what is the situation in South Africa with regard to teachers' knowledge and perceptions about ADHD? It is important to assess the accuracy of teachers' knowledge of ADHD, as well as the possible misperceptions they harbour, in order to help and support children diagnosed with ADHD in the best possible way. The findings of a study in South Africa could be compared to those of the studies done in other countries. In this way the generalisability of the research results could be strengthened and the consequent inter-

ventions effected in other countries could be taken into account when making recommendations for South Africa. Multiple studies have been done on all the different aspects of this disorder, but very few have examined teachers' knowledge and perceptions of ADHD. One Australian study and two North American studies were identified (Kos *et al.*, 2004; Sciutto *et al.*, 2000; Jerome, Gordon & Hustler, 1994). These studies showed that the teachers that participated had an average to good general knowledge of ADHD, that few teachers had any training in ADHD and that teachers' overall knowledge improved as a result of teaching a child with ADHD. There has not yet been a study that provides data regarding teachers' knowledge and misperceptions of ADHD in South Africa.

Objectives of the study

The research question of this study was: What knowledge and misperceptions with regard to ADHD do teachers in schools in the peripheral areas of the Cape Town Metropole in the Western Cape have? The objectives of this study were thus to determine the nature and degree of a sample of these primary school teachers' knowledge and misperceptions with regard to ADHD by means of the Knowledge of Attention Deficit Disorders Scale (KADDS). The study also set out to determine which, if any, of the selected demographic characteristics of the teachers correlate statistically with the total KADDS score.

If knowledge is defined by the acquisition of information and ways to use it, whether it occurred by means of informal experiences or formal instruction, the implication is therefore that having knowledge of ADHD means having information and skills that are the product of experience and/or education (Simpson & Weiner, 1989). Although teachers are familiar with the primary symptoms of ADHD, they often base their reasons for referral on these primary symptoms. The problem with this approach is that several of these primary symptoms have poor predictive value (Sciutto *et al.*, 2000). Being familiar with ADHD, therefore, cannot be seen as having adequate knowledge of the disorder.

Simpson & Weiner (1989) describe a perception as a way a person understands something. In this study the term 'misperceptions' is used to show that a particular teacher's belief, understanding or a specific point of view regarding a particular aspect of ADHD is incorrect.

Research methodology

This quantitative study was done within a post-positivist paradigm. A survey was chosen as it was considered to be the best available method to collect original data to measure attitudes and orientations from a population too large to observe directly or to make descriptive assertions about (Johnson & Christensen, 2008; Babbie & Mouton, 2002).

The research instrument selected was the Knowledge of Attention Deficit Disorders Scale (KADDS). This scale was developed by Sciutto *et al.* (2000)

and previously used in a similar study conducted in six New York area public schools. The scale chosen was used in part in a similar study conducted in Australia (Kos *et al.*, 2004). The KADDS measures teachers' knowledge and misperceptions of ADHD in three specific areas: symptoms/diagnosis of ADHD, general knowledge about the nature, causes and outcome of ADHD and possible interventions with regard to ADHD, which was also examined in the present study. *Correct*, *don't know*, and *incorrect* responses to the questions indicated, respectively, knowledge, a lack of knowledge and misperceptions concerning ADHD. The questionnaire was obtained from Professor Mark Sciutto (2000) from Muhlenberg College in the USA, who granted permission for the questionnaire to be used in this study.

KADDS is a 41-item rating scale. Professor Sciutto encouraged the researchers to add more items to this rating scale. Two questions, arising from the study of recent literature, were added to the original 39 questions.

The sample of respondents was selected on the basis of the researchers' "knowledge of the population, its elements, and the nature of (the) research aims" (Babbie & Mouton, 2002:166). The criteria that were used to select the sample were (a) the sample content reflecting more or less the population of the region, namely, the peripheral areas of the Cape Town Metropole in the Western Cape; (b) big schools from these regions in order to reach as many teachers as possible and thus gain as much information as possible; and (c) logistical reasons.

The first step was to apply for permission from the Western Cape Education Department (WCED) to conduct the research in primary schools in the periphery of the Cape Town Metropole (in Somerset West, Stellenbosch, Paarl, Wellington and in the Strand). These towns were selected for logistical reasons. A list of all the schools in the periphery of the Cape Town Metropole was obtained from the WCED. Forty schools were selected of which five indicated that they were not interested in taking part in the study. Questionnaires were therefore distributed to teachers in 35 schools, including teachers of all phases.

A demographic questionnaire was attached to the KADDS questionnaire to collect data regarding teachers' age, gender, years of teaching experience, training and their teaching roles. Respondents also had to indicate if they had ever requested an evaluation of a child whom they suspected of having ADHD, or if they had ever taught a child whom they knew was diagnosed with ADHD. Participants also rated their self-confidence to teach a child with ADHD effectively, by means of a 7-point scale.

Each KADDS item is phrased in terms of a statement about ADHD and uses a true (T), false (F) or don't know (DK) format. This format allowed for the differentiation of what teachers did not know from an incorrect belief or misperception. Making this distinction could lead to more effective intervention programmes. Most previous studies have measured ADHD knowledge through a series of only true or false questions about ADHD. The use of this format makes it possible for a respondent to have a 50% chance of guessing the correct answer. These "incorrect guesses" could lead to inaccurate esti-

mates about teachers' knowledge (Sciutto *et al.*, 2000).

In order to provide for content validity during the construction process of the KADDS, a deliberate effort was made to include only items regarding ADHD that were empirically supported and well documented (Sciutto *et al.*, 2000). The items in the KADDS questionnaire, referring to both positive and negative indicators of ADHD, are intended to measure respondents' knowledge of not only what ADHD is, but also what it is not. Thus items referring to negative behaviours more characteristic of other mental disorders were also included (e.g. stealing; inflated self-esteem). The original questionnaire was administered twice before it was used in the first study and the items were modified after each administration. Bender (in Sciutto *et al.*, 2000) found good internal consistency for the KADDS (Cronbach alfa = 0.81) and significant pre-post changes in KADDS scores for each of two types of educational interventions, thus offering preliminary evidence for the reliability of the KADDS. Good internal consistency for the KADDS was found in the present study (Cronbach alfa = 0.81 for correct responses and even higher for the incorrect responses).

As this questionnaire was designed to cover a representative sample of the behaviour domain to be measured (Anastasi, 1996), namely knowledge and misperceptions of the symptoms, criteria and accompanying disorders of ADHD according to scientifically supporting evidence, content validity is strived for and satisfactorily accomplished.

The questionnaire was translated into Afrikaans and the Afrikaans version was put on the same page next to the English version. Since most of the teachers in the study area were fairly bilingual, it meant that the participants could check to see that they had understood the meaning of each question. A pilot study was done where six teachers from different schools were asked to complete the questionnaire. No language problems were encountered during the pilot study.

After faxing a letter to each principal of the identified schools to arrange an appointment to state the reason for the visit and the motivation for the intended study, permission was obtained for the teachers in their schools to take part voluntarily in the study. At the meetings the principals were assured that the schools' responses would be kept anonymous, thus adhering to ethical considerations (Johnson & Christensen, 2008). Feedback of the findings of the study were promised and offered to the participants as soon as it was completed. The questionnaires were then handed over accompanied by a letter addressed to each teacher explaining the motivation for and importance of the study and thanking them for their cooperation. It was emphasized that taking part in this study was voluntary. To encourage honest responses teachers were not required to identify themselves or their schools on the questionnaire. A date on which the questionnaires were to be collected was set with the headmasters. Two days prior to the collection of the questionnaires, a fax was sent thanking them again for their cooperation and reminding them of the date of collection. According to Rosnow and Rosenthal (1999:225), these pro-

cedures to stimulate the participation of the people who take part in the study "provide incentives to researchers to act ethically and humanely". These processes illustrate the ethical principles which guided the researchers' methodology.

Of the 824 school teachers (including the headmasters of the schools) that participated in this study, 552 teachers returned their completed questionnaires, which yielded a response rate of 67%. This high response rate can probably be ascribed to the personal contact with the principals as well as to the explanation of the motivation, scientific importance and value of the study in the letter that was addressed to each teacher. The assurance that the identities of the teachers and schools would not be revealed probably allayed unwarranted fears of unfavourable evaluation. According to Rosnow and Rosenthal (1999) these techniques (e.g. personal contact, using reminders and follow-up communications, explaining the scientific importance and value of the study, ensuring the participants of confidentiality) are favourably linked to increased participation in surveys.

The statistical application software employed to analyse the data collected from the questionnaires was Statistica Version 6.1.409. It was used to determine the mean, median, minimum, maximum and standard deviation of demographic characteristics. To measure teachers' knowledge about ADHD on the Total or Combined Scale and the following three subscales: *symptoms/ diagnosis*, *treatment* and *general knowledge*, 2-way Analysis of Variance (ANOVA) was used. The Bonferroni corrections were used to determine possible differences in frequency of responding, e.g. *don't know*, on the three subscales. Pearson correlations were used to explore the relationships between teachers' knowledge of ADHD and various demographic characteristics.

Results

Good internal consistency for the KADDS was found in this study with a Cronbach alfa of 0.81 for correct responses and even higher for the incorrect responses. This confirms the reliability of the questionnaire, which enabled the researchers to generalize the results beyond the boundaries of this study (Johnson & Christensen, 2008).

Some 79% of the respondents were females and 21% were males. The mean age of the participants was 41,19 years (standard deviation (*SD*) = 8.61). The current educational level of the participants was as follows: 6% had a two-year teaching diploma, 31% had a three-year teaching diploma, 39% had a four-year teaching diploma, 8% had a bachelor's degree, 10% had a bachelor's degree and a teaching diploma, 5% had an honours degree and 1% had a master's degree or doctorate. Teachers in this sample reported an average of 16.65 (*SD* = 8.95) years of teaching experience.

With regard to ADHD, approximately 66% of the participants reported teaching a child whom they knew to have been diagnosed with ADHD. In addition, 58% of the participants had at some time requested an evaluation of a child suspected of having ADHD. The majority of participants (66%)

indicated that they had never been involved in assessing the effectiveness of stimulant medication for the treatment of ADHD. Table 1 gives a summary of the demographic characteristics of the sample.

Table 1 Descriptive statistics on demographic characteristics of sample

Variable	Valid number*	Mean	Median	Minimum	Maximum	*SD*
Age	530	41.19	42	21	65	8.61
Years teaching	540	16.65	16	0	43	8.95
Educational level	544	3.05	3	1	8	1.32
Hours ADHD training	486	1.59	0	0	13	3.31
Number ADHD evaluations requested	523	3.49	1	0	115	8.20
ADHD children taught	522	4.23	2	0	78	7.72
Assess medication	526	1.91	0	0	115	6.72
Number of articles read on ADHD	524	2.64	1	0	10	3.07
Workshops attended on ADHD	519	0.77	0	0	5	1.28
Confidence to teach ADHD child	511	3.80	4	1	7	1.63

* The valid number indicates the number of respondents who supplied an answer to the particular question

A series of Pearson correlations ($\alpha = .05$, two-tailed) were used to identify possible relationships between teachers' knowledge of ADHD and their background characteristics. The results of these correlations are presented in Table 2.

Discussion

The results were interpreted as follows: *Correct* responses represent knowledge, whereas *don't know* responses reflect a lack of knowledge. *Incorrect* responses indicate misperceptions.

The results of this questionnaire suggest that there is a substantial lack of knowledge about ADHD among teachers in primary schools in the periphery of the Cape Metropole. Teachers' overall percentage score of correct responses was 42.6%, indicating knowledge, 35.4% for don't know responses, indicating a lack of knowledge, and 22% for incorrect responses, pointing to misperceptions. These results are similar to those of Sciutto *et al.* (2000) who reported an average of 47.8% for correct responses for their sample of American teachers, and somewhat lower than the results of Kos *et al.* (2004)

Table 2 Correlations between KADDS total correct scores and teachers' demographic characteristics

Variable	Statistical parameter	KADDS total Correct	Age of teacher	Teaching experience	Educational level	ADHD (hours) included in training	Referrals made	Children taught with ADHD	Assessing use of medication	Articles read on ADHD	Workshops attended on ADHD	Confidence to teach ADHD child
KADDS	R	1.00*	–0.01	–0.04	0.10	0.18	0.30	0.33	0.25	0.49	0.36	0.43
Total correct	P	—	0.82	0.43	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Age of teacher	R	–0.01	1.00	0.86	–0.15	–0.26	0.16	0.17	0.12	–0.02	–0.06	0.01
	P	0.82	—	0.00	0.00	0.00	0.00	0.00	0.02	0.64	0.23	0.87
Teaching experience	R	–0.04	0.86	1.00	–0.19	–0.21	0.10	0.12	0.09	–0.06	–0.05	–0.01
	P	0.43	0.00	—	0.00	0.00	0.04	0.02	0.05	0.26	0.32	0.82
Educational level	R	0.10	–0.15	–0.19	1.00	0.07	0.06	0.10	0.02	0.14	0.06	0.03
	P	0.04	0.00	0.00	—	0.17	0.21	0.04	0.69	0.01	0.18	0.51
ADHD (hours) included in training	R	0.18	–0.26	–0.21	0.07	1.00	0.06	0.07	0.04	0.36	0.24	0.27
	P	0.00	0.00	0.00	0.17	—	0.21	0.15	0.42	0.00	0.00	0.00
Referrals made	R	0.29	0.16	0.10	0.06	0.06	1.00	0.77	0.78	0.39	0.32	0.21
	P	0.00	0.00	0.04	0.21	0.21	—	0.00	0.00	0.00	0.00	0.00
Children taught with ADHD	R	0.33	0.18	0.12	0.10	0.07	0.77	1.00	0.72	0.41	0.34	0.27
	P	0.00	0.00	0.12	0.04	0.15	0.00	—	0.00	0.00	0.00	0.00

Table 2 Continued

Variable	Statistical parameter	KADDS total Correct	Age of teacher	Teaching experience	Educational level	ADHD (hours) included in training	Referrals made	Children taught with ADHD	Assessing use of medication	Articles read on ADHD	Workshops attended on ADHD	Confidence to teach ADHD child
Assessing use of medication	R	0.25	0.12	0.09	0.02	0.04	0.78	0.72	1.00	0.36	0.27	0.18
	P	0.00	0.02	0.05	0.69	0.42	0.00	0.00	—	0.00	0.00	0.00
Articles read on ADHD	R	0.49	–0.02	–0.06	0.14	0.36	0.39	0.41	0.36	1.00	0.57	0.50
	P	0.00	0.64	0.26	0.01	0.00	0.00	0.00	0.00	—	0.00	0.00
Workshops attended on ADHD	R	0.36	–0.06	–0.05	0.06	0.24	0.32	0.34	0.27	0.57	1.00	0.41
	P	0.00	0.23	0.32	0.18	0.00	0.00	0.00	0.00	0.00	—	0.00
Confidence to teach ADHD child	R	0.43	0.01	–0.01	0.03	0.27	0.21	0.27	0.18	0.50	0.41	1.00
	P	0.00	0.87	0.82	0.51	0.00	0.00	0.00	0.00	0.00	0.00	—

$N = 522$; * $p < 0.05$

who reported that 60.7% of the items on the knowledge questionnaire were correctly answered by teachers in Australia.

The results revealed that teachers were very knowledgeable about the hallmark symptoms of ADHD, with more than 75% of the respondents correctly identifying the symptoms of distractibility, fidgeting, difficulties with organization, as well as of the primary clusters of ADHD symptoms. However, in a study done by Pelham and Evans (1992), it was found that the symptom 'easily distracted', a hallmark symptom of ADHD, had the lowest positive predictive power that the child has this disorder. Yet, the absence of this symptom indicates the absence of this disorder. A high percentage of respondents knew that children diagnosed with ADHD are fidgety or squirm in their seats. Although this is one of the hallmark symptoms of ADHD, it has very little predictive power to indicate the presence of this disorder (Pelham & Evans, 1992). Respondents are knowledgeable about the problems children diagnosed with ADHD have with organizational skills. It has been found that children diagnosed with ADHD are less skilled in the use of complex problem-solving strategies and organizational skills (Barkley, 2000). Research suggests that insufficient effort or inefficient use of proper strategies during the task could be responsible for this problem (DuPaul & Stoner, 2003). A majority of the respondents seemed to be knowledgeable about the subtypes of ADHD.

Teachers were also quite aware of the fact that parent and teacher training, in combination with medication, is quite effective in the treatment of ADHD (75.7%) and that the child with ADHD will be more distinguishable in a classroom setting than in a free play situation (76.3%). A majority of respondents knew that multifaceted methods are applied for effective treatment of ADHD. The emphasis in intervention is on the acquisition of developmental skills, adaptations to the natural environments (e.g. school, home) to promote performance and to address the underlying neurological dysfunctions (Chu, 2003). Behavioural parent training and behavioural interventions in the classroom are among the criteria for well-established interventions for ADHD (Pelham *et al.*, 1998). Although both forms of interventions are effective, there is more empirical support for classroom-based behavioural intervention than for clinic-based parental training (Pisecco, Huzinec & Curtis, 2000). Children diagnosed with ADHD have problems with persistence of effort or sustained attention, inhibiting their behaviour in response to situational demands and developmentally inappropriate levels of activity (Barkley, 1998). These difficulties are more apparent in the classroom than in free play settings. Most of the respondents showed that they were aware of this.

The present data suggest education on the epidemiology of ADHD is necessary [59.6% of the respondents showed a lack of knowledge and 31.2% held a misperception]. The causes of ADHD (the fact that genetics are a great contributor to ADHD) [70.8% of the respondents showed a lack of knowledge and 9.6% held a misperception] should also be included in a training curriculum. Situational variations of the symptoms (e.g. familiar situations versus unfamiliar situations) [25.2% of the respondents showed a lack of knowledge

and 62.3% held a misperception], the behaviour of the child in the presence of the mother versus the father [53.1% of the respondents showed a lack of knowledge and 32.2% showed a misperception], playing video games for a long period, but are not able to complete their schoolwork [21% of the respondents showed a lack of knowledge and 19.9% had a misperception], the purpose of behaviour rating scales [53.1% of the respondents showed a lack of knowledge while 38.8 % held a misperception], and the long-term outcome of ADHD [41.5% of the respondents indicated that they did not know and 31.9% believed that most children 'outgrow' ADHD by puberty], seem to be areas that need to be addressed in teacher training.

A clear lack of knowledge about the epidemiology of ADHD is also evident in the substantial percentage of respondents (31.2%) who indicated that 15% of all school children have ADHD. Holding this view could cause teachers to attribute many difficult behaviours to ADHD, which could lead to many wrong referrals (Livingston, 1997). A significant majority of the respondents showed a lack of knowledge about the causes of ADHD. Evidence points to genetic factors as one of the greatest contributors to this disorder (Consortium of International Scientists, 2002). Having this knowledge should enable teachers to communicate better with the parents of children, to understand that one or both of the parents may have/had ADHD and to be realistic about structure at the home of the child with ADHD. According to studies done by Barkley (1997) and Zentall (1985) children diagnosed with ADHD will show fewer behavioural problems in unfamiliar surroundings than in familiar surroundings (in Barkley, 1998). It is not uncommon to find that learners with ADHD are given a far better behaviour rating at the beginning of the academic year when they are presented with new teachers, classroom and peers (Barkley, 1998). The majority of the respondents held the view that unfamiliar situations do not significantly influence children diagnosed with ADHD as compared to familiar situations.

Symptoms of ADHD vary across tasks and settings. Children diagnosed with ADHD work best on tasks that they have chosen themselves and that they find interesting. They attend automatically to things they enjoy, but can have great difficulty in doing new things or less enjoyable tasks (Mash & Wolfe, 2005). These children find it very difficult to keep attending to dull, boring, repetitive tasks such as homework and independent schoolwork (Barkley, DuPaul & McMurray, in Barkley, 1998). A significant majority of respondents did not know — or wrongly believed — that a behaviour rating scale can be used diagnostically. It should be stressed that these behaviour rating scales only address the expressions of behaviour instead of the causes of the behaviour and that the behaviour rating scale is not diagnostic in itself (Hartnett, Nelson & Rinn, 2004).

There seems to be a great lack of knowledge and many misperceptions about the long-term outcome of ADHD. A small group of children do not show significant ADHD symptoms when they reach adolescence. The overall majority (more than 50%) of the children continue to experience difficulties

and for many children ADHD is a lifelong disorder (Barkley *et al.*, 2008; Mash & Wolfe, 2005). In the light of the long-term risk of this disorder, teachers should constantly try to create environments to help the children to succeed academically, emotionally and socially (DuPaul & Stoner, 2003). A minority of respondents held the view that children will 'outgrow' their symptoms by adolescence. Holding this view could imply that the seriousness of this disorder is overlooked. When adolescents with ADHD are compared with non-ADHD children, those with ADHD are at higher risk for school suspension, academic failure, dropping out of school and substance abuse (DuPaul & Stoner, 2003).

Misperceptions about ADHD are particularly resistant to change (Kos *et al.*, 2004; Sciutto *et al.*, 2000). In the present study, for example (and consistent with previous research), 65.2% of the respondents incorrectly believed that reducing dietary intake of sugar or food additives will effectively reduce the symptoms of ADHD (Kos *et al.*, 2004; Sciutto *et al.*, 2000; Jerome *et al.*,1994). Numerous studies have been done on the effect of the diet on the symptoms of ADHD (Barkley, 2000; Sue, Sue & Sue, 1997). To date, no scientific support could be found for the influence of the diet as the cause for ADHD or that changing the diet could influence the severity of the symptoms. Dietary factors play a minimal role in ADHD (DuPaul & Stoner, 2003). Only a very small number (5% or less) of children, mainly preschoolers, showed a slight increase in inattentiveness or activity when sugar or food additives were included in their diet (Barkley, 2000). The majority of the respondents saw the reduction of sugar and or food additives in the diet of children as an effective way to reduce the symptoms of ADHD. When teachers have this view about the effect of the diet on the ADHD symptoms, they may recommend that the child's diet has to change (DiBattista & Shepherd, in Sciutto *et al.*, 2000). This form of treatment could prove to be expensive, provide false hope for a quick cure and eventually delay empirically supported treatments that have been proven effective (Mash & Wolfe, 2005).

A person without knowledge may be cautious and seek information, but a person who holds an incorrect view may not seek additional information and may recommend misplaced advice (DiBattista & Shepherd, in Sciutto *et al.*, 2000). It is important to be aware of the distinction between misperceptions and a lack of knowledge when interventions for children (where the teacher is involved) and training for teachers are planned. The content of the interventions and training should therefore be targeted at the teachers' level of understanding (Kos *et al.*, 2004).

Correlating the above findings with the demographic characteristics of the teachers (Table 2) the following insights emerged from the data: The *overall knowledge of ADHD*, as measured by KADDS, was unrelated to the *age of the teachers*, as well as to the *years of general teaching experience* they have ($p > 0.05$ in both cases). The non-significant relationship between *overall knowledge of ADHD* and *general teaching experience* supports the findings of Kos *et al.* (2004) in their study of Australian teachers, but differs from the findings of Sciutto *et al.* (2000), indicating that teachers in the United States with more

years of teaching experience obtained higher scores than teachers with *less teaching experience*.

Teachers' *confidence in their ability to teach* a child with ADHD *effectively* was found to relate positively with the *overall knowledge of ADHD*, as measured by the KADDS ($r = 0.43$, $p < 0.05$). *Overall knowledge of ADHD* was also positively related to *teachers' exposure to ADHD* as childhood disorder. The exposure mentioned here was *teaching a child with ADHD* ($r = 0.33$, $p < 0.05$), the *number of workshops on ADHD attended* ($r = 0.36$, $p < 0.05$), the *reading of articles/papers on ADHD* ($r = 0.49$, $p < 0.05$), the *number of children they have referred for assessment* ($r = 0.29$, $p < 0.05$) and their involvement in *assessing the efficacy of stimulant medication* ($r = 0.25$, $p < 0.05$). There were also small, but significant correlations between KADDS *total scores* and the *educational level* of the teachers ($r = 0.10$, $p < 0.05$) and the *number of hours that were allocated to ADHD* in their initial training as a teacher ($r = 0.18$, $p < 0.05$).

The findings of Sciutto *et al.* (2000) that confidence in their ability to effectively teach a child with ADHD and prior exposure to a child with ADHD was positively related to the overall knowledge of the teachers was confirmed by the findings of the present study. In the study that was done by Kos *et al.* (2004) additional ADHD training and experience with teaching children diagnosed with ADHD were significantly associated with teachers' knowledge about ADHD. These findings support the findings of the present study, as well as the findings of Sciutto *et al.* (2000).

Conclusion

Firm conclusions can be extrapolated to the general teaching population in schools in the peripheral areas of the Cape Town Metropole in the Western Cape, since the sampling procedure and the psychometric properties of the measuring instrument ensured reliability and validity. This was supported by a high response rate and extensive evidence.

Inclusive education, embedded in the human rights philosophy articulated in the South African Constitution, requires from teachers to cope with more learners in their classes and with more learners with diverse difficulties, such as ADHD. The results of this study suggest that there is a substantial lack of knowledge among teachers in certain key areas of ADHD. This lack of knowledge is a matter of concern since teachers play a pivotal role in the recognition, referral and treatment of ADHD.

Teachers indicated that they had very little or no training in ADHD and the management thereof in the classroom, affecting their knowledge base on this disorder. Some of their knowledge was acquired through what is portrayed about ADHD in media reports, which is often incorrect and not based on scientific research. This conclusion is supported by the International Consensus Statement (2002), which was specifically addressed to the press by a Consortium of International Scientists. Inaccurate information about this serious disorder can lead to teachers making inaccurate referrals, giving incorrect advice to parents and failing to address the disorder effectively in the

classroom.

Very few teachers indicated that they had ever been involved in assessing the use of stimulant medication. This suggests, as is also found in the literature (Louw, 2009; Schlozman & Schlozman, 2000; Livingston, 1997; Jerome *et al.*, 1994), that the psychologist and medical practitioner do not have sufficient contact with the classroom teachers of children diagnosed with ADHD. A closer working relationship between classroom teachers, psychologists and medical practitioners would be likely to enhance the diagnostic process, and to improve the efficacy of medication management, as well as the treatment process (Louw, Oswald & Perold, 2009).

We have a responsibility towards our children to make sure that teachers are knowledgeable about ADHD and that they are in a position to offer support to children in order for them to manage their behaviour and achieve success both socially and academically.

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