a quantitative methodological approach which focuses on investigation and measurement as forms of inquiry.

Quantitative research requires statistical descriptions and inferences and to disprove hypotheses for resultant relationships between the variables of a study (Bless, Higson-Smith & Kagee, 2006). Furthermore, objective data resulting from empirical observations and measures used for testing the validity and reliability of scores on instruments which lead to meaningful interpretations of data are additional characteristics of quantitative methodologies (Kumar, 2005).

3.3 Research Design

The current study used a quantitati 

ach with a descriptive cross-sectional survey design. In cross-s of interest in a sample of subjects are assessed once and the relations etermined (Hopkins, 2000). Cross-sectional studies are carried out at a short period. They are usually conducted to estimate the prevalence of the outcome of interest for a given population. Data can also be collected on individual characteristics, including exposure to risk factors, alongside information about the outcome. In this way cross-sectional studies provide a 'snapshot' of the outcome and the characteristics associated with it, at a specific point in time (Cherry, 2010). Additionally, in survey designs, survey research uses scientific sampling and questionnaire design to measure characteristics of the population and produces statistical outcomes to try and prove or disprove hypotheses of the study (Bless, Higson-Smith & Kagee, 2006). Surveys are conducted for the general purpose of obtaining information about practices, opinions, attitudes and other characteristics of people. According to Knapp (1998), the most basic function of a survey is description.

3.4 Sample

This study was conducted at 28 primary schools in Kimberley. The pilot study was conducted at four schools that was not part of the main study. Upon request by the Department of Education, five out of eight special needs schools were added and formed part of the sample of 23 schools from previously disadvantaged and advantaged areas. Lists of names of teachers from grades 1 to 5 were used as a sampling frame, as it is within these grades that children are mostly referred for treatment of ADHD symptoms.

Population is defined as a complex set of individuals that a researcher wishes to study (Hinton, 2004). The population used in this study consisted of the primary school teachers in the Kimberley area. The sample of the study was drawn from a list of educators from 23 schools, 10 in previously advantaged areas and 13 in previously disadvantaged areas. The schools are located in areas according to the previous apartheid dispensation with areas geographically located according to socio-economic status. There are approximately between 8 to 20 grade 1 to 5 teachers at each school which resulted in the final sample of 200 participants. Gender was included based on a 50% split.

Balnaves and Caputi (2000) define sampling as a technique for selecting a subset of units of analyses from a population, suggesting that good sampling achieves representativeness. The technique of probability sampling was applied to the study as it involves the selection of a "random sample" from a list containing the names of everyone in the population you are interested in studying (Babbie & Mouton, 2001). The final sample consisted of 11% males and 89 % females. The racial categories were Coloured (n=82), African (n=68), White (n=47) and Indian (n=3) teachers.

3.5 Research Instrument

Participants completed self-reported questionnaires (Appendix C). The study used the Knowledge of Attention- Deficit-Disorder Scale (KADDS; Sciutto, et al., 2000) with additional items to collect biographical data, diagnosis of ADHD and management of children with ADHD in the classroom. The first section in the questionnaire contains demographic items examining age, gender, ethnicity, marital status, religion, number of years teaching and current grade level.

The next section contained the Knowledge of Attention Deficit Disorder Scale (KADDS; Sciutto, et al., 2000) consisting of 36 items. This scale was used to measure teachers' understanding and perceptions of the disorder. (See attached **Appendix C**). Examples of questions are as follows:

1. Teachers have access to research material on ADHD T F DK (Where T is true, F is false and DK is don't know)
2. In order to be diagnosed with ADHD, the child's symptoms must have been present before age seven T F DK
3. Antidepressant drugs have been effective in reducing symptoms for many children with ADHD. T F DK

A third section consisted of four questions with yes/no answers to investigate whether teachers have access to research material, whether they received any training on ADHD, whether they ever referred students for diagnosis and treatment, whether they have taught a child displaying symptoms of ADHD, whether they know how to manage ADHD in the classroom and which strategies they use to manage ADHD in the classroom. The section, on the management of ADHD in the classroom, contained 13 questions which were self-constructed based on a review of the literature to assess teachers' knowledge and level of

support regarding the effectiveness of classroom interventions for children with ADHD. Response categories ranged from 1 "Strongly Disagree" to 4 "Strongly Agree". Sample questions included "Class work must be broken down into smaller units for children with ADHD" and "Learning expectations should verbally be set daily before each lesson for children with ADHD."

The Knowledge of Attention Deficit Disorders Scale (KADDS) was constructed to assess important domains of ADHD knowledge (that is associated features, symptoms and diagnosis, treatment) among parents, teachers and mental health professionals. In addition to evaluating these domains of knowledge, the KADDS was also designed to distinguish lack of information about ADHD from incorrect beliefs about the disorder (that is misconceptions). Coefficient alpha for the resulting 36 item instrument was .81 (Bender, 1996). Test-retest correlations for the KADDS scores were moderate to high ($.59 < r < .76$).

3.6 Pilot Study and Results

A pilot study is a preliminary test of a questionnaire or interview schedule which helps to identify problems and benefits associated with the design (Balnaves & Caputi, 2001). Similarly, Terre Blanche, et al., (1999:94) state that pilot studies are preliminary studies on small samples that help to identify potential problems with the design, particularly the research instruments.

The pilot study was conducted with 15% of the identified sample in order to test the data collection method, instrument and reliability of the proposed study. Hence, approval of the study by the Senate for Higher Degrees Committee consequently was provided. Once permission had been received to conduct the study, permission was sought from the Head of Department of the Northern Cape Education Department to conduct the proposed research

with the teachers. The Head of Department offered permission and subsequently scheduled meetings were arranged with the school principals in order to establish a suitable time and venue permitting accessibility to the grade 1 to 5 teachers. The principals agreed to either have the data collected during first break in the mornings or after school. At a few of the schools, because of time constraints, principals requested that the questionnaires be left at the school for the teachers to complete, and collected at a scheduled date. Teachers would then be informed at their staff meetings about the study and handed the questionnaire to complete.

At the beginning of the data collection process, teachers were informed about the purpose, aims and objectives of the study. All ethical processes were adhered to. Teachers were informed that participation in the study is voluntary and they were also asked to complete a consent form (see appendix A) confirming their participation and acceptance into the study. At the schools where the questionnaires were left with the principals, they were informed that teachers who wanted to participate should complete the consent forms. The questionnaire was self-administered allowing the researcher to offer assistance and provide clarity to questions at the schools where she was present. Completion of the questionnaire lasted 30 minutes. Teachers were requested not to leave any of the items/questions blank, but to rather mark 'Don't know'. The questionnaire was constructed in English since this was the language the teachers were more comfortable with. Principals and teachers were requested to indicate whether they had any difficulty in understanding the questions and completing the questionnaire. Contact details of the researcher and supervisor were available to teachers in case they needed to contact the researcher and supervisor.

3.6.1 Results of the pilot study

The data for the pilot was coded, entered, cleaned and analysed with the Statistical Package in the Social Sciences (SPSS). Reported alphas for the KADDS were .59 and .76 (Sciutto & Terjesen, 2004). Coefficient alpha for the resulting 36 item instrument was .81 (Bender, 1996). Test-retest correlations for the KADDS scores were moderate to high (.59 < r < .76).

3.6.2 Changes to the instrument

No major changes were made to the questionnaire, except for adding additional sections to the demographic information of the participants such as: "Marital status:- widowed, divorced, cohabiting, married and never married"; "Religion:- Christian, Muslim, Hindu, Jewish, Buddhist and Other"; and "Home language:- English, Afrikaans, Setswana and Other".

3.6.3 Application of the instrument

The study focused on examining the knowledge of primary school teachers from grade 1 to 5 about ADHD and its management within the classroom. Results proved that it was better for the researcher to be in attendance when the questionnaires were completed as more cooperation was given and questions could be addressed immediately. The timing of the handing out of the questionnaires at schools also played a role in the amount received back/ response rate as more cooperation was given at the beginning of the school term.

3.7 Data collection for the main study

The data collection method for the main study followed the format of the pilot with implemented changes made during the pilot study. The data collection techniques used in the main study was through a self-administered questionnaire. A questionnaire is a set of relevant questions for gathering information from individuals, which is unique to individuals, while

ensuring ethical issues like maintaining participants' privacy (Babbie & Mouton, 2001). According to Balnaves and Caputi (2001) the administration of the questionnaire involves the layout, decisions on length, types of questions, implementation of the survey, monitoring the quality of the answers, response rates and ethical issues.

Approval of the study was provided by the Senate for Higher Degrees Committee. Once permission had been received to conduct the study, permission was sought from the Head of Department of the Northern Cape Education Department to conduct the proposed research with the teachers. The Head of Department offered permission and scheduled meetings were arranged with the school principals in order to establish a suitable time and venue permitting accessibility to the grade 1 to 5 teachers. The principals agreed to either have the data collected during first break in the mornings or after school. At a few of the schools, because of time constraints, principals requested that the questionnaires be left at the school for the teachers to complete, and collected at a scheduled date. Teachers would then be informed at their staff meetings about the study and handed the questionnaire to complete.

At the beginning of the data collection process, teachers were informed about the purpose, aims and objectives of the study. All ethical processes were adhered to. Teachers were informed that participation in the study is voluntary and they were also asked to complete a consent form (see appendix A) confirming their participation and acceptance into the study. At the schools where the questionnaires were left with the principals, they were informed that teachers who wanted to participate should complete the consent forms. The questionnaire was self-administered allowing the researcher to offer assistance and provide clarity to questions at the schools where she was present. Completion of the questionnaire lasted 30 minutes. Teachers were requested not to leave any of the items/questions blank, but to rather mark 'Don't know'. The questionnaire was constructed in English since this was the language the

teachers were more comfortable with. Principals and teachers were requested to indicate whether they had any difficulty in understanding the questions and completing the questionnaire. Contact details of the researcher and supervisor were available to teachers in case they needed to contact the researcher and supervisor.

3.8 Data Analyses

According to Cresswell (2003), the process of data analysis involves making sense of the text by preparing the data for analysis, moving deeper into understanding the data, representing the data, and making an interpretation of the larger meaning of the data. The data was entered, coded, cleaned and analyzed by means of the Statistical Package in the Social Sciences (SPSS) to provide information in terms of percentages, frequencies, means and standard deviations. A descriptive analysis was done to look at how responses to individual items are distributed, thus examining the frequency distribution for individual variables.

The instrument used in the study was the Knowledge of Attention Deficit Disorder Scale (KADDS; Sciutto, et al., 2000). This scale measures teachers' understanding and perceptions of ADHD. The items on the KADDS scale were used to form four measures; an overall knowledge scale and three subscales. The total knowledge scale was the sum of the number of correct items. The scale could range from 1 to 39. Both incorrect answers and "don't know" were coded as "0" while correct answers were coded as "1" for each item on this scale and all the subscales. Higher scores meant more knowledge (Sciutto et al., 2000). The first subscale was designed to measure general information related to ADHD using 15 items. The general information scale was constructed by summing the number of correct responses to those 15 items. The scale could range from 1 to 15. Higher scores meant more knowledge. Items on the general knowledge subscale included "Attention Deficit Disorder occurs in

approximately 5% of all school-aged children" and "It is possible for an adult to be diagnosed with ADHD" (Sciutto et al., 2000).

The second subscale was designed to measure symptoms/diagnosis of ADHD using nine items. The scale was constructed by summing the number of correct responses to those 9 items. The scale could range from 1 to 9. Higher scores meant more knowledge. Items on the symptoms/diagnosis knowledge subscale included "Symptoms must not be present before age 7 to be diagnosed with ADHD," and "Children diagnosed with an attention deficit disorder tend to have poor concentration" (Sciutto et al., 2000).

The third subscale was designed to measure knowledge of the treatment of ADHD using 12 items. The scale was constructed by summing the number of correct responses to those 12 items. The scale could range from 1 to 12. Higher scores meant more knowledge of ADHD treatment. Items on the treatment knowledge subscale included "Stimulant medication increases concentration," and "Electroconvulsive Therapy (ECT) are effective treatments for Attention Deficit Disorder" (Sciutto et al., 2000).

The first section in the questionnaire contained demographic items examining age, gender, ethnicity, marital status, religion, number of years teaching and current grade level. The section on the management of ADHD in the classroom contained 13 questions which were self-constructed based on a review of the literature to assess teachers' knowledge and level of support regarding the effectiveness of classroom interventions for children with ADHD. It uses a 5-point Likert-type scale ranging from 1 = strongly disagree to 5= strongly agree. Items were coded or recoded so that higher scores meant more agreement that the intervention was effective. Coefficient alpha for the 36 item instrument was .81 (Bender, 1996). Test-retest correlations for the KADDS scores were moderate to high ($.59 < r < .76$).

3.9 Ethical Statement

Research ethics emphasizes the sensitive treatment to communicate effectively with research participants who might feel at risk, ensuring the promotion of their welfare and protecting them from harm throughout the research process (Babbie & Mouton, 2001). Butz (2008) furthermore amplifies that it is essential for researchers to employ ethical procedures as underlying ideologies which are important aspects of critical reflexivity. According to Louw and Edwards (1998) ethical consideration is a set of rules or guidelines that is designed to ensure that members of a profession behave competently and within appropriate limits. Participants were thus treated with respect and dignity adhering to the following principles:

Informed consent: The participants were informed in terms of the process and purpose of the research, and thus completed the written consent form for their voluntary participation in the study. The contact details of the researcher and the supervisor were clearly stipulated on the consent form. This form was separated from the questionnaire before the teachers completed the questionnaire to ensure anonymity.

Voluntary information: Participation in the research was voluntary. Teachers were informed about their rights to refuse participation and their freedom to withdraw from the research at any point.

Privacy, anonymity and confidentiality: The researcher handled the acquired information respectfully and it was stored securely. This was done to ensure that each survey is coded using a number instead of a name for identification purposes during the process of data analysis. Students were also informed that they would not be identified as participants in the study and that their information would be confidential. The identities of the participants were therefore protected.

3.10 Conclusion

The research design reflects that a cross-sectional design was used to achieve the aims and objectives of the study. This chapter also included information regarding the sample, the research instrument the data collection process and the data analysis of the study. Ethical considerations were taken into account during the process of data analysis and data collection to ensure full protection of participants with regard to confidentiality and anonymity. The next chapter presents the results of the analysis.

CHAPTER 4

RESULTS

This chapter presents the results of the statistical analysis conducted for the study. The analysis was conducted using the Statistical Package for the Social Sciences 21 (SPSS). The results are presented as (1) descriptive information about the demographics of the primary school teachers, (2) descriptive analysis about primary school teachers' knowledge of the associated features, symptoms and diagnosis as well as treatment of ADHD, and (3) descriptive analysis about the teachers' years of teaching experience, training received and classroom management techniques. The list of variables is presented as a means of understanding the coding used in SPSS to conduct the analysis.

The following is a guide to abbreviations used in the analysis of the data:

Abbreviation	Variable
KADDS	Knowledge of Attention Deficit Hyper-Activity Disorder Scale
GAF	General Associated Features
SAD	Symptoms and Diagnosis
ADHD	Attention Deficit Hyperactivity Disorder

4.1. An overview of the analysis

The following hypothesis evolved from the aims and objectives of the study:

Hypothesis 1: Primary school teachers have limited knowledge of the symptoms of ADHD.

Frequencies and descriptives were used to describe the sample and ADHD knowledge levels. Descriptives were used to rank the order of preference for teacher-supported classroom interventions for ADHD.

4.2 A Description of the demographical characteristics of teachers

Table 4.1 provides an overview of the demographic variables of the primary school teachers. The demographics were age, gender, ethnicity, marital status, religion, number of years teaching and current grade level.

Table 4.1: Demographic descriptions of primary school teachers

Total sample	**Variables**					
N= 200	Gender (%)	Age (average)	Ethnicity	Marital Status	Language	Religion
	Male: 11% Female: 89%	43	White: 23,7% Black: 33,8 % Coloured: 40,9% Indian: 1,5%	Married: 57,6 % Divorced: 11,6 % Widowed: 7,6 % Never married: 23,2 %	Afrikaans: 50% English: 19,2% Setswana: 26,8% Other: 4%	Christian: 96% Muslim: 3,5 % Other: 0,5%

The demographic results in Table 4.1 (see Appendix D) indicate that in terms of gender, more females 89% (n=178) than males 11% (n=22) participated in the study. The results show that the participants identified themselves as Coloured (40, 9%) followed by Black African (33, 8%), White (23, 7%) and Indian (1, 5%). These statistics are indicative of the demographics in terms of the population of the Northern Cape, of which Coloureds are the majority, followed by Black and then the other population groups. Although the majority of participants used Afrikaans (50%) and Setswana (26, 8%) as their home language, some participants used English (19, 2%) and a few (4%) spoke other languages other than Afrikaans, Setswana and English as their home language. Christianity (96%) and Islam (3, 5%) is the most preferred/ followed religions of the respondents whilst 0, 5% of the sample represented other religions besides Christianity or Islam.

Looking at the marital status of the teachers, the majority of the sample were married (57, 6%) whilst the second highest proportion (23, 2%) were never married. The least number was widowed (7, 6%) and 11, 6% were divorced.

Table 4.2: Demographic statistics of primary school teachers (Years of teaching experience and grade levels taught)

Total sample	**Variables**				
N= 200	Grade teaching	Years teaching	Advantage/ disadvantage	School fees payable	Amount payable
	Gr 1: 22,8% Gr 2: 20% Gr 3: 19,4% Gr 5: 16,7%	0-12: 29,5% 13-20: 28,9% 21 or more: 41%	30% advantaged 70% disadvantaged	Yes: 59,3% No: 46,1%	0-100: 42% 300-500: 36% 600-800: 18% 800 or more: 4%

The schools have been divided/categorized according to quintiles. A quintile of a school indicates whether it is an advantaged or disadvantaged school. A quintile of 4 or 5 places the school in the advantaged category, while a quintile of 1 and 2 places a school in the disadvantaged category according to the previous apartheid dispensation. The schools with a quintile of 1 and 2 will therefore qualify as no fee schools, and parents of children from these schools will therefore not be liable/responsible to pay school fees. These are also the schools which participate in the feeding scheme of the Department of Education. The table above indicates that most of the respondents teach the foundation phase grades (1, 2 and 3), with the majority of the sample (22, 8%) teaching grade one. This is followed by grade two teachers who represents 20% of the sample and grade 3 teachers (19, 4%). The least of the sample of teachers (16, 7%) taught grade 5. Looking at years of teaching experience, the majority of

teachers (41%) has more than 21 years, followed by 29, 5% who had 0-12 years and 28, 9% who had 13-20 years of experience. Thirty percent (30%) of the sample taught at advantaged schools (quintiles 4 and 5) whilst the overwhelming majority (70%) taught at disadvantaged schools (quintiles 1 and 2), according to the previous dispensation. Fifty nine point three percent (59, 3%) of the sample of respondents indicated that school fees were payable with the highest amount being between R300 to R500 per month (indicated by 36% of the 59, 3% respondents who answered yes, which calculates to 61% of the sample). The lowest amount was R100 per month which was indicated by 42% of the 59, 3% respondents who responded "yes" (which calculates to 71% of the sample).

4.3 Internal consistencies of measures

Table 4.3: Internal consistencies of KADDS

Descriptive Statistics and Alpha Coefficients

		Sample				
Scale		Elementary Teachers (NY)a N= 149	Elementary Teachers (OH) b N=199	College Students c N=273	School Personnel d N=51	Elementary Education Students e N=63
Total (36 items)	M	46. 57	53.80	45.24	56.80	42.11
	SD	17.91	16.49	16.13	20.68	14.96
	Alpha	.87	.84	.82	.90	.80
Associated Features (15 items)						
	M	40.36	44.32	35.92	47.86	33.66
	SD	18.17	18.15	16.09	20.34	16.57
	Alpha	.69	.67	.56	.74	.60

Symptom/ Diagnosis (9 items)						
	M	62.86	66.44	59.14	66.47	58.60
	SD	23.53	19.76	21.15	23.83	18.78
	Alpha .71		.61	.61	.75	.52
Treatment (12 items)						
	M	42.11	56.16	46.46	60.71	40.32
	SD	20.57	19.84	21.39	23.83	17.93
	Alpha .69		.63	.66	.75	.61

Note: Mean scores represent the percentage of correct responses.
a Sciutto, Terjesen & Bender-Frank (2000)
b Sciutto, Nolfi & Bluhm (2004)
c Sciutto & Terjesen (2004)
d Herbert, Krittenden, & Dalrymple (2004)
e Bender (1996)

Table 4. 3 present the descriptive statistics and alpha coefficients for the KADDS total and subscales from five previous studies that were done. Data from these studies suggest that the KADDS total scale (36 items) has high internal consistency ($.80 < r\alpha < .90$).

According to Anastasi (1982) Cronbach Alpha coefficients above .75 are deemed to be acceptable. The Cronbach Alpha coefficient for the KADDS was .81. The Cronbach Alpha coefficient falls within the acceptable limits indicated by Anastasi (1982). Thus the instrument was considered reliable.

Total Sample: N= 196

Scale	Minimum	Maximum	Mean	Std. deviation	Total score possible
General Associated Features	0	13	5.37 (41, 3%)	2.56	15
Symptoms and Diagnosis	0	9	5.86 (65, 11%)	1.92	9
Treatment	0	10	4.92 (49, 2%)	2.29	12

Table 4.4: Primary school teachers' knowledge of symptoms of ADHD

Item	Min	Max	*M*	*SD*
7) One symptom of children with ADHD is that they have been physically cruel to other people	0	1	.57	.497
32) The majority of children with ADHD evidence some degree of poor school performance in the primary school years.	0	1	.74	.438
26)Children with ADHD often have difficulties organizing tasks and activities	0	1	.82	.386
21) In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).	0	1	.85	.354
17) Symptoms of depression are found more frequently in children with ADHD than in children without ADHD.	0	1	.37	.484
16) Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.	0	1	.82	.385
9) Children with ADHD often fidget or squirm in their seats.	0	1	.86	.348
5) In order to be diagnosed with ADHD, the child's symptoms must have been present before age seven	0	1	.49	.501
3) Children with ADHD are frequently distracted by extraneous stimuli	0	1	.85	.363
Total score of teachers on symptoms and diagnosis of ADHD:				

Scale	Min	Max	*M*	*SD*	Total score possible
Symptoms and Diagnosis	0	9	5.86 (65, 11%)	1.92	9

Table 4.4 presents the mean level of knowledge, standard deviation, minimum and maximum scores for all the items on the scale of symptoms and diagnosis among the teachers, as well as the maximum score possible on this scale, if all of the questions were correctly answered. The scores for the symptom/diagnosis scale ranged from 0 to 9 with a mean of 5.86. The mean scores in Table 4.4 indicate the percentage of correct responses. The number of items for this subscale is 9 and therefore the maximum score obtainable is 9 correct responses. Items on the symptoms/diagnosis knowledge subscale included: "Symptoms must not be

present before age 7 to be diagnosed with ADHD," and "children diagnosed with an attention deficit disorder tend to have poor concentration" (Sciutto et al., 2000).

Of the sample of 196, most of the teachers (61, 2%) scored correctly on 7 of the items measuring the symptoms and diagnosis of ADHD namely, item 7 (M= .57; SD= .497), item 32 (M= .74; SD= .438), item 26 (M= .82; SD= .386), item 21 (M= .85; SD= .354), item16 (M= .82; SD= .385), item 9 (M= .86; SD= .348) and item 3 (M= .85; SD= .363). An overall mean score for the 7 items are 5.51, and the SD = .395. Thirty eight point eight percent of the sample answered incorrectly on two of the items namely item 17(M= .37; SD= .484) and item 5(M= .49; SD= .501).

Overall, out of the sample of 196 teachers 65, 11% (M= 5. 86; SD= 1.92) were knowledgeable about the symptoms and diagnosis (SAD) of ADHD. The average score obtainable on this subscale out of 9 is 4.5. The teachers obtained a mean score of 5.86 which is above the average score. It can thus be said that teachers has an above average knowledge base of the symptoms and diagnosis of ADHD and that they correctly identified the **presenting symptoms** of ADHD in children.

Table 4.5: Primary school teachers' knowledge of general associated features of ADHD

Item	Min	Max	*M*	*SD*
1) Most estimates suggest that ADHD occurs in approximately 15% of school age children	0	1	.08	.264
2) Current research suggests that ADHD is largely the result of ineffective parenting skills	0	1	.56	.498
11) It is common for children with ADHD to have an inflated sense of self-esteem or grandiosity.	0	1	.26	.437
14) Children with ADHD often have a history of stealing or destroying other people's things.	0	1	0.37	.484
19) Most children with ADHD "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.	0	1	.26	.437
22) If a child with ADHD 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.	0	1	.46	.499
27) Children with ADHD generally experience more problems in novel situations than in familiar situations.	0	1	.10	.301
28) There are specific physical features which can be identified by medical doctors (e.g., paediatrician) in making a definitive diagnosis of ADHD.	0	1	.36	.482
29) In school age children, the prevalence of ADHD in males and females is equivalent.	0	1	.40	.492
30) In very young children (less than 4 years old), the problem behaviours of ADHD children (e.g. hyperactivity, inattention) are distinctly different from age appropriate behaviours of children without ADHD.	0	1	.06	.239
33) Symptoms of ADHD are often seen in children without ADHD who come from inadequate and chaotic home environments.	0	1	.38	.486
31) Children with ADHD are more distinguishable from children without ADHD in a classroom setting than in a free play situation.	0	1	.76	.426
13) It is possible for an adult to be diagnosed with ADHD.	0	1	.58	.496
6) ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population	0	1	.23	.419
4) Children with ADHD are typically more compliant with their fathers than with their mothers	0	1	.14	.348

Total score of teachers on the general associated features of ADHD

Scale	Min	Max	*M*	*SD*	Total score possible
General Associated Features	0	13	5.37 (41, 3%)	2.56	15

Table 4.5 indicates the subscale, General Associated Features, which was designed to measure general information related to ADHD using 15 items. This scale was constructed by summing the number of correct responses to those 15 items. The scale ranged from 0 to 15. Higher scores meant more knowledge. Items on the general knowledge subscale included "Attention Deficit Disorder occurs in approximately 15% of all school-agead children" and "It is possible for an adult to be diagnosed with ADHD" (Sciutto et al., 2000). Out of the sample of 196, only 14, 6% of the teachers scored correctly on 3 of the items measuring the general associated features of ADHD namely, item 2(M= .56; SD= .498), item 31(M= .76; SD= .426) and item 13 (M= .58; SD= .496). The majority of the sample (85, 4%) scored incorrectly on the remainder of the 15 items.

As can be seen from Table 4.5, overall the scores for the general knowledge scale ranged from 0 to 13 with a mean of 5.37. Taking all the answers on the items in this subscale into consideration, out of the sample of 196 teachers 41, 3% (*M*= 5.37; *SD*= 2.56) had knowledge of the general associated features (GAF- general information about the nature, causes and prognosis) of ADHD. The average score out of 15 is 7.5. If we take the overall score of 13 which was obtained the average would be 6.5. The mean score of 5.37 is thus below the average which indicates that the teachers has a below average knowledge base of the general associated features of ADHD.

Table 4.6: Primary school teachers' knowledge of the treatment of ADHD

Item	Min	Max	*M*	*SD*
12) When treatment of a child with ADHD is terminated, it is rare for the child's symptoms to return.	0	1	.46	.500
18) Individual psychotherapy is usually sufficient for the treatment of most children with ADHD.	0	1	.24	.428
23) Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.	0	1	.12	.326
34) Behavioural/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention.	0	1	.17	.377
35) Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD.	0	1	.18	.386
36) Management for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.	0	1	.53	.500
25) Stimulant drugs are the most common type of drug used to treat children with ADHD	0	1	.37	.483
20) In severe cases of ADHD, medication is often used before other behaviour modification techniques are attempted.	0	1	.56	.498
15) Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.	0	1	.57	.497
10) Parent and teacher training in managing a child with ADHD are generally effective when combined with medication treatment.	0	1	.80	.405
8) Antidepressant drugs have been effective in reducing symptoms for many children with ADHD.	0	1	.41	.492
24) A diagnosis of ADHD by itself makes a child eligible for placement in special education.	0	1	.48	.501
Total score of teachers on the treatment of ADHD				

Scale	Min	Max	*M*	*SD*	Total score possible
Treatment	0	10	4.92 (49, 2%)	2.29	12

Table 4.6 presents the mean level of knowledge, standard deviation, minimum and maximum scores for all the items on the scale of treatment among the teachers, as well as the maximum score possible on this scale, if all of the questions were correctly answered. This third subscale was designed to measure knowledge of the treatment of ADHD using 12 items. The scale was constructed by summing the number of correct responses to those 12 items. The scale could range from 1 to 12. Higher scores meant more knowledge of ADHD treatment. Items on the treatment knowledge subscale included "Stimulant medication increases

concentration," and "Electroconvulsive Therapy (ECT) are effective treatments for Attention Deficit Disorder" (Sciutto et al., 2000).

Overall, the scores for the treatment scale ranged from 0 to 10 with a mean of 4.92. Looking at the individual items on this subscale, out of the sample of 196 teachers only 18, 6% answered correctly on 4 of the items of the treatment subscale namely, item 36(M= .53; SD=.500), item 20(M= .56; SD= .498), item 15(M= .57; SD= .497) and item 10(M= .80; SD= .405). The rest of the sample (81, 4%) answered incorrectly on the remaining 8 items. The mean of 4.92 is 1.08 points less than the average score of 6 out of 12 which can be obtained on this subscale, which is quite significant. If we only consider the maximum score of 10 obtained above, the mean of 4.92 is almost an average score. The teachers therefore scored below average on the treatment subscale.

Table 4.7: Prevalence of training received

Total sample	Variables							
N= 197	Training received		Taught child with ADHD		Referred child with ADHD		Access to research material	
	Yes	No	Yes	No	Yes	No	Yes	No
	82,2 %	17,8%	61,9%	38,1%	38,6%	61,4%	49,2%	50,8%

Out of the sample of 197 teachers 82, 2% received training in terms of ADHD, while 17, 8% received no training. Thus the majority of the sample of teachers received training. Sixty one point nine percent (61, 9%) indicated that they have taught a child with ADHD whilst 38, 6% referred children presenting symptoms of ADHD and 49, 2% confirmed having access to research material. This data indicates that the majority of the teachers in the sample have some knowledge about ADHD as they have received some training. Apart from training they also had experience in teaching children diagnosed with or presenting symptoms of ADHD. A lesser though significant percentage of teachers (38, 6%) referred children to doctors,

whilst just over half of the sample (50, 8%) indicated that they had no access to research material.

Based on the fact that 65, 11 % of the teachers were knowledgeable about the symptoms and diagnosis of ADHD it can be said that the teachers correctly identified the **presenting symptoms** of ADHD in children whilst 38, 6 % used this knowledge to refer children to doctors. The results indicated that teachers demonstrated a significantly greater knowledge base of the symptoms and diagnosis of ADHD as mentioned above but lesser so of the *general associated features* (which includes general information about the nature. causes and prognosis of ADHD) and treatment thereof. The biggest proportion, though less than half of the sample (41%), had 21 or more years of teaching experience. No significant difference was therefore found between the general knowledge of teachers on the general associated features (GAF) of ADHD and its **treatmen**t and the years of teaching experience.

4.4 Classroom Management techniques

Table 4.8: Prevalence of support for classroom management techniques

Variables	Total sample	Agree	Disagree
Seating in classroom	N= 199	51,8%	15,5%
Educational interventions	N= 199	62,3%	0,5%
Assistive technology	N= 199	68,3%	15,1%
Academic & social improvements	N= 199	61,8%	13,1%
Setting of behavioural expectations	N= 198	67,7%	16,2%
Time given for tests	N= 197	41,6%	35%
Learning expectations	N= 198	67,7%	12,6%
Classroom rules	N= 199	59,8%	6,5%
Repetition of directions	N= 198	67,7%	14,1%
Class work broken into units	N= 198	58,1%	14,1%
Token reinforcement	N= 198	65,2%	10,1%
Communication as intervention	N= 198	57,6%	11,6%
Ignore disruptive behaviour	N= 198	53%	28,8%

Table 4.8 indicates that teachers were mostly supportive of assistive technology, setting behavioural and learning expectations and repetition of directions to use with children with ADHD. Token reinforcement and educational interventions were the third and fourth most supported. The least supported of the classroom interventions designed to help children with ADHD were seating of children in the classroom and time given for tests.

Although parent-teacher communication for managing the behaviour of children with ADHD is effective (Jurbergs et al., 2007), these teachers agreed but were less supportive of adopting this practice (57, 6%). Also of significance is that 53% of the sample (n=198) was in agreement with requesting the other learners in the class to ignore the disruptive behaviours of children diagnosed with ADHD in their classrooms. It is worth noting that, on average, teachers were mostly in agreement with 7 (46%) of the 13 effective practices investigated here.

4.5 Summary

The results of this study were presented in the form of descriptive statistics and frequencies regarding primary school teachers' knowledge about ADHD and its management within the classroom. The results show that the majority of teachers are knowledgeable about the symptoms and diagnosis of ADHD but less so about the general associated features and treatment. Also of significance is the fact that although the majority of teachers received training on ADHD, their knowledge and support about the use of evidenced-based classroom interventions in the treatment of ADHD is low.

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the study with a discussion of the main findings integrated with previous research, identified in chapter 2, as well as the theoretical framework. Limitations of the study are provided and concluded with recommendations for further study.

One hypothesis was generated to identify the specific objectives to be measured, namely:

Hypothesis: Primary school teachers have limited knowledge of the symptoms of ADHD.

5.2 Attention Deficit Hyperactivity Disorder

ADHD is a condition of the brain that "challenges the individual to control impulses" (American Psychiatric Association, 2000:85). It is characterized by the *Diagnostic and Statistical Manual of Mental Disorders 4th ed., Text Revision* (*DSM-IV TR*) as a continuous pattern of inattention and a displayed amount of hyperactivity/impulsive behaviour not in compliance with the normal developmental behaviour of a child without ADHD.

As one of the most common chronic conditions of childhood it is also often accompanied by emotional immaturity, aggressiveness and poor academic performance (National Institute of Mental Health, 2012). According to the American Psychiatric Association (APA; 2000), there are three sub-types that are associated with ADHD namely, 1) ADHD/Combined Type, 2) ADHD/Predominantly Inattentive Type, and 3) ADHD/Predominantly Hyperactive-Impulsive Type. Considerations for each diagnosis are dependent upon which symptoms are most prevalent. For the combined type, six symptoms of hyperactive-impulsivity and six of

inattentiveness must be present to form a diagnosis. For the predominantly inattentive type, six or more inattentive symptoms but fewer hyperactive-impulsivity symptoms must be present. Lastly, for the hyperactive-impulsive type six or more of hyperactivity-impulsivity but fewer inattention symptoms must be present (APA, 2000).

5.2.1 Teachers' overall knowledge about the symptoms, general features and treatment of ADHD

The *general associated features* of ADHD include general information about the nature, causes and prognosis of ADHD. This includes estimates of the prevalence of occurrence of ADHD in school aged children as well as the functional deficits associated with ADHD such as the ratings of impairments and the degree to which these behaviours (such as inattention, hyperactivity or impulsivity) cause children "real-life" difficulties or impairment in daily life functioning.

Assessing the defining features of ADHD is important because it provides a link to a considerable body of knowledge on treatments for ADHD and because it can help determine whether the child is eligible to receive treatment. Misperceptions about the symptoms of ADHD could hinder the implementation of educational interventions for children with ADHD (Garcia, 2009).

Pelham et al. (1993) examined the effectiveness of treating ADHD with medication alone and treating ADHD with medication combined with behaviour modification techniques. Evidence suggests that treatments emphasizing both the psychological and emotional aspects of ADHD are beneficial interventions for improving academic and behavioural functioning

among children with ADHD (Du Paul & White; Pelham et al.; Raggi & Chronis, 2006 as cited in Garcia, 2009).

Treatment of choice for ADHD is therefore psycho-stimulant medication, educational interventions, behaviour modification procedures, as well as diet manipulation and supplements

The results of this study indicate that the primary school teachers have a good knowledge base of the symptoms and diagnosis of ADHD but lesser so of the *general associated features* (which includes general information about the nature, causes and prognosis of ADHD), and the treatment thereof.

The results of studies that were done in Australia, North America and also South Africa, regarding the knowledge of school teachers about the symptoms of ADHD, found that they had an average to good general knowledge, that few teachers had any training in ADHD and that teachers' overall knowledge improved as a result of teaching a child with ADHD. Sciutto et al.'s (2000) study reported an average of 47, 8% for correct responses for their sample of American teachers. A study that was done in primary schools in the Cape Metropole area provides similar results (Perold, et al, 2008). This study suggests that 42, 6% of teachers had knowledge regarding ADHD, 35, 4% did not know, while 22% had incorrect responses, suggesting misperceptions regarding ADHD (Perold, et al; 2008; Gray, 2008).

The current study revealed that just over forty percent of teachers had knowledge of the general associated features (GAF- general information about the nature, causes and prognosis) of ADHD, while more than sixty percent were knowledgeable about the symptoms and diagnosis (SAD) of ADHD and almost fifty percent had knowledge about the treatment of ADHD. More than eighty percent of the teachers in the current study received

training in terms of ADHD, and just over sixty percent indicated that they have taught a child with ADHD. Based on the fact that the majority of the teachers were knowledgeable about the symptoms and diagnosis of ADHD it can be said that the teachers are able to correctly identify the **presenting symptoms** of ADHD in children. It can also be said that having taught a child with ADHD, besides the training received, increased/ improved their knowledge of the symptoms and diagnosis of ADHD.

The results indicated that teachers demonstrated a significantly greater knowledge base of the symptoms and diagnosis of ADHD but lesser so of the *general associated features* and *treatment* thereof. The present study is consistent with the literature. Overall, teachers scored below average for general knowledge (all 3 subscales' scores added together) on their total KADDS score.

The biggest proportion, though less than half of the sample, had 21 or more years of teaching experience. No significant difference was therefore found between the general knowledge of teachers on the general associated features of ADHD and its **treatment** and the number of years of teaching experience.

This lack of knowledge regarding the *general associated features* (which includes general information about the nature, causes and prognosis of ADHD), and treatment thereof, is a matter of concern since teachers need to be knowledgeable not only about the etiology, diagnosis and prognosis of the disorder in order to reduce misdiagnosis and referrals, they also need to know how to manage children diagnosed with ADHD in the classroom in order to effect positive outcomes (Perold, et al; 2008).

5.2.2 Teachers' support for classroom management techniques

The literature suggests that there are positive interventions for effectively instructing children with ADHD in the classroom setting (DuPaul & Weyandt, 2006; Raggi & Chronis, 2006; U.S. Department of Education, 2003 as cited in Garcia, 2009). These interventions may include behavioral (token reinforcement), social (social skills training), academic (peer tutoring; DuPaul & Weyandt) supports, computer-assisted instruction, task modifications, self-monitoring, and strategy training for the youth themselves (Raggi & Chronis, 2006 as cited in Garcia, 2009). Students with ADHD may respond positively to parent/teacher rewarding (praise or privileges) or reprimands of school behavior or to immediate reinforcers such as stickers provided in the classroom (DuPaul & Weyandt; Rief, 2005). Some basic strategies for academic interventions involve choice making which allows the student to choose between different classroom activities or tasks. In addition, the active teaching of rules including having teachers continually remind the student of classrooms rules verbally and through example has also been shown to reduce classroom behaviour problems (DuPaul & Stoner, 2003; DuPaul & Weyandt). Studies have indicated that computer assisted-instruction may also be effective in improving the reading and mathematics skills of children with ADHD (Clarfield & Stoner, 2005; Mautone, DuPaul, & Jitendra, 2005).

Of the 13 classroom interventions designed to help children with ADHD, teachers in the current study were mainly in agreement with seven of the practices investigated, namely assistive technology, setting behavioural and learning expectations and repetition of directions to use with children with ADHD. Token reinforcement, academic and social improvements and educational interventions were the third and fourth most supported. The least supported of the classroom interventions designed to help children with ADHD were seating of children in the classroom and time given for tests.

It is thus likely that teachers will know which interventions can be used to effectively manage ADHD in the classroom, but there is a lesser degree of support for these interventions. This can be due to many factors, of which two stands out most clearly: 1) Lack of resources at schools and 2) support to teachers by making use of support personnel (students/additional assistant teachers to assist with the children with special needs in the classroom). The irony is that the least supported classroom interventions such as seating of children in the classroom, token reinforcement and time given for tests can easily be implemented because it carries no cost. The scores obtained on these interventions may thus indicate that teachers are not fully knowledgeable of the type of interventions that can be implemented within the classroom.

The results also indicate that a significant number (38, 6%) of teachers, refers children to doctors for treatment. This referral rate is a source of concern, because the percentage of learners diagnosed is increasing past the generally accepted mark of 3% of the general population. This coincides with the findings in literature that there is a high rate of parental referrals by teachers to doctors for children who display symptoms of Attention Deficit Hyperactivity Disorder that is inattentiveness, impulse control, concentration problems and learning disabilities (Perold, et al., 2008). These referral frequency rates are echoed in earlier studies, which found that teachers initiated 40 % to 60 % of children's ADHD referrals. This is because the structured school environment means that children with problems of inattention, hyperactivity and impulsivity exhibit behaviours with which the other children and their teachers cannot cope (Malen, 2008). Educators are often the first to recognize symptoms of ADHD and then report their concerns to their student's parents. Based upon such concerns a parent may seek advice from their medical or mental health provider who can diagnose and treat the disorder.

Identifying ADHD may have considerable implications for the child's experience at school. In particular, a child who is identified as having ADHD may become eligible for additional resources from the school, such as one-on-one time with a teacher aide or support from a special education teacher, whereas children with other difficulties may not. Thus, accurate assessment of ADHD in school settings is a critical step in effectively treating ADHD in schools (Atkins & Pelham, 1991 as cited in Garcia, 2009). Previous research suggests that the challenge facing many South African educators is that they have not been trained to cope with the diversity of learners entering mainstream schools (Bothma, Gravett and Swart, 2000 as cited in Garcia, 2009).

Consequently, and because of the structured school environment, just over half of the sample of teachers in this study is in agreement that the other learners in the classroom should rather ignore the disruptive behaviours of children diagnosed with ADHD, when it comes to classroom management techniques. This can impede on the rights of learners without ADHD in the classroom as instead of teachers applying behaviour modification techniques or some other intervention, the child is left to disrupt the classroom.

The new education system stipulates that all learners, regardless of their impairments, should be accommodated in the mainstream schools. The South African Schools Act, Act No. 84 of 1996 (DoE, 1996:10) categorically states, "a mainstream school must admit all learners and serve their educational requirements without unfair discrimination in anyway." This implies that based on the rights of all learners and their parents, no learners may be turned away from any mainstream school if it is at all possible to accommodate the learner. However, this does not mean that learners should be left to disrupt the classroom and so impede on the rights of the other learners in the class when it comes to learning/ proper education.

Although the effectiveness of parent-teacher communication and token reinforcement for managing the behaviour of these children are effective (Jurbergs et al., 2007), the teachers in the current study agreed but were less supportive of adopting this practice. Teachers were mostly supportive of assistive technology such as, computed assisted instruction setting behavioural and learning expectations (such as classroom rules and setting learning goals, providing clear instructions)) and repetition of directions to use with children with ADHD.

Snider et al., 2003 found in their study that the primary methods teachers used to address ADHD were punishment and communication with their parents. Other research also found that there are three types of classroom interventions commonly used for children with ADHD, these types include a) behaviour management (token reinforcement, teacher mediated task modifications, self-management, self-monitoring); (DuPaul & Stoner, 2003; DuPaul & Weyandt, 2006; Raggi et al., 2006), b) academic support (peer tutoring, computed assisted instruction), and c) social skills development (social skills training) (DuPaul & Weyandt, 2006). The results of the current study indicate that token reinforcement (the student receiving immediate rewards for appropriate behaviour for example points, stickers) in the classroom) and educational interventions were the third and fourth most supported. The least supported of the classroom interventions designed to help children with ADHD, were seating of children in the classroom and time given for tests.

5.3 Erikson's Theory and training of teachers in terms of classroom management

According to Erikson (1968) human development is divided into eight stages. Each stage has a particular conflict that has to be resolved before the individual moves on to the next stage. Once the conflict in each stage has been successfully resolved, an ego-strength outcome is achieved, which build towards the development of a healthy self-concept. It also prepares the

individual for crises that emerge later in life (Mussen, et al., 1994; Phares, 1984; Shaffer, 1993; Soenens, 2006 as cited in Allen, 2006). Failure to resolve the conflict of a particular stage may markedly affect the person's capacity to cope successfully with the next stage (Phares, 1984 in Grootboom, 1999). Usually children between the ages of 6 to 12 are diagnosed with symptoms of ADHD (Gray, 2008). According to Erikson's theory this occurs in the fourth psychosocial stage of development namely *Industry versus Inferiority* which occurs from the age of 6 years until the onset of puberty. During this stage the repertoire of motor and mental abilities greatly expands. Children are eager to learn and accomplish more complex skills like reading, writing and telling time. Thus, the favorable outcome of this stage is for the child to learn to acquire direction, purpose and competence in activities.

Ideally, the primary school provides many opportunities for children to achieve the recognition of teachers, parents and peers by drawing pictures, solving mathematical problems, writing sentences, and so on. Additionally if children are encouraged to make and do things and are praised for their accomplishments, they begin to demonstrate industry by being diligent, persevering at tasks until completed and by putting work before pleasure. If children are instead ridiculed or punished for their efforts or if they find they are incapable of meeting their teachers' and parents' expectations, they develop feelings of inferiority about their capabilities (Allen, Eileen; Marotz & Lynn, 2003). Children with ADHD are at increased risk for academic underachievement, grade retention, suspension or expulsion from school, special education placement, and socialization deficiencies. Ultimately, the individual's self is affected either positively or negatively. Children, who have a 'negative' self, will exhibit low self-esteem. The self-esteem of an individual has a profound effect on progress at school and experience of the school environment. Erikson (1963) viewed the primary school years as critical for the development of self-confidence.

It is therefore of utmost importance for educators to have a good understanding of these learners' needs in their unique and relevant contexts (Engelbrecht & Jansen 2003). Running a classroom so that it becomes an optimally healthy and inclusive learning environment for all the learners is extremely important. It involves the teacher in a number of different roles each of which needs to be constantly adjusted and co-ordinated into a harmonious and productive whole (Donald, Lazarus & Lolwana, 2002). According to Kapp (2002) remediation of the problems of learning disabled children, that is ADHD is a highly specialized subject area which demands specific knowledge and skills from practitioners/teachers. The educator needs to do constant research, attend workshops/seminars and perhaps also, consider doing in-service courses to uplift their knowledge and understanding of learners with ADHD. Educators will also have to be adequately prepared to assess special educational needs, to adapt curriculum content to the needs of learners in the classroom, and to **utilize special assistive devices and instructional aids** (such as word processors, digital personal organisers, multi-media such as film clips and assistive devices, such as microphones and Braille translators) required by some of the ADHD learners. Token reinforcement will also assist in reinforcing positive behaviour and rewarding/ praising the learner for his/ her accomplishments. Additionally, instruction has to be planned to ensure that all learners will benefit. In particular, co-operative learning and teaching that accommodates a variety of learning and cognitive styles, are instructional techniques shown to be well suited to inclusive classrooms.

In addition to using teaching strategies that benefit all learners in an inclusive classroom, teachers have to acknowledge that certain learners will still need planned and specific interventions to address the barriers to learning that they experience. Significant attention in the international literature on inclusion is given to strategies that ensure individual access and

participation in the curriculum. This access is often achieved through making accommodations and adaptations to teaching, learning and assessment. Assessment is a significant area where modifications can be made to minimise the impact of any barriers to learning. Modifications may be made in the way the learner performs a task, like having a task read to the learner, or allowing oral response, or, the most frequently used modification, by providing additional time that reduces test anxiety and allows for the efficient use of test strategies (Elliot & Marquart, 2004). In grading or marking learner performance, learners who experience certain barriers to learning would not be penalised on criteria like spelling or handwriting and other assessment criteria may be modified (Bradley & Calvin, 1998). If modifications have been made to assessments in the light of individual needs, standardised reports would then have to be modified in some way (Bradley & Calvin, 1998; Bursuck, Plante, Epstein, Jayanthi & McConeghy, 1996).

5.4 Limitations of the study

In this study, data was collected only in the Kimberley area (Frances Baard region) which might not be truly representative of the population (urban and rural) of South Africa. The results may only apply to this study population and not to a generalization across the country. The racial categories in the study were: Coloured (40, 9%; n=82), Black African (33, 8% %; n=68), White (23, 7%; n= 47) and Indian (1, 5%; n= 3) teachers. A small male sample (11%; n=22) participated in the study as compared to the larger female sample (89%; n= 178) which could have implications should comparisons have been conducted for this study. Permission to conduct research at the schools was generally a challenge as principals felt that there was not sufficient time to allow for the data collection process. School rosters were a challenge and time for data collection had to be continually negotiated so that minimal disruption occurred at the school.

Due to a low response rate from the schools that were initially identified for the study, the study had to be extended to twenty eight schools, which included the special need schools. The data collection process became longer than expected and also some of the schools were not open for research to be done in their schools. Another possibility of a limitation could be that some respondents may not have answered correctly or guessed the correct answer on the KADDS questionnaire. Maybe some participants tend to give some information that they feel the researcher wants to hear, and some participants also do not want to disclose their personal information for fear that this can be used against them. Explaining in detail to the participants that the information will be confidential, and clarification of the main purpose, was done to try and minimize this. Another possible source of error could be in the way the participants understood the questions and their interpretation of the questions. This was minimized by clarification and availability of the researcher for questions. Despite these possible limitations in the data collection, the researcher has confidence that the results produced in this study will be a true reflection of the real situation. It is also hoped that it serves to recommend further research and advanced study on this particular issue, especially in terms of resources at schools and school based support teams for children with special needs.

5.5 Strengths of the study

The strengths of the study is the fact that the information gathered can be used for further research in terms of resources at schools, policy implementation or adaptation and school-based support structures in terms of inclusive education. A general interest was shown by teachers for additional training in terms of special needs and classroom management techniques. Teachers were vocal about their concerns about inclusive education and the minimal support they have when implementing policy.

5.6 Conclusion

The purpose of the study was to investigate primary school teachers' knowledge of ADHD, and its management within the classroom. The study also investigated the teachers' demographic variables. The demographics were age, gender, ethnicity, marital status, religion, number of years teaching and current grade level. Results indicated that teachers have an average knowledge base of ADHD, scoring just over forty percent on the total KADDS score. Teachers scored statistically significantly higher on the Symptoms/Diagnosis subscale compared to the General and Treatment subscales. They were also more in agreement with 7 of the 13 classroom management techniques that were proven effective for use with children diagnosed with ADHD. The objectives of the study have been proven and the hypothesis "Primary school teachers have limited knowledge of the symptoms of ADHD" has been proven wrong as they scored remarkably high on the symptoms and diagnosis subscale.

5.7 Recommendations

It may be helpful to investigate undergraduate teacher education programs and in-service training about ADHD to determine what information teachers actually receive about this disorder. Asking teachers what steps they take when a child is exhibiting specific inappropriate behaviours may also provide information regarding teachers' knowledge, training, and application of interventions/management techniques.

It would therefore be advantageous to have school psychologists work as consultants to teachers where they can observe teachers working with a child with ADHD, help them implement interventions and interview them about their techniques and barriers.

Furthermore, since research suggests a multidisciplinary approach to working with children with ADHD, the amount of support provided to teachers would be beneficial to include in future studies.

It would be helpful if the Department can either revise their decision of doing away with “special needs classes”, or put in place District Support Teams to assist the teachers who have to work with children with special needs.

Strive to have a 50/50 split of gender participants.

REFERENCES

Allen, Eileen; Marotz, Lynn (2003). *Developmental Profiles Pre-Birth Through Twelve* (4th ed.). Albany, NY: Thomson Delmar Learning.

American Academy of Pediatrics (2000). Clinical practice guideline: Diagnosis and evaluation of the child with Attention-Deficit/Hyperactivity Disorder. *Pediatrics*. 105, 1158-1170.

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, text revision. Washington, DC: American Psychiatric Press.

Anastopoulos, A. D., DuPaul, G. & Barkley, R.A. (1991). Stimulant Medication and parent training therapies for Attention Deficit-Hyperactivity Disorder. *Journal of Learning Disabilities.*24, 210-218.

Babbie, E., & Mouton, J. 2001. *The Practice of Social Research.* South Africa: Oxford University Press.

Bakare, M.O. Attention deficit hyperactivity symptoms and disorder (ADHD) among African children: a review of epidemiology and co-morbidities. Afr. J. Psychiatry 2012; 15:358-361.

Balnaves, M. & Caputi, P. (2001). *Introduction to Quantitative Research Methods*. London: Sage Publication.

Barkley, R. A., & DuPaul, G. (1991). Attention deficit disorder with and without hyperactivity: Clinical response to three dose levels of methylphenidate. *Pediatrics, 87(4),* 519-131.

Barkley, R. (2003). Issues in the diagnosis of attention-deficit/hyperactivity disorder in children. *Brain and Development.*25, 77-83.

Barkley, R. (1998). Attention-deficit hyperactivity disorder. *Scientific American*. 279, 44-49.

Baroni, A., Lunsford, J.R., Luckenbaugh, D.A., Towbin, K.E., &Leibenluft, E. (2009). Practitioner review: The assessment of bipolar disorder in children and adolescents. *Child Psychiatry and Psychology*.50, 203-215.

Bless C, Higson-Smith C & Kagee A 2006. *Fundamentals of social research methods. An African perspective*, (4th Ed) Cape Town: Juta & Co.

Butz, D. 2008. Sidelined by the Guidelines: Reflections on the Limitations of Standard Informed Consent Procedures for the Conduct of Ethical Research. ACME: *An International E-Journal for Critical Geographies*, 7 (2), 239-259.

Cherry, K. (2012). *Erikson's Theory of Psychosocial Development. Psychosocial Development in Infancy and Early Childhood*.

Clarfield, J., & Stoner, G. (2005). The effects of computerized reading instruction on the academic performance of students identified with ADHD. *School Psychology Review, 34(2),* 246-254.

Cunningham, C., Vitiello, B., Abikoff, H.B., Ghuman, J.K., Kollins, S., Wigal, S.B., Wigal, T., McCracken, J.T., McGough, J.J., Kastelic, E., Boorady, R., Davies, M., Chuang, S.Z., Swanson, J.M., Riddle, M.A., & Greenhill, L.L. (2007). Clinical presentation of Attention-Deficit/Hyperactivity Disorder in Preschool children: The Preschoolers with Attention-Deficit/Hyperactivity Treatment Study (PATS). *Journal of Child and Adolescent Psychopharmacology*.5, 547-562.

De Vos, A.S., Strydom, H., Fouche, C.B., & Delport, C.S.L. (2002). *Research at grass roots. For the social sciences and human professions.* 2nd edition. Pretoria: Van Schaik Publishers.

Donald, D. ,Lazarus, S. , Lolwana, P. 2002. *Educational psychology in social conterxt.* Second edition. Oxford: University Press.

Drabick, D.A.G., Gadow, K.D., &Sprafkin, J. (2006). Co-occurrence of conduct disorder and depression in a clinic-based sample of boys with ADHD. *Journal of Child Psychology and Psychiatry*.47, 766-774.

DuPaul, G. J., Ervin, R. A., Hook, C. L., &MCGoey, K. E. (1998). Peer Tutoring for children with attention deficit hyperactivity disorder: Effects on classroom behavior and academic performance. *Journal of Applied Behavior Analysis, 31(4),* 579-592.

DuPaul, G. J., & Henningson, P. N. (1993). Peer tutoring effects on the classroom performance of children with attention deficit hyperactivity disorder. *School Psychology Review, 22(1),* 134-143.

DuPaul, G. J., & Stoner, G. (1994). ADHD in the Schools: Assessment and Intervention Strategies. New York: The Guilford Press.

DuPaul, G. J., & White, G. (2006). ADHD: Behavioral, educational, and medication interventions. *Principal, 85*, 26-29.

DuPaul, G.J. & Weyandt, L.L. (2006). School-based intervention for children with Attention Deficit Hyperactivity Disorder: Effects on academic, social, and behavioural functioning. *International Journal of Disability, Development and Education.*53, 161-176.

Epstein, J.N., Rabiner, D., Johnson, D.E., FitzGerald, D.P., Chrisman, A., Erkanli, A., Sullivan, K.K., March, J.S., Margolis, P., Norton, E.C., & Conners, C.K. (2007). Improving Attention-Deficit/Hyperactivity Disorder treatment outcomes through use of a collaborative consultation treatment service by community-based pediatricians.*Pediatric Adolescent Medicine*. 161, 835-840.

Engelbrecht, P. & Jansen , Z. 2003*: Inclusive education*. Department of Educational Psychology. Stellenbosch: College Publications.

Erikson, E.H. (1968). *Identity: Youth and Crisis*. New York: Norton.

Fenstermacher, K., Olympia, D., & Sheridan, S. M. (2006). Effectiveness of a computer-facilitated, interactive social skills training program for boys with attention deficit hyperactivity disorder. *School Psychology Quarterly, 21(2),* 197-224.

Fisher, M., Barkley, R. A., Edelbrock, C. S., &Smallfish, L. (1990). The adolescent outcome of hyperactive children diagnosed by research criteria: II. Academic, attentional, and neuropsychological status. *Journal of Consulting and Clinical Psychology, 58(5),* 580-588.

Garcia, M. J. (2009). Teacher Knowledge of Attention Deficit-Hyperactivity Disorder (Adhd) and Effective Classroom Interventions.B.S.W., 2004. California State University: Los Angeles

Gray, C. A. (2008*). Lay and professional constructions of childhood ADHD: a discourse analysis*. (Doctoral thesis) Queen Margaret University.

Grootboom, A. (1999). *Needs of High School Students in a multicultural South African School.*University of Port Elizabeth.

Gumpel, T.P. (2007). Are social competence difficulties caused by performance of acquisition deficit? The importance of self-regulatory mechanisms. *Psychology in the Schools, 44(A),* 351-372.

Hinton, P. R. (2004). *Statistics explained* (2nd.ed). Rutledge: USA.

Holz, T. & Lessing, A. (2002). *Reflections on Attention-Deficit Hyperactivity Disorder (ADHD) in an Inclusive Education System.* Perspectives in Education, 20:103-110. American Psychiatric Association (2000). Diagnostic and Statistical Manual of Mental Disorders. 4th edn.Text Revision. Washington, DC.

Hopkins, W.G. (2000). Quantitative research designs. Sport science 4(1), sportsci.org/jour/0001/ wghdesign.html (4318 words)

Jurbergs, N., Palcic, J., & Kelly, M. L. (2007). School-home notes with and without response cost: Increasing attention and academic performance in low-income. *Children with Attention-Deficit/Hyperactivity Disorder, 22(3),* 358-379.

Kapp, J.A. 2002. *Children with problems, an orthopedagogical perspective. Pretoria:* Van Schaik .

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

Knouse, L. E., Bagwell, C. L., Barkley, R. A., &Murphey, K. R. (2005). Accuracy of self-evaluation in adults with ADHD: Evidence from a driving study. *Journal of Attention Disorders, 8(4),* 221-234.

Konza, D. (1999). *An Effective Teaching Model based on Classroom Observations of Students with Attention Deficit Hyperactivity Disorder*. (Doctoral Thesis) University of Wollongong.

Kos, J.M., Richdale, A.L., & Jackson, M.S. (2004). Knowledge about Attention-Deficit/Hyperactivity Disorder: A comparison of in-service and pre-service teachers. *Psychology in the Schools.*41,517-526.

Louw, D.A. and Edwards, D.J.A (1998). *Psychology: An introduction for students in Southern Africa*. Johannesburg: Heinemann Publishers.

Malen, M. (2008). *Teacher ADHD Referral Theory Modification May Reduce Referrals for Student ADHD Diagnosis*. (Doctoral Thesis, University of Minnesota, 2008)

Mautone, J. A., DuPaul, G. J., & Jitendra, A. K. (2005). The affect of computer assisted instruction on the mathematics performance and classroom behavior of children with ADHD. *Journal of Attention Disorders, 9(1),* 301-312.

Mayes, R., & Rafalovich, A. (2007). Suffer the restless children: The evolution of ADHD and pediatric stimulant use 1900-80. *History of Psychiatry, 18(4),* 435-

457.

Mazzotta, G., Cirulli, L., Sposato, M. &Serino, D.(2012*). Attention deficit hyperactivity disorder secondary to lesion of the basal ganglia*. World Journal of Neuroscience, 2012, 2, 44-46 WJNS doi:10.4236/wjns.2012.21007.

Meyer, A. (1998). Attention Deficit/Hyperactivity Disorder among North Sotho speaking primary school children in South Africa: Prevalence and sex ratios. *Journal of Psychology in Africa, 8,* 186-195.

National Institute of Mental Health.(2008). *Attention-Deficit-Hyperactivity-Disorder*. U.S. Department of Health and Human Services, National Institutes of Health NIH Publication No. 08-3572.

Patricia N. & Pastor Ph.D. 2010. *Office of analysis & epidemiology.* Article retrieved January 15, 2010 from EBSCO, online database. Academic Search Premier.

Pelham, W.E. & Fabiano, G.A. (2008). Evidence-based psychosocial treatment for Attention-Deficit/Hyperactivity Disorder.*Journal of Clinical Child and Adolescent Psychology*.37, 184-214.

Pelham, W.E., Fabiano, G.A., & Massetti, G.M. (2005).Evidence-based assessment of Attention Deficit Hyperactivity Disorder in children and adolescents.*Journal of Clinical Child and Adolescent Psychology*.34, 449-476.

Perold , M., Louw, Kleynhans. (2008). *Primary school teachers' knowledge and misperceptions of attention deficit hyperactivity disorder (ADHD).*

Picton, H. (April 2012) ADHASA: *Attention Deficit Hyperactivity Disorder*.

Polit, D. F., Beck, C. T., & Hungler, B. P. (2004). Understanding quantitative research designs. Essentials of nursing research (5th ed., pp 184-185). Philadelphia: US: Lippincott Williams and Wilkings.

Posner, K., Melvin, G.A., Murray, D.W., Gugga, S.S., Fisher, P., Skrobala, A., Selikowitz, M. (2004) *ADHD the facts.*New York: Oxford University Press.

Power, T. J. (2000, March). *Understanding and improving adherence with pharmacological and behavioral interventions.* Paper presented at the meeting of The National Association of School Psychologists, New Orleans, LA.

Raggi, V., & Chronis, A. (2006). Interventions to address the academic impairment of children and adolescent with ADHD. *Clinical Child and Family Psychology Review, 9(2),* 85-111.

Reeve, R. E. (1994). The academic impact of ADD. *Attention, 5*(2), 8-12.

Reif, S. F. (2005). *How to reach and teach children with ADD/ADHD practical techniques, strategies, and interventions.* San Francisco, CA: Jossey-Bass.

Sadock, B.J & Sadock, V.A. (2003). Synopsis of psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins.

Sciutto, M. J., Terjesen, M. D., & Bender Frank, A. S. (2000). Teachers' knowledge and misperceptions of Attention-Deficit/Hyperactivity Disorder. *Psychology in the Schools, 37,* 115 - 122.

Selikowitz, M. (2004). *ADHD the facts* .New York: Oxford University Press.

Schellack, N. & Meyer, H. (2012). The management of attention- deficit- hyperactivity disorder in children. SAfr. Pharm J 2012; 79(10): 12-20.

Small, M. A. (2003). Attention-Deficit/Hyperactivity Disorder: General Education Elementary School Teachers' Knowledge, Training, and Ratings of Acceptability of Interventions. (Doctoral Thesis, 2003) College of Education, University of South Florida

Snider, V.E., Bush, T., & Arrowood, L. (2003). Teacher knowledge of stimulant medication and ADHD. *Remedial and Special Education, 24*, 46-56.

Terre Blanche, M., & Durheim, K. (1999). *Research in practice. Applied methods for the Social Sciences.* Cape Town: University of Cape Town Press.

The MTA Cooperative Group. (1999). A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry*, 56(12), 1073-1086.

Trochim, W. M. (2006). The research methods knowledge base (2nd Ed.) Retrieved April 20, 2009, from http://www.socialresearchmethods.net/kb/.

U.S. Department of Education, Office of Special Education and Rehabilitative Services, Office of Special Education Programs. (2004). *Teaching children with attention deficit hyperactivity disorder: Instructional strategies and practices*, Washington, DC: Author.

U.S. Department of Education, Office of Special Education and Rehabilitative Services, Office of Special Education Programs. (2006). *Teaching Children with Attention Deficit Hyperactivity Disorder: Instructional Strategies and Practices*, Washington, D.C: Author.

William, C. (2011). *Theories of Development: Concepts and Applications* (6th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Appendix A

INFORMATION SHEET

Title of Research Project: An examination of primary school teachers' knowledge of the symptoms and management of children diagnosed with ADHD in their classrooms

What is this study about?

This is a research project being conducted by Beryl Topkin at the University of the Western Cape. We are inviting you to voluntarily participate in this research project because you are primary school teachers. The purpose of this research project is to examine primary school teachers' knowledge of the symptoms and management of children diagnosed with ADHD in their classrooms.

What will I be asked to do if I agree to participate?

You will be asked to complete a questionnaire. This questionnaire will ask you questions about:

- your understanding of ADHD, its diagnosis and classroom management interventions. This questionnaire will be completed at school, with permission of your principal at a time which is not disruptive to your school schedule. Completion of the questionnaire will be less than 30 minutes.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, the information you provide will be totally private; no names will be used so there is no way that you can be identified as a participant in this study. The information will be treated with anonymity and confidentiality. Your name will not be reflected on the questionnaire. The information obtained from the survey will be collated with the information from other completed surveys. Therefore there will be no way to connect you to the survey questionnaire.

What are the risks of this research?

There are no known risks in participating in the study.

What are the benefits of this research?

Information about this topic is limited. This research is not designed to help you personally, but the results can be useful in terms of areas of development for teachers. Since information about this particular research in South Africa is relatively limited, the information resulting from the study can add to the current information available about ADHD and the rates of referrals due to misperceptions or lack of knowledge about the disorder. Management techniques within the classroom with regard to ADHD can also be explored and implemented in the school setting.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part in the study. If you decide to participate in this research study, you may stop participating at any time.If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

Is any assistance available if I am negatively affected by participating in this study?

Every effort has been taken to protect you from any harm in this study. If however, you may feel affected you can be referred to your nearest community resource for assistance.

What if I have questions?

This research is being conducted by Beryl Topkin in the Social Work Department at the University of the Western Cape. If you have any questions about the research study itself, please contact Beryl Topkin at: 084 5156165 or email: beryl.topkin@gmail.com
Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Dr. Nicolette Roman – Study co-ordinator / Head of the Social Work Department
Tel No: 021 9592277/2970
Email address: nroman@uwc.ac.za

Appendix B

CONSENT FORM FOR TEACHERS

Title of Research Project: An examination of primary school teachers' knowledge of the symptoms and management of children diagnosed with ADHD in their classrooms

The study has been described to me in a language that I understand and I freely and voluntarily agree to participate in the study. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Teacher's name……..

Teacher's signature……

Witness……

Date……

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Dr N Roman

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: 021 959 2277/2970

Email: nroman@uwc.ac.za

Appendix C

Demographic information:

Gender: Male Female

Age:

Number of years teaching:

Ethnicity:

White ☐
Black ☐
Indian ☐
Coloured ☐

Marital status:

Widowed	Divorced	Cohabiting	Married	Never married

Religion:

Christian	Muslim	Hindu	Jewish	Buddhist	Other

Home Language:

English	Afrikaans	Setswana	Other

Grade currently teaching:

School fees payable: Yes ☐ No ☐

If yes, amount per annum: R

School: **A /D**

Knowledge of Attention Deficit Disorders Scale (KADDS)

Please answer the following questions regarding Attention-Deficit/Hyperactivity Disorders (ADHD) by ticking your response. If you are unsure of an answer, respond Don't Know (DK), DO NOT GUESS. Please try not to leave any items blank. It is for this reason that you have **DON'T KNOW**.

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

Questions	T	F	DK
1. Most estimates suggest that ADHD occurs in approximately 15% of school age children			
2. Current research suggests that ADHD is largely the result of ineffective parenting skills			
3. Children with ADHD are frequently distracted by extraneous stimuli			
4. Children with ADHD are typically more compliant with their fathers than with their mothers			
5. In order to be diagnosed with ADHD, the child's symptoms must have been present before age seven			
6. ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population			
7. One symptom of children with ADHD is that they have been physically cruel to other people			
8. Antidepressant drugs have been effective in reducing symptoms for many children with ADHD.			
9. Children with ADHD often fidget or squirm in their seats.			
10. Parent and teacher training in managing a child with ADHD are generally effective when combined with medication treatment.			
11. It is common for children with ADHD to have an inflated sense of self-esteem or grandiosity.			
12. When treatment of a child with ADHD is terminated, it is rare for the child's symptoms to return.			
13. It is possible for an adult to be diagnosed with ADHD.			
14. Children with ADHD often have a history of stealing or destroying other people's things.			
15. Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.			
16. Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.			
17. Symptoms of depression are found more frequently in children with ADHD than in children without ADHD.			
18. Individual psychotherapy is usually sufficient for the treatment of most children with ADHD.			
19. Most children with ADHD "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.			
20. In severe cases of ADHD, medication is often used before other			

Questions	T	F	DK
behaviour modification techniques are attempted.			
21. In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).			
22. If a child with ADHD is able to demonstrate sustained attention to video games or TV for over an hour, that child is also able to sustain attention for at least an hour of class or homework.			
23. Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.			
24. A diagnosis of ADHD by itself makes a child eligible for placement in special education.			
25. Stimulant drugs are the most common type of drug used to treat children with ADHD			
26. Children with ADHD often have difficulties organizing tasks and activities.			
27. Children with ADHD generally experience more problems in novel situations than in familiar situations.			
28. There are specific physical features which can be identified by medical doctors (e.g., paediatrician) in making a definitive diagnosis of ADHD.			
29. In school age children, the prevalence of ADHD in males and females is equivalent.			
30. In very young children (less than 4 years old), the problem behaviours of ADHD children (e.g. hyperactivity, inattention) are distinctly different from age appropriate behaviours of children without ADHD.			
31. Children with ADHD are more distinguishable from children without ADHD in a classroom setting than in a free play situation.			
32. The majority of children with ADHD evidence some degree of poor school performance in the primary school years.			
33. Symptoms of ADHD are often seen in children without ADHD who come from inadequate and chaotic home environments.			
34. Behavioural/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention.			
35. Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD.			
36. Management for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.			

Section 3

Have you received any training with regard to ADHD? YES / NO

Have you ever taught a child who was diagnosed with ADHD or displayed symptoms thereof? YES / NO

Have you ever referred a student/ parents of students who display symptoms of ADHD for diagnosis and treatment? YES / NO

Do you have access to research material on ADHD at school or elsewhere? YES / NO

Classroom Interventions for Children with ADHD Please provide your opinion as to what type of interventions can be used for children with ADHD. Please try not to leave any items blank.

Classroom Interventions	Strongly Disagree	Disagree	Agree	Strongly Agree
A child with ADHD should be seated in the front of the classroom so as not to disturb other children.				
The first step for providing an educational intervention for a child with ADHD is by evaluating the child's individual needs and strengths.				
Students with ADHD benefit from the use of visual forms of assistive technology (i.e. projector screens or computers) in the classroom.				
Usually children with ADHD need to be treated with more than one classroom intervention to demonstrate academic and social improvement.				
Behavioral expectation should be set verbally or by written contract for children with ADHD.				
Children with ADHD should not be given the same amount of time for tests as other children.				
Learning expectations should verbally be set daily before each lesson for children with ADHD.				
Children with ADHD need to be actively taught classroom rules by reminding them on a regular basis.				
Directions should be repeated to a child with ADHD individually in addition to the directions given to the entire class.				
Class work must be broken down into smaller units for children with ADHD.				
Token reinforcements (i.e. stickers, points) help children with ADHD to manage their behavioral expectations.				
Communicating with parents on a daily basis is a useful intervention when teaching children with ADHD.				
Other children in the classroom should be instructed to ignore disruptive behavior Demonstrated by a child with ADHD.				

Appendix D

Letter to Northern Cape Department of Education: Permission to do a study.

Title: *An examination of primary school teachers' knowledge of the symptoms and management of children diagnosed with ADHD in their classrooms*

My name is Beryl Topkin. I'm doing a Master's Degree in Child and Family Studies at the Social Work Department at the University of the Western Cape. I am currently involved in research that examines primary school teachers' knowledge of the symptoms and management of children diagnosed with ADHD in their classrooms. ADHD is one the most widely researched and yet poorly understood childhood conditions. It's also one of the most common child conditions. I'm interested in what this condition means to teachers based on their experiences.

There is a high rate of parental referrals by teachers to doctors for children who display symptoms of Attention Deficit- Hyperactivity disorder (ADHD). The symptoms are inattentiveness, impulse control, concentration problems and learning disabilities. Studies suggest that often a learning disability is mistaken for ADHD. ADHD is usually diagnosed from the age of 7, when children start their schooling. In some cases it is identified much earlier in the form of over-activity in children during the pre-school years. Teachers are responsible for creating an environment that is conducive to academic, social and emotional success for children with ADHD. More often than not a learning disability is mistaken for ADHD because it often co-exists with other clinical conditions. This could mean that a child would have difficulties with mastering languages or certain skills, such as reading, mathematics or handwriting. Learning Disabilities (LD) and ADHD are distinctive

neurologically-based disorders that are diagnosed and treated differently (Perold, et al., 2008). The teacher is most often the first person to make a referral for assessment for ADHD (Malen, 2008). This happens because the structured school environment means children with problems of inattention, hyperactivity and impulsivity exhibit behaviors with which the other children and their teachers cannot cope (Malen, 2008). It is important for teachers to organize their environments according to the diversity of needs of the learners in the classroom. Having a better understanding may prevent them from developing negative views of these learners or labeling them (Holz& Lessing, 2002. Only one known study has been conducted in this area of research in South Africa (Malen, 2008). The current study therefore adds to existing research as it will determine primary school teachers' knowledge of the symptoms and management of children diagnosed with ADHD in their classrooms, thereby strengthening the understanding of the disorder. Management techniques within the classroom with regard to ADHD can also be explored and implemented in the school setting.

Permission is therefore sought to conduct this study at identified schools in Kimberley.

The sample of the study will be drawn from a list of educators from 26 schools, 10 in previously advantaged areas and 16 in a previously disadvantaged area. The schools are located in areas according to the previous apartheid dispensation with areas geographically located according to socio-economic status. Thus 10 schools will be randomly selected, 5 advantaged schools and 5 disadvantaged schools, for teachers to participate in the study. Participation will be on a voluntary basis and teachers can withdraw at any time. Informed consent will be ensured, details of the researcher will be provided in the informed consent form so that the participants are able to contact the researcher when they need clarity about the issues of confidentiality. The individuals' right to anonymity will be respected as the survey will be coded and a number instead the participant's name will be assigned to the

questionnaire for the purpose of identification during the analysis of the data. Thus no names or any identification of participants or schools will be reported the results of the study. Protection of the data will be secured as only the researcher and research supervisor will have access to the data set. A resource list with the numbers of support services will be compiled in the event that any of the participants are inadvertently emotionally affected during any part of the data collection process.

Your anticipated support is highly appreciated.

Thanking you

Beryl Topkin

TABLES

Table 4.1: Demographic descriptions of primary school teachers

Total sample	**Variables**					
N= 200	Gender (%)	Age (average)	Ethnicity	Marital Status	Language	Religion
	Male: 11% Female: 89%	43	White: 23,7% Black: 33,8 % Coloured: 40,9% Indian: 1,5%	Married: 57,6 % Divorced: 11,6 % Widowed: 7,6 % Never married: 23,2 %	Afrikaans: 50% English: 19,2% Setswana: 26,8% Other: 4%	Christian: 96% Muslim: 3,5 % Other: 0,5%

Table 4.2: Demographic statistics of primary school teachers

Total sample	**Variables**				
N= 200	Grade teaching	Years teaching	Advantage/ disadvantage	School fees payable	Amount payable
	Gr 1: 22,8% Gr 2: 20% Gr 3: 19,4% Gr 5: 16,7%	0-12: 29,5% 13-20: 28,9% 21 or more: 41%	30% advantaged 70% disadvantaged	Yes: 59,3% No: 46,1%	0-100: 42% 300-500: 36% 600-800: 18% 800 or more: 4%

Table 4.3: Internal consistencies of KADDS

Descriptive Statistics and Alpha Coefficients

Scale		Sample				
		Elementary Teachers (NY)a N= 149	Elementary Teachers (OH) b N=199	College Students c N=273	School Personnel d N=51	Elementary Education Students e N=63
Total (36 items)	M	46. 57	53.80	45.24	56.80	42.11
	SD	17.91	16.49	16.13	20.68	14.96
	Alpha	.87	.84	.82	.90	.80
Associated Features (15 items)						
	M	40.36	44.32	35.92	47.86	33.66
	SD	18.17	18.15	16.09	20.34	16.57
	Alpha	.69	.67	.56	.74	.60
Symptom/ Diagnosis (9 items)						
	M	62.86	66.44	59.14	66.47	58.60
	SD	23.53	19.76	21.15	23.83	18.78
	Alpha	.71	.61	.61	.75	.52
Treatment (12 items)						
	M	42.11	56.16	46.46	60.71	40.32
	SD	20.57	19.84	21.39	23.83	17.93
	Alpha	.69	.63	.66	.75	.61

Note: Mean scores represent the percentage of correct responses.
aSciutto, Terjesen& Bender-Frank (2000)
bSciutto, Nolfi&Bluhm (2004)
cSciutto&Terjesen (2004)
d Herbert, Krittenden, &Dalrymple (2004)
e Bender (1996)

Total scores on KADDS

KADDS subscales

Total Sample: N= 196

Scale	Minimum	Maximum	Mean	Std. deviation	Total score possible
General Associated Features	0	13	5.37 (41, 3%)	2.56	15
Symptoms and Diagnosis	0	9	5.86 (65, 11%)	1.92	9
Treatment	0	10	4.92 (49, 2%)	2.29	12

Table 4.4: Primary school teachers' knowledge of symptoms of ADHD

Total Sample: N= 196

Item	Min	Max	Mean	Std. deviation
7) One symptom of children with ADHD is that they have been physically cruel to other people	0	1	.57	.497
32)The majority of children with ADHD evidence some degree of poor school performance in the primary school years.	0	1	.74	.438
26)Children with ADHD often have difficulties organizing tasks and activities	0	1	.82	.386
21) In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).	0	1	.85	.354
17) Symptoms of depression are found more frequently in children with ADHD than in children without ADHD.	0	1	.37	.484
16) Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.	0	1	.82	.385
9) Children with ADHD often fidget or squirm in their seats.	0	1	.86	.348
5) In order to be diagnosed with ADHD, the child's symptoms must have been present before age seven	0	1	.49	.501

3) Children with ADHD are frequently distracted by extraneous stimuli	0	1	.85	.363

Total score of teachers on symptoms and diagnosis of ADHD:

Scale	Minimum	Maximum	Mean	Std. deviation	Total score possible
Symptoms and Diagnosis	0	9	5.86 (65, 11%)	1.92	9

Table 4.5: Primary school teachers' knowledge of general associated features of ADHD

Total Sample: N= 196

Item	Min	Max	Mean	Std. deviation
2) Most estimates suggest that ADHD occurs in approximately 15% of school age children	0	1	.08	.264
2) Current research suggests that ADHD is largely the result of ineffective parenting skills	0	1	.56	.498
11) It is common for children with ADHD to have an inflated sense of self-esteem or grandiosity.	0	1	.26	.437
14) Children with ADHD often have a history of stealing or destroying other people's things.	0	1	0.37	.484
19) Most children with ADHD "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.	0	1	.26	.437
22) If a child with ADHD 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.	0	1	.46	.499
27) Children with ADHD generally experience more problems in novel situations than in familiar situations.	0	1	.10	.301
28) There are specific physical features which can be identified by medical	0	1	.36	.482

doctors (e.g., paediatrician) in making a definitive diagnosis of ADHD.				
29) In school age children, the prevalence of ADHD in males and females is equivalent.	0	1	.40	.492
30) In very young children (less than 4 years old), the problem behaviours of ADHD children (e.g. hyperactivity, inattention) are distinctly different from age appropriate behaviours of children without ADHD.	0	1	.06	.239
33) Symptoms of ADHD are often seen in children without ADHD who come from inadequate and chaotic home environments.	0	1	.38	.486
31) Children with ADHD are more distinguishable from children without ADHD in a classroom setting than in a free play situation.	0	1	.76	.426
13) It is possible for an adult to be diagnosed with ADHD.	0	1	.58	.496
6) ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population	0	1	.23	.419
4) Children with ADHD are typically more compliant with their fathers than with their mothers	0	1	.14	.348

Total score of teachers on the general associated features of ADHD

Scale	Minimum	Maximum	Mean	Std. deviation	Total score possible
General Associated Features	0	13	5.37 (41, 3%)	2.56	15

Table 4.6: Primary school teachers' knowledge of the treatment of ADHD

Total Sample: N= 196

Item	Min	Max	Mean	Std. deviation
12) When treatment of a child with ADHD is terminated, it is rare for the child's symptoms to return.	0	1	.46	.500
18) Individual psychotherapy is usually sufficient for the treatment of most children with ADHD.	0	1	.24	.428
23) Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.	0	1	.12	.326
34) Behavioural/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention.	0	1	.17	.377
35) Electroconvulsive Therapy (i.e. shock treatment) has been found to be an effective treatment for severe cases of ADHD.	0	1	.18	.386
36) Management for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD.	0	1	.53	.500
25) Stimulant drugs are the most common type of drug used to treat children with ADHD	0	1	.37	.483
20) In severe cases of ADHD, medication is often used before other behaviour modification techniques are attempted.	0	1	.56	.498
15) Side effects of stimulant drugs used for treatment of ADHD may include mild insomnia and appetite reduction.	0	1	.57	.497
10) Parent and teacher training in managing a child with ADHD are generally effective when combined with medication treatment.	0	1	.80	.405
8) Antidepressant drugs have been effective in reducing symptoms for many children with ADHD.	0	1	.41	.492
24) A diagnosis of ADHD by itself makes a child eligible for placement in special education.			.48	.501

Total score of teachers on the treatment of ADHD

Scale	Minimum	Maximum	Mean	Std. deviation	Total score possible
Treatment	0	10	4.92 (49, 2%)	2.29	12

Table 4.7 Frequencies in terms of training received

Total sample	Variables							
N= 197	Training received		Taught child with ADHD		Referred child with ADHD		Access to research material	
	Yes	No	Yes	No	Yes	No	Yes	No
	82,2 %	17,8%	61,9%	38,1%	38,6%	61,4%	49,2%	50,8%

Table 4.8: Frequency of support for classroom management techniques

Variables	Total sample	Agree	Disagree
Seating in classroom	N= 199	51,8%	15,5%
Educational interventions	N= 199	62,3%	0,5%
Assistive technology	N= 199	68,3%	15,1%
Academic & social improvements	N= 199	61,8%	13,1%
Setting of behavioural expectations	N= 198	67,7%	16,2%
Time given for tests	N= 197	41,6%	35%
Learning expectations	N= 198	67,7%	12,6%
Classroom rules	N= 199	59,8%	6,5%

Repetition of directions	N= 198	67,7%	14,1%
Classwork broken into units	N= 198	58,1%	14,1%
Token reinforcement	N= 198	65,2%	10,1%
Communication as intervention	N= 198	57,6%	11,6%
Ignore disruptive behaviour	N= 198	53%	28,8%