THE INFLUENCE OF YOGA ON LEARNERS WITH ATTENTION DEFICIT HYPERACTIVE DISORDER

BY

KARENA ANNE BEART

submitted in part fulfilment of the requirements for the degree of

MASTER OF EDUCATION- WITH SPECIALISATION IN GUIDANCE AND COUNSELLING

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: Prof A.C LESSING

FEBRUARY 2010

Student number: 893-489-4

I declare that “The Influence of Yoga on Learners with Attention Deficit Hyperactive Disorder”, is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

_____ **20. February 2010**

(K.A. BEART)

Dedication

This study is dedicated to my daughter, Reese Helen Beart, whose courage and determination have been a true inspiration.

Acknowledgements

I wish to thank the following people who enabled me to complete this research by rendering support and motivation:

The learners, teachers, parents and yoga instructor, who participated in this study and therefore enhanced my knowledge and understanding of the influence of yoga on learners with ADHD.

Professor Lessing, my supervisor, who patiently supported me throughout this research.

My fellow students who provided empathy and motivation.

My family who sacrificed family time to enable me to complete this research.

My husband, Rich, who has always encouraged and supported me through many years of studying.

Summary

The aim of this study was to explore the influence of yoga on learners with ADHD. In order to reach the aim of this study, an initial literature study was executed to describe ADHD and the practice of yoga. Particular aspects such as concentration, anxiety, self-esteem and aggression were highlighted. Semi-structured interviews with parents, teachers, learners and one yoga instructor were used to conduct the empirical study. Valuable data was also collected from the learners using projection tests and self-esteem questionnaires. Assessments were conducted at two points: during the situation analysis and at the outcome of the yoga intervention. Based on the data collected and analysed, findings were made and conclusions were drawn regarding the influence of yoga on learners with ADHD focusing on the aspects of concentration, anxiety, self-esteem and aggression. Recommendations for future research were then proposed.

Key words

ADHD
Yoga
Learners
Concentration
Anxiety
Self-esteem
Aggression

INDEX

CHAPTER 1: INTRODUCTION TO THE RESEARCH		**1**
1.1	Background	1
1.2	Problem analysis and statement of the research question	2
1.2.1	Research question	8
1.3	Aims of the research	8
1.4	Research method	9
1.5	Rationale for this study	10
1.6	Assessment and intervention procedures	11
1.6.1	The Children's Apperception Test (CAT)	12
1.6.2	The Lawseq Self-Esteem Questionnaire (LAWSEQ)	12
1.6.3	Learner interviews	13
1.6.4	Parent, teacher, yoga instructor questionnaires/ interviews	13
1.6.5	Psycho-stimulant medication	13
1.7	Demarcation of the research	13
1.8	Clarification of the concepts	14
1.8.1	ADHD	14
1.8.2	Yoga	15
1.9	Research programme	15
1.10	Conclusion	16
CHAPTER 2: ADHD AND YOGA- AN OVERVIEW		**17**
2.1	Introduction	17
2.2	Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD)	18

2.3	Diagnostic criteria for ADHD	20
2.4	The symptoms of ADHD	21
2.5	The causes of ADHD	24
2.6	The diagnosis of ADHD	26
2.7	The treatment of ADHD	27
2.8	Co-morbid conditions of ADHD	28
2.9	The social and emotional consequences of ADHD	29
2.9.1	Low self-esteem as a social and emotional consequence	29
2.9.2	Aggression as a social and emotional consequence	32
2.9.3	Anxiety as a social and emotional consequence	33
2.10	Yoga	34
2.10.1	The background of yoga	34
2.10.2	The influence of yoga on the individual	34
2.10.3	Yoga and its influence on the ADHD learner	36
2.10.4	Yoga and aggression in the ADHD learner	38
2.10.5	Yoga and self-esteem in the ADHD learner	39
2.10.6	Yoga and concentration in the ADHD learner	41
2.10.7	Yoga and anxiety in the ADHD learner	42
2.11	Postures in yoga and their influence	43
2.11.1	Table indicating specific yoga postures and benefits	44
2.11.2	*Savasana*: a posture with many benefits	46
2.12	Meditation and its influence on the ADHD learner	47
2.13	Conclusion	48

CHAPTER 3: RESEARCH DESIGN **49**

3.1 Introduction 49

3.2 Research question and aim of empirical investigation 49

3.3 Research paradigm 49

3.4 Research methodology 50

3.4.1 Table illustrating the qualitative research process 50

3.4.2 Planning 52

3.4.3 Sampling 53

3.4.4 Data collection 54

3.4.4.1 Interview schedule 55

3.4.4.2 The Children's Apperception Test 56

3.4.4.3 The Lawrence Self-Esteem Questionnaire 56

3.4.5 Data analysis 57

3.5 Ethical aspects 58

3.6 Trustworthiness and the role of the researcher 59

3.7 Conclusion 61

CHAPTER 4: DATA ANALYSIS AND DISCUSSION OF RESULTS **62**

4.1 Introduction 62

4.2 Realisation of sampling 62

4.2.1 Biographical data of the participants in the case study 62

4.2.2 Parents' awareness of possible ADHD 63

4.3 Application of yoga to the participants 64

4.4 Results from the case study 65

4.4.1 *Participant A* 65
4.4.1.1 Initial situation analysis and outcome 65
4.4.1.2 Learner 66
4.4.1.2.1 Anxiety 66
4.4.1.2.2 Aggression 67
4.4.1.2.3 Self-esteem 67
4.4.1.2.4 Learner's impressions of the yoga intervention 68
4.4.1.3 Parents 68
4.4.1.4 Teachers 68
4.4.1.5 Yoga instructor's impressions 69
4.4.1.6 Conclusion 69
4.4.2 *Participant C* 70
4.4.2.1 Initial situation analysis and outcome 70
4.4.2.2 Learner 70
4.4.2.2.1 Anxiety 71
4.4.2.2.2 Aggression 71
4.4.2.2.3 Self-esteem 72
4.4.2.2.4 Learner's impressions of the yoga intervention 72
4.4.2.3 Parents 73
4.4.2.4 Teachers 74
4.4.2.5 Yoga instructor's impressions 74
4.4.2.6 Conclusion 75
4.4.3 *Participant H* 75

4.4.3.1	Initial situation analysis and outcome	75
4.4.3.2	Learner	76
4.4.3.2.1	Anxiety	76
4.4.3.2.2	Aggression	76
4.4.3.2.3	Self-esteem	77
4.4.3.2.4	Learner's impressions of the yoga intervention	77
4.4.3.3	Parents	77
4.4.3.4	Teachers	78
4.4.3.5	Yoga instructor's impressions	79
4.4.3.6	Conclusion	79
4.4.4	*Participant I*	80
4.4.4.1	Initial situation analysis and outcome	80
4.4.4.2	Learner	81
4.4.4.2.1	Anxiety	81
4.4.4.2.2	Aggression	82
4.4.4.2.3	Self-esteem	82
4.4.4.2.4	Learner's impressions of the yoga intervention	82
4.4.4.3	Parents	83
4.4.4.4	Teachers	84
4.4.4.5	Yoga instructor's impressions	84
4.4.4.6	Conclusion	85
4.4.5	A summary of the six other participants in table form	85
4.5	Summary of the findings with regards to the main themes investigated in the study	92

4.5.1 Concentration 93

4.5.2 Self-esteem 96

4.5.3 Anxiety 98

4.5.4 Aggression 99

4.5.5 Additional theme that emerged: sleep related issues 102

4.5.6 Parental expectations 102

4.6 Conclusion 103

CHAPTER 5: CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY **106**

5.1 Introduction 106

5.2 Conclusions drawn from the literature study and the empirical investigation 106

5.2.1 Conclusions from the literature study 106

5.2.2 Conclusions from the empirical study 108

5.2.3 Overarching conclusion 109

5.3 Recommendations 110

5.3.1 Guidelines for parents and teachers 110

5.4 Limitations of the study 112

5.5 Contribution of the study 112

5.6 Future research 113

5.7 A final word 113

BIBLIOGRAPHY **115**

LIST OF ILLUSTRATIONS

Figure 1: Situation analysis- Parent rating of learners' levels of concentration when medicated and when not medicated 94

Figure 2: Situation analysis- Teacher rating of learners' levels of concentration when medicated and when not medicated 94

Figure 3: Self-esteem- Situation analysis and outcome of the yoga intervention 97

Figure 4: Situation analysis- Anger outbursts in past 6 weeks 100

APPENDICES

APPENDIX A: Letter to parents

APPENDIX B: Consent letter

APPENDIX C: Teacher Questionnaire/ Semi-structured interview questions for parents

APPENDIX D: Coding key for themes in data analysis

APPENDIX E: Participant I- CAT-H: Situation analysis

APPENDIX F: Participant I- Parent interview: Situation analysis

APPENDIX G: Participant I- Teacher interview: Situation analysis

APPENDIX H: Participant I- CAT-A: Outcome

APPENDIX I: Participant I- Semi-structured interview: Outcome

APPENDIX J: Participant I- Parent interview: Outcome

APPENDIX K: Participant I- Teacher interview: Outcome

APPENDIX L: Participant I- Yoga instructor: Outcome

CHAPTER 1

INTRODUCTION TO THE RESEARCH

1. 1 Background

In this study, the influence of yoga on the learner with Attention Deficit Hyperactivity Disorder was the primary focus. Attention Deficit Hyperactivity Disorder is more commonly known as ADHD and is an internationally validated medical condition involving brain dysfunction, in which individuals have difficulty in controlling impulses, inhibiting their behaviour and sustaining their attention span. This leads to a variety of educational, behavioural, social and related difficulties (O'Regan 2005:5). ADHD is characterised by persistent and excessive problems in which the learner is unable to focus and pay attention, or conversely displays hyperactive and impulsive behaviour (Stordy & Nicholl 2000:4).

Yoga as a daily exercise program can improve fitness, strength, and flexibility. People who practice yoga correctly every day report that it can promote high levels of overall health and energy. The mental component of yoga can clarify and discipline the mind, and yoga practitioners say its benefits can permeate all facets of a person's life and attitude, raising self-esteem and self-understanding. Once individuals learn the basics of yoga, certain poses can be used to help with particular needs, such as improving memory and concentration (Dupler & Odle 2005:4). Children who practice yoga enjoy better health, discipline, temperament, behaviour, concentration, memory and stamina (Ali & Brar 2002:17).

Hatha yoga is the most widely practiced form of yoga in America. It is the branch of yoga that concentrates on physical health and mental well-being. Hatha yoga uses bodily postures (*asanas*), breathing techniques (*pranayama*), and meditation (*dhyana*) with the goal of bringing about a sound, healthy body and a clear, peaceful mind. There are nearly 200 Hatha yoga postures, with hundreds of variations, which work to make the spine supple and to promote circulation in

all the organs, glands, and tissues. Hatha yoga postures also stretch and align the body, promoting balance and flexibility (Dupler & Odle 2005:2; Lesser 1998:124; Sivananda Yoga Vedanta Centre 1996:10). Postures are designed to enhance the body-cosmos equation by developing an inner awareness and calming down the mind. The practice of asanas results in improved health, better posture and increased self-esteem (Clothey 2006:68; Prakashan 2000:2; Stiles 2000:14).

Temper problems, anxiety, impulsivity, restlessness, insomnia, and lack of focus are common problems in individuals with ADHD (Amen 2001:331).

1.2 Problem analysis and statement of the research question

It was in Thailand, 2004 where the researcher spent over four months in daily practice of Hatha yoga and discovered the immense benefits of this exercise. Many of the *asanas* or postures were aimed at improving one's focus and concentration as well as increasing mindfulness. The researcher then returned to South Africa and began to work as a teacher in a school which specialised in learning difficulties. Many of the learners had been diagnosed with ADHD and thus had problems with concentration and focus and were generally hyperactive and impulsive. It was then that the researcher wondered how yoga might influence a learner who has ADHD and whether the practice would have a positive effect and reduce his or her symptoms.

ADHD is the most widely diagnosed disorder amongst children, at between 45 to 62 percent (Brown 2000:8). About three times more boys than girls are diagnosed with ADHD (Larimer 2005:33) and more than 50 percent of learners with learning impairment experience ADHD (Kruger & Nel 2005:367). Individuals with ADHD are described as having a low frustration tolerance and frequent temper outbursts. They are said to be bossy, stubborn and insist that their requests are met. They may also suffer from mood labiality, demoralisation,

dysphoria, rejection by peers, poor self-esteem, impaired academic performance and conflicts with family or adults in authority (Steffen 2001:14).

A high percentage of learners with ADHD typically have experiences of low self-esteem and often lead frustrating or difficult lives (Larimer 2005:144). ADHD learners generally experience poor self-esteem as they experience so much failure while social difficulties often predominate (Chee & Green 2004:37; Hill 2005:17; O'Regan 2005:12). Learners with ADHD are often rejected by their peers and can experience lower levels of self-esteem as a result (Hill 2005:2).

A child must exhibit six or more of the following diagnostic criteria to be considered as suffering from ADHD: (1) often fails to pay attention to detail and makes careless mistakes, (2) often has difficulty sustaining attention, (3) often does not seem to listen, (4) often fails to complete work, (5) often has problems with organisation, (6) often avoids/ dislikes tasks that involve mental effort, (7) often loses things, (8) is easily distracted, (9) is often forgetful. To be diagnosed as ADHD, the symptoms must have been present for more than six months, be inappropriate for the child's age and intelligence, have developed before the age of seven, and have a negative impact in at least two social settings, both at home and at school (Pauc 2006:25).

The word *yoga* derives from the Sanskrit term *yuj,* meaning "to yoke", as in yoking the mind and the body (Lehrer, Woolfolk & Sime 2007:411; Stiles 2000:6; Weller 2007:6). In this context, yoga means the union of the essential self of a human being with the essence of the universe. At the same time the individual is also united in his thoughts, feelings, emotions and actions to his real self (Malhotra 2003:5). Yoga practices are believed to have originated in early civilisations on the Indian subcontinent. They have been practised historically in India and throughout East Asia and have evolved distinctly separately from Oriental religions. In its modern, Western manifestation, yoga includes the practices of meditation, regulation of respiration, physical exercises and postures

in which the focus is more on isometric exercise and stretching than on aerobic fitness (Lehrer *et al.* 2007:449).

Yoga may have a positive influence on learners with ADHD. Yoga teaches children to rediscover the joy of stillness and silence, and to see that being able to relax is just as important to health and well-being as exercise and activity. Mindfulness and meditation are also important aspects of yoga (Gibbs 2005:84). The principle of mindfulness includes being focused on the present moment, concentrating calmly on that moment and being aware of what you are doing. Mindfulness leads to calmer and more peaceful thoughts and emotions (Bester 2006:58). Thus, cultivating and implementing mindfulness in workshops for parents of ADHD children is recommended as it is simple and logical and addresses the chaos that is often found in households with ADHD children. According to Bennet-Goleman (2001), a study undertaken with a group of meditators confirms that mindfulness counteracts distraction. Brainwave activity in the prefrontal lobe of the brain increases during effective mindfulness exercises (*cited in* Bester 2006:61). Inattention is a core symptom of ADHD and thus yoga may influence the learner in a positive manner as meditation involves focusing the mind and paying attention (Rakel & Faas 2006:225).

The intention to relax and the deepening of the breath in yoga elicit alpha brain wave activity. Common physiological effects of the alpha state include slowing the heart rate, reducing blood pressure, and increasing skin temperature and circulation (Rakel & Faas 2006:140). Many health professionals sort the myriad of existing relaxation techniques into more or less six groups: yoga stretching, progressive muscle relaxation, breathing exercises, autogenic training, imagery/ positive self-statements and meditation (Lehrer *et al.* 2007:42).

Relearning the correct way to breathe can have a significant impact on our well-being and can contribute to our ability to relax. If we are not able to breathe properly, we cannot fully relax our body and our mind (Corey & Corey 2006:168).

However, though one may notice the benefits to the mind and body within a few weeks of regular practice, the body needs at least six months of daily practice to condition itself to doing the exercises (Yogeswar 2004:14).

A focusing and relaxation exercise such as yoga usually calms the child, promotes normal sleeping patterns, enhances focusing ability and counteracts anxiety. It may also have an immediate effect on brainwave patterns and a long-term effect on focusing ability. Alpha brainwave activity also improves self-reporting or insight into one's own behaviour. As individuals with an ADHD profile usually have very poor insight into that part of their behaviour that is problematic, yoga may promote general self-awareness (Bester 2006:83).

There are three steps of meditation. These are called concentration *(dharana),* meditation *(dhyana)* and absorption *(samadhi)*. They are different stages of concentration ranging from the lowest to the highest. In concentration *(dharana),* the mind of the individual is cut off from disturbances arising from the external world and is ready to take inventory of its own contents. Here the student chooses an image or an idea of his own liking and attends to it. The student must constantly bring back his mind to the original idea and keep it there as long as he can. Since other ideas are distractions, the mind needs to be brought back again and again to the chosen idea. As concentration improves with practice, there are fewer and fewer distractions. When an individual is able to keep his mind on a chosen idea for a long time, this spontaneous concentration is called meditation *(dhyana).* Here the student is able to concentrate on any idea without distraction. The only distraction still present is one's awareness of oneself as a subject. With more practice this self-consciousness disappears and the individual becomes totally engrossed in the object of contemplation. This stage is called absorption *(samadhi)* (Malhotra 2003:43). In essence, yoga practice helps individuals to calm their wandering minds and increase their powers of concentration (Yogeswar 2004:6).

Two major dimensions of ADHD according to the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association 2000) are inattention and hyperactivity/impulsivity. The behavioural symptoms of inattention include making careless mistakes, being easily distracted, and having a difficult time completing projects. Other behavioural manifestations of inattention include difficulty listening, difficulty following directions, and difficulty with organisation, often losing homework and other things, and being late or forgetting appointments. Symptoms of the hyperactivity dimension include fidgeting, difficulty in sitting still, excessive talking, and difficulty with quiet activities. Learners often feel as if they are being driven by a motor. Impulsive symptoms include blurting out inappropriate comments, an inability to wait one's turn, and acting without thinking (Honos-Webb 2005:2).

A recent study suggests that yoga may influence learners with ADHD. According to Jenson and Kenny (2004:205), boys diagnosed with ADHD and stabilised with medication, reduced their ADHD symptoms and showed improvement in attention and behaviour when they practised yoga regularly. Researchers recruited 19 ADHD patients and divided them into two groups: a yoga group and a control group. The first group participated in 20 yoga sessions. Patients in the control group took part in cooperative activities. Both groups experienced improvements. Interestingly, among the members of the yoga group, those who practiced more frequently at home, in addition to attending the group sessions, showed greater improvement in behaviour and attention. The study therefore suggests that yoga may be a useful complementary activity for children who already take medication to manage their ADHD. However, the researchers called for larger studies on yoga's potential influence on these learners.

Koretsky (2003:1) confers that individuals with ADHD are finding yoga a valuable exercise as, "When practiced regularly, yoga offers numerous health benefits, such as increased strength and flexibility, and decreased blood pressure and cholesterol levels. Yoga combines physical activity with self-awareness, which

promotes a mind-body connection that many ADDers lack." Koretsky (2003:1) reveals that many learners with ADHD have challenges with impulsivity and hyperactivity and they often describe feeling like they don't have control over their own bodies. Yoga may help individuals with ADHD learn how to forge a mind-body connection that promotes self-awareness and self-control. Yoga practitioners are taught deep breathing and relaxation techniques that help centre the mind in the present moment.

An interdisciplinary approach of a "Body, Mind, Spirit: Yoga and Meditation" course which is taught to students at DePaul University is described by Dolan (2007:31). Many students reported significant improvements in their lives during the ten weeks of the course. They used breathing techniques to calm themselves in stressful situations at home; they gave themselves some quiet time in prayer or meditation, and most are now said to use yoga postures for at least a few moments every day. Students who suffered from insomnia reported the ability to sleep after doing yoga regularly. They could handle stress better, feel their own power and were more focused. Students also learned to focus on one thing at a time and increased their powers of concentration. Some of the students said that it should be a required course because calmer minds, healthier bodies and freer spirits lead to enhanced learning abilities.

Harrison, Manocha, and Rubia (2004:479) describe the use of complementary and alternative medicine (CAM) as a treatment for children diagnosed with ADHD. CAM is widespread, but little is known on the effectiveness of many such therapies. The study conducted by Harrison *et al.* (2004) investigated meditation as a family treatment method for children with ADHD, using the techniques of Sahaja Yoga Meditation (SYM). Parents and children participated in a six week programme of twice-weekly clinic sessions and regular meditation at home. Pre- and post-treatment assessments included parent ratings of children's ADHD symptoms, self-esteem and child-parent relationship quality. Perceptions of the programme were collected via parent questionnaires and child interviews.

Results showed improvements in children's ADHD behaviour, self-esteem and relationship quality. Children described benefits at home such as better sleep patterns and less anxiety. At school they were able to concentrate more and had less conflict with others. Parents reported feeling happier, less stressed and more able to manage their child's behaviour. Indications from this preliminary investigation are that SYM may offer families an effective management tool for family-oriented treatment of childhood ADHD.

1.2.1 Research question

According to the literature there appears to be the potential to explore the relationship between yoga and the ADHD learner. Learners with ADHD have difficulty concentrating, often have low self-esteem, may suffer from anxiety and are also prone to anger outbursts. Yoga is said to increase self-esteem, aid concentration as well as diminish anxiety and aggression. However, there appears to be a dirth of qualitative studies looking particularly at the influence of yoga on learners with ADHD. Thus, the research question arises: What is the influence of yoga on the learner with ADHD specifically with regards to concentration, self-esteem, anxiety and aggression?

1.3 Aims of the research

The aim is described by Fouche and De Vos (2005:104) as "an abstract conception of the end toward which effort or ambition is directed." The aim of this study was to determine the influence of yoga on the learner with ADHD. To be able to reach the aim, a number of objectives needed to be identified. Objectives can be described as the process to be followed or the steps that need to be taken to attain the aim or goal (Fouche & De Vos 2005:104). To reach the aim of this study the following objectives were required:

- To provide an overview of literature describing the learner diagnosed with ADHD with a specific focus on the aspects of concentration, self-esteem, anxiety and aggression.

- To execute an empirical study to determine if yoga has an influence on the learner diagnosed with ADHD. The focus primarily being on the aspects of concentration, self-esteem, anxiety and aggression.

- To verify the data against existing literature and to make conclusions to be able to determine if yoga has an influence on the learner with ADHD with regards to concentration, self-esteem, anxiety and aggression.

The specific aim of this study was therefore to focus on the influence of yoga on the learner with ADHD and to determine if concentration, self-esteem, anxiety or aggression had improved.

1.4 Research method

In this study a qualitative approach was followed and this may be defined as a multi-perspective approach to describe, to make sense and to interpret (Fouche & Delport 2005:74). Johnson and Christensen (2008:75) add that in a qualitative study, the research problem focuses on exploring some process, event, or phenomenon. The main aim of this qualitative approach was to explore the influence of yoga on the learner with ADHD.

Qualitative designs are initially classified as interactive or non-interactive. Interactive qualitative methods use face-to-face techniques to collect data from people in their natural settings. Due to the nature of this research, an interactive method, namely a case study, was used. McMillan and Schumacher (2006:26) define a case study as one that “examines a bounded system, or a case, over time in detail, employing multiple sources of data found in the setting.” In this

research, a set of individuals bounded in time and place were studied, namely the learners with ADHD at a remedial school.

Furthermore, for the purpose of this study the researcher made use of a collective case study as the researcher may gain greater insight into a research topic by concurrently studying multiple cases in one overall research study. Studying more than one case may be advantageous to the researcher in that several cases may be compared for similarities and differences. The theory may be more effectively tested by observing the results of multiple cases as each case is examined in total, and then the different cases are compared in a cross-case analysis for similarities and differences (Johnson & Christensen 2008:408).

1.5 Rationale for this study

In South Africa there appears to be a dirth of qualitative studies regarding the influence of yoga on learners with ADHD, particularly with regards to the aspects of concentration, anxiety, self-esteem and aggression. One study was conducted in Sydney, Australia by Jenson and Kenny (2004:205) on a group of boys diagnosed with ADHD. It was quantitative in nature with the Conners' Parents Rating Scales (CPRS) and the Conners' Teacher Rating Scales (CTRS) being the chosen methods of assessment. Results suggested that yoga played a role in stabilising emotions and reducing oppositional behaviour but more research to support the use of yoga for this population was indicated (Jensen & Kenny 2004:214). An interdisciplinary approach of a "Body, Mind, Spirit: Yoga and Meditation" course was taught to students at DePaul University and reflected significant improvements in concentration, stress and insomnia. However, these students in the United States of America had not been diagnosed with ADHD. Harrison, Manocha and Rubia (2004:479) conducted a quantitative study whereby "Sahaja Yoga Meditation (SYM)" was practiced by both children with ADHD and their parents. Results showed improvements in children's ADHD behaviour, self-esteem and relationship quality but it is important to note that the

study used only the practice of meditation, and not yoga as a treatment for children diagnosed with ADHD. Thus, in light of these findings it appeared to the researcher that further qualitative research was necessary to assess the influence of yoga on learners with ADHD. The few studies that have been conducted were of a quantitative nature and this afforded the researcher the opportunity to conduct a more in-depth study with a smaller sample using a qualitative paradigm.

In addition the researcher had been involved in the lives of children with ADHD as a teacher and therapist, and thus had a personal interest in assisting these learners in reaching their full potential. By conducting the study, the researcher wished to explore the influence of yoga on the participants in order to enrich their lives and possibly reduce their ADHD symptoms.

1.6 Assessment and intervention procedures

Hatha yoga was practiced by learners in this study who had been diagnosed with ADHD, with the aim of researching any influence it might have with regards to the following aspects: (1) concentration, (2) anxiety, (3) aggression and (4) self-esteem. Ten learners who had been diagnosed with ADHD attended classes conducted by a qualified yoga instructor. The yoga instructor was not familiar with the learners in the yoga class as she was an instructor from outside the school premises. The role of the yoga instructor was to instruct the classes in a professional manner and provide the researcher with her observations of the learners when the intervention was completed. The classes took place twice a week for six weeks and were 40 minutes in length. The researcher made use of a range of data collection procedures, which drew on several sources: learner projection tests, learner self-esteem questionnaires, interviews with learners, parent-rated questionnaires, teacher-rated questionnaires as well as interviews with parents and three teachers who taught the learners. Assessments were conducted at two points: prior to the commencement of the yoga intervention

otherwise called the situation analysis and at the outcome of the intervention when the yoga intervention had been completed.

1.6.1 The Children's Apperception Test (CAT)

The Children's Apperception Test (CAT) is a projective personality test used to assess individual variations in children's responses to standardised stimuli presented in the form of pictures of animals (CAT-A) or humans (CAT-H) in common social situations. For the purpose of this study, the researcher made use of the CAT-H during the situation analysis and the CAT-A once the yoga intervention had been completed. The researcher chose to use the different variations of the CAT to avoid replication of the same stories by the learners in the study. The main aim was to assess psychological health in relation to the aspects of anxiety and aggression in particular.

1.6.2 The Lawrence Self-Esteem Questionnaire (LAWSEQ)

The LAWSEQ is a particularly well standardised questionnaire and was selected for use in the 1979 National Child Development Study when it was administered to 15,000 boys and girls of primary age. The “Primary School Version” was standardised on an English and Australian population with the following norms Mean=19 SD=4. Full details of standardisation are given in Lawrence (1982; 1983). For the purpose of this study, the ten learners with ADHD were administered the LAWSEQ “Primary School Version” (Lawrence, 1982) during the situation analysis and at the outcome of the yoga intervention. The questionnaire measures global self-esteem and comprises of sixteen items which are answered with a yes, no or don’t know. A high score indicates a high self-esteem.

1.6.3 Learner interviews

Audio-taped interviews were conducted individually with the learners at the outcome of the intervention. Questions focused on the learners' experience of the intervention.

1.6.4 Parent, teacher and yoga instructor questionnaires/ interviews

Parents and three teachers of the learners completed a questionnaire devised by the researcher with regards to the learner's anxiety, concentration, self-esteem and aggression levels *(cf. Appendix C).* Simple 10-point rating scales (1= little; 10= a lot) were used to obtain information in the areas of self-esteem and concentration. Both parents and teachers attended interviews with the researcher at the outcome of the intervention to clarify whether there had been any change with regards to these aspects. The yoga instructor attended an interview with the researcher at the outcome of the intervention to comment on her observations of the learners who partook in the study.

1.6.5 Psycho-stimulant medication

Parents were asked about the dosage of medication *(if any)* that the learners were taking during the situation analysis and about any changes they had made to their child's level of medication at the outcome of the yoga intervention.

1.7 Demarcation of the research

This study comprised of ten learners who had been diagnosed with ADHD and who attended a remedial school. The remedial school was large and comprised of 325 learners. Not all the learners at the school had been diagnosed with ADHD, but the school also made provision for learners diagnosed with other disorders and inspecific learning disorders. The parents of the learners who had

been selected for the study received a letter from the researcher indicating the nature of the study *(cf. Appendix A)*. Only learners with ADHD whose parents had provided written consent for their children were included in the study and were interviewed *(cf. Appendix B)*. Parents and three teachers of the learners were also asked to participate in the study for the purpose of providing information regarding the learners' levels of concentration, anxiety, self-esteem, and aggression. Purposive sampling was conducted and the learners were selected on the grounds of the following criteria:

- The learner had to be a primary school learner
- The learner had to be diagnosed with ADHD
- No specific cultural or racial preferences were applicable

1.8 Clarification of the concepts

In order to ensure an understanding of the key concepts of the thesis the following terminology needs to be explained:

1.8.1 ADHD

ADHD may be described as a persistent pattern of inattention and/or hyperactivity that is more frequent and severe than is typically observed in individuals at a comparable level of development; manifests in at least two settings; interferes with developmentally appropriate social, academic, or occupational functions; and is present since before seven years of age. Children with ADHD may experience significant functional problems, such as school difficulties, academic underachievement, troublesome interpersonal relationships with family members and peers, and low self-esteem (Larimer 2005:31).

1.8.2 Yoga

"Yoga" means "union" in Sanskrit. A concerted practice of yoga leads to concentration of the mind and self-realisation which is the spiritual basis of a yoga teacher (Yogeswar 2004:2). In its modern, Western manifestation, yoga includes the practices of meditation, regulation of respiration, and physical exercises and postures in which the focus is more on isometric exercise and stretching than on aerobic fitness (Lehrer *et al.* 2007:449).

1.9 Research programme

The research report is presented in five chapters as follows:

- Chapter 1 contains the introduction to the research. This includes the introduction, motivation for the choice of topic, problem formulation, aim and objectives, research question, research methodology and definition of main concepts.

- Chapter 2 provides information on existing literature with regards to learners diagnosed with ADHD and the influence of yoga.

- Chapter 3 explains the research design.

- Chapter 4 contains the analysis and interpretation of information collected during the execution of the empirical research, as well as the findings.

- Chapter 5, the final chapter, contains the conclusions made, based on the findings of the research.

1.10 Conclusion

The first chapter has formed the theoretical basis and defined the direction of the research to follow. This chapter explained the need for the research and the aim it wished to achieve. In the next chapter a description of the learner diagnosed with ADHD and the influence of yoga practice will be completed.

CHAPTER 2

ADHD AND YOGA: AN OVERVIEW

2.1 Introduction

Heinrich Hoffman's 1863 nursery rhyme was invariably about a boy who had ADHD (Buttross 2007: xi):

"Phil, stop acting like a worm,
The table is no place to squirm
Thus speaks the father to his son,
severely says it, not in fun.
Mother frowns and looks around, although she doesn't make a sound.
But Philipp will not take advice,
he'll have his way at any price.
He turns,
and churns,
and wiggles,
and jiggles
here and there on the chair.
"Phil, these twists I cannot bear."

In this chapter a description of the learner diagnosed with ADHD is provided with particular emphasis on the aspects of self-esteem, concentration, anxiety and aggression. The practice of yoga is highlighted in relation to these aspects which form the main component of the study and serve as a conceptual framework for the interview schedule drafted for the empirical study.

The symptoms of Attention Deficit Hyperactive Disorder (ADHD) were first recorded many hundreds of years ago. During the last fifty or sixty years, emphasis was placed on the different aspects of the condition and the name changed accordingly. During the fifties it was believed that 'minimal brain injury'

resulted in the condition and it was called Minimal Brain Damage; this was replaced by Minimal Brain Dysfunction (Picton 2005:3).

The initial descriptions of ADHD focused on the behavioural aspects, particularly hyperactivity. Even into the 1980's children with attention problems, hyperactivity, learning disabilities, and borderline intelligence were labelled as having "minimal brain dysfunction" or "minimal brain damage" (Buttross 2007:4). In 1980, the term 'Hyperkinetic Disorder of Childhood' was renamed Attention Deficit Disorder with Hyperactivity (ADDH) or without Hyperactivity (ADD) and this term was introduced in the DSM-III. The distinction between ADDH and ADD was short-lived and the terminology was again revised to Attention Deficit Hyperactivity Disorder (ADHD). This revision was made in the DSM-III R (1987) and its use is retained in the DSM-IV (1994). With this new term, the co-existence of inattention and hyperactivity in the disorder were recognised. This new system of classification has had a profound influence on clinical practice. It has led to an increase in the recognition of the disorder in the community, the development of various forms of treatment and a tremendous interest in research work (Hill 2005:3; Yiming 2003:15). The process of analysing the symptoms as a means of explaining the syndrome was upheld by a number of influential researchers. They believed that attention rather than hyperactivity was the key feature of the condition. As a result 'attention' became the key word (O' Regan 2005:7).

2.2 Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD)

Attention Deficit Disorder (ADD) may be defined as a developmental disorder characterised by a disability that interferes with the ability of the child to attend to a stimulus long enough to accomplish a task and receive information. If the child also exhibits hyperactive behaviours, it is referred to as Attention Deficit Disorder with Hyperactivity (ADHD). ADHD is more common in boys while ADD is more common in girls. The onset of this condition occurs during the early years. Some

symptoms may persist into adulthood or disappear during puberty (Paasche, Gorrill & Strom 2004:22).

Many people continue to use the two distinct terms of ADD and ADHD. Some use the two terms interchangeably, and others specifically use ADD when referring to those who do not have the symptoms of hyperactivity. However, the most current and official term or acronym is ADHD (with or without the slash). This is the umbrella term or acronym under which all three types of the disorder are included (Buitelaar 2002:48; Greeff 2005:38; Rief 2005:3):

- The predominantly inattentive type of ADHD (those without hyperactivity)
- The predominantly hyperactive/ impulsive type of ADHD (those without a significant number of inattentive symptoms)
- The combined type (the most common type of ADHD - those with a significant amount of symptoms in all three core areas - inattention, impulsivity, and hyperactivity)

The Attention Deficit and Hyperactivity Support Group of Southern Africa (ADHASA) estimates that between eight percent and ten percent of the general South African population have ADHD while five percent of the school-age population are affected to some degree by ADHD; and of these approximately one percent is severely hyperactive (Louw, Oswald & Perold 2009:152; Meyer 2004:10; O' Regan 2005:11). According to DSM-IV reports, three to five percent of children of school age have ADD or ADHD (Picton 2005:3). Not all children with ADD are hyperactive and ADD is diagnosed according to the DSM-IV as ADD with or without hyperactivity, ADD with hyperactivity being referred to as ADHD. Hypoactive children are frequently overlooked. These are ADD children who are very underactive and their problems are often not noticed. They may be branded as being exceptionally lazy as they are inclined to daydream, are slow and seldom complete anything they start (Picton 2005:6).

Furthermore, the difference between the ADHD Inattentive Type and ADHD Hyperactive Impulsive Type is that the former refers to children who have greater difficulty with memory and perceptual motor speed and are prone to daydreaming and often socially withdrawn. While the latter requires at least six out of the nine symptoms listed in the hyperactive/ impulsivity section (O'Regan 2005:8). Attention Deficit Hyperactivity Disorder (ADHD) is an umbrella term for a problem interfering with one's ability to stay focused on meaningful tasks, control impulses, and regulate one's activity level. Symptoms of this neurologically based disorder are hyperactivity, inattention and/ or impulsivity and can lead both children and adults to underachieve at school, at work, in relationships and marriage, and in all other settings (Hallowell & Ratey 2005:5; Kranowitz 2005:29).

2.3 Diagnostic criteria for ADHD

The fourth edition of the Diagnostic and Statistical Manual (DSM-IV), published by the American Psychiatric Association (APA) in 1994, is the source of the official criteria for diagnosing ADHD. According to the DSM-IV diagnostic criteria:

- symptoms must be present prior to seven years of age. The reasoning behind this is that ADHD is a developmental disorder that likely has a genetic cause. Thus, the manifestation of symptoms should occur at least by the time the child enters primary school, when real demands on attention and self-control are made on the child.
- symptoms must be continuous and present in more than one setting, such as at home, school, and work.
- the problem should cause a significant impairment.
- the symptoms must occur for more than six months continuously (Buttross 2007:4; Hallowell & Ratey 2005:4; Hill 2005:19; Honos-Webb 2005:2; Kruger & Nel 2005:368; Larimer 2005:32; O'Regan 2005:9; Pauc 2006:23; Rief 2005:4; Young 2007:7).

Entry into elementary school, the end of early childhood is the most common event that initiates an evaluation for ADHD (Reber & Reber 2001:62). Disruptive, fidgety behaviour, failure to follow directions, and incomplete work are common complaints. On the playground, children with ADHD generally fail to take turns and follow rules and may exhibit aggressive behaviours (Buttross 2007:12).

Essentially, ADHD comes in three basic variants: ADHD predominately hyperactive-impulsive type, ADHD predominately inattentive type, and ADHD (combined type). The last variant is the most common. A fourth designation, ADHD not otherwise specified, or ADHD (NOS), is designated for patients who did not have noticeable impairments due to ADHD until after age seven, as well as for those who had some but not all of the specified symptoms. DSM-V, not due out until 2013, may eliminate the minimum age standard necessary for the diagnosis (Young 2007:5).

2.4 The symptoms of ADHD

The symptoms of ADHD are characterised by serious and persistent difficulties in three areas, namely:

- Inattention
- Impulsivity
- Hyperactivity (Barlow & Durand 2002:457; Buttross 2007:ix; Honos-Webb 2005:2; McNamara & McNamara 2000:4; O' Regan 2005:5; Pauc 2006:2; Snyman & Truter 2010:161; Strydom & du Plessis 2001:13; Yiming 2003:9)

Hyperactivity manifests itself as an inability to sit still, with constant foot tapping and fidgeting, disruptive behaviour in the classroom, excessive talking, and an inability to do anything quietly. The child will often act in a silly childish way, is attention-seeking, rough with his and others' toys, and unfortunately may end up

hurting other children (Pauc 2006:23). Other physical and behavioural characteristics of hyperactivity include excessive motor activity, frequent non-goal directed activity, non-functional movements of the parts of the body such as grimacing and grinding of teeth, thumb-sucking, running and climbing rather than walking, frequent touching and experimenting with little apparent learning taking place, sleep problems, restlessness during sleep and impatience (Honos-Webb 2005:2; Paasche *et al.* 2004:22).

Impulsivity in the child with ADHD can be in both communication and actions. The child will attempt to answer the question before it is completed and will often interrupt a conversation with an inappropriate question. The child often cannot wait his turn, intrudes into others' play, tends to have a short fuse and lashes out when frustrated (Greene 2005:28; Honos-Webb 2005:2; Pauc 2006:23). The child will often act without thinking, flit from one activity to another and cannot organise his play and learning activities. He generally requires constant supervision, performs tasks quickly but poorly and tends to give quick guesses rather than thinking through problems presented. The ADHD child often displays poor judgement in social situations and personal safety situations (Paasche *et al.* 2004:24; Perez-Alvarez & Timoneda-Gallart 2005:158).

Excitability is a characteristic that may see the child as easily upset. Often the child has the potential to change moods quickly, is easily frustrated and is irritable for no apparent reason. The child who is excitable can be aggressive or destructive when upset, has temper tantrums, can be rude and tactless, and may blame others for his or her problems (Paasche *et al.* 2004:24).

Though the two conditions overlap, the 'inability to pay attention' aspect of ADHD not surprisingly provides an accurate description of what is categorised as ADD. Inattention may be regarded in a child who has a poor attention span, makes careless mistakes, loses homework, is easily over-stimulated by visual and auditory environments, does not appear to be listening, fails to complete tasks

even when motivated to do so, forgets daily routines, daydreams, has difficulty following instructions, is easily distracted, has a poor short term memory, poor organisational skills and avoids anything that involves a sustained mental effort (Buttross 2007:12; Holz & Lessing 2002:241; Honos-Webb 2005:2; Pauc 2006:23; Paasche *et al.* 2004:23).

According to Michael Murray (1998) (*cited in* Rief 2005:8) , the characteristics of ADHD, cited in the order of frequency, are: 1) hyperactivity, 2) perceptual motor impairment, 3) emotional instability, 4) general coordination deficit, 5) disorders of attention, 6) impulsiveness, 7) disorders of memory and thinking, 8) specific learning disabilities, 9) disorders of speech and language, and 10) equivocal neurological signs and electroencephalographic irregularities (Steffen 2001:8). Other common characteristics in children and teens with ADHD include: a high degree of emotionality, easily frustrated, overly reactive, difficulty with transitions and changes in routine, aggressive behaviour, difficult to discipline, cannot work for long term goals or payoffs, low self-esteem, poor handwriting and fine motor skills, poor written expression and output; overly sensitive to sounds, textures, or touch (tactile defensive), motivational difficulties, negative attention or interaction from peers and adults, learning difficulties or not achieving to a level that is expected (given his or her apparent ability), language and communication problems (sticking to topic, verbal fluency).

ADHD tends to affect boys more than girls, and boys are six times more likely to be referred for help than girls. However, it is possible that the true ratio in the community is more like 3:1, as many girls remain undiagnosed. By nature girls tend to be less disruptive and suffer more silently that their male counterparts. They may not be referred to the clinic for bad behaviour, but they may still be failing at school (Chee & Green 2004:3).

2.5 The causes of ADHD

Attention Deficit Hyperactivity Disorder (ADHD) is a neuro-developmental disorder in the sense that it arises early in child development, before the age of seven. ADHD is related to abnormalities in brain functioning and development. In ADHD, certain chemicals in the brain, especially dopamine, are not working properly. Dopamine levels in the brains of typical children are 48 percent higher than in ADHD children. Dopamine is a neurotransmitter found in the brain and helps initiate and control movement, energy and alertness (Hill 2005:8). The exact cause of ADHD is not known but doctors have attributed the causes to five main factors, namely:

- Family and genetic factors
- Factors before and during birth
- Chemical toxins
- Psychosocial stressors
- Abnormalities in brain structure and function (Buttross 2007:19; Hill 2005:9; Yiming 2003:20)

Other possible causes include: poor maternal nutrition, viral infections, maternal substance abuse, exposure to lead, traumatic brain injury, and neurological disorders of unknown origin. It is not, as once popularly believed, due to poor parenting (Paasche *et al.* 2004:25).

ADHD has also been described as a brain-based disorder that arises out of differences in the central nervous system (CNS), both in structural and neuro-chemical areas (Lawlis 2004:179; Rief 2005:3). Differences between those with ADHD and control groups have been identified using brain activity and imaging tests/ scans (MRIs, SPECT, EEG, BEAMS, PET, and functional MRIs). Those brain differences include decreased activity level and lower metabolism levels in certain regions of the brain (mainly the frontal region and the basal ganglia);

lower metabolism of glucose (the brain's energy source) in the frontal region; decreased blood flow to certain brain regions; and specific brain structures are smaller than in those unaffected by ADHD (Hallowell & Ratey 2005:8; Rief 2005:15). Four different studies done in the past decade using MRI (magnetic resonance imaging) all found a slight reduction in the size of four regions of the brain: the corpus callosum, the basal ganglia, the frontal lobes, and the cerebellar vermis (Hallowell & Ratey 2005:8).

Various theories attribute hyperactivity to a dysfunction of the brain or central nervous system (such as under arousal of the central nervous system), delayed maturation of the central nervous system, genetic variation, metabolic disturbance, emotional disturbance, or an allergic reaction to certain foods, such as those containing artificial colouring and food additives. These factors may occur either alone or in combination (Larimer 2005:105).

ADHD is viewed by some researchers as genetically influenced, but not genetically determined as the environment combines with genetics to create ADHD due to environmental toxins, too much television and excessive stimulation (Hallowell & Ratey 2005:7). Shepard, Carter and Cohen (2000:410) confirm that stimuli in the environment can also trigger inattention or hyperactivity. A person diagnosed with ADHD also shows a high predominance in the Alpha and Theta ranges, and the inability to sustain Beta ranges in the higher magnitudes greater than Alpha, Theta, or Delta, which are necessary for concentration and problem solving (Lawlis 2004:173).

Children with ADHD may have a malfunction with their neurotransmitters. These are chemicals by which a message is sent between nerve cells, exciting the receiving cell and helping it to propel the message further. Such chemicals as dopamine, norepinephrine and serotonin regulate the way we think, feel and our capacity to pay attention (Train 2000:47). Professor Andre Venter, head of the Department of Paediatrics and Child Care at the University of the Free State,

described the brain as a mass of telephone cords that conveyed electrical messages or impulses with spaces between the brain cells, “So when an impulse comes through, neurotransmitters are pushed into the gap and carry the impulse across. Children with ADHD do not produce enough neurotransmitters to bridge the gap and the unused transmitters are reabsorbed by the brain cells” (Meyer 2007:15).

2.6 The diagnosis of ADHD

ADHD is defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM IV; American Psychiatric Association, 1994) as a persistent pattern of inattention and/ or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development; manifests in at least two settings; interferes with developmentally appropriate social, academic, or occupational functions; and is present since before seven years of age (Larimer 2005:32).

When making a diagnosis, physicians, psychologists and educators should conduct a multidisciplinary evaluation of the child, which would include: a medical evaluation, psychological and educational testing, speech and language assessment, neurological evaluation and behavioural rating scales completed by the child’s parents and teachers. The process should also include: parent interviews, teacher interviews, and computerised testing. Questions based upon the DSM-IV diagnostic criteria, the qEEG, the SPECT, the ADHD Rating Scale or the Brown scale should be included. It is necessary that a thorough evaluation be conducted by trained professionals as the diagnosis may impact on a child’s expectations and self-worth (Buttross 2007:33; Hallowell & Ratey 2005:9; Hill 2005:30; Honos-Webb 2005:3; O’Regan 2005:27; Rief 2003:65; Young, 2007:3).

Furthermore, a diagnosis of ADHD requires that there be evidence that these symptoms are severe enough to impair functioning in more than one setting.

Usually this means that the child has to be disruptive both in a school setting and at home. Other possible disorders should be ruled out, for example a child who is anxious, depressed, or oppositional may have symptoms that look like ADHD (Hinshaw 2005:353; Honos-Webb 2005:2).

2.7 The treatment of ADHD

The most commonly used medications are the stimulants, like Ritalin or Adderall, or their long-acting equivalents, like Concerta, Ritalin LA, or Adderall XR. The nonstimulant Amantadine has been used to great advantage in treating ADD, as has Bupropion (Wellbutrin) and the latest nonstimulant, Strattera (Hallowell & Ratey 2005:17). The treatment for ADHD often involves behaviour management and other psychological approaches, as well as psychostimulants such as Ritalin, to make the child's brain available for learning (Kranowitz 2005:29).

The debate with regards to children using medication for ADHD continues. The benefits include being able to sit still for longer, focus more and display less problematic behaviour. Medication invariably allows the child to manage his behaviour and therefore to hit appropriate developmental milestones on time. It also has the benefit of demonstrating immediate, positive effects to the child, parents and teachers (Honos-Webb 2005:27). The action of stimulants has been studied extensively with most researchers reporting improvements in 70 to 90 percent of children with ADHD (Chee & Green 2004:141).

However, there are many debatable aspects to using medication to treat ADHD. Short-term negative effects include insomnia, stomach problems, irritability, headaches, and heart palpitations, among others. Long-term effects are unknown, but some have raised concerns about these drugs stunting physical, mental, and emotional development. Another concern is the potential for addiction to these drugs. The behavioural benefits that are observed only last as long as the child is on medication. These medications do not cure the disorder

but rather simply suppress the symptoms while the child is on them (Honos-Webb 2005:28). Sunderland (2007:108) states that “children on Methylphenidate also seem to lose their sparkle, fun and ability to play.”

The number of children and adolescents who take psychiatric drugs such as Ritalin (for ADHD) and Prozac (for depression) more than doubled between 1987 and 1996, according to a study of 900,000 children and adolescents published in the *Archives of Paediatric and Adolescent Medicine* in January 2003 (*cited in* Shaw 2003:16). However, Meyer (2004:15) reflected that, “not all people suffering from ADHD can be medicated. Up to 30 percent of children being diagnosed with ADHD will not be able to tolerate chemical medications.”

Since similar behavioural symptoms are common to other child disorders, it is important to make sure the child has had a thorough physical examination to first rule out a physical problem such as with hearing, vision or motor skills. Furthermore, other childhood disorders such as mood and behavioural disorders, and specific learning disabilities involving visual, auditory, and motor dysfunction must be ruled out (Matthews 2002:42). In addition, psychosocial therapy and parental guidance, combined with carefully regulated medication, will help to lessen and often control ADHD and ADD symptoms (Paasche *et al.* 2004:25).

2.8 Co-morbid conditions of ADHD

Children with ADHD have a higher-than-normal risk of many co-morbid conditions (Klass & Costello 2003:57; Shokane, Rataemane & Rataemane 2004:67; Young 2007:88). The most common conditions that may occur along with ADHD are dyslexia and other learning difficulties, depression, oppositional defiant disorder, conduct disorder, antisocial personality disorder, substance abuse, post-traumatic disorder, anxiety disorders and bipolar disorder (Chee & Green 2004:52; Hallowell & Ratey 2005:11; Klass & Costello 2003:57; Rief 2005:12). Children who have been diagnosed with ADHD are often perceived as

interpersonally defiant or oppositional (Honos-Webb 2005:139). While disruptive behavioural disorders such as oppositional defiant disorder (ODD) and conduct disorder occur in about 50 percent of ADHD cases, anxiety disorders occur in about 30 percent (O'Regan 2005:24).

Though not considered a co-morbid condition, studies have shown that numerous children with ADHD have problems with sleep. This includes difficulties going to sleep quickly, difficulties staying asleep, and less time spent in sleep per night (Hill 2005:27).

2.9 The social and emotional consequences of ADHD

Low self-esteem, aggression and anxiety may be considered as social and emotional consequences of ADHD and will thus be discussed in depth.

2.9.1 Low self-esteem as a social and emotional consequence

Children with ADHD may experience significant functional problems, such as school difficulties, academic underachievement, troublesome interpersonal relationships with family members and peers, and low self-esteem (Larimer 2005:31). The label of ADHD can have a negative impact, which can lead to problematic behaviours. When children with ADHD believe that they will fail, they will avoid trying so as to be able to protect their self-esteem. If a child struggles at school, is socially inept and in trouble all the time, he is more at risk of experiencing a negative self-concept (Chee & Green 2004:156; Honos-Webb 2005:9).

Some common struggles in children with ADHD are (Rief 2005:55):

- poor self-control and inhibition of behaviour
- difficulty regulating emotions and responses

- poor problem-solving skills, over-reactivity, easily provoked to fighting, arguing, name-calling, and inappropriate means of resolving conflicts
- problems with anger management
- easily over-aroused, overstimulated, difficulty calming down

As a result of the above struggles, children with ADHD often have poor self-esteem and find it difficult to form and maintain friendships (O'Regan 2005:30; Paasche *et al.* 2004:25). Furthermore, studies have shown that ADHD children have greater emotional labiality problems than the average person, low tolerance levels and temper outbursts (Hill 2005:23; Larimer 2005:105). Ramphal (2009:15) is of the opinion that the child with ADHD has "a poor self image which is concealed behind bravado and clowning."

Children with ADHD are different from their peers in the way they relate to other people and the way they express their emotions (Olson 2002:248). In many cases the child with ADHD would have been excluded from invitations to other children's birthday parties and social events from the age of two upwards. They may have been regarded as too unruly or too different to attend (O'Regan 2005: 62). Playground problems are common for the ADHD child as the child misreads social cues and overreacts to teasing. This has immense implications for self-esteem as children with a diagnosis of ADHD tend to be even more sensitive and emotional (Chee & Green 2004:5; Honos-Webb 2005:137).

Self-esteem may be defined as, "The value each of us places on our own characteristics, abilities and behaviors" (Woolfolk 2010:560). In essence, "Self-esteem is an affective reaction, an overall judgment of self-worth that includes feeling confident and proud of yourself as a person" (Woolfolk 2010:91). Honos-Webb (2005:57) also sees self-esteem as a child's fundamental sense of being worthy, of deriving respect, and of respecting others. A child with a healthy sense of self-esteem does not feel less than other people, nor does he feel better than anyone else. Honos-Webb (2005:57) is of the opinion that because of both the

insulting sound of the diagnosis of ADHD and the repeated failure experiences in school, a child with ADHD's self-esteem is in double jeopardy.

Children who have ADHD often don't think they have any talents or strengths (Hallowell & Ratey 2005:14). The ADHD child may often feel like schoolwork and behaviours such as sitting still come so much easier for others. The loss of a sense of positive self-worth and the feeling of being inferior to others cause many behavioural disturbances and academic and social disturbances (Honos-Webb 2005:58). Children with symptoms predominantly of ADHD may suffer the same fate as children with dyslexia, as their hyperactivity and poor ability to concentrate will impact upon learning (Pauc 2006:24). The ADHD diagnosis can become a central aspect of a person's identity and the words "deficit" or "disorder" may lead to a child seeing themselves as defective and this may undermine their self-esteem. The child with ADHD may feel that he has a disease, is not in control of his behaviour and that his self is fundamentally untrustworthy because it is disordered or ill (Honos-Webb 2005:18).

Teachers and parents who are not knowledgeable about ADHD are likely to consider children with unruly behaviour as purposely defiant and uncooperative and might label the child as a troublemaker, immature and undisciplined. The child may receive unfair criticism and may be punished by teachers and parents and is thus more likely to have a low self-esteem (Buttross 2007:15; Yiming 2003:12). Children with ADHD are more at risk of giving up as they are less persistent in academic tasks than children who do not have the diagnosis. Children with ADHD who remain unrecognised and untreated will suffer needlessly and the consequences for them are significant. They are likely to lose further interest in their studies and have low self-esteem (Honos-Webb 2005:59; Yiming 2003:11; Young 2007:58).

Young (2007:260) indicates some common beliefs among individuals with ADHD:

- I'm stupid (stupidity is also attributed to virtually every symptom of ADHD)
- I'm lazy (often confused with distractibility and procrastination)
- I don't try hard enough
- I can't do anything right (often confused with disorganisation and distractibility)
- Nobody has confidence that I can get the job done

2.9.2 Aggression as a social and emotional consequence

Aggression as an emotional consequence is evident in many children who have ADHD. Sixty-five percent of children with ADHD may display secondary behavioural complications such as non-compliance, argumentativeness, temper outbursts and being easily angered. The main effects of ADHD often result in poor frustration, low tolerance, lying, swearing, stealing and blaming others. However, not all individuals will manifest these traits. Twenty-one percent of typical children will argue with adults compared to 72 percent of ADHD children (O'Regan 2005:23; Rief 2005:12).

Children with ADHD have little emotional control and often display a host of behaviours like temper tantrums or meltdowns, angry outbursts and aggression towards siblings or peers. These often coexist due to co-morbid conduct or mood disorders (Hill 2005:22; Honos-Webb 2005:165). Children with developmental delay invariably suffer from low self-esteem and this is often present in the child with ADHD symptoms. The frustration that the child feels can lead to violent outbursts and is a clear sign of the hopelessness many of these children feel but cannot express (Pauc 2006:24). In turn this socially aggressive behaviour may lead to social isolation, feelings of rejection and depression which, in turn, give rise to acting out behaviour and showing-off. The hyperactive, impulsive child can

have a remarkably short fuse and may overreact and be self-destructive (Chee & Green 2004:118).

Most teachers will agree that ADHD teenagers are often disrespectful and sometimes even show aggressive and unpredictable behaviour (Bester 2006:45). While some studies have reported that up to 85 percent of people with ADHD have rage outbursts others have found that more than 50 percent of those convicted of violent crimes or antisocial behaviour have been diagnosed with ADHD (Amen 2001:192; Lawlis 2004:244).

2.9.3 Anxiety as a social and emotional consequence

The word “anxiety” comes from the Latin verb “angere” which means to press tightly or choke (Weller 2007:78). Anxiety can produce many symptoms, including palpitations, rapid breathing, nausea, increased muscle tension, hypervigilance, impatience, errors in judgement, poor concentration, sweating, irritability, forgetfulness and sleeplessness. It also depletes vital energy leading to a general state of nervousness and tension (Jollands 1998:52; Weller 2007:78). Lawlis (2004:171) explains how anxiety confuses the brain and actually speeds up the perceived speed of things, probably because of the lack of coping skills and the fear of failure to manage the events that come to us. The majority of individuals with ADHD have co-occurring psychiatric conditions and the development of an episode of anxiety or depression is among the most common reasons that ADHD is ultimately revealed (Young 2007:45). Research studies and the observations of many clinicians have indicated that individuals suffering from ADHD are more prone to anxiety, often causing them to search for ways to relax. In one report, 20 percent of generalised anxiety disorder patients had ADHD (Amen 2001:193; Buttross 2007:17; Young 2007:54).

2.10 Yoga

2.10.1 The background of yoga

"You are the infinite ocean,
In whom all the things of the world
Rise and fall like waves,

Oh child,
There is nothing to gain,
Nothing to lose,
You are already pure awareness."

Ashtavakra Gita, 15:11-12 (Singleton 2004:9)

Yoga may be defined as a Sanskrit word meaning "union", which is accomplished through meditation. It refers to the union of mind, body, and spirit. Hatha yoga is one of five types of meditation and it emphasises physical balance. *Hatha* actually translates to (a balance of) the sun *(ha)* and the moon *(tha)*. Hatha yoga is the most commonly practised form of yoga meditation in the United States (Seaward 2006:395).

Yoga evolved several thousand years ago, in India, as a system of self-enlightenment (Yogeswar 2004: xi). The gurus who devised a code of practice for all-round health, believed that by training the physical body, they could tame the mind, improve concentration, and find their inner self or soul. Yoga, developed by the sages in India, has been practised down the ages as a composite system of physical, mental and spiritual discipline (Gibbs 2005:10).

2.10.2 The influence of yoga on the individual

Yoga is essentially about doing the best you can at that day or time, without comparing yourself to others. As a non-competitive activity, yoga enables you to

see the strengths you already have and to build on those strengths. In addition to managing stress, yoga provides numerous health benefits in both prevention and treatment of illnesses and problems such as insomnia as it brings the mind to a state of calm. Yoga is believed to benefit people of all ages, from preparing and doing well in exams to improving memory and keeping fit after a certain age Specific types of yoga can work on both internal and external organs as well as on the muscular and skeletal systems (Corey & Corey 2006:171; Pegrum 2003:6; Ramachander 2006:149). If yoga is practised faithfully, with due concentration and awareness, the practice will begin to show results within a few weeks. Regular practice tones up the nervous, lymphatic and muscular systems and keeps them in good condition. Continued practice enables the individual to get a better control over one's emotions and increases the powers of concentration (Yogeswar 2004:6).

The guru Patanjali, who defined yoga as "the mastery of the stilling of the mind", believed in training the mind to focus completely on one thing at a time. This aspect is such an important component of learning as it makes for attentiveness in school and the ability to understand and retain information. It allows us to fully engage with the people around us, and helps to cement relationships (Gibbs 2005:15). Yoga emphasises the concept of mindfulness and essentially this is a process of paying attention to whatever arises in consciousness, bringing full awareness to our experience, awareness of thoughts, feelings, and sensations rather than being carried away mindlessly by their flow. Mindfulness begins by focusing on the breath, and when concentration and attention increases one can witness the depths of the physical sensations of breathing. The practice then expands to whatever feelings and thoughts that arise in one's consciousness (Cortright 2007:112).

2.10.3 Yoga and its influence on the ADHD learner

Yoga may be considered a form of exercise as it stimulates the central nervous system, increasing blood flow and oxygen to the brain. Some of the benefits of exercise include a boost in mood, an increase in focus, alertness, learning and memory. Exercise strengthens the heart, promotes good circulation, helps to relax tense muscles and releases mental stress and negative emotions. It also acts as an anti-depressant and an anti-anxiety agent, promotes mental endurance and reduces mental fatigue making it an excellent treatment for ADHD. It is thus particularly important for children with ADHD to exercise regularly (Gibbs 2005:13; Hallowell & Ratey 2005:220; Rief 2005:429). Yoga is helpful to ADHD children in that it builds strength, aids in relaxation, improves concentration and focus and can be used along with medication (Hill 2005:62).

Exercise also stimulates the production of epinephrine, dopamine, and serotonin, which is exactly what the medications that treat ADHD do (Hallowell & Ratey 2005:16). De Jager (2001:11) explains that when a person moves, their blood circulation is improved throughout the body, and more oxygen molecules are transported to every cell in the body. The increased oxygen content and polarity in the cell membrane make it easier for messages to move from the senses through the nervous system, so that one can react.

Learners with ADHD are often in a state of stress from trying to cope with the challenges and daily struggles in their lives. The ADHD child may be hyperactive, emotionally over-reactive or anxious, and by learning relaxation and stress-reduction strategies in yoga it enables the child to find positive outlets to channel his energy (Hill 2005:106; Rief 2005:425). Meditation accompanies yoga practice and develops the individual's ability to sustain focused attention in one direction, without distraction, over a period of time and can help the ADHD child to calm and focus the mind. Research also shows that learning is easier when the

learner is in a relaxed, receptive state (Hallowell & Ratey 2005:16; Kraftsow 2002:186; Rief 2005:435).

When teaching at the Alice Project, an education experiment in northern India based on the principles of yoga, it was noted by the school psychologist that after a couple of years the self-esteem, emotional intelligence, IQ, social skills and academic performance of almost all the children improved dramatically (Singleton 2004:10). In the United Kingdom it was evident that the physical grounding of yoga postures helped to create stability in a child and "how wild-and sometimes destructive-energies can be managed and harnessed creatively" (Singleton 2004:11).

Yogic meditation frees the mind and *Yoganidra* relaxes it. *Yoganidra* is a practice that systematically relaxes the body and mind resulting in the production of alpha waves. Alpha waves are naturally produced during sleep and immediately before and after it (Hota 2008:122). Yoga has a profoundly calming influence on a child's mental and emotional states as it can slow down a child's heart and breathing rate and strengthens the central nervous system. Controlled, conscious breathing has the benefit of relaxing muscles and reducing stress and is helpful to children with ADHD. Yoga teaches children how to breathe correctly by inhaling slowly and deeply through the nose and drawing the breath right down into their lungs. This type of breathing creates a calm, focused and receptive state of mind (Rief 2005:425; Singleton 2004:17).

A yogic technique called *Up and Down the Mountain* which is also known as "alternate nostril breathing" helps to bring the right and left sides of the brain into balance. It has been extremely beneficial in the treatment of children with ADHD and can calm the learner if feeling elated and refresh him if he is feeling sluggish (Singleton 2004:106). Furthermore, if a child is prone to tantrums, clumsiness, poor memory or antisocial behaviour, regular yoga practice can gradually help with these problems (Singleton 2004:19).

An appropriate yogic routine followed correctly and sincerely from childhood can cure and prevent ailments and ensure proper physical and mental growth of the child (Hota 2008:12). Yoga teaches a child to carry his body in a positive way and thus has a profound effect on mood and self-esteem. This is partly why yoga has been so effective in the treatment of problems such as depression and aggression (Singleton 2004:21). However, regular practice for ADHD children is recommended with at least two or three times a week being considered optimal as the combination of breathing methods with poses in yoga helps ADHD children develop greater awareness, emotional balance and concentration, thus increasing their capacity for schoolwork and creative play (Wenig 2003:110).

2.10.4 Yoga and aggression in the ADHD learner

Anger may be viewed as a corroding emotion that creates havoc with one's health. Sudden and intense anger can lead to a heart attack resulting in death while rage can arrest the digestive processes, ceasing them completely. Angry people suffer in other ways too as they can hardly make lasting friends and even close relatives start avoiding them (Hota 2008:27). The ADHD learner may often exhibit moods where they are angry or "down in the dumps" due to frustration and low tolerance (Hallowell & Ratey 2005:5). Children who practice yoga and meditation, and follow a healthy eating plan have the best chance of being healthy, happy and successful and enjoy a better life (Hota 2008:132).

Anger is a widely prevalent emotional problem that has been linked to both physical and mental disease (Lehrer *et al.* 2007:648). The treatment of anger has included cognitive behavioural therapy, cognitive therapy, relaxation, skills training, and multi-component interventions. Gibbs (2005:20) describes how non-aggression, or *ahimsa*, is one of the principal *yamas* in yoga. This encourages us to avoid injury in a yoga asana by underlining the importance of being nice to our bodies. Developing compassion for others and protecting the environment are also aspects of the non-aggression principle.

The meditation technique used in yoga has a positive effect on individuals who are aggressive as it starts with the observation of the outer environment and gradually moves on to the inner environment of the individual. The "outer" exercises help to hone in one's concentration and awareness of one's surroundings while the "inner" exercises teach one ways to deal with distracting thoughts or negative feelings and how to cultivate positive emotions such as love (Singleton 2004:110).

Yoga is one of the best ways to change a situation as it helps control anger to a great extent. Since anger is caused by the over-secretion of adrenal hormones, *asanas* or postures that control this gland are a great help (Hota 2008:28). The stress hormones released into the blood stream due to anger need to be used up to protect the system from harm. This is achieved through dynamic postures while *Pranayama*, a breathing technique, successfully calms the nerves and the mind. The most beneficial asana to control one's anger is called, *Shashankasana* (Hota 2008:28).

"Breathing biofeedback" is technique based on the same principle as *Pranayama*, that is breathing with the belly, and is used to help individuals with ADHD become more focused, less anxious and enables the learner to have better control over their tempers (Amen 2001:333).

2.10.5 Yoga and self-esteem in the ADHD learner

A child diagnosed with ADHD is affected in his emotional, social and academic functioning and generally suffers from low self-esteem as a result (Berk 2000:289). Children with low self-esteem are not able to take responsibility for their actions, and they don't usually take risks. They may blame themselves or others for their own failure, and are suspicious and oversensitive. Children with low self-esteem need constant reassurance and material awards. They have difficulty concentrating, are easily influenced by others and easily frustrated. In

contrast, children with high self-esteem trust their own ability and therefore are able to take risks and act independently. They are able to make choices and to accept challenges and responsibility. They have a good sense of humour, are confident, resourceful and able to learn from their mistakes (Durham 2001:11).

Self-esteem is the first step to creating the conditions that are necessary for learning. If a child believes that they are good, intelligent and creative, they will come to embody these qualities. Psychologists at the Alice Project, an experimental learning program in India, found that as self-esteem increases, so does a child's academic proficiency and social skills. Furthermore, practising yoga on a regular basis builds self-esteem in a child. A balanced posture practice, with the right blend of challenge and support teaches a child to move with relaxed awareness and a sense of grace. Children who do yoga tend to be self-possessed and confident in their actions and speech (Singleton 2004:128).

Seaward (2006:395) reveals that yoga has been shown to improve muscle tone and create inner calmness, which yoga instructors attribute to improved self-esteem. A study by Birkel (1991) (*cited in* Seaward 2006:386) compared a ten-week Hatha yoga class with an interpersonal-relationship development psychology course. Subjects were measured for self-concept and self-perception. Those enrolled in the yoga course showed a significant positive change in self-image, while no substantial change was found in the other subjects.

Sankalpas (in Sanskrit) or affirmations used in yoga are a highly effective way to build self-esteem. These are positive comments of intent about who we wish to become or the identities we wish to embody (Jollands 1998:54; Singleton 2004:129). The learners in this research study used the following affirmation in their yoga practice, "I am strong and steady; for anything I am ready."

2.10.6 Yoga and concentration in the ADHD learner

Mental energy enables a learner to be vigilant in the classroom and to concentrate on important incoming information. If mental energy is poorly controlled a child is likely to reveal a neuro-developmental dysfunction affecting his ability to stay alert. Thus, when learners with attention control problems try to concentrate, they often feel exhausted (Levine 2002:59).

Mindfulness is the quality that distinguishes a yoga practice from most other kinds of exercise. Children benefit greatly from mindfulness as their powers of concentration improve and they develop a greater awareness of themselves and their surroundings. Instead of being scattered they become focused and attentive (Singleton 2004:21). Invariably, the mind-body connection is so strong as relaxation techniques promote not only physical calming but rebound to calm mental processes, creating mental homeostasis which allows for greater self-awareness (Seaward 2006:350). Visualisation techniques, used in relaxation in yoga, are used to improve memory, enhance learning, facilitate healing, and increase other important skills, for example: study, social, coping and creative expression (Rief 2005:427). Yoga improves concentration and attention, and reduces the stress and anxiety that comes from the pressure to perform well (Singleton 2004:127).

Pranayama is a breathing technique that is a central part of yoga and literally means the control of life or energy. It is believed that the better you breathe, the easier you will find it to concentrate, relax, learn and you will sleep more deeply. It also de-stresses the body and mind particularly from emotions like frustration and anger (Rakel & Faas 2006:229; Ramachander 2006:154; Seaward 2006:353; Singleton 2004:102).

2.10.7 Yoga and anxiety in the ADHD learner

Anxiety may be described as a state of being troubled by an uncertain, unspecified circumstance, either inside or outside oneself, that threatens some kind of serious harm (Lewis 2002:8). ADHD is associated with a higher-than-chance incidence of anxiety disorders (Nigg 2006:155). Relaxation exercises such as meditation, used in yoga, have shown beneficial effects on anxiety (Rakel & Faas 2006:225).

Research on yoga's effectiveness of treating disorders like depression or anxiety was among the earliest studies of yoga therapy. In particular, the studies by Vahia and colleagues were among the first, beginning with a case series report in 1966, followed by an uncontrolled study and then three reports with randomised controlled trials. Despite the improvements in anxiety reported in the studies, very little research has evaluated yoga treatments specifically for anxiety disorder (Lehrer *et al.* 2007:454). Brooks' (2007) action research project, "Yoga as an anxiety reducing technique with elementary students", reported results in two of the participants whereby yoga proved effective in lowering their anxiety" (*cited in* Gates 2007:85).

Yogic techniques such as *Up and Down the Mountain* and *Straw and Bee Breathing* teach the learner to calm and soothe the mind when feeling anxious. The techniques have a soothing and calming effect on the nervous system. *Bee Breath* is very effective for soothing children who are feeling stressed or over-tired. It's also good when children are having trouble sleeping (Singleton 2004:107). *Bee Breath* also helps to open up the heart chakra, which is the centre of communication. It can help to dissolve the fear of speaking up at school to teachers, and will help when speaking to new friends (Gibbs 2005:90).

A yogic technique called *Watching your Breath*, that is observing the way that your breath moves in and out of your body, is particularly good for children if

they're feeling worried about something while *Wave Breathing* provides the body with the optimum amount of oxygen for the least amount of effort and calms the entire nervous system (Singleton 2004:104). *Anti-Anxiety Breath* counteracts anxiety and averts panic and is useful in managing emotions such as anger and frustration (Weller 2007:60). Learning to be aware of and improving habitual breathing patterns can dynamically enhance an individual's physical, mental and emotional well-being (Gibbs 2005:16).

Yoga demonstrates viable potential for immune support, circulatory efficiency of blood and lymph, improved neurotransmitter profiles, and overall health enhancement. A favourable neurotransmitter profile is characterised by decreased norepinephrine, elevated cholinesterase and beta endorphins and elevated melatonin (Rakel & Faas 2006:140). Benson (1975) (*cited in* Lehrer *et al.* 2007:450), explains that a general feature of yoga practice is the capability of inducing a coordinated psycho-physiological response that is the antithesis of the stress response. This "relaxation response" consists of generalised reduction in both cognitive and somatic arousal, as observed in the modified activity of the hypothalamic-pituitary axis and the autonomic nervous system (Lehrer *et al.* 2007:450). Over the last 20 years, an overwhelming body of research evidence has emerged supporting the notion that being physically active improves overall health and well-being (Rakel & Faas 2006:125).

2.11 Postures in yoga and their influence

Children love animals and many of the yogic postures that were incorporated in the sessions in the research project were based on birds and beasts. "The ancient yogis of India lived deep in the forest, far away from people or towns, and had plenty of time to study nature. They found that by impersonating certain animals, they could acquire the strengths and gifts possessed by them. For example, by imitating a lion, their voices became clear and strong" (Singleton 2004:61).

Following is a table highlighting the particular aspects of concentration, aggression, anxiety and self-esteem and the various postures in yoga which are believed to affect these elements in individuals who practice yoga. These postures were intentionally incorporated into the classes of the yoga intervention as the researcher deemed it essential to the aim of the study with regards to the influence of yoga on the aspects of concentration, aggression, anxiety and self self-esteem.

2.11.1 Table indicating specific yoga postures and benefits

Aspects	Posture	Benefits
1. Concentration	*The Eagle*	- balancing posture - develops concentration and focus - good for nurturing determination and inner conviction - improves attention span, calms the mind, good for the eye muscles (Currie 2002:37; Gibbs 2005:36; Singleton 2004:134; Weller 2007:35)
	The Frog	- a quick boost of energy - to let off some steam (Gibbs 2005:39)
	The Crow	- requires strength, confidence, concentration - helps one to feel in control and strengthen inners conviction (Gibbs 2005:41)
	The Mouse or "Child's Pose"	- settles the learner down when hyperactive or over-tired - restores energy, calms the mind, and can help induce sleep (Singleton 2004:68; Weller 2007:108)
	Mirror, mirror on the wall	- builds concentration and co-ordination - makes children subtle to the energies of others

		(Singleton 2004:94)
	Tree Pose, Mountain Pose and *The Dancer*	- standing poses where concentration is needed to stand completely still (Gibbs 2005:86).
	Forward Bend with Chair	- a relaxing pose that requires no effort and helps to quieten a busy mind or an aching head (Gibbs 2005:94)
	The Scorpion	- aids concentration and balance - confidence booster (Currie 2002:157)
2. Aggression	*The Fish*	- improves posture and chases away negative feelings (Gibbs 2005:38)
	The Crocodile	- strengthens the back and gives energy - helps to release anger and aggression (Gibbs 2005:40)
	The Blue Whale	- provides a little "lift" - calms one down (Gibbs 2005:42)
	The Pigeon	- helps to calm an agitated mind (Gibbs 2005:46)
4. Self-esteem	*The Camel*	- helps to correct poor or lazy posture - helps all learners to stand tall and feel proud of who they are (Gibbs 2005:56)
	The Lion	- energises the body and mind - builds self-confidence and improves communication skills - helps with anxiety (Gibbs 2005:32)

	The Cobra	- keeps the spine supple and healthy - tones the nerves, improving communication between the brain and body - helps the learner feel strong and powerful (Gibbs 2005:34)
	The Warrior	- helps one to feel grounded (Gibbs 2005:21)

2.11.2 *Savasana*: a posture with many benefits

"Sava" means "dead body" in Sanskrit and *Savasana* is as an exercise that is unique to yoga. It is in a sense a withdrawal and mental quietening and is a first step towards meditative practice. To practise this asana, the student should lie motionless on the floor like a dead body in order to secure complete relaxation of all parts of his body and remove tensions, both physical and mental (Ali & Brar 2002:16; De Michelis 2004:256; Yogeswar 2004:227).

The benefits of *Savasana* are:

- it pacifies the body and quietens the mind by discharging muscular, nervous, mental and emotional tensions almost immediately
- persons who are tense by temperament and who find it hard to relax may do it whenever they are restless or agitated and they will gain stability and feel more rested
- debilitating effects of anxiety, frustration, fear, insecurity and restlessness, both physical and mental are minimised
- improves concentration
- deep relaxation helps to promote sounder sleep
- develops strong will power (Ali & Brar 2002:16; Gibbs 2005:89; Weller 2007: 62; Yogeswar 2004:252)

Savasana was an essential component to the yoga intervention. The learners were instructed to lie in this posture at the end of each yoga class for approximately five minutes as this promoted a sense of quiet, a meditative state for the participants to prepare themselves for the day and to relax the mind and body. Participants who were most relaxed would often fall asleep.

2.13 Meditation and its influence on the ADHD learner

"Concentrate on silence. When it comes, dwell on what it sounds like. Then strive to carry that quiet wherever you go" (Gibbs 2005:85).

Meditation is a process of directing our attention to a single, unchanging, or repetitive stimulus. It may include the repetition of a word, sound phrase *(I am strong and steady, for anything I am ready),* or prayer, but its main purpose is to eliminate mental distractions and relax the body. Meditation sharpens concentration and thinking power and is aimed at personal transformation. It is a tool to increase awareness, become centred, and achieve an internal focus. The process of meditation keeps our attention anchored in the present moment (Corey & Corey 2006:165; Jollands 1998:24).

Meditation is effective in creating a deep state of relaxation in a fairly short time. Its beneficial effects are numerous, and it has been shown to relieve anxiety and stress-related disease. There are also mental benefits of meditation such as improved tranquillity, patience, concentration and memory, and enhanced understanding and empathy for others. Brain imaging studies reveal that meditation appears to rewire the brain's neurons, thereby creating the perception of inner peace (Corey & Corey 2006:167; Seaward 2006:378).

Meditation is an age-old method used to get rid of stress. During this practice, the rate at which the heart beats drops, respiration is slowed down and even the brain functions at a slower pace which are all signs of a highly relaxed body and

mind. Lactic acid, a stress-related hormone which is generally expelled from the body during sleep, is eliminated four times faster during meditation (Hota 2008:114).

Research conducted by Marcus (1974) (*cited in* Seaward 2006:374) showed that subjects who meditated when compared with the controls who never attempted the technique, showed less anxiety. Rohsenow *et al*. (1985) (*cited in* Seaward 2006:374) conducted a study whereby subjects who practiced meditation were also found to demonstrate greater degrees of self-actualisation and increased internal locus of control, and were able to sleep more soundly.

2.13 Conclusion

This chapter described the learner with Attention Deficit Hyperactivity Disorder. Learners who have ADHD find it difficult to concentrate in the classroom and may be anxious as a result of a co-morbid condition. The ADHD learner may suffer from anger outbursts or rages and find it challenging to curb his temper. As a result of learning difficulties or social rejection, the ADHD learner may have low self-esteem. The researcher highlighted the benefits of yoga in relation to the particular aspects that may result due to ADHD, namely: anxiety, lack of concentration, aggression and low self-esteem. The influence of yoga on the learner with ADHD will be the emphasis of this study.

In Chapter 3 the research design will be discussed.

CHAPTER 3

RESEARCH DESIGN

3.1 Introduction

In chapter 2 a description of the learner diagnosed with ADHD was provided with particular emphasis on the aspects of self-esteem, concentration, anxiety and aggression. The influence of yoga on the learner with ADHD was also discussed. The literature study done in chapter 2 served as a conceptual framework for the interview schedule drafted for the empirical study. In this chapter, an overview of the research process that was followed will be described.

3.2 Research question and aim of empirical investigation

The focus of this study was to determine the influence of yoga on learners with ADHD, particularly with regards to the aspects of concentration, self-esteem, anxiety and aggression. The researcher had taught at a particular remedial school for many years and completed part of her Masters internship under the educational psychologist at the school. The researcher was involved in group therapy sessions at the school and all the learners involved in the study attended group therapy sessions with the researcher. The learners had all been diagnosed with ADHD and were in Grade Four. The influence of yoga on learners with ADHD was inspired by the researcher's participation in yoga classes for many years and the need for qualitative research in this area as indicated in the rationale for this study in chapter one *(cf. 1.5)*.

3.3 Research paradigm

The research conducted by the researcher was qualitative in nature. Five possible strategies may be followed in qualitative research, namely:

phenomenological studies, content analyses, grounded theory studies, ethnographies and case studies (Leedy & Ormrod 2010:136). For the purpose of this study the research was executed by means of the exploration of an instrumental case study of which the learners of the school who were diagnosed with ADHD formed the case study. An instrumental case study may be described as an exploration or in depth analysis of a system, comprising of a single or multiple cases, bound by time and place (Cresswell 2003:15). Johnson and Christensen (2004:376) state that the researcher's primary interest is in understanding something other than the particular case. Babbie (2007:298) defines a case study as "the in-depth examination of a single instance of some social phenomenon." In this study, the influence of yoga on learners with ADHD was explored.

3.4 Research methodology

This study was qualitative in nature. According to Wiersma and Jurs (2009:13) qualitative research stresses a phenomenological model in which multiple realities are rooted in subjects' perceptions. McMillan and Schumacher (2006:322) illustrate the five phases of qualitative research: planning (Phase 1), data collection (Phases 2, 3, 4), and completion (Phase 5). While, De Vos (1998:44) describes seven phases of the qualitative research process comprising of 12 steps. These are illustrated in the following table:

3.4.1 Table illustrating the qualitative research process

I. Choice of a research problem
Step 1: Look for a researchable topic.
II. Decision on the qualitative choice
Step 2: Consider the underlying assumptions or basic characteristics of the qualitative mode of enquiry.

III. Selection of the qualitative design

Step 3: Select the qualitative design to be used.

IV. Preparation for data collection

Step 4: Plan how the qualitative sampling will be executed.

Step 5: Delineate the researcher's role (e.g. how entry to a research site is going to be gained and consideration of ethical issues, for instance when leaving the field).

Step 6: Tentatively design the protocol for recording information.

Step 7: Write a research proposal.

V. Data collection and analysis

Step 8: Collect the information, e.g. through observational methods, especially participant observation, grounded theory methodology, interviews, including focus group interviews and visual material; record immediately.

Step 9: Process the data (preparation for analysis), i.e. reduce the data to themes and categories with the aid of a coding procedure.

Step 10: Analyse and interpret the data (putting it altogether and drawing conclusions).

VI. Data verification

Step 11: Ensure internal validity, e.g. by applying the available criteria for the assessment of qualitative research.

VII. Report Writing

Step 12: Plan the narratives; compare with theories and literature, i.e. undertake a literature control.

The researcher used a combination of these phases as guidelines in the research process (De Vos 1998:44; McMillan & Schumacher 2006:322).

3.4.2 Planning

This phase comprised of the identification and selection of a researchable topic. The researcher had considered the influence of yoga on learners with ADHD while working as a teacher at a remedial school for learners with learning difficulties. Attention Deficit Hyperactivity Disorder is described in the DSM-IV (Diagnostic Manual of Mental Disorders) as characterised by hyperactivity, impulsivity and inattentiveness (Barlow & Durand 2002:457). Studies conducted by Harrison, Manocha, and Rubia (2004:479) and Jenson and Kenny (2004:205) revealed that yoga has an influence on learners with ADHD, though the need for more studies was deemed necessary. A tentative research question was thus formulated as part of the first step:

What is the influence of yoga on learners with Attention Deficit Hyperactivity Disorder?

The next step required that the place and the individuals of the literature study in the research process be selected (McMillan & Schumacher 2006:322). The researcher was involved in a remedial school where many of the learners had been diagnosed with ADHD and thus it seemed an appropriate place of study. Cresswell (2007:118) states that it is an important step to find people or places to study and to gain access to and establish rapport with participants so that they will provide good data. The researcher gained permission from the principal to conduct the research on the premises of the school. The researcher was familiar with the site and the learners as she had been a teacher there for a number of years and was an intern psychologist on the premises at the time of the research. A literature study was conducted to gain sufficient background information on ADHD. The influence of yoga on aspects such as concentration, anxiety, self-esteem and aggression was also highlighted.

The research process required the selection of a qualitative research design. The researcher believed that a case study was more suitable. Yin (2009:18) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.” Ten learners were selected as case studies to make comparisons and thus the approach may be termed as a multiple or collective case study (Leedy & Ormrod 2010:137).

3.4.3 Sampling

The researcher made use of purposive sampling in this study. Leedy and Ormrod (2010:212) reveal that in purposive sampling, people or other units are chosen for a particular purpose. The researcher specifies the characteristics of a population of interest and then tries to locate individuals who have those characteristics (Johnson & Christensen 2008:239). The site of sampling was a school for children with learning difficulties where many had been diagnosed with ADHD. For the purpose of this study the learners diagnosed with ADHD were selected as the participants on the grounds of the following criteria:

- The learner had to be a primary school learner at the school
- The learner had to be diagnosed with ADHD
- No specific cultural or racial preferences were applicable

A sample represents a portion of the group of persons that would be relevant to include in the study. Purposeful samples can range from one to forty or more (McMillan & Schumacher 2006:321). Patton (2002:244) states that there are no rules for sample size in qualitative inquiry. The remedial school was fairly large (325 learners), and a small sample, comprising of ten learners was selected. The participants were between nine and ten years of age. These participants had attended group therapy sessions with the researcher and appeared to be

representative of learners with ADHD in that they demonstrated the particular aspects of anxiety, lack of concentration, aggression and low self-esteem.

3.4.4 Data collection

The method of collection and analysis of data was identified. Learners, parents, three teachers and a yoga instructor contributed to a range of data collection procedures, which drew on several sources: learner self-esteem questionnaires, learner projection tests, parent-rated questionnaires, teacher-rated questionnaires and semi-structured interviews with learners, parents, teachers and the yoga instructor. Assessments were conducted at two points: at the commencement of the yoga intervention which is regarded as the situation analysis and at the completion of the yoga intervention which is considered as the outcome. The aim was to determine the influence of yoga on learners with ADHD.

In this study, rich data was collected through semi-structured interviews with the parents and teachers of the ten learners at the school. An interview schedule was drawn up for the purpose of the interview. Rosnow and Rosenthal (2005:130) refer to an interview schedule as a script containing the questions to be asked in the interview. Semi-structured interviews were conducted as this allowed for more flexibility in scope and depth with regards to questions surrounding ADHD and the influence of yoga on the learners. The initial purpose was to collect information with regards to the aspects of anxiety, concentration, self-esteem and aggression. The purpose of an interview is an opportunity to obtain qualitative descriptions of the life world of the participant with respect to interpretation of their meaning as interviews yield direct quotations from people about their experiences, opinions, feelings and knowledge (Kvale 1996:124; Patton 2002:4).

Rich data was collected from those who were willing to participate in the study until saturation had been reached. The participants included ten learners, three teachers, eleven parents and one yoga instructor. A projective technique *(Children's Apperception Test)* and a self-esteem scale (*The Lawrence Self-Esteem Questionnaire)* were completed by the learners during the situation analysis. The yoga intervention took place for six weeks and the learners attended classes twice a week for forty minutes at a time. Once the yoga intervention was completed, rich data was once again collected using the same methodology as before.

The data collected was managed by capturing it in detailed process reports containing details of the interviews. Learner, parent and teacher interviews as well as the projective technique used were recorded using a voice recorder for the purpose of transcribing the data. Parents and teachers completed consent forms prior to their interviews. Participants were informed and verbally agreed to the recording of the interview. As the participants were minors it was necessary for parents to provide informed consent in writing on their behalf *(cf. Appendix B).*

3.4.4.1 Interview schedule

Semi-structured interviews were conducted over a period of two weeks. The researcher made use of the interview guide approach whereby topics were selected in advance, but the researcher decided on the sequence and wording of the questions during the interview (McMillan & Schumacher 2006:351). The interviews took place during the situation analysis and at the outcome of the yoga intervention. The interviews were approximately twenty to thirty-five minutes in length. The researcher was familiar to the parents, teachers and learners as she was involved in a therapeutic role at the school. The learners who were selected for the yoga intervention had attended group therapy sessions once a week with the researcher and thus felt comfortable during the interviews. The interviews were conducted in a room designated for the researcher's therapy sessions and

distractions were limited. The aim of the semi-structured interviews with parents and teachers was to provide information regarding the learners' levels of concentration, anxiety, aggression and self-esteem. The yoga instructor attended an interview with the researcher at the outcome of the intervention to comment on her observations of the learners who partook in the study.

3.4.4.2 The Children's Apperception Test (CAT)

During the data collection process, the researcher made use of a projective technique to elicit data from the learners. Marshall and Rossman (1995:97) report that projective techniques have been used fairly extensively in comparative studies about culture and for the analysis of personality dynamics. The projective technique that was used is called, "The Children's Apperception Test" (CAT). The CAT was developed by Bellak and Bellak in 1949. The CAT is a projective personality test used to assess individual variations in children's responses to standardised stimuli presented in the form of pictures of animals (CAT-A) or humans (CAT-H) in common social situations. The CAT is used to assess personality, level of maturity and often, psychological health. The researcher's aim was to assess possible aspects of anxiety or aggression in the participants. The CAT-H was used during the situation analysis and the CAT-A at the outcome of the yoga intervention. The researcher chose to use the different variations of the CAT to avoid replication of the same stories by the learners in the study. The duration of the projective technique varied and was largely dependent on the verbal ability of the learners. The children were free to express themselves with regards to the different pictures shown by the researcher.

3.4.4.3 The Lawrence Self-Esteem Questionnaire (LAWSEQ)

For the purpose of this study, the ten learners with ADHD were administered the LAWSEQ Self-Esteem Questionnaire. The "Primary School Version" (Lawrence 1982) was used during the situation analysis and at the outcome of the yoga

intervention. The “Primary School Version” was standardised on an English and Australian population with the following norms: Mean=19, SD=4. The questionnaire measures global self-esteem and comprises of sixteen items which are answered with a yes, no or don’t know. A high score indicates a high self-esteem. The aim was to assess the level of self-esteem in the learners.

3.4.5 Data analysis

The researcher was involved in the interpretation and presentation of the collected data. The research process involved the processing and analysing of the data and verification of the results with existing literature. Leedy and Ormrod (2010:138) describe data analysis in a case study that typically involves the following steps:

- *Organisation of details about the case*. The researcher arranged the specific facts about the cases in chronological order.
- *Categorisation of data*. The researcher identified categories that could help cluster the data into meaningful groups. Concentration, self-esteem, anxiety and aggression were four specific aspects that were focused upon.
- *Interpretation of single instances*. Specific documents such as the self-esteem scale were examined for specific meanings that might be relative to the cases. The projective technique, namely the CAT was tape recorded, transcribed and analysed. Parent, teacher and yoga instructor interviews were also transcribed and analysed.
- *Identification of patterns*. The data and their interpretations were scrutinised for underlying themes and other patterns that would characterise the cases and reveal more than single pieces of information. As recommended by Blanche, Durrheim and Painter (2006:322)**,** the researcher also made use of the coding technique. Creswell (2002:266) regards coding as the process of segmenting and labeling text to form

descriptions and broad themes in the data. The different themes were coded by marking the data that was collected on the same theme with particular symbols to narrow the themes down into a number of sub-themes *(cf. Appendices D, E, F, G, H, I, J, K, L)*. Kelle (2004:315) quotes Charmaz (1983) who describes qualitative coding as a means of creating categories from interpretation of the data.

- *Synthesis and trends*. The researcher constructed an overall portrait of the cases. Conclusions were drawn that may have implications beyond the cases that were studied.

3.5 Ethical aspects

Johnson and Christensen (2004:96) regard research ethics as a set of principles which guide and assist researchers in conducting ethical studies. The researcher followed the guidelines set out by Johnson and Christensen (2004:102) to ensure that the study was ethically acceptable and that the research participants were treated ethically by everyone involved in the study. The guidelines were as follows:

- The necessity of obtaining informed consent. The researcher obtained active consent from the parents of the participants in the study and followed the ethical regulations of the Health Professions Act of South Africa (1974). In doing this, the researcher provided the participants who were minors and legally incapable of giving informed consent with an appropriate explanation regarding the study, sought the participant's assent, considered the participant's preferences and best interests and obtained appropriate permission from a person legally authorised to give consent to protect the participant's rights and welfare *(cf. Appendix B).* The learners who were willing to participate in the study were thus informed of its purpose, procedures, risks, benefits, alternative procedures and limits of confidentiality. Teddlie and Tashakkori (2009:199) refer to the

informed consent form as a participant's agreement to participate in a research study, with explicit understanding of the risks involved.

- Deception may be justified by the study's educational value. The researcher deemed it necessary to withhold information from the participants regarding the reason behind the study which was to assess the influence of yoga on the learners with ADHD with regards to the aspects of self-esteem, anxiety, concentration and aggression.
- Freedom to withdraw. The research participants were informed that they were able to withdraw from the study at any time without prejudice.
- The research participants were protected from physical and mental discomfort, harm and danger that may have arisen from the research procedures. The yoga instructor was a fully qualified private practitioner who conducted classes that were both safe and professional.
- Confidentiality. The researcher ensured that the confidentiality of the participants and the data was protected. Confidentiality meant that the participant's identity was not revealed to anyone other than the researcher and her staff. Confidentiality is important to avoid connecting the participant with any information that could be embarrassing or harmful.

3.6 Trustworthiness and the role of the researcher

The role of the researcher is paramount in qualitative research. With regards to interviews, there are limitations of this type as interviews provide "indirect" information filtered through the views of the interviewees. Interviews also provide information in a designated "place" rather than the natural field setting. The researcher's presence may bias responses and people are not equally articulate and perceptive (Cresswell 2003:186). Validity may be viewed as a strength of qualitative research and is used to suggest whether the findings are accurate from the standpoint of the researcher, the participant or the readers of an account (Cresswell 2003:195).

Johnson and Christensen (2004:249) discuss researcher bias which is obtaining results consistent with what the researcher wants to find. Researcher bias tends to result from selective observation and selective recording of information and also from allowing one's personal views and perspectives to affect how data are interpreted and how the research is conducted. From the researcher's point of view it is important for the aim of the research to be as objective as possible in the light that should yoga influence or not influence the learners with ADHD in any way, the results would be reflective of this. Strategies used to address this problem were thus implemented. Qualitative researchers frequently use triangulation; that is comparing multiple data sources in search of common themes to support the validity of their findings. Leedy and Ormrod (2010:100) mention several additional strategies that are employed such as:

- Extensive time in the field- spending time looking for evidence that supports or disconfirms the hypotheses
- Negative case analysis- the researcher actively looks for cases that contradict existing hypotheses, and revises the explanation until all cases have been accounted for
- Thick description- the situation is described in sufficiently rich and "thick" detail and readers can draw their own conclusions from the data presented
- Feedback from others- the researcher seeks the opinion of colleagues in the field to determine whether they agree or disagree that the researcher has made appropriate interpretations and drawn valid conclusions from the data
- Participant validation- the researcher takes her own conclusions back to the participants in the study and asks if they agree with findings based on own experiences

The researcher made use of "thick description" in that the responses of the participants were described in sufficiently rich detail and despite the researcher's

own analysis of the data the readers will be able to draw their own conclusions. The researcher also sought feedback from colleagues in the field to ascertain if valid conclusions had been drawn from the data.

3.7 Conclusion

In this chapter the research design was described. The ethical guidelines were also highlighted. In the following chapter, the empirical data and research findings will be described, analysed and compared with existing literature.

CHAPTER 4

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

In Chapter 3 the research design was described. The ethical guidelines were also highlighted. This chapter focuses on the findings of the case study with regards to the influence of yoga on the learners with ADHD. The findings are categorised into rich themes that emerged from the assessment and interview sessions, namely with regards to the aspects of concentration, self-esteem, anxiety and aggression. The findings are discussed and compared with findings from the literature. Following is a discussion of the realisation of the sampling, data collection and results of the case study.

4.2 Realisation of sampling

The researcher made use of purposive sampling in this study. Ten learners who were diagnosed with ADHD were selected to partake in the study. The learners all attended a primary school which catered for children with learning difficulties. No specific cultural or racial preferences were applicable when making the selection. Following is an account of the biographical data of the ten learners and a description of parents' initial awareness of the learners' ADHD.

4.2.1 Biographical data of the participants in the case study

The participants included in the study were between the ages of nine and ten years old. Seven of the participants were nine years old and three were ten years old. All of the participants were of male gender. With regards to medication and supplements for ADHD, six of the participants were using Ritalin, two were using Concerta, one was not medicated and one was using Eye-Q. Participant I who

was using Eye-Q, changed at the beginning of the yoga intervention to Ritalin. Participant H, who was using Concerta, stopped his medication once the data had been captured during the situation analysis and as the yoga intervention commenced.

4.2.2 Parents' awareness of possible ADHD

The researcher deemed it necessary to ascertain the history behind the learners' diagnosis of ADHD as it provided relevant background information as to the behaviour and learning difficulties the learners may have experienced. The following information was provided by parents of the participants who will be discussed in length, namely participants A, C, H and I.

Participant A's parents reflected about the events leading to their child's diagnosis of ADHD: *"What brought it out was his motor skills as he couldn't hold a fork or spoon…we noticed it in Grade 1, but the wheels fell off in Grade 2…its' nothing to do with the way he behaves, it's his concentration, he's also immature emotionally, but that doesn't make him naughty."*

While participant C's parent reflected on a similar age when ADHD had become evident: *"When he got to Grade 1, at the latter part, his teacher said he was battling with school and was fidgety and I should have him checked out…he's always been active at home."*

Participant H's parent noted that, *"His problem was diagnosed in late Grade 1 and we did a full assessment in Grade 2. In a classroom situation he battled to focus and lacked confidence to complete a task on his own, but now lately there's been a change…as a child he would listen to you but he wouldn't hear. I noticed the mood swings, the anxiety and the concentration. But now he would follow through on an instruction."*

The parent of participant I commented that, *"In Grade 1 the teacher noticed he was slow, his pronunciation wasn't good, and he would go off and tell the children that Hulk was outside if he was bored in class."*

The parents of the remaining six participants had very similar stories to the above four participants in that the diagnosis of ADHD came to the fore in the early school days of the learners, generally in Grade Two. Often a learner, "couldn't finish his work," may have been "battling to hold a pencil…and couldn't write for long." Entry into elementary school, the end of early childhood, is the most common event that initiates an evaluation for ADHD (Reber & Reber 2001:62).

4.3 Application of yoga to the participants

The yoga intervention took place for six weeks and the learners all attended classes twice a week for forty minutes at a time. The yoga instructor was a private practitioner who was not familiar with the participants. For observation purposes it was necessary for the researcher to participate in the yoga classes as not to be a spectator and to limit any self-consciousness on the part of the learners. The time allocated for the duration of the classes did not always appear adequate as the learners would initially take some time to settle down in the morning. Once the yoga class commenced, the learners would begin to focus and the class would run more smoothly with less distractible behaviour from the learners. We were unable to increase the length of the class as learners had to attend school lessons once the yoga class was finished. Six weeks went very quickly and the learners wished to continue with the yoga classes but the end of the term approached and the holidays would have interfered with the results of the study and thus it was not possible. Ideally, regular practice for ADHD children is recommended with at least two or three times a week being considered optimal as the combination of breathing methods with poses in yoga helps ADHD children develop greater awareness, emotional balance and concentration, thus increasing their capacity for schoolwork and creative play (Wenig 2003:110).

Thus, the learner may have benefited more from a yoga intervention of six months or more with classes of fifty minutes each, three times a week.

4.4 Results from the case study

Due to the limited scope of the research report, the researcher has chosen to discuss the results of only four of the participants in detail. The results of the other six participants will be reflected in table form and graphs will provide an overview. There appears to be evidence that yoga had an influence on all the participants to some degree with regards to the aspects of concentration, self-esteem, anxiety and aggression and this will be highlighted.

4.4.1 Participant A

The findings in relation to participant A will now be discussed with regards to the situation analysis and the outcome of the yoga intervention. Participant A was on medication throughout the yoga intervention.

4.4.1.1 Initial situation analysis and outcome

Learners, parents and teachers contributed to a range of data collection procedures, which drew on several sources: learner projection tests, learner self-esteem questionnaires, parent-rated questionnaires, teacher-rated questionnaires and semi-structured interviews with learners, parents and teachers. Assessments were conducted at two points: during the situation analysis and at the outcome of the yoga intervention. This was done to determine the influence of the intervention on the aspects of learners' self-esteem, anxiety, aggression and concentration.

4.4.1.2 Learner

Participant A completed The Children's Apperception Test (CAT) and The Lawrence Self-esteem Questionnaire (LAWSEQ) during the situation analysis and at the outcome of the yoga intervention. The findings provide an indication of the participant's anxiety, aggression and self-esteem and will now be discussed. As they are still very young, the participants could not always reflect on their ability to concentrate and thus the researcher relied upon the information provided by class teachers and parents regarding this aspect.

4.4.1.2.1 Anxiety

The Children's Apperception Test was used as a projective tool to get an insight into the learner's level of anxiety. Participant A initially reflected slight levels of anxiety as indicated by the following quotes:

> *"…he woke up and heard a big thumping coming from his living room and he felt scared and it turned out to be Santa Claus." (Card 9)*
> *"…the boy was chased by a bear and never went out to the woods again*." *(Card 4)*
> *"The others were feeling scared and she got chased and squashed by a mammoth." (Card 6)*

It appears from the responses above that participant A may have an innate fear of the unknown, of possible threatening figures or of situations that he has no control over. In the one story it seems that the learner's anxiety is resolved by the appearance of Santa Claus who is not a threatening figure. At the outcome of the yoga intervention, participant A's level of anxiety seems to have been reduced by the yoga. He again told a story that revealed anxiety, but the anxiety was not resolved by a fictitious Santa Claus, but by his parents instead. He said:

"A rabbit woke up in the middle of the night and looked out the door because someone was there and he was very scared because he is in the dark in his cot. In the end it was just his parents." (Card 9)

4.4.1.2.2 Aggression

During the situation analysis, participant A told a story with regards to card ten of the CAT, and it appears that aggression is coming clearly to the fore in his words: *"…he started screaming and felt angry with his mother and he slapped her and kicked her and bit her."* Participant A's story highlights aggression and anger and thus may be reflective of his own emotions during the situation analysis. In comparison the story below was told at the outcome of the yoga intervention about card seven of the CAT:

"A tiger jumps out from the bushes and tries to attack the monkey. The monkey is feeling very scared and the tiger is feeling very hungry. In the end the monkey escaped."

It appears from the response above that participant A's CAT story is less aggressive then that told during the situation analysis in that the characters do not engage in actual aggressive acts but rather the tiger's attempted attack is thwarted by the monkey's escape.

4.4.1.2.3 Self-esteem

Participant A scored 19 in the LAWSEQ during the situation analysis and 18 at the outcome of the yoga intervention. This slight decline in self-esteem would not appear to be relevant as the score still remains at average.

4.4.1.2.4 Learner's impressions of the yoga intervention

Participant A attended a semi-structured interview at the outcome of the yoga intervention and revealed that yoga *"made me feel more relaxed…at break time I became hyper again…I used the exercise with the hands to help me focus."*

4.4.1.3 Parents

The parents of participant A attended an interview with the researcher. They indicated that his ability to concentrate "… *depends on the situation. He can be hyperactive and excited and he works himself up. His sister is usually the trigger"*. They affirmed anxiety in their child, indicating: *"He won't walk close to a railing and he's scared of heights, escalators and the dark. He won't sleep on his own in his bedroom so sleeps in his sister's room."*

With regards to participant A's self-esteem his parents reflected: *"I would rate his self-esteem as 5/10. He sits by himself and doesn't know how to make friends. He thinks about what will happen if they don't like him."* The parents indicated concern about their child's aggression: *"His sister brings out the worst in him. He uses hurtful words to fight prior to physical slaps, he doesn't punch."*

At the outcome of the yoga intervention, parents commented on the influence of the intervention on participant A: *"Normally he would lie on his bed with his socks and underpants, but on the mornings there was yoga he was up and ready saying, Daddy it's time to go, he really loved it… but he still gets angry with the people closest to him."*

4.4.1.4 Teachers

The teacher of participant A attended an interview with the researcher. She indicated a lack of focus with regards to concentration in her words, *"He often*

forgets homework books." She verified his anxiety by saying that, *"He looks "worried" a lot. He gets very anxious if he has done something wrong and very emotional if he doesn't understand something."*

With regards to participant A's self-esteem, his teacher revealed: *"I would rate his self-esteem as 6/10. It seems like he worries about what others think about him initially but then he becomes more confident."* Participant A's teacher did not appear to find him aggressive as she reported that, *"He doesn't really have anger outbursts…he only tends to get indignant when someone does something to him."*

The teacher indicated during the semi-structured interview at the outcome of the yoga intervention that participant A, *"really enjoyed the yoga and took it very seriously. He seems less anxious and happier."*

4.4.1.5 Yoga instructor's impressions

The yoga instructor only commented on the performance of participant A at the outcome of the yoga intervention and reflected during the semi-structured interview: *"I think for the most part he did very well…he was the most involved."*

4.4.1.6 Conclusion

With regards to the results and the aspects of concentration, anxiety, self-esteem and aggression it appears that the yoga intervention had a positive influence on participant A to a certain degree. It appears that he was able to concentrate better directly after the yoga class for the following two hours but he became less focused after break on the field. He also made use of a yoga technique that he had learned to help him focus which showed self-awareness. Parents reported that he was more motivated to go to school on yoga mornings. Self-esteem according to the LAWSEQ showed a slight decline of one point but this was not

major. There appears to have been little improvement in aggression at home though the CAT reflected a story that was less aggressive than previously recorded. In relation to anxiety, it appeared from the CAT stories that there was an element of fear that had been resolved in the participant, the teacher also found him to be less anxious and happier.

4.4.2 Participant C

The findings in relation to participant C will now be discussed with regards to the situation analysis and the outcome of the yoga intervention.

4.4.2.1 Initial situation analysis and outcome

Learners, parents and teachers contributed to a range of data collection procedures, which drew on several sources: learner self-esteem questionnaires, learner projection tests, parent-rated questionnaires, teacher-rated questionnaires and semi-structured interviews with learners, parents and teachers. Assessments were conducted at two points: during the situation analysis and at the outcome of the yoga intervention. This was done to determine the influence of the intervention on the aspects of learners' self-esteem, anxiety, aggression and concentration.

4.4.2.2 Learner

Participant C completed The Children's Apperception Test (CAT) and The Lawrence Self-esteem Questionnaire (LAWSEQ) during the situation analysis and at the outcome of the yoga intervention. The findings provide an indication of the participant's anxiety, aggression and self-esteem and will now be discussed. As they are still very young, the participants could not always reflect on their ability to concentrate and thus the researcher relied upon the information provided by class teachers and parents regarding this aspect.

4.4.2.2.1 Anxiety

The Children's Apperception Test was used as a projective tool to get an insight into the learner's level of anxiety. Participant C initially reflected quite high levels of anxiety as indicated by the following quotes:

> *"When they opened the fridge they were robbed and everybody was worried because their mother was only going to get paid next month." (Card 5)*

> *"The boys heard crying over the fence and they couldn't get over…they started to dig a hole under the fence." (Card 1)*

> *"…the children weren't very happy because they couldn't find their mother or father." (Card 4)*

From the above responses participant C appears to be concerned about economic issues, that is whether there is food or money in the house. There also appears to be anxiety over a possible lack of control over events and security needs.

Participant C's level of anxiety seems to have been reduced by the yoga. At the outcome of the yoga intervention, he told a story in which his anxiety appears to be resolved. He said:

> *"A rabbit is in the cot waiting patiently for his parents to arrive home. He's eating carrots." (Card 9)*

4.4.2.2.2 Aggression

During the situation analysis participant C told a story about card seven of the CAT and only slight aggression appears to be evident in his words:

"This crazy guy was in the jungle and he tried to attack the boy and the boy climbed the tree until the guy fell asleep." (Card 7)

In comparison the following story was told at the outcome of the yoga intervention about the animal version of the same card:

"The tiger is very hungry, so hungry he's going to try and attack the monkey but the monkey's too quick and climbed the vines and got away and the monkey was in a panic." (Card 7)

It appears from the response above that participant C's CAT story at the outcome of the yoga intervention is very similar to the one told during the situation analysis in that the attackers are outwitted by their potential victims. However, the aggression is moved from a person to an animal which is less personal as the card was of an animals (CAT-A) and not humans (CAT-H).

4.4.2.2.3 Self-esteem

Participant C scored 22 in the LAWSEQ during the situation analysis and 21 at the outcome of the yoga intervention. This slight decline in self-esteem would not appear to be relevant as the score still remains at average.

4.4.2.2.4 Learner's impressions of the yoga intervention

Participant C attended a semi-structured interview at the outcome of the yoga intervention and revealed that yoga "was very nice- relaxationing (relaxing), but I pulled a few muscles." He also said that he "worried less" and "usually I feel left out because even though I am chosen in something it's like I won't pass or anything but when the yoga was finished it's like I touched the goal lots of times." This reflection by Participant C indicates that he gained much from the yoga.

4.4.2.3 Parents

The mother of participant C attended an interview with the researcher during the situation analysis. She indicated with regards to the aspect of concentration that her son *"is very active and talkative…he's always jumping around and playing. It's very hard for him to sit and do his work and he's despondent and negative against it."*

Participant C's anxiety was confirmed by his mother when she reported, that *"he's very scared of the dark so I leave the light on."* His self-esteem was rated by as being 4/10 and she added that, *"He often compares himself to other children and thinks that he is not good enough, not as good as other children."*

With regards to the aspect of aggression present in participant C, his mother revealed that just the day before *"he was back-chatting and screamed like he wanted to punch something. He gets so frustrated but is too passive and walks away."*

At the outcome of the yoga intervention, the influence of the yoga intervention on Participant C was reported by his mother who indicated*: "There haven't been any outbursts for quite some time now… there hasn't been any aggression or anything like that…his homework that he's been bringing home is much better, so the time we have taken for homework has been quicker as he's done things properly and there have been fewer corrections."* She also said that, *"On market day, he was able to take a joke when he was the joke as he had to have water thrown at him and usually he isn't like that, so I'm not sure maybe his self-esteem has improved."*

4.4.2.4 Teachers

The teacher of participant C attended an interview with the researcher. She indicated with regards to the aspect of concentration that the learner *"rushes through his work. He doesn't like to participate much in class discussion and he tends to daydream."*

With regards to anxiety, the teacher reported that the learner *"seems very confident, but I don't think he is really- he doesn't like to be wrong. If he says a wrong answer he tends to look a bit embarrassed."*

Participant C's self-esteem according to his teacher was rated as *"6/10. He doesn't like to be wrong and looks embarrassed if it's the wrong answer."* While he doesn't appear to be aggressive in class he seems to show an oppositional streak in that *"sometimes when he is reprimanded he sulks and has a face like thunder and he refuses to do his work."*

At the outcome of the yoga intervention the teacher commented: *"He has his moments still. I think the yoga helped him a little bit, he still daydreams and has attitude though."*

4.4.2.5 Yoga instructor's impressions

The yoga instructor only commented on the performance of participant C at the outcome of the yoga intervention and reflected during the semi-structured interview: *"He was erratic but at times he was quite present…some days he could be disruptive by chatting and bouncing around."*

4.4.2.6 Conclusion

With regards to the results and the aspects of concentration, anxiety, self-esteem and aggression it appears that the yoga intervention had a positive influence on participant C to a certain degree. Concentration during homework tasks appeared to have improved as he was more conscientious and completed work with less errors. The yoga intervention appeared to have appeased the learner's aggression as there had been no anger outbursts at home and only slight levels of aggression had been recorded in the CAT stories during both the situation analysis and at the outcome of the yoga intervention. According to his mother, the participant's self-esteem had improved noticeably while the LAWSEQ showed a slight decline of one point but this was not considerable. There appears to have been a decrease in the anxiety levels of the participant which was confirmed by the CAT stories.

4.4.3 Participant H

The findings in relation to participant H will now be discussed with regards to the situation analysis and the outcome of the yoga intervention. Participant H had been taken off medication prior to the commencement of the yoga intervention.

4.4.3.1 Initial situation analysis and outcome

Learners, parents and teachers contributed to a range of data collection procedures, which drew on several sources: learner projection tests, learner self-esteem questionnaires, parent-rated questionnaires, teacher-rated questionnaires and semi-structured interviews with learners, parents and teachers. Assessments were conducted at two points: during the situation analysis and at the outcome of the yoga intervention. This was done to determine the influence of the intervention on the aspects of learners' self-esteem, anxiety, aggression and concentration.

4.4.3.2 Learner

Participant H completed The Children's Apperception Test (CAT) and The Lawrence Self-esteem Questionnaire (LAWSEQ) during the situation analysis and at the outcome of the yoga intervention. The findings provide an indication of the participant's anxiety, aggression and self-esteem and will now be discussed. As they are still very young, the participants could not always reflect on their ability to concentrate and thus the researcher relied upon the information provided by class teachers and parents regarding this aspect.

4.4.3.2.1 Anxiety

The Children's Apperception Test was used as projective tool to get an insight into the learner's level of anxiety. Participant H initially reflected a slightly high level of anxiety as indicated by the following quote: *"The boy is feeling very scared because he is afraid of the dark" (Card 9).* It appears from the response that participant H is very afraid of the dark and this is clarified later by his mother.

It is unclear in the participant's story at the outcome of the intervention as to whether his level of anxiety has been reduced by the yoga as his feelings in the story appear more of a depressive nature than anxious:

> *"The children are feeling sad because their parents don't like to be with them when they are having their supper."(Card 1)*

4.4.3.2.2 Aggression

In the story that Participant H told with regards to card six of the CAT, aggression is clearly evident in his words: *"The boy died because he went in the forest and the bear killed him."*

Participant H's story reflects aggression that results in death and thus may be insightful of his own emotions during the situation analysis. In comparison the story below was told at the outcome of the yoga intervention about card seven of the CAT: *"The monkey ran away from the tiger and ran to a trap for the tiger and killed the tiger."*

It appears from the response above that participant H's CAT story is as aggressive as the one told during the situation analysis where there is a clear victim in the story. However, in the story above there is a turn of events in that the victim becomes the attacker.

4.4.3.2.3 Self-esteem

Participant H scored 19 in the LAWSEQ during the situation analysis and 22 at the outcome of the yoga intervention. Thus there was a slight increase in self-esteem though the score still remains at average.

4.4.3.2.4 Learner's impressions of the yoga intervention

Participant H attended a semi-structured interview at the outcome of the yoga intervention and revealed that during the yoga, *"I feel calmer and I like to do the yoga at home."*

4.4.3.3 Parents

The mother of Participant H attended an interview with the researcher. She indicated with regards to the learner's concentration that, *"He will not listen and doesn't participate in any family activities. It's impossible to get him to complete his homework. He often blurts out things without thinking."*

Participant H appears to have a high level of anxiety as verified by his mother who said: *"He has fears of the dark, of burglars and of death. He was confident at home when he practiced his oral but at school he said he was very nervous so I think his anxiety affected him. He's also scared of going up on stage and collecting the outstanding effort badge."*

With regards to Participant H's self-esteem his mother rated this as 4/10 and justified this score by saying that, *"He lacks self-confidence and is only comfortable around familiar faces. He doesn't have confidence in his own abilities."* His mother then commented that, *"he often feels frustrated if he can't express himself. He gets very upset and angry and is reduced to tears…he can be self-centred,"* indicating higher levels of frustration than aggression.

At the outcome of the yoga intervention, participant H's mother commented on the influence of the yoga intervention on her child: *"He thought it was a lot of fun he enjoyed the company, he enjoyed the yoga… on a personal level it's something he would like to do in his spare time…I've seen some changes mainly if I give him a task, before he would forget but now he's actually following it through… it will still take him time to complete it, he's listening though, and it also comes with maturity… we've taken him off the Concerta because of the side effects, he was picking at his head and analysing the pores in his skin…now he's on the Omega 3 and 6 and Biostrath combined so it should all show some improvement towards the end of this month…he's a lot more confident, he's made more friends…we had to do all the postures, grannies and grandpas and all…he's a bit bossy but not aggressive."*

4.4.3.4 Teachers

The teacher of participant H attended an interview with the researcher. She revealed that, *"Since he has been off meds, his concentration is a real issue. He*

also shouts without thinking," indicating that the learner had failed to focus in class and was more impulsive then when he had previously been on medication.

With regards to the aspect of anxiety, his teacher commented: *"He is very insecure in new situations. He will want constant confirmation about what is needed to be done."* While the learner's self-esteem was rated as being above average, 6/10, his teacher reflected that *"he becomes very anxious in a 'changed situation' and will keep seeking reassurance."* There appears to be no evidence of aggression in the learner in the school environment as his teacher indicated: *"I haven't witnessed any anger outbursts."*

The teacher indicated during the semi-structured interview at the outcome of the yoga intervention: *"He's off meds now and the anxiety I have noticed is gone when he's off meds…he enjoyed the yoga, it seemed to have calmed him down…he does seek reassurance so the self-esteem and anxiety seem to go hand and hand there- it seems to have been more in control when he was doing the yoga."*

4.4.3.5 Yoga instructor's impressions

The yoga instructor only commented on the performance of participant H at the outcome of the yoga intervention and reflected during the semi-structured interview: *"There were days when he was focused and days when he was disruptive, chatting and bouncing around."*

4.4.3.6 Conclusion

With regards to the results and the aspects of concentration, anxiety, self-esteem and aggression it appears that the yoga intervention had a positive influence on participant H to a certain degree. His mother reported that he was able to concentrate better at home as he was following through with tasks and listening

more carefully. Self-esteem according to the LAWSEQ showed a slight increase of three points but still remained at average while both parent and teacher noticed a more confident child. There appears to have been a decline in the learner's level of aggression in that at home he was reported to be more "bossy" than aggressive and his CAT story at the outcome of the yoga intervention appeared to show more control with regards to this aspect. In relation to anxiety, there was an element of anxiety apparent in the CAT story during the situation analysis. This fear of the dark was also confirmed by his mother in her interview. While at the outcome of the yoga intervention, the CAT story reflected less anxiety.

4.4.4 Participant I

The findings in relation to participant I will now be discussed with regards to the situation analysis and the outcome of the yoga intervention. It is important to note that the learner was not on any medication during the situation analysis but began taking a dosage of 10mg Ritalin at the start of the yoga intervention and continued with this dosage throughout.

4.4.4.1 Initial situation analysis and outcome

Learners, parents and teachers contributed to a range of data collection procedures, which drew on several sources: learner self-esteem questionnaires, learner projection tests, parent-rated questionnaires, teacher-rated questionnaires and semi-structured interviews with learners, parents and teachers. Assessments were conducted at two points: during the situation analysis and at the outcome of the yoga intervention. This was done to determine the influence of the intervention on the aspects of learners' self-esteem, anxiety, aggression and concentration.

4.4.4.2 Learner

Participant I completed The Children's Apperception Test (CAT) and The Lawrence Self-esteem Questionnaire (LAWSEQ) during the situation analysis and at the outcome of the yoga intervention. The findings provide an indication of the participant's anxiety, aggression and self-esteem and will now be discussed. As they are still very young, the participants could not always reflect on their ability to concentrate and thus the researcher relied upon the information provided by class teachers and parents regarding this aspect.

4.4.4.2.1 Anxiety

The Children's Apperception Test was used as a projective tool to get an insight into the learner's level of anxiety. Participant I initially revealed a relatively high level of anxiety as indicated by the following quotes *(cf. Appendix E)*:

> *"…they taking a photo of them and he's (father) thinking how it's going to look and he's (little boy) feeling weird as his father's sitting like that with his legs crossed." (Card 3)*
> *"…they want their mother to come. They are thinking where is their mother…afterwards they fell asleep." (Card 5)*

Participant I appears to be anxious in his feelings regarding his father; in this case he almost seems embarrassed by him. There is also a possible indication of separation anxiety in the character's reliance on his mother to be near him prior to his feeling secure and falling asleep.

Participant I's level of anxiety seems to have been reduced by the yoga. At the outcome of the yoga intervention, he told a story in which his anxiety appears to be resolved *(cf. Appendix H)*. He said:

"This rabbit's lonely because he lost his mother and father and he's feeling sad… in the end he finds his mother and father." (Card 9)

4.4.4.2.2 Aggression

During the situation analysis participant I told a story about card eight of the CAT and a high level of aggression appears to be evident in his words:

"The children were hitting the boy outside and then after he took a bat and hit them then they were bleeding."

In comparison the following story below was told at the outcome of the yoga intervention and though not as violent is still indicative of aggression in the learner: *"A fox tried to eat them and the mother chick hit him and the fox died." (Card 1)*

4.4.4.2.3 Self-esteem

Participant I scored 22 in the LAWSEQ during the situation analysis and 14 at the outcome of the yoga intervention. This dramatic decline in self-esteem would appear to be noteworthy as initially the learner's score was average and it then dropped below average. It is unclear as to whether the medication or the yoga had this adverse effect on the learner. In addition, this result is not in accordance with parent's and teacher's impressions of the learner's self-esteem at the outcome.

4.4.4.2.4 Learner's impressions of the yoga intervention

Participant I attended a semi-structured interview at the outcome of the yoga intervention and reflected *(cf. Appendix I)*: *"I could concentrate more…It calmed me down…I didn't worry about nothing."*

4.4.4.3 Parents

The mother of participant I attended an interview with the researcher during the situation analysis *(cf. Appendix F)*. She indicated with regards to concentration that her son, *"is slow moving and less energetic, he daydreams a lot too. But it's a lot to do with his mood, if he's motivated he will work harder."*

Participant I's anxiety was confirmed by his mother when she reported that, *"he has panic attacks if he feels pressurised… he says, 'I can't breathe, I'm choking'. He fusses about small things and has a fear of something happening to us (parents)."*

With regards to self-esteem, the participant's mother rated her son's self-esteem as 3/10. She reiterated that *"he always feels he needs to try and prove himself… to be acknowledged or liked. His biggest problem is that he lacks self-esteem…he doesn't acknowledge his achievements."*

Participant I does not appear to be physically aggressive at home as his mother reported that, *"…sometimes he will aggravate his sister and say something nasty …he's doesn't get physical."*

At the outcome of the yoga intervention, the influence of the yoga intervention on Participant I was reported by his mother in an interview *(cf. Appendix J)*. She indicated that, *"As you know we put him on 10mg Ritalin, there's been a big change but at the same time there's a lot of anger. He goes out of his way to irritate his sister, always picking and very sensitive. In his sleep he's groaning a lot."* She commented that *"he enjoyed the yoga…I've never seen someone so excited about something …even starting earlier wasn't a problem for him. His concentration has improved but he's on Ritalin now…His self-esteem has definitely improved he's more bubbly than ever before and he can just say it as it is and not care. He's totally open now."*

4.4.4.4 Teachers

The teacher of participant I attended an interview with the researcher during the situation analysis *(cf. Appendix G).* She indicated with regards to the aspect of concentration that the learner has *"poor concentration and lack of focus…no motivation whatsoever- everything becomes a drag."*

With regards to anxiety, the teacher reported that the learner *"worries about having to wait for Mom after school."* Participant I's self-esteem according to his teacher was rated the same as his mother, that being 3/10. His teacher commented that, *"his body language portrays someone who is down in the dumps…head always drooping, slouching and dragging feet."*

It appears that participant I is not physically aggressive in the classroom but he may be prone to sulking as indicated by his teacher*:* He gets *"annoyed with learner P at times".* He has the *"attitude of being the victim- everybody else is always wrong."*

At the outcome of the yoga intervention the teacher commented in the interview *(cf. Appendix K): "We noticed a very much together child all together, there was a difference as he was also on meds, he was getting everything right…From a yoga point of view I think it was beneficial to him but it's difficult to comment because of the meds…After yoga he was so relaxed he wanted to sleep…There was definitely an improvement in his self-image because he was now able to do his work and he was motivated and would get on with it."*

4.4.4.5 Yoga instructor's impressions

The yoga instructor commented on the performance of participant I at the outcome of the yoga intervention and reflected during the semi-structured

interview *(cf. Appendix L)*: *"He tried very hard, he was very mature…very present."*

4.4.4.6 Conclusion

With regards to the results and the aspects of concentration, anxiety, self-esteem and aggression it appears that the yoga intervention had a positive influence on participant I to a certain degree though it is difficult to ascertain whether the improvement on certain aspects was due to the medication or the yoga. Concentration during class and at home appears to have improved as the learner was completing work with more motivation and efficiency. His mother reported that he was very motivated to attend school on the days of the yoga classes and he was more excited than she had ever seen him. There does not appear to have been a major change in the learner's aggression at home as he appears to still be angry and continues to rile his sister. Both CAT stories during the situation analysis and the outcome reflected high levels of aggression, though it is interesting to note that he does not appear to be aggressive at school. According to both the teacher and his mother, the participant's self-esteem had improved noticeably while the LAWSEQ showed a considerable decline of eight points and thus remains questionable. There appears to have been a decrease in the anxiety levels of the participant which was confirmed by the CAT stories at the outcome of the yoga intervention.

4.4.5 A summary of the six other participants in table form

The results of the six other participants will now be reflected in table form. Comments by parents, teachers, learners and the yoga instructor as well as results from the CAT and self-esteem scale will be summarised for the purpose of evaluating the data.

	Situation Analysis	Outcome
B	Teacher and parent found B to be a '*daydreamer'* who doesn't follow instructions. His self-esteem was reported as low *"due to his learning difficulty, he feels he is not good enough"* and *"his body language often shows low self-esteem."* B worries about *"security, baddies and that he is not going to make it"* and *"wakes up in the night thinking about possible 'break-ins' if he hears a noise."* No anger outbursts were reported.	B was reported to have been enthusiastic each evening after yoga and showed his mother what he had learned but no noticeable change in any aspects. His teacher felt he was still *"in his own world"* but that there had been a definite boost in his self-esteem, *"It made him feel quite good being part of that group."* The learner felt the yoga made him *"stronger"* and *"tired"* but he still has *"trouble sleeping,"* while the yoga instructor commented: "He participated in a quieter way…at times he lost focus."
	CAT: anxiety- concerns about death, being afraid at night and achievement were evident: *"…father had died in a car crash", "husband…had died in a plane crash."*	CAT: anxiety appears to have been resolved in that the character's fear of the dark is alleviated by a rescue team and *"she got light."*
	CAT: Evidence of aggression apparent in story about a "*naughty boy"* who "*killed shongololos and the red juice went everywhere"*, was also destructive, *"banging toilet seats"* and *"bursting pipes"*, and *"got a hard smack from his mother".*	CAT: The story was not as aggressive but the monkey's tail was bitten by a tiger after annoying him and he learned his lesson.
	LAWSEQ-self-esteem 20	LAWSEQ- self-esteem remained at 20
D	Teacher and parent found D to be *"very impulsive", "wild when off Ritalin", "easily frustrated"* and *"fixates when fiddling."* His self-esteem is *"very erratic and unrealistic"*	D's parent reported that there was *"no change"* at home though *"he enjoyed it and was very happy,"* and *"his teacher told me it definitely helped in the*

	and *"he will undress naked in front of class without showing any signs of embarrassment."* D is *"very scared of the dark"* and *"if he says a wrong answer he tends to look a bit embarrassed".* While, *"he generally gets more frustrated, he's not usually aggressive or angry,"* at home, but at school *"he does do irritating things to children to annoy them and calls them names incessantly."*	*classroom."* While D's teacher said*, "he was definitely calmer in the morning but after break it fizzled out"*. The learner revealed: *"I don't feel any different but I enjoyed the yoga,"* and the yoga instructor commented: *"…it was hard for him to open up his body…maybe it was a protection thing."*
	CAT: Anxiety was indicated in, *"the children were in their bed and were thinking it was scary outside."*	CAT: Resolved anxiety in, *"the rabbit is scared cause there's someone at the door but there was nobody there."*
	CAT: Story indicated more fear than aggression *"The boy was scared…thought he was going to get eaten."*	CAT: The story indicated aggression, *"The mother is smacking the baby dog and the dog is screaming."*
	LAWSEQ-self-esteem 22	LAWSEQ-self-esteem increased to 24
E	Parent found E to *be "more impulsive than he is hyperactive…easily distracted during homework time."* While his teacher commented: *"When he is not focused, the whole class is distracted by his movements, behaviour and facial expressions which are all exaggerated and over the top."* Self-esteem appeared to be low as his mother said, *"he doesn't have confidence, cries at home…doesn't like to be inadequate,"* verified by the teacher who said, *"scholastically if he is unsure of his work, his self-esteem takes a knock…he doesn't want to be incompetent."* Anxiety appears to be	Parent reported: *"We have seen a change…his anxiety has improved, it's sitting at a 6/10 now…he's calmed down a lot with regards to aggression."* While E's teachers said, *"Definitely the aggression issues seem to have dissipated in that time…generally all round improvement in concentration."* The yoga instructor reflected: *"Most of the time he was present and aware of what was going on, he can get totally into it…he is capable of that."* The learner added: *"I was more relaxed."*

	high according to parent as, *"He's scared of the dark...he sleeps with me (mother)...he's full of anxiety, he always worries about what time we're coming home."* The teacher hadn't noticed any anxiety, *"but mom says he is anxious at home and sleeps in her bed."* With regards to aggression, he had a *"physical argument"* with the coach and *"screams at me (mother) and always finds satisfaction in arguing with his older sister,"* while his teacher said, *"he can get quite rude and huffy."*	
	CAT: anxiety was evident in, *"The boy was scared and the ladies were wondering if he would be fine."*	CAT: anxiety still appeared evident in, *"There's a rabbit in a cot by himself and dreaming that he would have a family as he's all alone."*
	CAT: aggression, death and destruction evident in *"A pot of fire burnt the alien who was chasing a boy, the boy jumped on the alien and he fell into a pit of water and the alien died."*	CAT: aggression not as apparent in story, *"He was chasing the rat and was going to have rat for breakfast tomorrow."*
	LAWSEQ-self-esteem 22	LAWSEQ-self-esteem raised to 23
F	Parent found F *"tends to drift and needs to be focused…is often in his own dream-world"* while his teacher added that, *"He doesn't complete his work, is slow and takes a long time to get himself organised."* F's self-esteem was rated as 7/10 by his mother who said, *"he speaks very well in front of the class but I find him immature and naïve…he*	F's mother commented that her son *"seems more chilled in some ways…he seems to be more relaxed and at peace with himself…anxiety hasn't been too bad lately…but he's often not present…I think he quite enjoyed the yoga process."* While his teacher agreed to a large extent, *"His self-esteem and*

	has performance anxiety on tests, but he's not afraid to ask questions." In contrast his teacher rated F's self-esteem as, *"4/10 as he is very nervous to answer questions in class and will only do so if he is sure of the answers…I was very surprised that he did a History teach-back confidently."* With regards to anxiety his parent noted that, *"he is anxious…he takes things personally, is afraid of 'baddies', is inclined to be quite tearful, very emotional, sensitive and worries unduly."* This was confirmed by his teacher who said, *"he gets very upset and tearful often, especially if he is blamed for something he didn't do."* F appears to be more aggressive at home than at school as *"he gets very angry with his sister, she pushes his buttons and he tries to hit her…he gets very frustrated."* While his teacher has *"never seen him angry, only upset if he has been wrongly accused."*	*anxiety seems to have improved with the teach-back at his new school…he did have more concentration during the yoga but he is so ADD it's just not true. He's been fiddling with his glue and a piece of plastic the past three days and staring into space."* The yoga instructor *"found him the most absent in his presence…he did something well when he put his attention there…but generally I found him not connected with himself."* Participant F reflected on the yoga: "*It was lots of fun doing it but some of the stretches were hard, like the downward dog."*
	CAT: anxiety was evident in, *"The little boy's scared because his mom and dad aren't there and he thinks a werewolf will come and grab him and he wants to just hide away and he feels scared and worried."*	CAT: anxiety appears to be resolved in, *"The bunny's very scared because he thinks there going to be a whole lot of monsters in his bedroom and his mommy and daddy have gone out. A baddy comes and he sorts out the baddy, he gives the baddy a wedgy."*
	CAT: aggression was evident in *"The kid jumps on him and kicks him in the face and kicks him in the balls and sticks his fingers in his eyes and the wolf guy can't hang on for*	CAT: aggression seems less pronounced in the story, *"The baby bears are playing and the maid comes along and gives them a hiding."*

	any longer and he dies." Another story was also indicative of aggression, "*The baby attacks the vampire wolf and ties him up and throws him under the bed and the vampire wolf tries to get out, they get axes and stuff and chop the vampire wolf in two."*	
	LAWSEQ-self-esteem 20	LAWSEQ-self-esteem increased to 21
G	Participant G's parent commented on his concentration: *"He doesn't always concentrate but I don't think it's a problem, he likes to play Playstation at home,"* while his teacher disagreed, *"I find that he definitely lacks concentration, he doesn't finish his work and he's impulsive."* With regards to self-esteem his parent rated him *"8/10, he's very confident and very argumentative"* at home while at school his teacher found the opposite with a rating of *"4/10, he's not confident or sure of himself with teachers but with his friends he stands his ground."* Anxiety appears to be apparent to some degree as his parent said, *"he does have a fear of the dark and sleeps with the bedroom light on …he had night terrors when he was younger,"* while his teacher added, *"he is quite tense and doesn't take the blame for anything…his mom always says that his biggest fear is being embarrassed."* With regards to aggression at home, G *"sometimes voices his anger at his sisters…he doesn't like being teased and gets angry and a bit sulky,"* while at school G	Participant G's parent found *"he was quite keen and was a little surprised as he quite enjoyed it…I know there has been a difference in class, he has pulled his socks up and he's completing his work a lot better. In the mornings he would say, 'Come hurry, I have to get to school early for yoga'…with anxiety, he has been a lot more relaxed, he's kind of matured a little more…he's serious about school and a lot more in control. Self-esteem has definitely picked up, absolutely! There are still a few anger outbursts at home with his sister but nothing at school they said he has been pulling his weight."* His teacher reported that, *"Of late he's been quite a happy boy who looks forward to coming to school, but at the end of each term he seems to behave in a similar manner."* The yoga instructor found that*, "he can participate well and do well but something was taking his presence away from participating fully."* Participant G found the yoga *"made me more relaxed."*

	"swore and said F this school…he always has anger outbursts with his friends and believes he is never wrong."	
	CAT: Anxiety appeared apparent in, *"This little boy had to go to bed but he was very scared because he always used to hear these noises in the house and he was just looking at the door in case someone would come in."*	CAT: Anxiety appears more resolved in, *"Once there was a little monkey who couldn't find his mom and the big tiger wanted him for his dinner and the monkey climbed a tree and the tiger started laughing and they both became friends."*
	CAT: Aggression is not that apparent in his words, *"Once there was a little boy who couldn't find his mom and the big giant wanted him for his dinner."*	CAT: Aggression is also not that apparent in his words, *"He was naughty breaking everything 'cause he was a baby dog."*
	LAWSEQ-self-esteem 19	LAWSEQ-self-esteem decreased to 18
J	With regards to concentration J's parent commented: *"He doesn't bounce off the wall…he has a sense of urgency in the mornings when he wants to be noticed and is attention-seeking."* While his teacher said, *"He stares into space, is always out of his seat, puts up his hand but when asked says he doesn't know the answer…he can get very excited at times…he rushes through his work and wants to finish first."* J's self-esteem varied according to the situation as his parent reflected: *"Sport related it's 9/10. Meeting new people it's 1/10 and meeting other children it's 5/10."*His teacher rated his self-esteem as *"7/10.He seems confident."*	J's parent commented at the outcome of the yoga intervention: *"I must be honest he's been sleeping through lately. On the whole it's been much better. He hasn't been putting his light on at night and is actually sleeping through…He thoroughly enjoyed his yoga and kept hounding me for a mat…Being on the yoga, he's been sleeping much better which is great in my books as I'm reluctant to put him on meds, I'd rather go the healthy way."* J's teacher found, *"He still always puts his hand up and then when you ask him to answer the question, he says he doesn't know."*

	Participant J *"may have anxiety due to the divorce…he is skittish and nervous of loud noises…if it thunders he will jump into my bed…he has nightmares every second night and sleeps with the light on,"* reported his father. While, his teacher said*: "No anxiety related issues that I know of."* With regards to aggression, J's parent said, *"He is not aggressive…karate has been a great help,"* while his teacher added with regards to anger outbursts, *"None that I am aware of."*	While the yoga instructor believes, *"He did well, and participated fully but he's still hyper."* J reflected on the yoga intervention: *"I felt sore…very sore."*
	CAT: anxiety appeared evident in, *"The boy was scared and wondering why it was so dark so he went inside the tent."*	CAT: none of the stories indicated anxiety at the outcome of the yoga intervention.
	CAT: aggression was evident in, *"The boy jumped onto the man and ripped his hair out…the boy was playing with glass and chucked it at someone."*	CAT: aggression was still evident though not as violent as in the previous story: *"A tiger's going for the monkey and the monkey's jumping away and the monkey's going to kick the tiger."*
	LAWSEQ-self-esteem 24	LAWSEQ-self-esteem decreased to 21

4.5 Summary of the findings with regards to the main themes investigated in the study

A summary of the findings with regards to the main themes investigated in the study will now be discussed. Parents, teachers and learners all contributed to the findings with regards to the aspects of concentration, self-esteem, anxiety and aggression in the learners with ADHD.

4.5.1 Concentration

Concentration was a necessary theme in this research as symptoms of ADHD comprise of hyperactivity, inattention and/ or impulsivity. These symptoms can lead both children and adults to underachieve at school, at work, in relationships and marriage, and in all other settings (Hallowell & Ratey 2005:5; Kranowitz 2005:29). Inattention may be regarded in a child who has a poor attention span, makes careless mistakes, loses homework, is easily over-stimulated by visual and auditory environments, does not appear to be listening, fails to complete tasks even when motivated to do so, forgets daily routines, daydreams, has difficulty following instructions, is easily distracted, has a poor short term memory, poor organisational skills and avoids anything that involves a sustained mental effort (Buttross 2007:12; Honos-Webb 2005:2; Pauc 2006:23; Paasche *et al.* 2004:23). Disruptive and fidgety behaviour are also common complaints (Buttross 2007:12).

Parents and teachers provided information during the situation analysis with regards to the learners' levels of concentration while medicated and when not medicated. They were asked to rate the learner's level of concentration out of a score of 10. The results are indicated in Figure 1 and Figure 2.

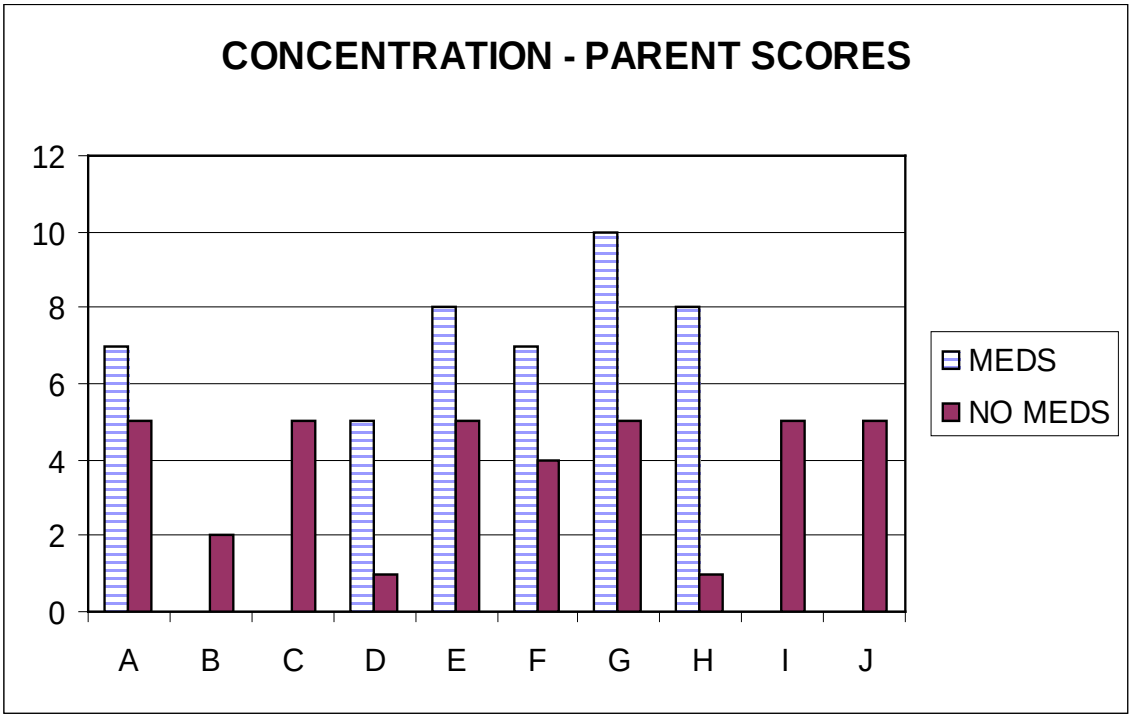

FIGURE 1: Situation analysis- Parent rating of learners' levels of concentration when medicated and when not medicated

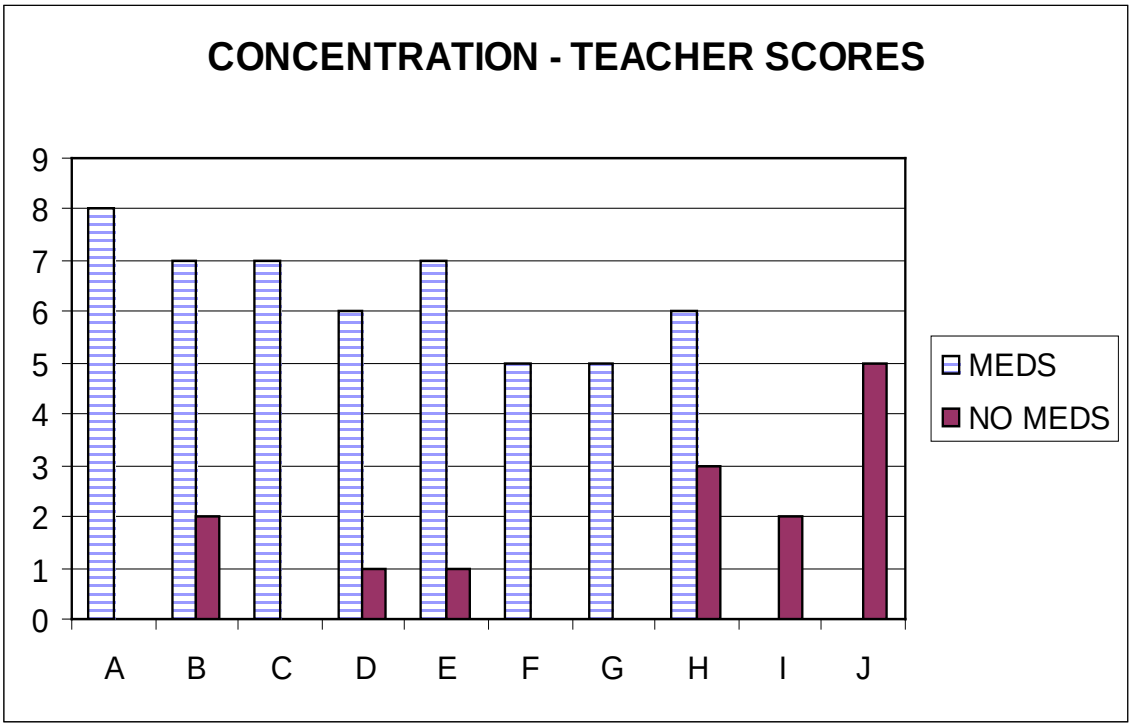

Figure 2: Situation analysis- Teacher rating of learners' levels of concentration when medicated and when not medicated

When analysing the above graphs, it must be noted that where there is a score of 0, parents and teachers were unable to comment on the learner with regards to being medicated or not medicated as they had not witnessed the child in that state. However, it appears that both parents and teachers experience a considerable difference in the learners' concentration when medicated. Medication for ADHD is believed to improve the learners' levels of concentration with most researchers reporting improvements in 70 to 90 percent of children with ADHD (Chee & Green 2004:141). However, short-term negative effects include insomnia, stomach problems, irritability, headaches, and heart palpitations, among others (Honos-Webb 2005:28).

During the situation analysis, parents and teachers commented on the aspect of concentration in the learners in the semi-structured interviews, for example, *"C is very active and talkative…he's always jumping around and playing. It's very hard for him to sit and do his work and he's despondent and negative against it",* "*It's impossible to get H to complete his homework. He often blurts out things without thinking,"* and *"He (I) has poor concentration and a lack of focus."* It appeared evident from the responses that all the learners lacked concentration both at home and in the classroom.

At the outcome of the yoga intervention, teachers and one participant reported that concentration improved in the learners but only for the short period of two hours prior to break-time at school. One teacher added, *"I did find them definitely calmer…almost sort of into themselves,"* while participant A said, *"I used the exercise with the hands to help me focus."* In particular, there was a noticeable improvement in the concentration of participants C, D, E, G, H and I: "*I know there has been a difference in class, he has pulled his socks up and he's completing his work a lot better" (parent Participant G)* and "*I've seen some changes mainly if I give him a task, before he would forget but now he's actually following it through… it will still take him time to complete it, he's listening though" (parent Participant H). "His homework that he's been bringing home is much*

better, so the time we have taken for homework has been quicker as he's done things properly and there have been fewer corrections," (parent Participant C). Participant I was placed on medication and thus his result is inconclusive as one is unable to ascertain whether it was the medication or the yoga intervention that improved his concentration.

4.5.2 Self-esteem

The aspect of self-esteem was a particular focus in this study as children with ADHD often have poor self-esteem. They may find it difficult to form and maintain friendships, experience school difficulties and have troublesome interpersonal relationships with family members (Larimer 2005:31; O'Regan 2005:30; Paasche *et al.* 2004:25). In addition, children who have ADHD often don't think they have any talents or strengths (Hallowell & Ratey 2005:14). As a result, they are likely to lose further interest in their studies and their self-esteem generally diminishes even further (Honos-Webb 2005:59; Yiming 2003:11; Young 2007:58).

However, practising yoga on a regular basis is believed to build self-esteem in a child. Singleton (2004:128) is of the opinion that a balanced yoga practice teaches a child to move with relaxed awareness and a sense of grace which culminates in a child who is self-possessed and confident in his actions and speech. Seaward (2006:395) reveals that yoga has been shown to improve muscle tone and create inner calmness, which yoga instructors attribute to improved self-esteem. A study by Birkel (1991) (*cited in* Seaward 2006:386) showed a significant positive change in self-image in those who attended a yoga course, while no substantial change was found in the other subjects. Affirmations used in yoga are also a highly effective way to build self-esteem (Jollands 1998:54; Singleton 2004:129). The learners in this research study used the following affirmation in all their yoga practices, *"I am strong and steady; for anything I am ready."*

From the responses of parents and teachers during the situation analysis it appeared that learners' levels of self-esteem fluctuated and depended on the circumstance. Many of the participants appeared to have low self-esteem in social situations and particularly with regards to their scholastic ability such as indicated in the following quotes: *"He worries about what others think about him (A)," "He feels he is not good enough (B, C)," "His self-esteem is very erratic and unrealistic (D)," "He doesn't have confidence (E,G)," "He is very nervous to answer questions (F)," "His biggest problem is his lack of self-esteem (I)."*

For the purpose of this study, the ten learners with ADHD were administered the Lawrence Self-Esteem Questionnaire (LAWSEQ), the "Primary School Version" (Lawrence 1982) *(cf. Chapter 3.4.4.3)* during the situation analysis and at the outcome of the yoga intervention. The questionnaire was standardised on an English and Australian population with the following norms Mean=19 SD=4.

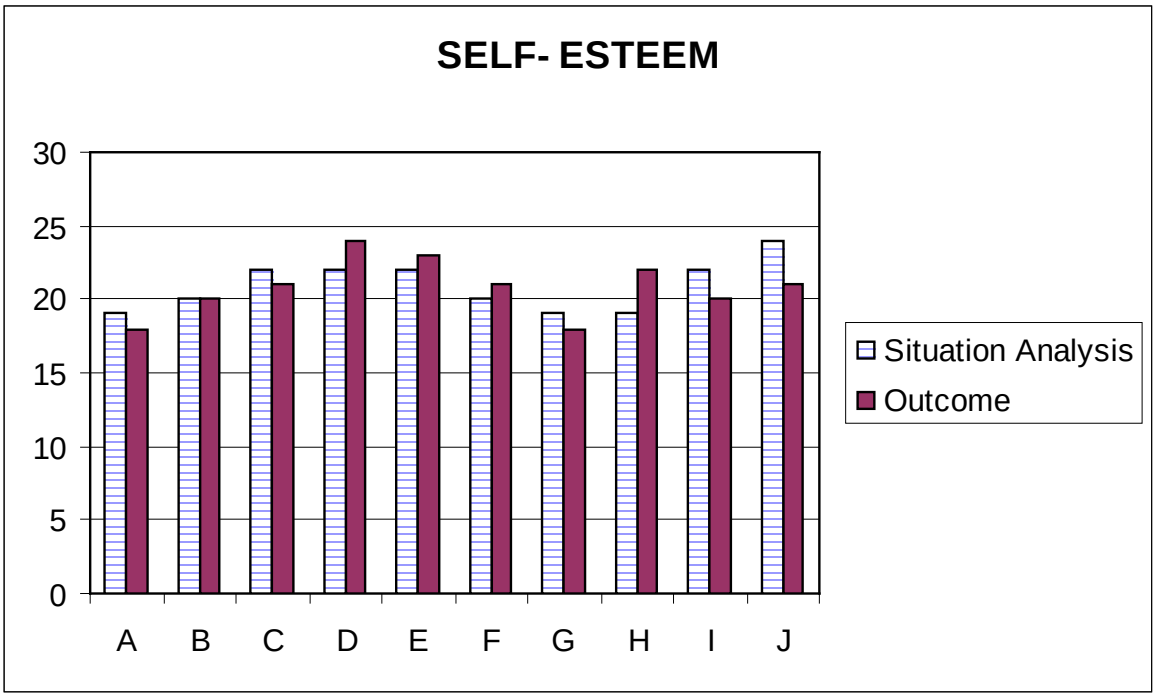

Figure 3: Self-esteem- Situation analysis and outcome of the yoga intervention

The data captured in *Figure 3* appears to show a slight difference in the self-esteem of four of the participants at the outcome of the yoga intervention. There appears to have been a slight increase in the self-esteem of participants D, E, F and H and a slight decline in the self-esteem of participants A, C, G, I and J however, these scores remain at average. Participant B's self-esteem remained unchanged. Participant C reflected at the end of the yoga intervention: *"Usually I feel left out because even though I am chosen in something it's like I won't pass or anything but when the yoga was finished it's like I touched the goal lots of times."* Participant C's parent reflected: *"On market day, he was able to take a joke when he was the joke… usually he isn't like that, so I'm not sure maybe his self-esteem has improved."* While with participant B, *"It made him feel quite good being part of that group."* Both parents of participant G and H believed the yoga intervention raised their children's self-esteem, *"He's a lot more confident, he's made more friends," and "self-esteem has definitely picked up, absolutely!"*

4.5.3 Anxiety

Anxiety was selected as an aspect of focus in this study as ADHD is associated with a higher-than-chance incidence of anxiety disorders (Nigg 2006:155). Relaxation exercises such as meditation, used in yoga, have shown beneficial effects on anxiety (Rakel & Faas 2006:225). However, despite the improvements in anxiety reported in studies conducted by Vahia *et al.* (1966) (*cited in* Lehrer *et al.* 2007:454), very little research has evaluated yoga treatments specifically for anxiety disorder. A more recent study by Brooks' (2007) (*cited in* Gates 2007:85) reported results in two of the participants whereby yoga proved effective in lowering their anxiety.

Parents and teachers attended a semi-structured interview during the situation analysis whereby they commented on the levels of anxiety of the various learners. From the parent and teacher responses, it was clear that many of the participants had anxiety related issues. Participants A, C, D, E, G, and H were all

scared of the dark with many comments echoing, *"He's very scared of the dark (A),"*or *"He is anxious (F)."* Participants B, F and H were reported to be afraid of *"baddies"* and *"burglars".*

It also appeared from the CAT responses during the situation analysis that many of the participants were fearful of the dark or robbers. *"The boy is feeling very scared because he is afraid of the dark"* was a common theme as well as *"he always used to hear these noises in the house."* Participant B made a few references to death due to tragic circumstances, *"He died in a plane crash/ car accident"* in his stories. The researcher concluded that all the participants appeared anxious during the situation analysis.

From the CAT responses at the outcome of the yoga intervention there appeared to be evidence of anxiety related issues which may have been resolved by participants A, B, C, F, G, and I. Many of the stories reflected a reason to not be afraid any longer for example, *"…it was just his parents (A)"* not a *"baddie"* or that the characters in the story were more able to take control of the situation for example, *"…he was arrested and she got light (B)."*

Parents and teachers reported a reduction in anxiety in participant E, *"I think his anxiety has improved, it's sitting at 6 on a scale out of 10,"* while participant F's *"anxiety hasn't been too bad lately"* and *"he (G) has been a lot more relaxed."* Participant H appeared to be less anxious as *"he's been sleeping through lately."*

4.5.4 Aggression

Aggression was selected as an aspect of focus in this study as the main effects of ADHD often result in poor frustration, low tolerance, lying, swearing, stealing and blaming others (O'Regan 2005:23; Rief 2005:12). ADHD children may overreact and be self-destructive (Chee & Green 2004:118). While, the frustration that the child feels can lead to violent outbursts and is a clear sign of

the hopelessness many of these children feel but cannot express (Pauc 2006:24).

Yoga appears to be beneficial to those with ADHD as it is believed to help control anger to a great extent. Anger is caused by the over-secretion of adrenal hormones and certain postures in yoga control this gland. The stress hormones released into the blood stream due to anger need to be used up to protect the system from harm. This is achieved through dynamic postures while *Pranayama*, a breathing technique, successfully calms the nerves and the mind (Hota 2008:28).

During the situation analysis, parents provided data relating to the various learners levels of aggression. The question asked by the researcher was: *How many of your child's anger related outbursts or acts of aggression have you been aware of in the past 6 weeks?* The results are depicted in Figure 4.

Participants	None	1-6	7-12	More than 13
A				**x**
B	**x**			
C		**x**		
D	**x**			
E		**x**		
F				**x**
G		**x**		
H		**x**		
I		**x**		
J	**x**			

Figure 4: Situation Analysis- Anger outbursts in past 6 weeks

From the information in Figure.4, it appeared evident that participants B, D and J had no anger related outbursts in the 6 weeks prior to the yoga intervention. Participants C, E, G, H and I had 1-6 anger related outbursts while participants A and F had more than 13 anger related outbursts.

Parent and teacher responses during the situation analysis indicated mostly high levels of frustration in the learners. Participants A, E and F seemed more likely to become physically aggressive than the other participants, *"He gets very angry with his sister, she pushes his buttons and he tries to hit her…he gets very frustrated (F)".* Participants B and J were reported to not be aggressive at all. From the CAT responses during the situation analysis there appeared to be an element of aggression evident in all the participants stories, *"The kid jumps on him and kicks him in the balls and sticks his fingers in his eyes…and he dies (F)", "There was a boy who was naughty and killed shongolos (B)"*. The comments in the stories of participants A, B, E, F, I and J were particularly violent. From the CAT responses at the outcome of the yoga intervention, the researcher concluded that there was still an element of aggression evident in all the participants' stories, for example*, "The mother is smacking the baby dog and the dog is screaming (D)"*. However, the comments in the stories in general appeared less violent than those comments made during the situation analysis.

With regards to aggression, parents' and teachers' impressions at the outcome of the yoga intervention included some positive comments: *"There haven't been any outbursts for quite some time now (C)", "He still gets angry but the people that get to him the most are the closest to him (A)," "He's calmed down a lot with regards to aggression (E)," "He seems more chilled in some ways (F)," "Definitely the aggression issues seem to have dissipated in that time (E)".*

4.5.5 Additional theme that emerged: sleep related issues

The semi-structured interviews with parents provided data relating to the sleep pattern of the learners. The researcher asked the question: *How does your child sleep at night? At what time does he go to bed and wake up in the morning?*

The information provided by parents was as follows: Five of the participants were reported to be good sleepers at night. Participants C and J were restless sleepers and had nightmares often. Participant D generally goes to bed at eight o' clock but may still be singing in his bed at eleven o' clock. Participant E wouldn't sleep at night if his mother was not there. Participant F had difficulty falling asleep. At the outcome of the yoga intervention, participant J's parent commented that the yoga intervention had improved his sleep pattern as he was now sleeping through without the light on with fewer nightmares.

4.5.6 Parental expectations

The semi-structured interviews provided data relating to parents expectations of the yoga intervention on the participants. The researcher asked the question: *Do you have any expectations related to the yoga classes and your child's behaviour/ anxiety/ aggression/ concentration/ self-esteem?*

The information provided by parents was as follows: Parents of participants A, B, D and J revealed that they had no expectations but believed the intervention might be a positive experience for their child. Participant C's parent was "very interested" and hoped it would make her son more calm and relaxed. The parent of participant E reflected, "I hope and pray that it might make a slight improvement". Participant F's parent considered the yoga intervention as "good" in terms of possibly boosting self-esteem and relaxing her son. The parent of participant G believed it might provide her son with a "fresh start and calm him a little". Participant H's parent hoped her child would "learn how to focus" and

"become more confident". Participant I's parent hoped that the yoga intervention might boost his self-esteem, so that "he might know he is acknowledged when he has done something well". At the outcome of the intervention, the comments of the parents of participants C, F, G, H and I's related to these expectations either directly or to an extent. This leads the researcher to surmise that the parents' expectations of the yoga intervention may have influenced their perceptions of their child in relation to the aspects of concentration, aggression, self-esteem and anxiety.

4.6 Conclusion

From the responses of the parents, the yoga intervention appears to have had a positive influence on all the participants to a certain degree. With regards to the main themes of concentration, aggression, self-esteem and anxiety the following may be deduced: There was no change in participant A, who was still aggressive though he was highly motivated to attend yoga. Participant B had *"a definite boost in his self-esteem...it made him feel quite good being part of that group."* Participant C appeared to be less aggressive, more confident and had improved focus on his homework. Participant D's parent reported that there was *"no change"* at home though *"his teacher told me it definitely helped in the classroom."* There appears to have been a change in participant E's behaviour according to both parent and teacher, he was reported to be less anxious and less aggressive. Participant F's concentration had deteriorated, though he was reported to be less anxious and more relaxed. Participant G's level of self-esteem seems to have increased. He was reported as *"less anxious"*, with fewer aggressive episodes at home and school and was more serious about his schoolwork. Participant H was taken off Concerta just prior to the start of the yoga intervention. His parent reported that he was now able to finish a task, was more confident and was *"bossy but not aggressive"*. Participant I was newly medicated during the yoga intervention and thus it was difficult to assess whether the yoga had an influence on the learner or whether it was a result of the

medication. He was reported to have been very excited about the yoga and his self-esteem and concentration had improved. However, his mother was concerned that he was *"angrier and was groaning in his sleep"*. Participant J was not medicated and the yoga appears to have had a positive effect on his sleeping pattern in that he was sleeping through the night and did not need his light on any longer.

The teachers appear to have found many of the participants calmer and more contained when arriving back at class after the yoga. Participant A was reported to be less anxious while participant B appeared to have a boost in his self-esteem. Participant C still lacked concentration while participant D was calmer. Participant E's concentration had improved and his aggressiveness had dissipated. Participant F was reported to be less anxious and was more confident with improved self-esteem. Participant G was reported to be happier in his self. Participant H appeared to be less anxious and more in control when doing the yoga while participant I had an improved self-image but had been placed on medication at the start of the yoga intervention and the result is thus inconclusive. Participant J appeared to be as impulsive in class as before the start of the yoga intervention.

From the responses provided by the yoga instructor it appeared that the participants were at times erratic in their focus during the yoga classes. Participants A and I were very involved and seemed to try very hard. While the other participants were at times disruptive or found it difficult to maintain concentration and thus may not have attained the full benefit of all the postures in the yoga class.

From the responses of the participants themselves it appears that they became more relaxed as a result of the yoga. Participant A felt that he became hyperactive after break and hence the effects of the yoga class were short-lived. Participant C appears to have had a self-esteem boost as he was selected for

the yoga intervention. Participant I reported feeling calmer, less anxious and more able to concentrate.

Thus, though the yoga appears to have had a positive influence on the learners with ADHD, it appears to have had a different effect on each individual. The process may have boosted self-esteem in one learner but not in another, and the same applies to the other aspects of concentration, anxiety and aggression as one also has to take into account that all the learners are unique.

CHAPTER 5

CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

5.1 Introduction

Chapter four focused on the findings of the case study with regards to the influence of yoga on the learners with ADHD. The findings were categorised into rich themes that emerged from the assessment and interview sessions, namely with regards to the aspects of concentration, self-esteem, anxiety and aggression. The findings were discussed and compared with findings from the literature. Following are the conclusions, recommendations and limitations of the study.

5.2 Conclusions drawn from the literature study and the empirical investigation

In light of the findings, conclusions drawn from the literature study and the empirical investigation will now be discussed.

5.2.1 Conclusions from the literature study

The focus of this study was the influence of yoga on learners with ADHD. The researcher indicated in the literature study that yoga is believed to have many benefits, particularly with regards to the aspects of concentration, anxiety, self-esteem and aggression. Learners with ADHD often lack concentration, exhibit anxious and aggressive behaviour and suffer from low self-esteem which resulted in the researcher's decision to explore the influence of yoga on these aspects in particular.

The literature study indicated that continued yoga practice enables the individual to get a better control over one's emotions and also increases the powers of concentration (Yogeswar 2004:6). Yoga may also be considered a form of exercise as it stimulates the central nervous system while benefits include a boost in mood, an increase in focus, alertness, learning and memory. Exercise also acts as an anti-depressant and an anti-anxiety agent, promotes mental endurance and reduces mental fatigue making it an excellent treatment for ADHD. It is thus particularly important for children with ADHD to exercise regularly (Gibbs 2005:13; Hallowell & Ratey 2005:220; Rief 2005:429). Yoga is believed to be helpful to ADHD children in that it builds strength, aids in relaxation, improves concentration and focus and can be used along with medication (Hill 2005:62).

The ADHD child may be hyperactive or anxious and may exhibit moods where they are angry or down in the dumps due to frustration and low tolerance. By learning relaxation and stress-reduction strategies in yoga it enables the child to find positive outlets to channel his energy (Hallowell & Ratey 2005:5; Hill 2005:106; Rief 2005:425). Meditation accompanies yoga practice and develops the individual's ability to sustain focused attention in one direction, without distraction, over a period of time and can help the ADHD child to calm and focus the mind (Hallowell & Ratey 2005:16; Kraftsow 2002:186; Rief 2005:435). A child diagnosed with ADHD is affected in his emotional, social and academic functioning and generally suffers from low self-esteem as a result (Berk 2000:289). Practicing yoga on a regular basis builds self-esteem in a child as children who do yoga tend to be self-possessed and confident in their actions and speech (Singleton 2004:128).

Children who practice yoga and meditation, and follow a healthy eating plan have the best chance of being healthy, happy and successful and enjoy life better (Hota 2008:132). However, regular practice for ADHD children is recommended with at least two or three times a week being considered optimal as the

combination of breathing methods with poses in yoga helps ADHD children develop greater awareness, emotional balance and concentration, thus increasing their capacity for schoolwork and creative play (Wenig 2003:110).

5.2.2 Conclusions from the empirical study

This study focused on the influence of yoga on learners with ADHD. The literature study highlighted the many benefits of practicing yoga with its positive results in reducing anxiety, boosting self-esteem, enhancing concentration and minimising aggression. The researcher thus wished to explore the influence of yoga on learners with ADHD with regards to these aspects in particular as a qualitative study of this nature does not appear to have been conducted in South Africa.

With regards to the aspect of anxiety, the Children's Apperception Test (CAT) indicated that in general the participants were more anxious prior to the yoga intervention then at the outcome. Parents and teachers revealed that all the learners were anxious to some degree and were afraid of the dark or robbers prior to the yoga intervention while parents and teachers comments at the outcome of the yoga intervention revealed a decline in anxiety experienced by many of the learners, particularly participants A, C, E, F, G, H and J.

The results of the Lawrence Self-Esteem Questionnaire (LAWSEQ) indicated a slight difference in the self-esteem of many of the participants. There appeared to have been a slight increase in the self-esteem of participants D, E, F and H and a slight decrease in the self-esteem of participants A, C, G, I and J. Participant B's self-esteem remained unchanged. From the responses of parents and teachers during the situation analysis it appeared that learners' levels of self-esteem fluctuated and depended on the circumstance. Many of the participants appeared to have low self-esteem in social situations and particularly with regards to their

scholastic ability. At the outcome of the yoga intervention, parents and teachers reported an increase in the self-esteem of participants B, F, G and I.

With regards to aggression in the participants, The Children's Apperception Test (CAT) during the situation analysis revealed an element of aggression in all the participants' stories. The comments in the stories of participants A, B, E, F, I and J were particularly violent. At the outcome of the yoga intervention, the researcher concluded that there was still an element of aggression evident in all the participants' stories, however, the comments in the stories appeared less violent than those comments made during the situation analysis. From the responses by parents and teachers during the situation analysis there was mainly evidence of frustration in the participants. Participants A, E and F seemed more likely to become physically aggressive than the other participants. Participants B and J were reported to not be aggressive at all. At the outcome of the yoga intervention, parents and teachers revealed that there had been an improvement in the level of aggression in participants C, E and G in particular.

5.2.3 Overarching conclusion

The aim of this study was to explore the influence of yoga on learners with ADHD and in doing so determine its effect on the aspects of anxiety, self-esteem, concentration and aggression in the learners. The aim was achieved as existing literature was utilised to form the background on which informed semi-structured interviews could be conducted with ten learners who were diagnosed with ADHD as well as their parents, three teachers and their yoga instructor. An empirical study was conducted with learners, parents, teachers and yoga instructor contributing to a range of data collection procedures. These drew on several sources: learner self-esteem questionnaires, learner projection tests, parent-rated questionnaires and teacher-rated questionnaires. Assessments were conducted at two points: the situation analysis and the outcome of the yoga intervention. On completion of the data collection, the transcribed data was

quoted in chapter four and was brought into context by relating the data to existing literature. This process enabled the researcher to draw conclusions regarding the influence of yoga on the ten learners in the study who had been diagnosed with ADHD.

The yoga intervention appears to have had an influence on the learners with ADHD to a certain degree, whether it was with regards to their self-esteem, concentration, anxiety or aggression levels. However, it would be necessary to conduct further studies of this nature with a larger sample and a yoga intervention that lasted six months or more, to really ascertain the true influence that yoga may have on the learner with ADHD.

5.3 Recommendations

Guidelines for parents and teachers of learners with ADHD will now be provided regarding the practice of yoga and the aspects of self-esteem, concentration, anxiety and aggression.

5.3.1 Guidelines for parents and teachers

The following are simple techniques that teachers and parents of learners with ADHD may use in the classroom and at home. These techniques are known to enhance self-esteem, aid concentration, reduce anxiety and diminish aggression.

1. Self-esteem: *Sankalpas* (in Sanskrit) or affirmations used in yoga are a highly effective way to build self-esteem. These are positive comments of intent about who we wish to become or the identities we wish to embody (Jollands 1998:54; Singleton 2004:129). The learners in this research study used the following affirmation in their yoga practice, *"I am strong and steady; for anything I am ready."* However, parents and teachers may begin their child's day with focusing on an affirmation that is applicable to

the child such as, *"I am my own unique self- special, creative and wonderful."*

2. Concentration: *Pranayama* is a breathing technique that is a central part of yoga and literally means the control of life or energy. It is believed that the better you breathe, the easier you will find it to concentrate, relax, learn and you will sleep more deeply. It also de-stresses the body and mind particularly from emotions like frustration and anger (Rakel & Faas 2006:229; Ramachander 2006:154; Seaward 2006:353, Singleton 2004:102). Parents and teachers may begin and end each day with this simple breathing technique to aid the child's concentration in the classroom and enable him to unwind after a long day.

3. Anxiety: Parents and teachers may assist the ADHD child when he is anxious by using a yogic technique such as *Bee Breath* as it has a soothing and calming effect on the nervous system and is very effective for soothing children who are feeling stressed or over-tired. It's also good when children are having trouble sleeping (Singleton 2004:107). *Bee Breath* also helps to open up the heart chakra, which is the centre of communication. It can help to dissolve the fear of speaking up at school to teachers, and will help when speaking to new friends (Gibbs 2005:90).

4. Aggression: Meditation used in yoga has a positive effect on individuals who are aggressive as the "outer" exercises help to hone in one's concentration and awareness of one's surroundings while the "inner" exercises teach one ways to deal with distracting thoughts or negative feelings and how to cultivate positive emotions such as love (Singleton 2004:110). Parents and teachers may start by playing a CD of calming music reflecting the sounds of the ocean or birds in a forest to the children who lie quietly on the floor with their eyes closed in a relaxed position prior to the start of the day or at any stage where the class may be unsettled due to a frustrating event.

5.4 Limitations of the study

The researcher made use of purposive sampling in this study. Leedy and Ormrod (2010:212) reveal that in purposive sampling, people or other units are chosen for a particular purpose. One limitation of this study was that only a very small sample of ten learners who had been diagnosed with ADHD were selected and thus one cannot generalise these findings to the entire population of learners with ADHD. This is considered a disadvantage of qualitative research in that the findings cannot be extended to wider populations with the same degree of certainty that quantitative analysis can. This is because they are not statistically significant or due to chance.

Secondly, another limitation of this study may be that the learners attended yoga classes for six weeks, twice a week only. Practicing yoga more than twice a week for at least six months may be more beneficial for a study of this nature. Yogeswar (2004:14) has suggested that though one may notice the benefits of yoga to the mind and body within a few weeks of regular practice, the body needs at least six months of daily practice to condition itself to doing the exercises.

Thirdly, this study was homogenous in nature in that the ADHD learners in this study were all boys and thus the findings are applicable only to this gender. A study with boys and girls may have resulted in very different findings.

5.5 Contribution of the study

This study contributed to further knowledge regarding the practice of yoga and its influence on learners with ADHD. Yoga's influence on the aspects of concentration, anxiety, self-esteem and aggression were highlighted. The yoga intervention in this study appears to have had some influence on learners with ADHD as was reflected in the results. Learners' concentration improved, anxiety

diminished, self-esteem was enhanced according to the observations of a few parents and teachers, and aggression was reduced. However, due to the qualitative nature of the study and the small sample one cannot generalise these finding to the entire population of learners with ADHD.

5.6 Future research

This study on the influence of yoga on learners with ADHD has raised further questions. It proved difficult when analysing the data to discern whether the yoga intervention or the medication had made a difference to participant I's ADHD symptoms as they were both introduced simultaneously. It is thus recommended in the future that researchers consider exploring yoga practice as an alternative therapy for learners with ADHD with a specific focus on the aspects of concentration, anxiety, self-esteem and aggression. In doing so a study of a quantitative nature with a control group on medication and an experimental group without medication is proposed or alternatively a replication of the same study with a control group who has had no intervention to assess any difference between the groups. It may be also suggested to exclude participants who have recently changed medication as the results are then unreliable. A further suggestion would be to replicate this study or one similar in nature, using either a qualitative or quantitative paradigm with a considerably larger sample which would produce more definitive results that one could generalise to the population and propose that yoga certainly has an influence on learners with ADHD.

5.7 A final word.

As a teacher and therapist to learners with ADHD, the researcher has had a personal interest in assisting these children to reach their full potential. Thus, exploring any means that may have enriched their lives and reduced their ADHD symptoms has been a meaningful experience. The results of this study may not be generalised to all learners with ADHD but it has enlightened the researcher to

the fact that yoga has had some influence on these ten learners specifically and this has been a true inspiration in itself.

BIBLIOGRAPHY

Ali, M. & Brar, J. 2002. *Therapeutic Yoga.* London: The Random House Group Ltd.

Amen, D.G. 2001. *Healing ADD: The breakthrough program that allows you to see and heal the six types of attention deficit disorder*. New York: Berkley Books.

Babbie, E. 2007. *The Practice of Social Research.* Belmont: Thomson Wadsworth.

Barlow, D.H. & Durand, V.M. 2002. *Abnormal Psychology. An Integrative Approach.* New York: Wadsworth.

Bellak, L. & Bellak, S.S. 1949. *Children's Apperception Test (CAT)*. Oxford. C.P.S Publishing Inc.

Berk, L.E. 2000. *Child Development*. Boston: Allyn and Bacon.

Bester, H. 2006. *How to cope with AD/ HD. A South African guide for parents, teachers and therapists*. Cape Town: Human & Rousseau.

Blanche, M.T; Durrheim, K. & Painter, D. 2006. *Research in Practice: Applied methods for social sciences*. Cape Town: University of Cape Town Press (Pty) Ltd.

Brown, T.E. 2000. *Attention Deficit Disorders and Comorbidities in Children, Adolescents and Adults.* Washington DC: American Psychological Association.

Buitelaar, J.K. 2002. Epidemiological aspect: What have we learned over the last decade? In Sandberg, S. & Barton, J. 2002*. Hyperactivity and Attention Disorders of Childhood.* Cambridge: Cambridge University Press.

Buttross, L.S. 2007. *Attention Deficit Hyperactivity Disorder*. Mississippi: The University Press of Mississippi.

Chee, K. & Green, C. 2004. *The Pocket Guide to Understanding ADHD*. London: Vermilion.

Clothey, F.W. 2006. *Religion in India- A Historical Introduction*. London: Routledge.

Corey, G. & Corey, M.S. 2006. *I never knew I had a Choice- explorations in personal growth.* Pacific Grove: Thomson Brooks/ Cole.

Cortright, B. 2007. *Integral Psychology- Yoga, Growth, and Opening the Heart*. Albany: State University of New York Press.

Cresswell, J.W. 2002. *Educational Research. Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Upper Saddle River: Merrill/ Prentice Hall.

Cresswell, J.W. 2003. *Research Design: Quantitative, Qualitative and Mixed Methods Approaches.* Thousand Oaks: Sage Publications, Inc.

Cresswell, J.W. 2007. *Qualitative Inquiry & Research Design. Choosing Among Five Approaches.* Thousand Oaks: Sage Publications, Inc.

Currie, B. 2002. *10- Minute Yoga Workouts: Power tone your body from top to toe.* London: Thorsons.

De Jager, M. 2001. *Brain Gym for All.* Cape Town: Human & Rousseau.

De Michelis, E. 2004. *A History of Modern Yoga.* London: Continuum.

De Vos, A.S. 1998. *Research at Grass Roots. A primer for the caring professions.* Pretoria: Van Schaik Publishers.

Dolan, M. 2007. A New Transformation in Higher Education: Benefits of Yoga and Meditation. *International Forum of Teaching and Studies*, 3(1):31-38.

Dupler, D., & Odle, T.G. 2005. "Hatha Yoga". The Gale Encyclopedia of Alternative Medicine. Ed. Jacqueline L. Longe. 2nd ed. Detroit: Gale. 4 vols. Updated July 1, 2006. URL: www.galenet.galegroup.com (Accessed 8. September 2008).

Durham, C. 2001. *Chasing Ideas- the fun of freeing your child's imagination*. Sydney: Finch Publishing.

Fouche, C.B & De Vos, A.S. 2005. *Problem Formulation*. In De Vos, A.S., Strydom, H., Fouche, C.B., & Delport, C.S.L.2005. *Research at Grass Roots. For the Social Sciences and Human Service Professions.* Pretoria: Van Schaik: 100-110.

Fouche, C.B. & Delport, C.S.L. 2005. *Introduction to the research process.* In De Vos, A.S., Strydom, H., Fouche, C.B & Delport, C.S.L. 2005. *Research at Grass Roots. For the Social Sciences and Human Service Professions.* Pretoria: Van Schaik: 71-85.

Gates, G.S. 2007. *Emerging Thought and Research on Student, Teacher, and Administrator Stress and Coping*. Charlotte: Information Age Publishing, Inc.

Gibbs, B. 2005. *Yoga for children*. London: Anness Publishing Ltd.

Greeff, D. 2005. Are you paying enough attention to ADHD?: Clinical. *Professional Nursing Today*, 9(5):38.

Greene, R.W. 2005. *The Explosive Child*. New York: HarperCollins Publishers.

Hallowell, E.M. & Ratey, J.J. 2005. *Delivered from Distraction- getting the most out of life with Attention Deficit Disorder.* New York: Ballantine Books.

Harrison, L.J. Manocha, R. & Rubia, K. 2004. Sahaja Yoga Meditation as a Family Treatment Programme for Children with Attention Deficit-Hyperactivity Disorder. *Clinical Child Psychology and Psychiatry,* 1359-1045 (200410) 9:4. London: Sage.

Hill, B.A. 2005. *The AD/HD Book*. New York: Penguin Group.

Hinshaw, S.P. 2005. Enhancing Social Competence in Children with Attention Deficit Hyperactivity Disorder. In Hibbs, E.D. & Jensen, P.S 2005. *Psychosocial Treatments for Child and Adolescent Disorders. Empirically Based Strategies for Clinical Practice.* Washington DC: American Psychological Association.

Holz, T. & Lessing, A. 2002. Aid to the teacher to identify the learner with ADHD in the classroom: a literature study. *Educare*, 31(1&2):236-250.

Honos-Webb, L. 2005. *The Gift of ADHD: How to transform your child's problems into strengths*. Oakland: New Harbinger Publications, Inc.

Hota, B. 2008. *Yoga for schoolchildren.* New Delhi: Rupa and Co.

Jensen, P.S. & Kenny, D.T. 2004. The effects of yoga on the attention and behaviour of boys with Attention-Deficit/ hyperactivity Disorder (ADHD). *Journal of Attention Disorders*, 7(4): 205-16.

Johnson, B. & Christensen, L. 2004. *Educational Research: Quantitative, Qualitative and Mixed Approaches.* Boston: Pearson Education, Inc.

Johnson, B. & Christensen, L. 2008. *Educational Research: Quantitative, Qualitative and Mixed Approaches.* Los Angeles: Sage Publications.

Jollands, B. 1998. *Instant Calm- Natural ways to reduce stress*. New York: Lorenz Books, Anness Publishing Inc.

Kelle, U. 2004. *Theory building in Qualitative Research and Computer Programs for the Management of Textual Data*. In Seale, C. 2004. Social Research Methods: A Reader. London: Routledge.

Klass, P. & Costello, E. 2003. *Quirky Kids*. New York: Ballantine Books.

Koretsky, J. 2003. Using Yoga to Manage ADHD. URL: www.mental-health-matters.com. (Accessed on 13 September 2008)

Kraftsow, G. 2002. *Yoga for Transformation.* New York: Penguin Compass.

Kranowitz, C.S. 2005. *The Out-of-sync Child: Recognising and Coping with Sensory Processing Disorder.* New York: The Berkley Publishing Group.

Kruger, D. & Nel, N. 2005. *Addressing Barriers to Learning: A South African Perspective.* Pretoria: Van Schaik Publishers.

Kvale, S. 1996. *Interviews: an introduction to qualitative research interviewing*. Thousand Oaks: Sage Publications, Inc.

Larimer, M.P. 2005. *Attention Deficit Hyperactivity Disorder (ADHD) Research Developments*. New York: Nova Science Publishers, Inc.

Lawlis, F. 2004. *The ADD Answer*. New York: Penguin Books Ltd.

Lawrence, D. 1982. Development of a self-esteem questionnaire. *British Journal of Education/ Psychology*, 51:245-9.

Leedy, P.D. & Ormrod, J.E. 2010. *Practical Research*. Upper Saddle River: Pearson Education, Inc.

Lehrer, P.M., Woolfolk, R.L. & Sime, W.E. 2007. *Principles and Practice of Stress Management.* New York: The Guilford Press.

Lesser, R. 1998. *The Yoga Manual*. New York: Todtri Productions Limited.

Levine, M. 2002. *A Mind at a Time*. New York: Simon & Schuster, Inc.

Lewis, D. 2002. *Helping your Anxious Child: An effective treatment for childhood fears*. London: Vermilion.

Louw, C.; Oswald, M.M.; Perold, M.D. 2009. General practitioners' familiarity, attitudes and practices with regard to Attention Deficit Hyperactivity Disorder (ADHD) in children and adults: original research. From *South African Family Practice*, 51(2): 152-157.

Malhotra, A. K. 2003. *An Introduction to Yoga Philosophy: An annotated translation of the yoga sutras*. Surrey: Ashgate Publishing Limited.

Marshall, C. & Rossman, G.B. 1995. *Designing Qualitative Research*. Thousand Oaks: Sage Publications, Inc.

Matthews, D.D. 2002. *Attention Deficit Disorder Sourcebook*. Detroit: Omnigraphics.

McMillan, J.H. & Schumacher, S. 2006. Research in Education: Evidence-Based Inquiry. Boston: Pearson Education, Inc.

McNamara, B.E. & McNamara, F.J. 2000*. Keys to Parenting a Child with Attention Deficit Disorders.* Hauppauge: Barron's Educational Series, Inc.

Meyer, J. 2004. *Telling the brats from the 'just misunderstood'.* Durban: Sunday Tribune Newspaper (May 30th*).*

Meyer, J. 2007. *ADHD on the increase*. Durban: Sunday Tribune Newspaper (April 1st)

Nigg, J.T. 2006. *What Causes ADHD? Understanding what goes wrong and why*. New York: The Guilford Press.

Olson, S. 2002. Development perspectives. In Sandberg, S. 2002. *Hyperactivity and Attention Disorders of Childhood.* Cambridge: Cambridge University Press.

O'Regan, F.J. 2005. *ADHD*. London: Continuum International Publishing Group.

Paasche, C.L., Gorrill, L. & Strom, B. 2004. *Children with Special Needs in Early Childhood Settings. Identification. Intervention. Inclusion.* Scarborough: Delmar Learning, a division of Thomson Learning.

Patton, M.Q. 2002. *Qualitative Research and Evaluation Methods*. Thousand Oaks: Sage Publications, Inc.

Pauc, R. 2006. *Is That My Child? Exploding the myths of Dyspraxia, Dyslexia, Tourette's syndrome of childhood, ADD, ADHD and OCD*. London: Virgin Books.

Pegrum, J. 2003. *Hatha Yoga: The Complete Mind and Body Workout.* London: Cico Books.

Perez-Alvarez, F. & Timoneda-Gallart, C. 2005. Attention deficit hyperactive disorder as impulsivity disorder according to pass neuro-cognitive function. In Larimer, M.P. 2005. *Attention Deficit Hyperactivity Disorder. Research Developments.* New York: Nova Science.

Picton, H. 2005. *Hyperactivity and ADD: Caring and Coping*. Johannesburg: Witwatersrand University Press.

Prakashan, V.K. 2000. *Yoga: asanas, panayama, mudras, kriyas*. Vivekananda Kendra. Chennai: Prakashan Trust.

Rakel, D. & Faas, N. 2006. *Complementary Medicine in Clinical Practice*. Massachusetts: Jones and Bartlett Publishers.

Ramachander, S. 2006. *Creativity @ Work.* New Delhi: Response Books.

Ramphal, A. 2009. *Being Different*. Durban: Daily Newspaper (July 23rd).

Reber, A.S. & Reber, E. 2001. *The Penguin Dictionary of Psychology*. London: The Penguin Group.

Rief, S.F. 2003. *The ADHD Book of Lists: a practical guide for helping children and teens with Attention Deficit Disorders*. San Francisco: Jossey-Bass.

Rief, S.F. 2005. *How to Reach and Teach Children with ADD/ ADHD*. San Francisco: Jossey-Bass.

Rosnow, R.L. & Rosenthal, R. 2005. *Beginning Behavioural Research: a conceptual primer.* Upper Saddle River: Pearson Education, Inc.

Seaward, B.L. 2006. *Essentials of Managing Stress*. Sudbury: Jones and Bartlett Publishers.

Shaw, R. 2003. *The Epidemic*. New York: HarperCollins Publishers Inc.

Shepard, B.A., Carter, A.S. & Cohen, J.E. 2000. *Attention Deficit Hyperactivity Disorder and the Preschool Child.* In Brown T.E. 2000. *Attention Deficit Disorders and Comorbidities in Children, Adolescents and Adults*. Washington DC: American Psychological Association.

Shokane, M.J., Rataemane, L.U.Z., Rataemane, S.T. 2004. Attention-deficit/ hyperactivity disorder- co-morbidity and differential diagnosis. *South African Journal of Psychiatry*, 10(3):67-72.

Singleton, M. 2004. *Yoga for you and your child*. London: Duncan Baird Publishers.

Sivananda Yoga Vedanta Centre.1996. *Yoga: Mind and Body*. London: Dorling Kindersley Limited.

Snyman, S. & Truter, I. 2010. Complementary and Alternative Medicine for Attention Deficit/ Hyperactivity Disorder: an Eastern Cape Study: Scientific Letter. *From South African Family Practice*, 52(2):161-162.

South Africa. 1974. *Health Professions Act, 1974 (Act No.56 of 1974*). Pretoria: Government Gazette.

Steffen, C.E. 2001. *ADHD: A Guide to Natural Healing*. New Lenox: Realizing Potentials Press.

Stiles, M. 2000. *Structural Yoga Therapy: Adapting to the individual.* Boston: Red Wheel/ Weiser, LLC.

Stordy, J. & Nicholl, M.J. 2000. *The LCP Solution: The remarkable nutritional treatment for ADHD, Dyslexia, and Dyspraxia*. London: Macmillan.

Strydom, J. & du Plessis, S. 2001. *The Myth of ADHD and other Learning Disabilities: Parenting without Ritalin.* Lafayette, LA: Huntington House Publishers.

Sunderland, M. 2007. *What Every Parent Needs to Know*. London: Dorling Kindersley Limited.

Teddlie, C & Tashakkori, A. 2009. *Foundations of Mixed Methods Research. Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences.* Thousand Oaks: Sage Publications, Inc.

Train, A. 2000. *ADHD*. *How to Deal with Very Difficult Children* (Human Horizon Series). London: Souvenir Press Ltd.

Weller, S. 2007. *Healing Yoga: A practical approach to healing common ailments with yoga.* London: Collins & Brown.

Wenig, M. 2003. *YogaKids: Educating the Whole Child through Yoga*. New York: Stewart, Tabori & Chang.

Wiersma, W & Jurs, S.G. 2009. *Research Methods in Education*. Boston: Pearson Education, Inc.

Woolfolk, A. 2010. Educational Psychology. 11th Edition. London: Pearson Education International.

Yiming, C. 2003. *Living with A.D.H.D*. Singapore: Times Media Private Limited.

Yin, R.K. 2009. *Case Study Research: Designs and Methods.* Thousand Oaks: Sage Publications, Inc.

Yogeswar. 2004. *Textbook of Yoga*. New Delhi: Penguin Books.

Young, J.L. 2007. *ADHD Grown Up: A guide to adolescent and adult ADHD*. New York: W.W Norton & Company.

Appendix A

16. May 2009

Dear Parents

I am currently a Masters Educational Psychology student and a teacher at _____School and would like the opportunity for your child to participate in my research. The study will research the influence of yoga on children with Attention Deficit Hyperactive Disorder. Your child will participate in forty minute classes twice a week for 6 weeks. The classes will be held early in the morning from 7.20 a.m -8.00a.m.

Please return the reply slip as soon as possible and do not hesitate to contact me should you have any queries regarding this matter. Interviews will be conducted with both parents and learners prior to the commencement of the yoga classes. All information will be treated as highly confidential and no true names will be used in the research.

Regards
Karena Beart
_____

Mrs. *
(Principal)
_____

(Contact Number: 0829692357, UNISA Student Number: 08934894, UNISA Supervisor: Prof. Lessing 0832840782)

REPLY SLIP

My child _____ will be/ will not be attending the yoga classes at _____School.

Parent Sign _____

Appendix B

Consent Letter:

TO WHOM IT MAY CONCERN DATE: _____

I am presently a Masters student *training* to be an Educational Psychologist and am acting under the auspices of the University of South Africa. The university requires that we complete a research thesis and in doing so conduct interviews and psychological assessments. A tape recording of the interviews and assessments will take place but all information is treated as highly confidential according to the Health Professions Council of South Africa (HPCSA). A pseudonym will be used.

Your participation in this matter will be greatly appreciated.

Parents are to please sign the following declaration on behalf of themselves and their children who are minors:

I _____ (parent), hereby give permission to Karena Beart to interview my child _____ and conduct any psychological assessments that are deemed necessary.
I understand that all information received is treated as highly confidential.

Parent Sign: _____

My student details are as follows:

Karena Beart
Student Number: 08934894
Contact Number: 0829692357
Supervisor: Professor Lessing 012-4294330

Regards
Karena Beart

_____

Appendix C

Teacher Questionnaire/ Semi-structured interview questions for parents:

The participant was referred to as the learner in the questions addressed to the teachers:

1. How do you experience your child's impulsivity/ lack of concentration/ hyperactivity?

2. Does your child have any fears or anxiety related issues? Please expand.

3. How does your child sleep at night? At what time does he/ she go to bed and wake up in the morning? *(Parents only)*

4. How would you rate your child's self-esteem on a scale from 1-10 *(10 being very good and 1 being low)*. Please substantiate.

5. How do rate your child's concentration when medicated on a scale from 1-10 (1=poor; 5= adequate; 10=very good). Please expand.

6. How do you rate your child's concentration when not medicated on a scale from 1-10 (1= poor; 5= adequate; 10= very good). Please expand.

7. How many of your child's anger related outbursts or acts of aggression have you been aware of in the past 6 weeks?

None □
1-6 □
7-12 □
More than 13 □

Please describe a few of these related incidents.

8. Do you have any expectations related to the yoga classes and your child's behaviour/ anxiety/ aggression/ concentration/ self-esteem? Please substantiate.

Appendix D

Coding Key for Themes in Data Analysis:

A = Anxiety

Ag = Aggression

S = Self-esteem

C = Concentration

Sl = Sleep

Appendix E

Participant I **CAT- H: Situation analysis**

Card 1: *"They're having a pot of porridge and they're happy and that's all I can say."*

Card 2: *"They're having a tug of war and the small one's doing it and then these two won…they are feeling happy and nervous before the tug of war."*

Card 3: *"This big man's sitting down and the small boy's sitting near him and he's smoking a black thing…they taking a photo of them and he's (father) thinking how its going to look and he's (little boy) feeling weird as his father's sitting like that with his legs crossed."*

Card 4: *"This boy is riding a bicycle, this woman's running because her baby is in the wind. This boy is trying to get home quickly."*

Card 5: *"The two twins are in the cot and they want their mother to come. They are thinking where is their mother…afterwards they fell asleep."*

Card 6: *"They were sleeping in the cave and the small one's going for the snake, the others are sleeping and the snake bit him. He felt like crying and in the end his mother and his father put a plaster on it."*

Card 7: *"This nasty old man wants to eat the small child…before the small boy stole the old man's money. He's trying to catch him and the small boy kicks him and will run to his mother…in the end the big man breaks his leg. The small boy's feeling scared."*

Card 8: *"They all talking and having tea and the mother's telling the boy to go play outside to the other children…and those two are telling secrets. Before the child came running in the house and he said that the other children are hitting him …afterwards the small child took a bat and hit them then they were bleeding. The little boy was feeling guilty and the mother felt sad …she was thinking she had done something wrong."*

Card 9: *"The small child is worrying he can't go to sleep and he was screaming for his mother to tell her he can't go to sleep and he wants to go and watch TV…his mother let him go watch TV the whole night."*

Card 10: *"The mother's drying him and the child wants to go outside and play …before the child didn't want to go in the bath he was running away from his mother and afterwards his mother catched him and put him in the bath and dried him."*

Appendix F

Participant I **Parent Interview: Situation Analysis**

The following questions were posed to the parents in the semi-structured interview by the researcher:

Researcher: *"Is your child medicated?"*

Parent: *"He was medicated before when he was at * school for six months but he had bad morbid thoughts and did not respond well so we took him off it. He's now on Eye-Q and Scotch Emulsion capsules."*

Researcher: *How do you experience your child's impulsivity/ lack of concentration/ hyperactivity?*

Parent: *"He is the opposite, he is slow moving and less energetic, he daydreams a lot too. He has panic attacks if he feels pressurised. His concentration has improved, he's done the Dore program, but it's a lot to do with his mood, if he's motivated he will work harder. He also gets hyped up when he needs to get his point across."*

Researcher: *Does your child have any fears or anxiety related issues? Please expand.*

Parent: *"Yes, if he's under pressure he has panic attacks if he's screamed at. When he has panic attacks he says, 'I can't breathe, I'm choking.' There are fears, I'm not sure what they are…he sleeps in his own bed now, he has overcome quite a bit…he has a fear of the dark. He is an anxious child; he fusses about small things and has a fear of something happening to us."*

Researcher: *How does your child sleep at night? At what time does he go to bed and wake up in the morning?*

Parent: *"He goes to bed at 8.30 at night and is up at 6 in the morning…he sleeps well."*

Researcher: "*How would you rate your child's self-esteem on a scale from 1-10 (10 being very good and 1 being low). Please substantiate."*

Parent: *"His self-esteem is very low- 3/10. He always feels he needs to try and prove himself. I think he feels he needs to prove something to be acknowledged or liked. His biggest problem is that he lacks self-esteem, I mean he couldn't even tap himself on the back when he achieved the outstanding effort badge so I think he doesn't acknowledge his achievements, he's just apathetic…he also tries so hard to be noticed in soccer."*

Researcher: *How do rate your child's concentration when medicated on a scale from 1-10 (1=poor; 5= adequate; 10=very good). Please expand.*

Parent: *"He's not medicated at the moment."*

Researcher: *How do you rate your child's concentration when not medicated on a scale from 1-10 (1= poor; 5= adequate; 10= very good). Please expand.*

Parent: *"I would say 5/10…it seems adequate at the moment."*

Researcher: *How many of your child's anger related outbursts or acts of aggression have you been aware of in the past 6 weeks?*

None □
1-7 □
7-13 □
More than 13 □

Please describe a few of these related incidents.

Parent: *"1-6. He has anger outbursts from time to time. There was quite a bit of anger initially this year. He has been frustrated with the increase of work at school this year. He has the attitude of it's "too much" and he felt quite overwhelmed. He generally kicks the soccer ball when he's angry and sometimes he will aggravate his sister and say something nasty …he doesn't get physical."*

Researcher: *"Do you have any expectations related to the yoga classes and your child's behaviour/ anxiety/ aggression/ concentration/ self-esteem? Please substantiate."*

Parent: *"My main concern is his self-esteem, to know he's acknowledged when he does something well. I'm also not sure if he's aware of his emotions, I can't always gauge with him how he's feeling. He also feels that he is victimised by others…I don't know…I feel he can achieve more if his self-esteem improves."*

Appendix G

Participant I **Teacher Interview: Situation Analysis**

The following questions were completed by the teacher in a questionnaire compiled by the researcher:

Researcher: *How do you experience the learner's impulsivity/ lack of concentration/ hyperactivity?*

Teacher: *"Poor concentration and lack of focus. No motivation whatsoever- everything becomes a drag. Will make an issue of incidents which happen in the class."*

Researcher: *Does the learner have any fears or anxiety related issues? Please expand.*

Teacher: *"Worries about having to wait for mom after school."*

Researcher: *"How would you rate the learner's self-esteem on a scale from 1-10 (10 being very good and 1 being low). Please substantiate."*

Teacher: *"3/10. His body language portrays someone who is down in the dumps. Head always drooping, slouching and dragging feet."*

Researcher: *How do you rate the learner's concentration when medicated on a scale from 1-10 (1=poor; 5= adequate; 10=very good). Please expand.*

Parent: *"He's not medicated at present."*

Researcher: *How do you rate the learner's concentration when not medicated on a scale from 1-10 (1= poor; 5= adequate; 10= very good). Please expand.*

Teacher: *"2/10. All work is too difficult. Cannot focus and no work is ever completed."*

Researcher: *How many of the learner's anger related outbursts or acts of aggression have you been aware of in the past 6 weeks?*

None □
1-8 □
7-14 □
More than 13 □

Please describe a few of these related incidents.

Teacher: *"1-6. Annoyed with learner P at times. Attitude of being the victim- everybody else is always wrong."*

Appendix H

Participant I **CAT-A: Outcome**

Card 1: *"The mother chick got worms for the small chicks and the mother chick said, 'Eat all your food.' A fox tried to eat them but the mother chicken hit him and the fox died."*

Card 2: *"The one bear and the two other bears are pulling against one and the bear with no partners pulled them all over. He's feeling happy because they won and these two are feeling sad because they lost. In the end he gets a trophy and these two get a small trophy."*

Card 3: *"The lion is the king and he's sitting down and he's talking to his people…the mouse is scared of him…the lion dies and he makes his son come the king."*

Card 4: *"The baby kangaroo and the oldest kangaroo are going for a picnic and it was windy so they went back home and had hot chocolate and the small one doesn't know what's going on…they are feeling sad because the wind ruined the picnic."*

Card 5: *"The two brothers are fighting in the bed for the toy, the mother and the father are downstairs and they are watching TV… these two are feeling mad at each other, in the end mother shouts at them and takes the toy and puts it away."*

Card 6: *"The other two bears don't want this bear to come lay with them so this bear tries to play a trick on them…he does play the trick and then they do make him lay with them."*

Card 7: *"This tiger is chasing the monkey, the monkey's scared and the tiger is hungry… in the end the monkey gets away."*

Card 8: *"This monkey's telling a secret to that monkey but they're talking about this monkey about the child monkey. They're saying that the child is so rude…the child feels sad…in the end the mother monkey finds out and they get arrested."*

Card 9: *"This rabbit's lonely because he lost his mother and father and he's feeling sad …in the end he finds his mother and father."*

Card 10: *"This small puppy is so happy because his mother is massaging him."*

Appendix I

Participant I **Semi-structured interview: Outcome**

Researcher*: What can you tell me about the yoga- did it make you feel any different to what you normally feel?*

Participant I: *"I could concentrate more"*

Researcher: *"Anything else?"*

Participant I: *"It calmed me down and I didn't worry about nothing."*

Appendix J

Participant I **Parent Interview: Outcome**

Researcher: *When did you first suspect you child might have ADHD?*

Parent: *"In Grade 1 the teacher noticed he was slow, his pronunciation wasn't good, and he would go off and tell the children that Hulk was outside if he was bored in class."*

Researcher: *"Do you feel that the yoga intervention had any influence on your child with regards to the aspects of concentration, anxiety, self-esteem or aggression?"*

Parent: *"As you know we put him on 10mg Ritalin, there's been a big change but at the same time there's a lot of anger. He goes out of his way to irritate his sister, always picking and very sensitive. In his sleep he's groaning a lot. He enjoyed the yoga, I must say I've never seen someone so excited about something, I mean even starting earlier wasn't a problem for him. His concentration has improved but he's on Ritalin now and his self-esteem has definitely improved he's more bubbly than ever before and he can just say it as it is and not care. He's totally open now."*

Appendix K

Participant I **Teacher Interview: Outcome**

Researcher: *"Do you feel that the yoga intervention had any influence on the learner with regards to the aspects of concentration, anxiety, self-esteem or aggression?"*

Teacher: *"We noticed a very much together child all together, there was a difference as he was also on meds, he was getting everything right…From a yoga point of view I think it was beneficial to him but it's difficult to comment because of the meds…After yoga he was so relaxed he wanted to sleep…There was definitely an improvement in his self-image because he was now able to do his work and he was motivated and would get on with it."*

Appendix L

Participant I **Yoga instructor: Outcome**

Researcher: *"What was your impression of Participant I's participation in the yoga intervention?"*

Yoga Instructor: *"He tried very hard, he was very mature…very present."*