EFFECTS OF POSITIVE REINFORCEMENT AND RESPONSE COST COUNSELLING TECHNIQUES ON ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) SYMPTOMS AMONG PRIMARY SCHOOL PUPILS IN KANO METROPOLIS

BY

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B. A. Ed. Hausa, B.U.K (2003), M. Ed. Guidance and Counselling, B. U. K (2009)

PhD/EDUC/00580/2008-2009

A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA, THROUGH THE DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND COUNSELLING IN PARTIAL FULFIMENT OF THE REQUIREMENTS FOR THE AWARD OF DOCTOR OF PHILOSOPHY IN GUIDANCE AND COUNSELLING

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FEBRUARY, 2014

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DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND COUNSELLING

FACULTY OF EDUCATION

AHMADU BELLO UNIVERSITY, ZARIA

MAY, 2014

DECLARATION

I hereby declare that the work in this Dissertation entitled 'Effects of Positive Reinforcement and Response Cost Counselling Techniques on Attention Deficit Hyperactivity Disorder (ADHD) Symptoms among Primary School Pupils in Kano Metropolis' has been carried out by me in the Department of Educational Psychology and Counselling. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

Kabir Dungurawa BELLO
PhD/EDUC/00580/2008-09 Signature/Date _____

CERTIFICATION

This Dissertation entitled ‘‘Effects of Positive Reinforcement and Response Cost Counselling Techniques on Attention Deficit Hyperactivity Disorder (ADHD) Symptoms among Primary School Pupils in Kano Metropolis’ by Kabir Dungurawa BELLO meets the regulation governing the award of PhD. in Guidance and Counselling of the Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This research is dedicated to my parents for their unwavering support and encouragement during my years of study. I also dedicate it to mychildren Abubakar, Umar, Aishatu, Ramla, Ummul-Khulsum and Usman.

ACKNOWLEDGEMENTS

Praise belongs to Allah (SWT) Lord of the world for given me the opportunity to successfully complete this research work. Several people who made me realize and appreciate the importance of good education made my successful completion of this doctoral degree program at Ahmadu Bello University, Zaria possible.

I am extremely grateful for the assistance, advice and guidance of my Major Supervisor, Dr. Raliya Muhammad Bello. I thank you especially for your continuous support and encouragement with my research and for giving me the confidence to persevere with this study. I appreciate the time you gave for meetings, phone calls and for your suggestions and ideas for this study.

I also appreciate the supportive encouragement of my two other supervisors Dr. Mustapha Abdullahi and Dr. Sani Sambo. Also to mention are the Head of Department Prof. Musa Balarabe, Prof Festus D. Kolo, Prof. E. F. Adeniyi, Dr. J.O. Bawa, Dr. Yunusa Umaru, Dr. Aisha, Muhammad, Dr. Hadiza Tukur, Dr. Khadija Mahmud, Dr. E. Adamu, Dr. Alhaji A. Bagudu, Dr. Maimuna Yaroson, Dr. Dominic Oliagba, Prof. Mrs. Sulaiman and all the academic staff and non-academic staff of the Department for their patience and for providing constructive feedback during the various phases of my dissertation.

I am extremely grateful to my employer (Bayero University, Kano) for supporting my study and for allowing me the time to complete this research. I am also grateful to my Head of Department, Prof. Talatu Musa Garba.

To my family, I am specifically grateful to my wives: Balaraba Aminu Isma'il and Sadiya Mu'azu Sani for their patient understanding, love and encouragement and for carrying the greater load to see me through.

My colleagues and friends deserve to be acknowledged particularly Abubakar Abdullahi, Dr. Ahmad Muhammad Garba, Dr. Ahmed Iliyasu, Dr. Maigari Abdu, Dr. Bello A. Bello, Dr. Suwaiba Ahmed Sa'id, Binta Abba, Halima Rabi'u Abdullahi, Dahiru Inuwa, Dr. Gali Sa'idu, Nura Lawal, Muhammad Adamu Kwankwaso, Bello Shehu Karofi, Nasiru Sa'ad, Mukhtar Muhammad, Abdullahi Ibrahim, Mujtaba Lawal, Iliyasu Bala Indabawa, Salmanu Ado Abdullahi, Salisu Garba and others deserve to be acknowledged, I thank you all for your active interest and emphatic support.

I must equally thank and appreciate the staff, pupils and the management of the three sampled schools for their kind acceptance, willingness and cooperation to participate in the study. Also Prof. Mu'azu Sani Zaria and Dr. Ibrahim Garba Satatima deserve commendation for their support.

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ABBREVIATIONS

PR: Positive Reinforcement

RC: Response Cost

ADHD: Attention Deficit Hyperactivity Disorder

EG: Experimental Group

CG: Control Group

ASC: ADHD Symptoms Checklist

OPERATIONAL DEFINITION OF TERMS

1. **ADHD:** This refers to a behaviour problem common among children that cause them to be inattentive, disruptive and impulsive.

2. **Attention Deficit:** Inability of the pupil to give close attention to details or making careless mistakes in school tasks.

3. **Hyperactivity**: Inability of the pupil to remain seated in the class when lessons are going on.

4. **Impulsivity:** Is an act of impatience, difficulty in delaying responses, blurting out answers before questions have been completed and frequent interrupting others in classroom activities.

5. **Positive Reinforcement:** Refers to providing rewards such as clapping of hands, praise, a chocolate or money on the child's performance of desired behaviour.

6. **Response Cost:** Withdrawing rewards or privileges on the performance of unwanted behaviour.

ABSTRACT

*This study employs a quasi-experiment, pre-test post-test control group design in investigating the effects of positive reinforcement and response cost counselling techniques on attention deficit hyperactivity disorder (ADHD) symptoms among primary school pupils in Kano Metropolis. The main objective is to find out whether positive reinforcement and response cost counselling techniques can be effective in reducing ADHD symptoms among primary school pupils in Kano Metropolis. Twelve research questions with corresponding null hypotheses were formulated to guide the study.The population comprises of 61 ADHD primary five pupils.The sample was 36 (18 male and 18 females) drawn from three public primary schools (Dorayi, Chiranchi and Rijiyar Zaki). An instrument tagged 'ADHD Symptoms Checklist' which is in line with the Diagnostic and Statistical Manual for Mental Disorder was adapted and used for the study. The study lasted for 12 weeks in which 9 children were treated with the positive reinforcement technique, 9 received the response cost intervention and 18 ADHD pupilsconstituted the control group.*D*ata were analyzed using mean scores for the research questions, t-test for independent samples was used for hypotheses 1, 2, 3, 4 and 5, t-test for dependent samples for hypotheses 7, 8, 9, 10, 11, 12 andone way analysis of variance (ANOVA) for hypothesis 6.Finding indicates that positive reinforcement technique had significantly reduced the symptoms of inattentiveness, hyperactivity and impulsivity among primary school pupils. Finding also revealed that response cost counselling techniquesignificantly reduced the symptoms ofinattentiveness, hyperactivity and impulsivity among primary school pupils. Another finding revealed that the two counselling techniques were found to have similar effects on inattentiveness, hyperactivity and impulsivity symptoms reduction. In the case of male and female respondents treated with the positive reinforcement technique, no significant difference was observed in the ADHD symptoms scores. On the other hand, the response cost technique was found to have different effect between male and female respondents, hence the technique is gender sensitive. Recommendations are made which include,* s*ince the two techniques were found to be effective on inattentiveness, hyperactivity and impulsivity symptoms reduction, school counsellors should utilize the technique in their counselling practice either through individual or group counselling.Since the two techniques have no differential effects on inattentiveness, hyperactivity and impulsivity symptoms reduction, teachers and school counsellors should utilize the technique of positive reinforcement in rewarding desired behaviour and the response cost technique in punishing unwanted behaviours displayed by pupils during classroom instruction instead of physical punishment. Also parents training programs should be developed to increase parenting skills. These should focus on increasing parents' skills in managing their children's behaviour, facilitating social skills development, and encouraging parents' positive interaction with their child.*

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Childhood is an important life stage regarding the psychologicalbasis of human development of which ADHD may also occur during this time. According to DSM-IV-TR, 2000 ADHD is oneof the most common childhood behaviour disorders with recorded prevalence estimated rates of 5% of school-age children in the general population. The disorder is characterized by attention problem; motor restlessness and impulsive responding.Abiodum(2007) adjudged the prevalence of ADHD symptoms in Nigeria as 8.7 per cent of school-age children. While Darma (2010) reported the prevalence estimate of ADHD in the study area as 9 to 13 percent, in a classroom of 76-88 pupils, 7-11 were diagnosed as having ADHD.

ADHD has numerous symptoms, although the three most identifiable symptoms are impulsivity, hyperactivity and inattention. Impulsivity (the tendency to act without consideration or judgment), hyperactivity (the tendency to fidget excessively and having a difficulty working quietly) and inattention such as having trouble sustaining and directing attention from class lessons, readings and conversation; having a difficulty completing homework and in class assignments (DuPaul and Stoner, 1994).

Children with symptoms of inattentiveness often begin tasks before directions have been given, talk out of turn, do not show regard for social consequence, and take unnecessary risks. Difficulty maintaining sustained attention often occurs in situations demanding attention to boring, repetitive tasks (Milich, Loney& Landau, 1982). A child with ADHD frequently does not complete assigned work, daydreams, and has difficulty following directions. Hyperactivity can be displayed both motorically and verbally.

These children are frequently described as always on the go, unable to sit still, fidgety, and talkative. Children with ADHD often display great variability in task performance.

On the other hand, impulsivechildren seem unable to curb their immediate reactions or think before they act. They will often blurt out inappropriate answers, display their emotions without restraint, and act without regard for the later consequences of their conduct. Their impulsivity may make it hard for them to wait for things they want or to take their turn in classroom activities and games. Impulsivity causes difficulty in any task requiring a delay: raising hands to answer questions, reading or listening to directions, asking questions to clarify information, planning, and organizing.

Children with ADHD may experience significant functional problems, such as academic underachievement, troublesome interpersonal relationship, and poor self-esteem (Barkley, 1991). In addition, studies have reported as many as 56% of children with ADHD require tutoring, 30% repeat a grade, 30- 49% are placed in special education, 46% have a history that includes suspension from school and 10-35% drop out of school before finishing high school (Barkley, Fischer, Edelbrock & Smallish, 1990; Weiss & Hechtman, 1993). Given the numerous responsibilities assumed by teachers in regular education classrooms, having a student with ADHD symptoms can cause teachers anxiety, as they attempt to meet the needs of all their students. In this regard, teachers spend more time on classroom management; and less time on classroom instructions. Additionally, a substantial number of children diagnosed with ADHD experience difficulties in interpersonal relationships, such as peer rejection, due to their aggressive and boisterous interactions (Landau & Moore, 1991).

Therefore, designing effective, reliable and empirically based classroom interventions is critically important to improve the academic performance and social

development of young children who manifest ADHD characteristics. In this regard, counselling intervention may be one of the ways to assist such children; specifically the positive reinforcement and the response cost counselling techniques wereemployed in this study.

Positive reinforcement was first derived from operant conditioning theory. It is a behaviour management system in which reinforcers are dispensed for a variety of classrooms or school activities. The consequences brought about by a particular behaviour can be pleasant or unpleasant for the individual and others. In other words, it is a concept that determines the increase and frequency of behaviour. Reinforcement may take form of comments of approval, as a smile, money, a handshake, a clap and the like. For example, a teacher may present a gift or a verbal reward to a student for giving the correct answer in the class. The reinforcer should immediately follow a response that increases the future rate and/or probability of the re-occurrence of the response.

Response cost, on the other hand, focuses on a direct action being taken as a result of unacceptable behaviour. This usually costs the pupil something in terms of a punishment, such as the loss of a privilege or withdrawal from certain activities. Under this system, the child is initially provided with a maximum number of points or tokens to be earned during a school day and must work throughout the school day to retain those reinforcers. With the response cost procedure, pupils can lose points for noncompliance with classroom rules. Points are taken away as a consequence for engaging in disruptive behaviors and being non-compliant with teacher requests.

1.2 Statement of the Problem

Primary education is the bedrock upon which later education rely on. Success or otherwise in this particular level significantly affects later education. To fully benefit from the classroom instruction children are expected to fully concentrate on what is going on in the classroom and participate actively without disrupting the classroom activities. Children with ADHD symptoms find it difficult to concentrate in class. They often get into trouble for disrupting the class or not following instructions, thus becoming frustrated as they find concentration impossible.There is no time within a teacher's schedule to really sit down with a child to discover what is wrong with such children. This causesa greater level of stress to teachers.

Experience has shown that in a classroom setting, ADHD pupils have difficulty because of the many distractions.Yet, pupils are told to 'sit still', 'don't talk', 'don't move'; 'pay attention to all the lessons whether it is boring or not', 'keep on the task until the work is done'. None of these things come easily to ADHD pupils, yet every day the parents send them off to school and the teacher awaits them with a pack full of the 'don'ts'. Teachers are concerned why children become restless and too playful when given a task. Many of these signs may be symptoms of ADHD.Unless a proper diagnosis is made, teachers may continue to manage the situation on their own without success.

Most of the measures being taken to reduce ADHD are more of use of drugs and diet/nutrition supplements which involves the use chocolate or substances containing artificial colourings. For parents who are reluctant to use medication, the careful monitoring of their child's diet may help to alleviate some of the symptoms of ADHD. The problem has not been well addressed despite the danger it has on the individual's well being and the society at large. In addition, teachers may not see the situation as a

behavioural problem needing attention; rather they attribute it to lack of proper home training from parents as claimed by teachers. Since teachers attribute this problem to lack of proper home training from parents, counsellors and those in the helping relationship need to employ intervention, which are effective and designed to help pupils to acquire the knowledge, attitude, and skills for functioning more effectively in the school community, at home and in society. One main educational obstacle of ADHD children is how their disruptive classroom behavior can inhibit their ability to learn.

While many behavioral interventions,such as time out, token economy, reinforcement, self-management, response costexist to decrease the inattentive and disruptive behaviors, it would appear that using several techniques in one approach might have greater utility than using a single behavioral intervention strategy.

The present study explored the effects of positive reinforcement and response cost counselling techniques on attention deficit hyperactivity disorder (ADHD) symptoms among primary school pupils in Kano metropolis.

1.3 Objectives of the Study

The study was designed to achieve the following objectives:

1. Determinethe effect ofpositive reinforcement counselling technique on inattentiveness, the hyperactivity and the impulsivity symptoms of the respondents.
2. Find outthe effect ofresponse cost counselling technique on the inattentiveness, hyperactivity and the impulsivity symptoms of the respondents.

3. Find out the differential effect of positive reinforcementand the response costcounselling techniques onthe inattentive, the hyperactive and the impulsive symptoms of the respondents.
4. Find out the differential effect of the positive reinforcement technique on the inattentive, the hyperactive andthe impulsive symptoms ofthe male and the female respondents.
5. Find out the differential effect of the response cost technique on the inattentive, the hyperactive andthe impulsive symptoms ofthe male and the female respondents.
6. Find outthe difference in ADHD pupils treated with positive reinforcement,the response cost and those in thecontrol group.
7. Find out the effect of the positive reinforcement counselling technique on the inattentiveness symptoms of the respondents.
8. Find out the effect of the positive reinforcement counselling technique on the hyperactivity symptoms of the respondents.
9. Find out the effect of the positive reinforcement counselling techniqueon the impulsivity symptoms of the respondents.
10. Find out the effect of the response costcounselling technique onthe inattentiveness symptoms of the respondents.
11. Find out the effect of the response cost counselling technique on the hyperactivity symptoms of the respondents.
12. Find out the effect of the response cost counselling techniqueon the impulsivity symptoms of the respondents.

1.4 Research Questions

The following research questions were answered in this study:

1. What effect would the positive reinforcement counselling technique have on inattentive, hyperactive and impulsive symptoms of the respondents?
2. What is the effect of the response cost counselling techniqueon inattentive, hyperactive and impulsivesymptoms of the respondents?
3. What is the differential effect ofpositive reinforcement and the response cost counselling techniquesonthe inattentive, hyperactive and impulsivesymptoms of the respondents?
4. What is the differential effect ofpositive reinforcement counselling technique on the ADHD symptoms of the male andthe female respondents?
5. What is the differential effect ofresponse cost counselling technique on the ADHD symptoms ofthe male and the female respondents?
6. What is the difference in the post-test scores of ADHD pupils exposed to the positive reinforcement, the response costand the control group?
7. What is the effect ofpositive reinforcement counselling technique on the inattentiveness symptoms of the respondents?
8. What is the effect of positive reinforcement counselling technique onthe hyperactivity symptoms of the respondents?
9. What effect would positive reinforcement counselling technique have on the impulsivity symptoms of the respondents?
10. What is the effect of response cost counselling technique on theinattentiveness symptoms of the respondents?
11. What is the effect of response cost counselling technique on the hyperactivity symptoms of the respondents?

12. What is the effect of response cost counselling technique on the impulsivity symptoms of the respondents?

1.5 Hypotheses

The following hypotheses were formulated and tested at α 0.05 level of significance:

HO_1: There is no significant difference between the pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms of respondents exposed to the positive reinforcement technique and the control group.

HO_2: There is no significant difference between the pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms of respondents exposed to the response cost technique and the control group.

HO_3: There is no significant difference between the post-testinattentiveness, hyperactivity and impulsivity symptomsof the respondents exposed to the positive reinforcementand those in the response cost technique.

HO_4: There is no significant difference between the post-testinattentiveness, hyperactivity and impulsivity symptoms of the male and the female respondents exposed to the positive reinforcementcounselling technique.

HO_5: There is no significant difference between the post-test inattentiveness, hyperactivity and impulsivity symptoms of the male and the female respondents exposed to the response cost counselling technique.

HO_6: There is no significant difference between the post-test inattentiveness, hyperactivity and impulsivity symptoms of the respondents exposed to positive reinforcement,response cost and control group.

HO_7: There is no significant difference between the pre-test and the post-test inattentivenesssymptoms of the respondents exposed to positive reinforcementtechnique.

HO_8: There is no significant difference between pre-test and post-test hyperactivity symptoms of the respondents exposed to positive reinforcement technique.

HO_9: There is no significant difference between pre-test andpost-test impulsivity symptoms ofthe respondents exposed to positive reinforcement technique.

HO_{10}: There is no significant difference between pre-test and post-test inattentiveness symptoms ofthe respondents exposed toresponse cost counselling technique.

HO_{11}: There is no significant difference between pre-test and post-test hyperactivity symptoms of the respondents exposed to response cost technique.

HO_{12}: There is no significant difference between pre-test and post-test impulsivity symptoms ofthe respondents exposed to response cost technique.

1.6 Basic Assumptions

This study was conducted based on the following assumptions:

1. The positive reinforcement counselling technique will have the effect of reducing the symptoms of inattentiveness, hyperactivity and impulsivity of the respondents.
2. The response cost counselling technique will have the effect of reducing the inattentiveness, hyperactivity and impulsivity symptoms of the respondents.
3. Assumed that positive reinforcement would be more effective than response cost counselling technique in reducing inattentiveness, hyperactivity and impulsivity symptoms of the respondents.
4. The positive reinforcement counselling technique will have differential effect on inattentiveness, hyperactivity and impulsivity symptoms of the male and female respondents.
5. The response cost counselling technique will have differential effect on the inattentiveness, hyperactivity and impulsivity symptoms of the male and female respondents.
6. Assumed that the positive reinforcement and the response cost counselling techniques will have differential effect on the inattentiveness, hyperactivity and impulsivity symptomsof the respondents.
7. Assumed that positive reinforcement counselling technique will have the effect of either reducing or increasing the symptoms of inattentiveness.
8. Assumed that positive reinforcement counselling technique will have the effect of either reducing or increasing the symptoms of hyperactivity.
9. Assumed that positive reinforcement counselling technique will have the effect of either reducing or increasing the symptoms of impulsivity.

10. Response cost counselling technique will have the effect of either reducing or increasing the inattentiveness symptoms.
11. Response cost counselling technique will have the effect of either reducing or increasing the hyperactivity symptoms.
12. Response cost counselling technique will have the effect of either reducing or increasing the impulsivity symptoms.

1.7 Significance of the Study

There is a dearth of literature with indigenous authors. The few literature materials found were on behaviour techniques and stimulants medication by foreign authors. With this gap in the literature, the findings of this study will make significant contributions to knowledge especially in the area of educational psychology and counselling by pointing out the effects of positive reinforcement and response cost counselling techniques on inattentiveness, hyperactivityand impulsivitysymptoms among primary school pupils.

The following stand to benefit from the findings of this study: school counsellors, teachers,ADHD pupils, parents and future researchers.

It is hoped that the findings of this study will make a significant contribution to children who exhibits symptoms of ADHD, because the findings will acquaint school counsellors/teacher-counsellors on how to effectively utilize the techniques in assisting ADHD pupilsto reduceinattentive and disruptive behaviours, which invariably enhances academic performance, interpersonal relationship and self- esteem.

In addition the findings could enable teachers gain an insight into teaching/learning strategies when they read about the treatment packages used in this study, therebyfacilitating an effective classroom management instead of physical punishment.Also the study will provide teachers with the knowledge on the symptoms of ADHD pupils.

The study will equally, enrich the available literature on the variables being studied. Thereby making it a source of reference to future researchers who may wish to carry out further studies on attention deficit hyperactivity disorder; it will also motivate them to explore other counselling techniques.

1.8 Scope and Delimitation of the Study

The scope of this study centred on the effects of positive reinforcement and response cost counselling techniques on the behavioural characteristics of ADHD (inattentiveness, hyperactivity and impulsivity) among primary five (5) pupils in Kano metropolis. These set of pupils were used because at this age,the ADHD symptoms were highly manifested and they were not occupied with the preparations for the common entrance examination, as such it is assumed that they will have time to participate fully in the study.

The study is therefore, delimited to primary five (5) pupils of Dorayi, Chiranchi and Rijiyar Zaki primary schools, other behaviour techniques such as time out, token economies,parent behaviour training (PBT) and self management techniques were also delimited from the study.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Introduction

The chapter presents review of related literature on the concept of positive reinforcement and response cost techniques on ADHD. The chapter is presented under the following headings: conceptual framework, theoretical framework, related empirical studies and summary.

2.2 Conceptual Framework

2.2.1 Concept of Reinforcement

Reinforcement is a term in operant conditioning and behaviour analysis referring to the process of increasing the rate or probability of behaviour by the delivery or emergence of a stimulus immediately or shortly after the behaviour called a 'response' is performed. Skinner (1983) defined reinforcement as 'creating situations that a person likes or removing a situation he doesn't like, and punishment as removing a situation that a person likes or setting up one he doesn't like'.

Reinforcement is a behaviour management system in which reinforcers are dispensed for a variety of classroom or school behaviours. The consequences brought about by a particular behaviour can be pleasant or unpleasant for the individual and others. In other words, it is a concept that determines the probability of response and frequency of behaviour. It may take the form of comments of approval, as smile, money, handshakes, clap and the like. This technically is different from every day conversation when the people used the term 'reinforcement' to mean a reward. Usually a reward is something given in return for service, merit or achievement. Sometimes both terms are interchangeable. Therefore, reinforcement is the presence of using a reinforcer to increase the frequency of behaviour (Luka, 2010).

According to Miller (2006), a reinforcer is any event or stimulus that follows behaviour closely in time and increases the frequency of that behaviour. In other words, reinforcement is the procedure of using a reinforcer to increase the rate of behaviour. It is the most important element of most behaviour change. It should be noted that activities, foods, or items that are generally considered pleasant or enjoyable by others may not necessarily be reinforcing. For example, if a child receives a piece of chocolate when he asks for one and the frequency of "chocolate-requesting behavior" increases, the chocolate can be seen as a reinforcer that reinforces "chocolate-requesting behavior." On the other hand, if chocolate-requesting behavior does not increase, the chocolate cannot be considered a reinforcer.

2.2.1a Types of Reinforcement: There are generally two types of reinforcement, positive and negative.

1. Positive Reinforcement

This technique of behavioural management focuses primarily on the promotion of good behaviour, which is positively and consistently reinforced. Castelijns, Geidd and Marsh (1996) suggests that a 'positive' approach is concerned with '…encouraging a child *to do* something rather than on instructing him to *stop doing* something.' Teachers are advised to look out for acceptable behaviour and praise the children when they are conducting themselves in this manner. This form of behaviour modification is viewed as being effective in managing a range of pupils who tend to be disruptive. Given the potential importance of a positive approach for a child with ADHD, this approach will now be examined more closely.

Skinner (1983) maintained that positive reinforcement is superior to punishment in altering behaviour. He states that 'punishment was not simply the opposite of positive reinforcement; positive reinforcement results in lasting behaviour modification,

whereas punishment changes behaviour only temporarily and presents many detrimental effects'. Positive reinforcement refers to an increase in the future frequency of a behavior due to the addition of a stimulus following an event. For example, a cookie is given to a child (the addition of the stimulus) whenever he sits appropriately, and the frequency of the child's sitting appropriately increases. The most common type of positive reinforcement is: praise, token remark, approval and so forth. Generally, anything one does or gives to increase the probability of behaviour is positive reinforcement (Lawal, 2011).

According to Adebayo (2010), positive reinforcement is a contingent presentation of a stimulus immediately following a response that increases the future rate and or probability of re-occurrence of the response. Westwood (1993) appears to advocate positive reinforcement and states that, 'The hyperactive child's on-task behaviour, attention to work, completion of assignments, reduction of disruptive outbursts, all need to be reinforced and rewarded.' It should follow that the child becomes more productive and perhaps able to apply him or herself in a much more efficient way to his or her education. Rewards can be used very successfully to encourage children to continue behaving in an appropriate way. Green and Chee (1997) propose that, 'the secret of behaviour modification is to reinforce with small, frequent rewards.' These rewards may take the form of praise, enthusiasm, stars, stamps, tokens, food or a special privilege.

Generally all children should prosper in a positive environment where encouragement is fostered, but those with ADHD symptoms may already have low self-esteem, will tend to need more encouragement than their peers. This is further endorsed by Holowenko (1999) who states that, 'Children with AD/HD respond well to a caring attitude of their educators and will thrive as a result.' Green and Chee (1997) also

appear to support this nurturing of self-esteem and recommend that we must move the focus from what children cannot do to what they can. Circle time in the classroom may be a means of fostering positive attitudes and respect, not only for themselves but also for other class members.

This positive approach may be perfectly acceptable for most teachers to implement in a classroom but perhaps some struggle with how to cope with unacceptable behaviour when it occurs. Westwood (1993) suggests that misbehaviours should be ignored where possible, or at least played down in importance. Failing this, Westwood recommends that time out or the removal of the child from positive reinforcement has been shown to be effective in reducing hyperactivity.

Positive reinforcement should follow immediately after good behaviour. It should be specific and initially continuous, slowly moving to an intermittent schedule. Material reinforcers provide the child with something tangible. Social reinforcers are more versatile, and, even if material reinforcers are used, a kind word from the teacher should always accompany them. It is also easier to increase behaviour than decrease it. Thus, when choosing target behaviour, it is preferable to focus on behaviours to be increased rather than on those to be decreased.

Westwood (1993) further described the following process of applying positive reinforcement effectively:

1. Select target behaviour to increase, define the behaviour, and choose a reinforcer.
2. Observe the child and watch for the behaviour.
3. Reinforce the target behaviour every time it is exhibited.
4. Comment in a positive way about the behaviour when providing reinforcement.
5. Be enthusiastic -and interested.

6. Offer assistance.
7. Vary the reinforcer.

2. Negative Reinforcement

Shertzer and Stone (1980) defined negative reinforcement as a behaviour that precedes the removal of a stimulus event. Such behaviour has a good chance of occurring under similar conditions in the future. These stimuli are usually painful; unpleasant and include disapproval, criticism and nagging. A negative reinforcer is a noxious stimulus which terminates contingent upon the occurrence of a particular response.

Azrin and Holz (1966) cited in Ahmed, (2013)defined negative reinforcement as a 'reduction of the future probability of a specific response as a result of the immediate delivery stimulus for that purpose'. There are primary and secondary reinforcers, a primary reinforcer is sometimes called an unconditional reinforcer. They are stimuli that are naturally reinforcing to individual, and are necessary for a species survival such as food, water, air, warmth, sleep and sex. While the secondary reinforcer is sometimes called a conditioned reinforcer, they are stimuli that are not naturally reinforcing. Their value has been learned or conditioned. They are also stimulus or situation that has acquired reinforcing power after been associated with a primary reinforcer or an earlier condition reinforcer such as money. Some of the secondary reinforcement is social reinforcers such as attention, praise, token, smiling and so forth. The appropriate application of positive reinforcement has repeatedly been demonstrated to increase both on-task behaviour and work completion as such teachers and counsellors should adopt the use of secondary reinforcer while shaping behaviours.

In a nutshell, negative reinforcement is a process of presenting a stimulus in order to stop unacceptable behaviour. In other word, negative reinforcement can be

described as removal of pleasant situation or presentation of unpleasant situation immediately after an undesired behaviour in order to discourage the re-occurrence of that behaviour in future.

TABLE 1: Model for Reinforcement (IFEED-AV)

Rules	Model for Reinforcement (IFEED-AV rules)
Immediately	I = stand for reinforcing the student immediately. The longer the teacher waits to reinforce a student, the less effective the reinforcer will be. This is particularly true of younger students or students with severe disabilities. For example, reinforce effectiveness is limited if the student has to wait until the end of the week to receive it.
Frequently	F = stands for frequently reinforcing a student. It is especially important to frequently reinforce when a student is learning a new behaviour or skill. If reinforcers are not given frequently enough, the student may not produce enough of a new behaviour for it to become well-established. The standard rule is three or four positive reinforcers for every one negative consequence (including negative verbal comments) that the teacher delivers. If, in the beginning, there is a great deal of inappropriate behaviour to which the teacher must attend, positive reinforcement and recognition of appropriate behaviour must be increased accordingly to maintain the desired three or four positives to each negative. The reinforcer can be a simple social reinforcer such as, "Good job. You finished your math assignment."
Enthusiasm	The first E = stands for enthusiasm in the delivery of the reinforcer. It is easy to simply hand an edible reinforcer to a student; it takes more effort to pair it with an enthusiastic comment. Modulation in the voice and excitement with a congratulatory air convey that the student has done something important. For most teachers, this seems artificial at first. However, with practice, enthusiasm makes the difference between a reinforcer delivered in a drab, uninteresting way and one that indicates that something important has taken place in which the teacher is interested.
Eye Contact	It is also important for the teacher to look the student in the eyes when giving a reinforcer, even if the student is not looking at him or her. Like enthusiasm, eye contact suggests that a student is special and has the teacher's undivided attention. Over time, eye contact may become reinforcing in and of itself.
Describe the Behaviour	D = stands for describing the behaviour that is being reinforced. The younger the student or the more severe the disability, the more important it is to describe the appropriate behavior that is being reinforced. Teachers often assume that students know what it is they are doing right that has resulted in the delivery of reinforcement. However, this is often not the case. The student may not know why reinforcement is being delivered or may think that it is being delivered for some behavior other than what the teacher intended to reinforce. Even if the student does know what behavior is being reinforced, describing it is important. First, describing the behaviour highlights and emphasizes the behavior the teacher wishes to reinforce. Second, if the behavior has several steps, describing it helps to review the specific expectations for the student. An example is, "Wow, you got yourself dressed - look at you! You have your socks on, your shoes are laced, your pants are on with a belt, and your shirt has all the buttons fastened and is tucked in." This is much more effective than saying, "Good job dressing."
Anticipation	Building excitement and anticipation for the earning of a reinforcer can motivate students to do their very best. The more "hype" the teacher uses, the more excited students become to earn the reinforcer. Presenting the potential reinforcer in a mysterious way also builds anticipation.

Rules	Model for Reinforcement (IFEED-AV rules)
Variety	Just like adults, students get tired of the same things. A certain reinforcer may be highly desired, but, after repeated exposure, it loses its effectiveness. It is easy to get caught up in giving students the same old reinforcers time and time again. However, variety is the spice of life for everyone. Generally, when teachers are asked why they do not vary their reinforcers, they indicate that it worked very well once. It is necessary to change reinforcers frequently to make the reinforcement more effective.

Source: Rhode, G., Jenson, W.R., & Reavis, H.K. (1992)

2.2.2 Concept of Response Cost

Response cost, as the name suggests, focuses on a direct action being taken as a result of unacceptable behaviour. This usually costs the pupil something in terms of a punishment, such as the loss of a privilege or withdrawal from certain activities. Curtis and Patel (2008) suggest that as opposed to being viewed as a punishment the consequence should be logical and related to the misbehaviour. It should imply no element of moral judgement, be concerned with future behaviour and permit choice. McNamara (1999) advises that the consequence should have been decided at an earlier stage with the pupil and administered as a specific result of certain behaviour. He continues to suggest that warning cues, private reprimands, public reprimands or time out can be utilised effectively to deal with unacceptable behaviour. Care must be exercised when each method is employed, especially when a public reprimand is administered.

Abramawitz and O'Leary(1991) reported thatsome negative consequences, such as reprimands, are importantin managing certain behaviors such as the off-task behaviour exhibited by many individuals with ADHD. One intervention thatinvolves punishment, or consequences that reduce the future probabilityof a behavior, is response cost. In this procedure, predeterminedamounts of reinforcers are withdrawn each time a specifiedinappropriate behavior occurs. There are many ways teachersapply response costs. Bender and Mathes (1995) report one inwhich a teacher listed the numbers 20 to 1, indicating the amountof time allocated for break. Every time a child

blurted out an answer,the targeted behavior, the teacher crossed out the highestnumber. If, for example, a student blurted out five times during apredetermined period of time, she or he would have fifteen minutesfor break instead of the full twenty minutes.

Response cost, which combines positive reinforcement (earning tokens that can be exchanged for privileges or rewards) and punishment (deducting tokens for undesirable behavior), can increase on-task behavior and work completion. Response cost is a punishing technique that translates to the equivalent of losing what you possess or have earned. Earned consequences are considered reinforcers. When they are lost, this is response cost. Under this system, the child is initially provided with a maximum number of points or tokens to be earned during a school day and must work throughout the school day to retain those reinforcers. With the response cost procedure, students can lose points for noncompliance with classroom rules. Points are taken away as a consequence for engaging in disruptive behaviors and being non-compliant with teacher requests. The child loses what he/she has earned as a result of inappropriate behaviour, it is often used to reduce off-task behaviour and improve compliance with directions.

A response cost system can be as simple as chips in a cup, marks on a chart, or marbles in a jar. A more complex means of managing response cost includes electronic devices such as the Attention Training System (Rapport, 1987). The Attention Training System is a remote-controlled counter that sits on the student's desk. This device provides the student with a digital readout showing the number of points he or she has earned. Using a remote control device, points can be added or removed from anywhere in the classroom, contingent on the child's on- and off-task behaviour. By not having to move within physical proximity of the child, the teacher avoids becoming a negative reinforce when the child is off task. DuPaul, Guevremont, and Barkley (1992) demonstrated the efficacy of response cost contingencies for managing classroom

behaviour and academic productivity using the Attention Training System. Response cost contingencies led to marked improvements on task-related attention and a reduction in ADHD symptoms during work time.

Response cost combines rewards for positive behaviour and a loss of a privilege for a negative behaviour. There are research evidences that response cost decreases ADHD symptoms (Brock, 2002, Cathleen-DuPual et. al. 1996, Bender & Mathes, 1995). Response cost provides mild negative consequences when problem behaviour is displayed. For example, a child may lose earned points or privileges when previously specified rules are broken. This technique involves giving a specific number of points at the start of each day, when a rule is broken (a problem behaviour is displayed), points are taken away. Thus, to maintain their points, avoidance of breaking or displaying unwanted behaviour must be maintained so that at the end of the period or day, students are typically allowed to exchange the points they earned for a tangible reward or privilege.

With the response cost procedure, students can lose points for noncompliance with classroom rules. Points are taken away as a consequence for engaging in disruptive behaviors and being non-compliant with teacher requests.The response cost technique requires the teacher to remove tokens, points, or privileges due to inappropriate behavior. This technique often coincides with an opportunity to gain privileges, points, or tokens; therefore, teachers may feel that a response cost technique provides a balanced approach to managing behavior. Furthermore, as previously mentioned for token economy techniques, response cost techniques may also be employed in a class wide format. Although only speculation, teachers may prefer this strategy in an effort to avoid singling out a particular child. However, research has demonstrated that teachers prefer positive treatments over negative treatments (e.g. Power et al., 1995). One reason

for this could be that teachers often find that a student's initial response to the removal of privileges, points, or tokens may intensify negative behavior and create additional conflicts between the teacher and child. In addition, if the choice were made to establish a response cost program for the entire class, it would likely increase additional time and effort for the teacher.

Response cost technique can be used for a wide variety of misbehaviours and situations. The item taken away does not always have to be money. It could be points, recess, tokens or snacks. When working with ADHD children, keep the rewards happening often. Too many response cost programs fail because the child had to wait too long to become rewarded. Expecting an ADHD child to wait a week before they can spend the money or obtain the reward is not likely to succeed. Below are some steps to increase the success of a response cost behavioural intervention (Brock, 2002).

1. Clearly define what behaviour you wish to extinguish or terminate. Measure how often the behaviour occurs and when it occurs. This is your baseline rate, usually when you start an intervention this rate will decrease, then increase and finally decrease. If the intervention is effective, within a few months the behaviour should occur much less frequent than this measure.
2. Determine what to use as the penalty and how much of the penalty to take away. The amount of money should be a reasonable amount based on your income and the child's normal expectations for 'spending money'. For example, some families have children who feel N200 a day is much money. On the other hand, some families have children who can easily spend N1000 a day in spending money. For example, let us use a family whose children do not spend much. If the base line rate is 3 times a day and the penalty is 25 per cents then the amount of money in the jar should be N200. If the base line is seven times per day and you

did not want to spend more than one hundred, then the penalty could be a N20 per offense. For baseline rates of 12-17, then N50 per offense would be appropriate.

3. If using money, give the child the day's money. If you are using snacks, have one day before implementing the response cost, where you allow the child to obtain all the snacks. This helps the child realize what he can achieve having a day where he is able to control his behaviours. Remember that each day starts off new. Many response cost programs have failed because the child was expected to wait a week to get the reinforcer. Short time periods to wait for the reinforcement are best for children with ADHD.
4. Put tomorrow's rewards in plain sight of family members. If using money as a reward, the child should at any time be able to look and see how much money is left in the jar. The jar serves as a constant reminder to the ADHD child of the intervention. You can even label the jar 'being nice to sister' or some other positive label.
5. Explain how the program works to your child. Make sure he can repeat back to you what the program is all about.
6. Be fair and consistent. If using money for the response cost system, do not buy your child things he/she could use the spending money for. Do not overspend on the other children. If another sibling is doing the same kind of behaviour, they must receive an appropriate consequence (e.g., time-out). Every morning give your child the contents of the jar, then refill the jar.
7. Make sure that everyone is clear as to what is and what is not behaviours that will cause money to be taken.

8. When the amount of problem behaviours exceed the amount of money in the jar (or other reward), simply give another consequence (e.g., time-out). This will send the message that the problem behaviour will not be tolerated.
9. When money or other reward is given to the child, give positive praise. Let them know that you appreciate their effort to change.

Duhaney, (2003) cited in Bender and Mathes, (1995) also stressed that teachers need to ask themselves some questions before using response cost technique in their classes:

1. Have I made every effort to use positive procedures to manage student's behaviour?
2. Am I generally positive toward students, giving very frequent praise and other forms of positive attention to them when their behaviour is appropriate?
3. Am I able to administer punishment without a display of anger, and without nagging threats, demoralizing or trying to induce guilt by shaming the student?
4. Is the punishment immediate, fair and consistent?
5. Does the punishment quickly produce behavioural change?
6. Have I communicated my punishment procedures to all concerned parties?

Answers to the above questions, will then pave way for teachers to pay their students for good behaviour either the whole classes, individuals staying on-task or cooperative work such as group assignment. Students who did not complete homework, getting out of seats or off-task behaviour can be punish through response cost.

If you are consistent, response cost can be a very effective technique for stopping inappropriate behaviours. After a month of 90% compliance, then you can begin to fade out the reward system. Make sure you continue with verbal praise when the child behaves appropriately. In time, your child may revert back to old behaviour

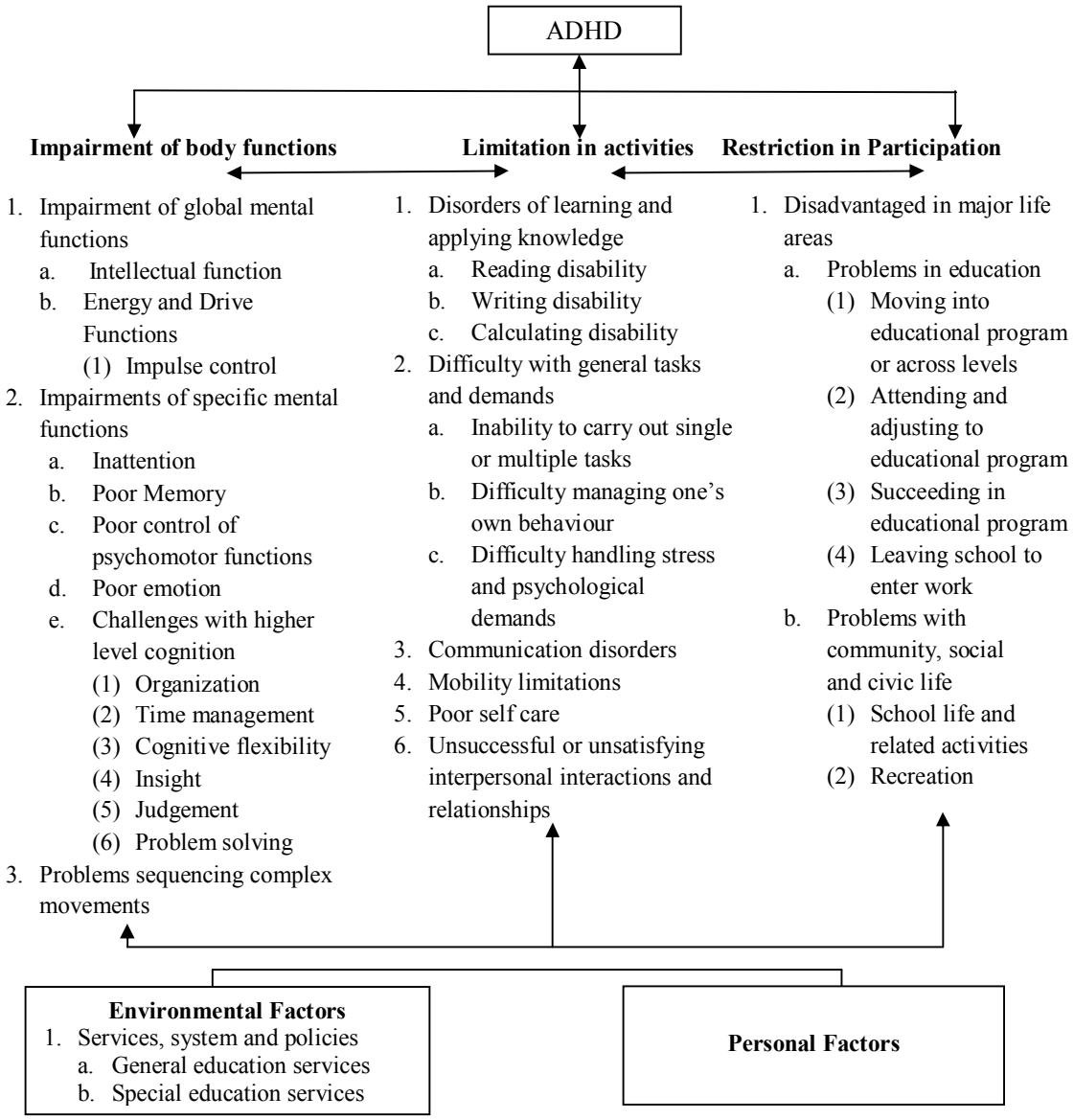
patterns. If this happens, use your normal methods of disciplining do not correct the problem, you may need to start the response cost system again. It should not take as long the second time as it did the first time of the response cost intervention.

2.2.3 Concept of ADHD

The study used the International Classification of Functioning and Disability (ICF) as the conceptualframework for describing the functional problems associatedwith ADHD. The World Health Organizationdeveloped the ICF to provide a systematic and comprehensiveframework and common language for describingand assessing functional implications of health conditions,regardless of the specific disease or disorder. Useof this model facilitates comparisons of ADHD-relatedstates across conditions, studies, interventions, populations, and countries.

In the underlying ICF conceptual framework, ADHD conditions impact function at 3 mutually interactinglevels of analysis (Figure 1): body functions andstructures, activities of daily living, and social participation.Problems of body functions and structures arecalled impairments, a more specific and narrow meaningfor the term than that used in DSM-IV. Problems ofactivities of daily living are called limitations. Problems ofsocial participation are called restrictions. Environmentaland personal factors can also affect functioning.Treatments may address the ADHD conditions directly,may be aimed at one or more domains within the levelsof functioning, or may be designed to change theenvironment.

Figure 1: International Classification of Functioning Disability & Health (ICF) Model



Behavioural symptoms may appear to be innocent and merely annoying; however, if left untreated, the persistent and pervasive effects of ADHD can severely interfere with a person's ability to get the most out of education or the workplace. Secondary effects, such as poor motivation and low self-esteem, are at times inappropriately dealt with by professionals and families. The behavioural criteria for diagnosing ADHD fall into three categories – inattention, hyperactivity and impulsivity (Cooper and Bilton, 1996).According to the fourth and current edition of the DSM (DSM-IV), AttentionDeficit/Hyperactivity Disorder is a disorder characterized by a

"persistent pattern ofinattention and/or hyperactivity-impulsivity that is more frequent and severe than istypically observed in individuals at a comparable level of development" (APA, 1994).

ADHD is a highly debilitating condition, and misunderstanding of this can lead to negative personal and social outcomes for the person affected. The majority of professionals now accept that ADHD is a complex but genuine condition, which may cause a child to underachieve at school and display unpredictable challenging behaviours. It is not a result of bad parenting, and parents should be encouraged not to feel guilty (Train, 2004).

Cooper and Bilton (1996) viewed ADHD as a neurobehavioral, developmental disorder with associated cognitive difficulties, and is primarily characterised by the co-existence of chronic inattentiveness and hyperactivity. It is considered to be the result of a neurological dysfunction which causes a deficiency in neuromotor transmitters in the brain cells. Genetics research also indicates that ADHD may be a result of abnormalities to the dopamine system, which is concerned with the regulation of movement (Hughes and Cooper, 2007).

Scheres (2001) states that, ‘ADHD is a manifestation of an underlying self-regulatory defect.’ Douglas (1999) as cited in Scheres (2001) defines this as ‘a failure to allocate adequate effort to meet task demands.’ Different subtypes of ADHD have also recently been defined and perhaps this caters more adequately for people who display different characteristics of the condition.

Attention deficit hyperactivity disorder (ADHD) is characterized by inattention, hyperactivity, impulsivity, and cognitive, behavioural, and emotional deficits. ADHD is also closely related to learning disabilities, lack of self-control, and social skill deficits (Morris and Corner, 1987). Approximately half of ADHD children

show overt symptoms by the time they are 5 years old, and most begin to display behavioural problems during the early school years when they have to follow instructions from teachers and obey school rules. ADHD children are reported to have difficulty with self-control both at home and in school, to have a tendency to show aggressive behaviours, to suffer from low self-esteem, to have frequent fights with peers, to experience isolation in social situations, to display problems with underachievement, and to have learning disabilities (Barkley 1997; Silver, 1992).

2.2.3a. Types of ADHD

DSM-IV identifies the essential feature of Attention-Deficit/ Hyperactivity Disorder 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. Some hyperactive-impulsive or inattentive symptoms that cause impairment must have been present before age 7 years, although many individuals are diagnosed after the symptoms have been present for a number of years. Some impairment from the symptoms must be present in at least two settings (e.g., at home and at school or work). There must be clear evidence of interference with developmentally appropriate social, academic, or occupational functioning.

Children with ADHD symptoms may show several signs of beingconsistently inattentive. They may have a pattern of beinghyperactive and impulsive far more than others of their age.Or they may show all the three types of behaviour. This meansthat there are three subtypes of ADHD recognized byprofessionals. These are the **predominantly inattentive type, hyperactive or impulsivetype.**

2.2.3i Inattentive Type

Problems in attention may be conceptualized into three aspects: (a) sustained, (b) divided, and (c) alternating (Resnick, 2000). Sustained attention is the ability to maintain focus over time. Divided attention refers to attending to the competing but relevant stimuli, such as simultaneously driving and listening to the Radio. The third aspect of attention is Shifting attention. For example, if a person hears an ambulance siren while driving, instead of continuing to divide his attention between the highway and the radio, he/she fully shifts attention to the road, searching for the ambulance. Individuals with ADHD may continuously be shifting or altering attention when sustained attention is needed. Individuals with ADHD often do not pay close attention to details; they may make careless mistakes in work, schoolwork, or other activities. Children have difficulty maintaining attention on tasks or play activities. They may not seem to listen, even when spoken to directly. They are easily distracted; often forgetful in daily activities; and often lose things, such as their pens pencils needed for tasks and activities.

Children diagnosed with the Predominantly Inattentive Type of ADHD have significant problems paying attention. They appear to be daydreaming, "spacey," easily confused, slow moving and lethargic. They may have difficulty processing information as quickly and accurately as other children. DSM-IV provided the following as indicators of inattention:

a) Inattention appearing not to listen when spoken to
b) Being easily distracted by extraneous stimuli
c) Having difficulty in organising tasks and activities
d) Frequent forgetfulness
e) Often avoiding or being reluctant to engage in tasks
f) Making careless mistakes in work and other activities

Fundamentally, children who are attention deficit have difficulties in sustaining attention when engaging with educational and other activities (Hughes and Cooper, 2007). It may manifest in academic, occupational, or social situations. Children with this disorder may fail to give close attention to details or may make careless mistakes in schoolwork or other tasks. Work is often messy and performed carelessly and without considered thought. Individuals often have difficulty sustaining attention in tasks or play activities and find it hard to persist with tasks until completion. They often appear as if their mind is elsewhere or as if they are not listening or did not hear what has just been said. There may be frequent shifts from one uncompleted activity to another. Individuals diagnosed with this disorder may begin a task, move on to another, and then turn to yet something else prior to completing any one task. They often do not follow through on requests or instructions and fail to complete schoolwork, chores, or other duties. Failure to complete tasks should be considered in making this diagnosis only if it is due to inattention as opposed to other possible reasons (e.g. a failure to understand instructions).

They often have difficulties organizing tasks and activities. Tasks that require sustained mental effort are experienced as unpleasant and markedly aversive. As a result, these individuals typically avoid or have a strong dislike for activities that demand sustained self-application and mental effort or that requires organizational demands or close concentration (e.g. homework or paperwork). This avoidance must be due to the person's difficulties with attention and not due to a primary oppositional attitude, although secondary oppositionalism may also occur. Work habits are often disorganized and the materials necessary for doing the task are often scattered, lost, or carelessly handled and damaged.

Children with this disorder are easily distracted by irrelevant stimuli and frequently interrupt ongoing tasks to attend to trivial noises or events that are usually and easily ignored by others (e.g. a car honking, a background conversation). They are forgetful in daily activities (e.g. missing appointments, forgetting to bring lunch). In social situations, inattention may be expressed as frequent shifts in conversation, not listening to others, not keeping one's mind on conversations, and not following details or rules ofgames or activities.

In addition they have a hard time keeping their minds on any one thing and may get bored with a task after only a few minutes. If they are doing something they really enjoy, they have no trouble paying attention. But focusing deliberate, conscious attention to organizing and completing a task or learning something new is difficult. Homework is particularly hard for these children. They will forget to write down an assignment, or leave it at school. They will forget to bring a book home, or bring the wrong one. The homework, if finally finished, is full of errors and erasures. Homework is often accompanied by frustration for both parent and child.

When the teacher gives oral or even written instructions, this child has a hard time understanding what he or she is supposed to do and makes frequent mistakes. Yet the child may sit quietly, unobtrusively, and even appear to be working but not fully attending to or understanding the task and the instructions.

2.2.3ii Hyperactive Type

Chess, (1960) cited in Cosser (2005) defined hyperactivity as follows: The hyperactive child is one who carries out activities at a higher than normal rate of speed than the average child, or who is constantly in motion, or both. Chess's article was historically significant because: (1) it emphasized activity as the defining feature of the disorder, as other scientists of the time would also do, (2) it stressed the need to

consider objective evidence of the symptom beyond the subjective reports of parents or teachers, (3) it took the blame for the child's problems away from the parents; and (4) it separated the syndrome of hyperactivity from the concept of a brain-damaged syndrome. It would now be recognized that hyperactivity was a behaviour syndrome that could arise from organic pathology; but also occur in its absence. Even so, it would continue to be viewed as a result of some biological difficulty, rather than solely due to environmental causes.

Also noteworthy in this era (1960-1969) was the definition of hyperactivity given in the 2nd edition of DSM-II. It employed only a single sentence describing the disorder and, following the lead of Chess (19600, stressed the view that the disorder was developmentally benign: 'the disorder is characterized by over-activity, restlessness, distractibility and short attention span, especially in young children, the behaviour usually diminishes by adolescence (APA, 1968).

Hyperactive child tend to exhibits a rapid movement of high intensity and high frequency, high levels of excitement and strong emotional reactions. Indicators of hyperactivity include:

a) Excessive fidgeting with hands or feet
b) Climbing or running excessively
c) Talking excessively
d) Difficulty remaining in a seated position.

Hyperactivity may be manifested by fidgetiness or squirming in one's seat, by not remaining seated when expected to do so, by excessive running or climbing in situations where it is inappropriate, by having difficulty playing or engaging quietly in leisure activities, by appearing to be often "on the go" or as if "driven by a motor," or by talking excessively. They fidget with objects, tap their hands, and shake their feet or

legs excessively. They often get up from the table during meals, while watching television, or while doing homework; they talk excessively; and they make excessive noise during quiet activities. Hyperactive child may experience serious social difficulties, social isolation especially from their peers, and be susceptible to school exclusion (Cooper and Bilton, 1996).

2.2.3iii Impulsive Type

Impulsivity is a neurological predisposition which makes self-regulation difficult. The person with impulsivity may have difficulty in controlling their behavioural response to a given stimulus (Hughes and Cooper, 2007).They will typically act without reflection or anticipation of consequences (Cooper and Bilton, 1996). In the classroom, this impatience can often be displayed as blurting out answers before the end of a question or when the question is directed towards another student, instead of raising a hand and waiting as instructed. Some pupils may also appear rude and antisocial as they are careless in what they say to others, speaking without thought and paying little attention to social norms (Hughes and Cooper, 2007).

Children with ADHDoften have a low level of frustration tolerance and cannot delay gratification. They may act impulsively and in the moment without thinking. They may make important decisions without adequate information about or reflection on the consequences of their actions. They may have difficulty waiting their turn and with inhibiting emotional reactions to others, such as blurting out answers, interrupting others, or saying tactless things. They often cannot seem to stop behaviours such as touching thing and people. Situations and games that require sharing, cooperation, and restraint with peers are particularly difficult. They have difficulty exercising impulse control. They may be able to explain great deal detail what they should have done and may be the first to point out when another child has not followed the rules. ADHD is a

matter of not knowing what to do but of not being able to inhibit oneself. Children with ADHD often take risks and may be accident prone, for example, they may run our from between cars without looking. Accidental poising and burring are common to this group of children.

Impulsivechildren seem unable to curb their immediate reactions or think before they act. They will often blurt out inappropriate comments, display their emotions without restraint, and act without regard for the later consequences of their conduct. Their impulsivity may make it hard for them to wait for things they want or to take their turn in games. They may grab a toy from another child or hit when they're upset. Even as teenagers or adults, they may impulsively choose to do things that have an immediate but small payoff rather than engage in activities that may take more effort yet provide much greater but delayed reward.

Impulsivity manifests itself as impatience, difficulty in delayingresponses, blurting out answers before questions have been completed,difficulty awaiting one's turn, and frequently interrupting or intruding onothers to the point of causing difficulties in social, academic, or occupationalsettings. Others may complain that they cannot get a word in edgewise.

Children whoare impulsive typically make comments out of turn, fail tolisten to directions, initiate conversations at inappropriate times, interruptothers excessively, intrude on others, grab objects from others, touch thingsthey are not supposed to touch, and clown around. Impulsivity may lead toaccidents (e.g., knocking over objects, banging into people, grabbing a hotpan) and to engagement in potentially dangerous activities withoutconsideration of possible consequences (e.g., riding a skateboard overextremely rough terrain).

2.2.3b Diagnosis/Symptoms of ADHD

Diagnosis is defined by Barkley (1995) as the determining of a disease or disorder on the basis of the observed symptoms. Symptom is described as any sign or indication of the presence of a disease or psychic disorder. The criteria set forth by the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV TR), is used as the standardized clinical definition to determine the presence of ADHD. A person must exhibit several characteristics to be clinically diagnosed as having ADHD:

The DSM-IV criteria break down symptoms into two groups: inattentive andhyperactive-impulsive. Six of the nine symptoms in each section must be present fora 'combined type' diagnosis of ADHD. If there are insufficient symptoms for acombined diagnosis then predominantly inattentive (ADHD-I) and hyperactive(ADHD-H) diagnoses are available. Additionally, symptoms must be: chronic (present for 6 months), maladaptive, functionally impairing across two or more contexts,inconsistent with developmental level and differentiated from other mental disorders. To be diagnosed as having symptoms of ADHD, the following are things to consider:

Severity: The behaviour in question must occur more frequently in the child than in other children at the same developmental stage.

Early onset: At least some of the symptoms must have been present prior to age 7.

Duration: The symptoms must also have been present for at least 6 months prior to the evaluation.

Impact: The symptoms must have a negative impact on the child's academic or social life. **Settings:** The symptoms must be present in multiple settings. For example, the combination of inattention and hyperactivity should be presentboth at home and at

school, or at both school and another setting where childrenare observed, such as a clinic.

The specific DSM-IV criteria are set forth in the following. **DSM-IV Criteria for Attention Deficit/Hyperactivity Disorder**

A**.** According to the DSM-IV, a person with attention deficit hyperactivity disorder must have either (1) or (2):

Symptoms of Inattention: Six or more of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

i. Fails to give close attention to details or makes careless mistakes in school work or other activities

ii. Has difficulty sustaining attention in tasks or play activities

iii. Does not seem to listen when spoken to directly

iv. Does not follow through on instructions and fails to finish school work, chores, or duties in the workplace (not due to oppositional behaviour or failure to understand instructions)

v. Has difficulty organizing tasks and activities

vi. Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)

vii. Loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)

viii. Easily distracted by extraneous stimuli

ix. Forgetful in daily activities

Symptoms of Hyperactivity-Impulsivity: Six or more of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity

i. Fidgets with hands or feet or squirms in seat

ii. Leaves seat in classroom or in other situations in which remaining seated is expected

iii. Runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults may be limited to subjective feelings of restlessness)

iv. Has difficulty playing or engaging in leisure activities quietly

v. Often "on the go" or often acts as if `driven` by a motor

vi. Talks excessively

Impulsivity

i. Blurts out answers before questions have been completed

ii. Has difficulty awaiting turn

iii. Interrupts or intrudes on others (e.g. butt into conversations or games)

Three types of diagnostic categories emerged as follows:

1. Attention-deficit/hyperactivity disorder, combined type: if both Criteria A_1 and A_2 are met for the past 6 months
2. Attention-deficit/hyperactivity disorder, predominantly inattentive type: if Criterion A_1 is met but Criterion A_2 is not met for the past 6 months
3. Attention-deficit/hyperactivity disorder, predominantly hyperactive-impulsive type: if Criterion A_2 is met but Criterion A_1 is not met for the past 6 months.

(APA, 1994) has identified that parents and teachers are the ones who seek help for about 20% of children population diagnosed and exhibit the problems of ADHD. There are no reliable laboratory tests that can accurately diagnose the symptoms nor is there blood test for ADHD. For a pupil to be diagnosed as having ADHD inattention type the child most manifest six (6) out of the nine (9) symptoms stated above in at least two settings preferably at home and at school. Pupils who manifest these symptoms will basically not be able to complete a given task without making what appear to be silly mistakes because s/he did not pay attention to the instructions. Such pupils are likely to lose materials such as pencils, books erasers that are meant for a particular task. Irrelevant things often distract a pupil that has ADHD inattention type because of these distractions s/he cannot complete a given task. They carry these behavioural problems into the school. While in school, they equally pose problems to their teachers and peers. They lack self-control and are, sometimes aggressive, with their attention span being very short. ADHD pupils in school need to pay attention to the right thing, at the right time until they are finished.

Similarly, Barkley (1995) believes that, 'ADHD involves impairment in the ability of the individual to inhibit responses to situations or events.' He considers people with ADHD to have a problem with self-control and as a result suggests that a more appropriate label for the condition is the term Developmental Disorder of Self-Control (DDSC). This emerged from new research that suggested that the front part of the brain is not as active in those who have ADHD. He suggests that this frontal part of the brain is directly related to the ability to inhibit our behaviour and it gives us our powers of self-control. As a result this will contradict the view that a person's upbringing or environment is largely responsible for their potential to display control.

The principle characteristics of ADHD are **inattention**, **hyperactivity**, and **impulsivity**. These symptoms appear early in a child's life. Because many normal children may have these symptoms, but at a low level, or the symptoms may be caused by another disorder, it is important that the child receive a thorough examination and appropriate diagnosis by a well qualified professional. Symptoms of ADHD will appear over the course of many months, often with the symptoms of impulsiveness and hyperactivity preceding those of inattention that may not emerge for a year or more. Different symptoms may appear in different settings, depending on the demands the situation may pose for the child's self-control. A child who "can't sit still" or is otherwise disruptive will be noticeable in school, but the inattentive daydreamer may be overlooked. The impulsive child who acts before thinking may be considered just a "discipline problem," while the child who is passive or sluggish may be viewed as merely unmotivated. Yet both may have different types of ADHD. All children are sometimes restless, sometimes act without thinking, and sometimes daydream the time away. When the child's hyperactivity, distractibility, poor concentration, or impulsivity begin to affect performance in school, social relationships with other children, or behaviour at home, ADHD may be suspected. But because the symptoms vary so much across settings, ADHD is not easy to diagnose. This is especially true when inattentiveness is the primary symptom.

Children with ADHD consistently show various degrees of inattention, hyperactivity, and impulsiveness. *Inattention* means that people with ADHD have difficulty keeping their minds on one thing. They may get bored with homework or other tasks after a few minutes, make careless mistakes, have trouble listening, and seem to daydream. However, children with ADHD sometimes can concentrate on and complete new or unusually interesting tasks. *Hyperactivity* involves almost constant

motion, as if driven by a motor. Children may squirm and fidget at their desks in school, get up often to roam around the room, constantly touch things, disturb other people, tap pencils, and talk constantly. ADHD also makes children unusually *impulsive,* so that they act before thinking. They may run into the street without looking, blurt out inappropriate comments in class, interrupt conversations, and be unusually clumsy or accident-prone.

Children with ADHD often have severe learning problems because of their difficulties in paying attention, following instructions, and completing tasks. In addition, their disruptive, demanding behavior makes them unpopular with peers. Children with ADHD often receive constant criticism and correction from teachers and parents, who believe the behavior, is intentional. The combination of negative feedback, poor academic achievement, and social problems may contribute to low self-esteem and other emotional problems. The primary characteristics of ADHD and the specific criteria for diagnosis of ADHD are listed in the Diagnostic and Statistical Manual of Mental Disorders (2000).

Barkley (1998) classified the symptoms of ADHD often found in children as follows:

a) Academically: They tend to be underachievers for intelligence and show some specific learning disabilities.
b) Behaviorally:They have short attention span, easily distracted, restlessness, poor impulsive control and destructiveness.
c) Socially:They have poor peer relations, noncompliance to command, very aggressive, belligerent and disrespectful to language, poor self-control/high risk taking, poor social problem solving skills and immature self-speech.
d) Cognitive aspect: They are inattention and distractible.

e) Emotionally: ADHD child show depression, excitability, immature emotional control, excessive frustration.

2.2.3c Causes of ADHD

ADHD has traditionally been viewed as a problem related to attention, stemming from an inability of the brain to filter competing sensory inputs such as sight and sound. Recent research, however, has shown that children with ADHD do not have difficulty in that area. Instead, researchers now believe that children with ADHD are unable to inhibit their impulsive motor responses to such input (Barkley, 1998).

It is still unclear what the direct and immediate causes of ADHD are. Most researchers suspect that the cause of ADHD is genetic or biological, although they acknowledge that the child's environment helps determine specific behaviours. There is often a family history of ADHD, supporting a role for genetic predisposition. Many theories exist, and ADHD is possibly thought to be a disorder of central behavioral disinhibition, or a poor adaptation to environment. Some research supports the role of the basal ganglia and prefrontal lobes in ADHD. Interestingly, ADHD is often associated with co-morbid conditions. For example, the inattentive type is associated with academic, cognitive and emotional problems; while the hyperactive/impulsive subtype is associated with aggression, conduct disorder and oppositional defiant disorder. Studies of co-morbid conditions with ADHD demonstrate a rate of about 35% for ODD, 26 % for conduct disorder, and 18 % for depressive disorders. Additionally, learning disabilities are frequently seen in children with ADHD (Barkley, 1995).

There has been much speculation and debate on the actual causes of ADHD; Scientists do not know what causes ADHD. However, they have discredited many theories that once were widely accepted. One theory contended that ADHD resulted from minor head injuries or undetectable brain damage due to infections or

complications during birth. Experts called ADHD “minimal brain damage” and “minimal brain dysfunction” when this theory was popular in the early 1970s. Another theory linked ADHD with consumption of refined sugar and food additives. Scientists questioned this theory when studies showed that few children with ADHD benefited from diets restricting sugar and food colorings. Most experts also reject the idea that poor parenting or a dysfunctional home environment causes ADHD. The following have been supported by literature as the causes of ADHD:

Genetic Influences

Attention deficit hyperactivity disorder in an early onset, clinically heterogeneous disorder of inattention, hyperactivity and impulsivity. ADHD is genetically transmitted highly heritable cluster of traits symptoms that can be described as extremes of normal behaviour. It was found that ADHD symptomatology is highly heritable and influenced by genetic effects. Molecular Genetics studies on the causes of ADHD have identified the dopamine (DA) neurotransmitters including the DAD2, DAD4, DAD5 receptor gene and DA transporter gene which are mainly responsible for ADHD disorder, Nadder(1998). Burgoes(2002) studied the linkage analysis in genetic of ADHD disorder, the study involved 27 multi generations pair families from Antioquia, Colombia. The result found that ADHD is genetically heterogeneous and different functions of age-dependent penetrance.

Similarly, twin studies suggest thataround 75% of the variation in ADHD symptoms in the population is because ofgenetic factors (heritability estimate of 0.7 to 0.8) (Faraone et. al., 2005). The geneticinfluences appear to affect the distribution of ADHD symptoms across the wholepopulation and not just in a clinically defined sub-group. No single gene of largeeffect has been identified in ADHD; rather several DNA

variants of small effect –each increasing the susceptibility of ADHD by a small amount – have been associated.

Steffensson(1999) investigated the genetic disposition for global maturity on ADHD symptoms. A total of 1480 pairs of twins aged 8-9 years were identified through the population based Swedish twin registry. The result showed that global maturity mediated part of genetic effects for ADHD for both boys and girls. There were also genetic, shared environmental, as well as non-shared environmental effects uniquely to ADHD not in common with global maturity. Mc-Loughlin (2007) examined the genetic overlap between the inattentive and hyperactive/impulsivity components. The sample included parents of 6,222 approximately 8 years old twin pairs from the Twin Early Developmental Study (TEDS). They found that ADHD is highly heritable disorder. Bivariate genetic modelling indicated substantial genetic overlap between the two components, many gene associated with hyperactivity/impulsivity dimension will also be associated with inattention but that there is significant genetic heterogenetic.

Silberg(1996) adjudged the genetic and environmental influence on ADHD. The sample includes 262 male-female twin pairs, aged 8-16 years who participated in the Virginia, Twin Study of Adolescent Behavioural Development (VTSABD). The additive genetic influence and contrast effects were found for hyperactivity children. He reckoned the linkage of tandem duplication polymorphism up stream of the dopamine D4 receptor gene (DRD4) with attention deficit hyperactivity disorder (ADHD). The sample included 371 children with ADHD and their parents using the transmission disequilibrium test (TDT). Results featured significant preferential transmission of the 240 –bp (long) allele with ADHD. Research into the cause of ADHD has continued to indicate some substantial genetic contributions. This data supports the conclusion that

these may be same familial transmission involved in the cause of ADHD. Heritability estimates range from 60 to 80 percent.

Biological Factors

A range of factors that adversely affect brain development during prenatal life andearly childhood are associated with an increase in the risk of ADHD or attentiondeficit disorder without hyperactivity. These include maternal smoking (Linnet et al.,2003), alcohol consumption (Mick, 2002) and heroin during pregnancy (Ornoy, 2001),very low birth weight (Botting, 1997) and fetal hypoxia, braininjury, exposure to toxins such as interact with one another. For example, therisk of ADHD associated with maternal alcohol consumption in pregnancy may bestronger in those children with a dopamine transporter (DAT) susceptibility gene(Brookes, 2006). Further research is required to confirm whether these act asdirect risks for ADHD.

There is increased risk of ADHD symptoms in epilepsy and of ADHD in geneticconditions such as neurofibromatosis type 1, and syndromessuch as Angelman, Prader-Willi, Smith Magenis, velocardiofacial and fragile X(Hagerman, 1999). Secondary ADHD may follow traumatic brain injury (Gerring, 1998).

Psychosocial Factors

ADHD has been associated with severe early psychosocial adversity, for instance, inchildren who have survived depriving institutional care (Roy, 2000). The mechanismsare not known but may include a failure to acquire cognitive and emotionalcontrol.Disrupted and discordant relationships are more common in the families of youngpeople with ADHD (Biederman, 1992). Discordant family relationships,however, may be as much a consequence of living with a child with ADHD as a riskfor the disorder itself. In established ADHD, discordant relationships with a harshparenting style are a risk factor for developing oppositional and conduct

problems.Parental hostility and criticism can be reduced in children where ADHD symptomshave been successfully treated with stimulants (Schachar, 1997). Parents themselvesmay also have unrecognised and untreated ADHD, which may adversely affecttheir ability to manage a child with the disorder.

Environmental Factors

ADHD is genetically transmitted disorder but is sensationalized by some environmental factors. Some of the studies have found that moderated to significant proportion of susceptibility to ADHD may be accented by non-shared factors. The non-shared factors may include poor school performance, difficult temperament inflated self-esteem, impulsivity, low verbal intelligence and biological events such as prenatal insulate and head trauma. While shared family, peer and neighbourhood risk factors may play a significant role in development of oppositional deficient disorder, conduct disorder and ADHD. Some of the adverse factors may include large amount of siblings within the family, families that have experienced separation, single parent households, child neglect, parental conflict and poverty. Parent-child rearing practices, such as harsh physical discipline and poor supervision have also been implicated in oppositional deficient disorder, conduct disorder and ADHD. The family unit is considered as one of the important social factors for causing ADHD disorder (Karahmadi, 2006).

David(2007) identifies potential environmental risk factors for ADHD in the Paisa community. The sample included 200 ADHD children between 6 and 11 years age group. The data were analyzed using cross tabulation analyses. The results revealed that ADHD associated with variety of factors, including premature delivery symptoms, maternal respiratory viral infection, moderate to severe physical illness in the mother during gestation, parental cigarette and alcohol exposure, neonatal seizures, asphyxia or

anoxia, severe neonatal illness, mild speech retardation, moderate brain injury and febrile seizures.

Neuman(2003) observed the interactions between prenatal exposure to smoking and variation in the DAT1 and DRD4 loci in children with ADHD problem. The odds of a diagnosis of DSM-IV combined subtype was 2-9 times greater in twins who had inherited the DAT1 440 allele and who were exposed, than in unexposed, than in exposed twins without the risk allele. Results indicated that smoking during pregnancy is associated with specific subtypes of ADHD in genetically susceptible children.

Curtis(2008) reviewed the available literature of nutritional and environmental factors on ADHD. Many studies reported that exposure to toxins such as mercury, lead, pesticides and in utero smoking exposure to higher level of ADHD problem. Some studies have reported that many nutritional deficiencies in ADHD patients and supplementary nutrients such as omega-3 fatty acids, vitamins, zinc, and magnesium and photochemical may provide moderate benefits to ADHD patient.

Baschgens(2008) examine differential sibling experiences and its effect on behavioural outcomes with ADHD families. The sample includes 45 Dutch ADHD probands and their unaffected sibling reported differences in sibling interaction parental treatment and peer characteristics. The results revealed that these non-shared environmental influences that operate within ADHD families and were related to both the severity of ADHD symptoms as well as to cumorbid problem behaviours. The studies suggest that low socio-economic status of family dysfunction impaired social relationships, parental exposure to nicotina and alcohol might increase the risk of developing ADHD among children.Many parents are led to believe that a child's

environment or nurture is to blame, and that they have, in some way, failed their children.

Barkley (1995) identifies this notion as a fallacy by informing parents that, 'our child was born with this problem; it is through no fault of his own …you should neither assign blame to yourself nor accept it from others'.

Cooper and Shea (1998) however, appear to believe that environmental factors have a bearing on the outcome of the behaviour. They suggest that ADHD is best viewed from a bio-psycho-social framework which is, 'concerned with the ways in which biological differences, which may result from genetic, congenital or environmental factors, interact with psychological and social factors and lead to specific behavioural and emotional outcomes.' Cooper and Shea evidently do not apportion all the blame to environmental factors but rather suggest that they have a role to play along with other factors in a child being diagnosed with ADHD.

Similarly, Barkley (1995) views ADHD as having multiple contributory factors and offers some probable causes. One popular theory about the causes of the condition is that it is hereditary, a suggestion which Cooper and Shea (1998) also appear to support. This is endorsed by Green and Chee (1997), who state that, 'ADHD is a strongly hereditary condition'. They claim that children with ADHD are most likely to have a close relative with similar symptoms. Green and Chee (1997) also reveal that siblings have a 30 to 40 percent risk of inheriting ADHD.

Brain Injuries

Most scientists regard ADHD as a biological disorder caused by abnormalities in the brain. Studies have shown that areas of the brain that control attention span and limit impulsive behavior are less active in people with ADHD. Children who have suffered a brain injury may show some behaviour similar to those of ADHD. However,

only a small percentage of children with ADHD have suffered a traumatic brain injury. Other possible causes of ADHD identified by Barkley (1995) are brain damage or abnormal brain development. Barkley continues to explain that this abnormal brain development is most likely to be caused by substances consumed during pregnancy. Complications during pregnancy or delivery may also interfere with the normal development of the brain. Subtle forms of brain damage may also be present in a child but Stewart and Olds (1973), as cited in Gelfand (1988), estimate that only ten percent of referrals for hyperactivity show a clear history of brain damage. No single cause for ADHD has been recognized and many myths certainly exist. Barkley (1995) admits that we have a lot more to learn about ADHD and its causes. He concludes that, 'When we fully comprehend what causes this disorder, perhaps we will also discover how to cure it'.

Sugar

The idea that refined sugar causes ADHD or makes symptoms worse is popular, but more research discounts this theory than supports it. In one study, researchers gave children foods containing either sugar or a sugar substitute every other day. The children who received sugar showed no different behaviour or learning capabilities than those who received the sugar substitute.Another study in which children were given higher than average amounts of sugar or sugar substitutes showed similar results.

In another study, children who were considered sugar-sensitive by their mothers were given the sugar substitute aspartame, also known as Nutra-sweet. Although *all* the children got aspartame, half their mothers were told their children were given sugar, and the other half were told their children were given aspartame. The mothers who *thought* their children had gotten sugar rated them as more hyperactive

than the other children and were more critical of their behaviour, compared to mothers who thought their children received aspartame (Farrington, 1994).

Dietary Factors

The influence of dietary factors in ADHD has attracted much public attention: foodadditives, sugar, colourings and 'E' numbers are often regarded as causes of ADHD,and elimination and supplementation diets are widely used, often without professionaladvice.Nevertheless, epidemiological research indicates a link between additives andpreservatives in the diet and levels of hyperactivity (McCann et al., 2007); and at leasta small proportion of children with ADHD demonstrate idiosyncratic reactions tosome natural foods and/or artificial additives, and may be helped by a carefullyapplied exclusion diet.

Richardson (2004) cited in Brookes (2006) reviewed the evidence on associations between ADHD and longchainpolyunsaturated fatty acids (PUFA) and commented on the brain's need throughoutlife for adequate supplies, a relative lack of omega-3 PUFA, and a possibility thatmales may be more vulnerable because testosterone may impair PUFA synthesis.Scientific uncertainties remain, however, concerning the physiological significance ofdifferent measures of PUFA metabolism and they are not used in practice.

Recent British research indicates a possible link between consumption of certain food additives like artificial colors or preservatives, and an increase in activity.Research is under way to confirm the findings and to learn more about how food additives may affect hyperactivity.

2.2.3d Prevalence of ADHD

Lack of a single, consistent, and standard research protocol for case identification of ADHD, variable and disparate findings on prevalence are noted in the literature. Studies confirm that ADHD is prevalent worldwide as children suffering

from this disorder are found in all countries (Brown, 2001; Cantwell, 1996; Jensen, 2001).

Prevalence estimates are around 1.5% for boys in the primary school years.In the international scientific literature, prevalence estimates vary widely acrossstudies. At one extreme, in Colombia, the prevalence rates were estimated to be19.8% and 12.3% for boys and girls respectively (Pineda et al., 2003). Such a widerange in prevalence estimates is unlikely to reflect true differences in the numbersof individuals with ADHD in various populations. He further made a systematic review of prevalence studies and concluded that the great majorityof variability derived from the methods used, such as the way symptoms were measuredand the exact definitions used. There were relatively minor differences in differentparts of the world and the review's summary of rates was around 5.3%.

The prevalence of attention and behaviour difficulties is influenced by several factors including the definition and criteria used in identification, assessment methods, the population sampled, the person conducting the assessment, and the culture of the community. For example, a northern Aboriginal community may have a different tolerance level for behaviour considered "atypical" in a large urban centre. As a consequence, for this reason and others, fewer children may be identified as having difficulties. Socioeconomic factors also influence prevalence rates. For example, in some northern schools, it is not feasible to identify all eligible children because of insufficient funds or resources for remediation. In addition, the referral source or family may perceive public identification as a stigma and data collection is often characterized by limitations to sample size and cultural representation. Bussing, Schoenberg and Perwien (1998) claimed that minority children have higher unmet ADHD treatment needs, but have generally been under-represented in ADHD research populations in the

past. The regional prevalence of attention and behaviour difficulties is difficult to ascertain.

The DSM-IV (1994) cites a prevalence rate of 3% to 7% in school age children in the U.S. However, issues in methodology and the evolving dynamics of ADHD have led to a wide variation in the reported prevalence with estimates ranging from 1% to 20% (Department of Health and Human Services, 2002). Across such studies, the setting, gender, and diagnostic classification affected the prevalence rates. In community samples, studies using DSM-III criteria to diagnose ADHD in which inattention is not a criterion for impairment, reported prevalence rates ranged between 4% and 12% with a median of 5.8% (Newcorn, Halperin, & Schwartz, 1994). Wolraich and colleagues (1998) investigated a community sample with 4323 children using the DSMIV functional impairment criteria and found an overall prevalence rate of 6.8% when all ADHD subtypes were considered. Within the subtypes, most of the children met criteria for the inattentive type (3.2%) or the combined type (2.9%). If DSM-IV impairment criteria had not been considered, 16% of the sample qualified for a diagnosis (Wolraich, 1998). This underscores the importance of incorporating DSM-IV criterion for functional impairment when making the diagnosis of ADHD.The best current estimate is that ADHD symptoms affects about 3 per cent to 5 per cent of all school age children as many as 2 million or more children in North American. An average of one child in every classroom requires help for this problem (APA, 1994; Szatmari, 1992). The rate of 26.7 per cent prevalence found among 11-12 year old, whereas, the rate for hyperactivity among younger population of 7-8 year old was found to be 18.3 per cent.

McArdle(1995) found that at a symptomatic level, hyperactivity proved common in both 7-8 year old and 11-12 year old children. Further, hyperkinesias are

more common in boys than in girls. The prevalence of ADHD was 18 per cent when the diagnosis made using DSM-IV criteria (Guardiola, 2000). Ages 6-12 children are assessed on ADHD and identified overall prevalence of 9.4 per cent of ADHD symptoms (Bener, 2006). The prevalence of ADHD in childhood population has been estimated 3-7 per cent (APA, 2002). Stephen, (2003) has reviewed a total of 50 studies on ADHD and concluded that ADHD is a behavioural disorders that effects up to 1 in 20 children in the USA and non-USA population and he recognized that ADHD is not purely an American disorder and that the prevalence of this behavioural disorder in many countries is in the same range that in the USA.

In the United States, an estimated 3% to 5% of the student population has ADHD (APA, 1994, 2000), a figure that comprise an estimated 1.46 million to 2.46 million children. Boys are five to nine times more likely than girls to be diagnosed. The disorder is found in all cultures, although prevalence figures differ. The prevalence of ADHD had dramatically increased in recent years (Robison, Sclar, Skaer & Galin, 2004). They reported that rate of US office based physicians documenting a diagnosis of ADHD increased from 19.4 per 1,000 U.S population ages 5 through 18 in 1990 to 59 per 1,000 in 1998. One-third to on-half of all referrals to child mental health facilities are for children with ADHD (Popper, 1998).

Based on the first cycle of the national longitudinal survey of children and youth, Romano, Baillargeon and Tremblay (2002) estimated that among Canadian children aged two to eleven, between 9% and 23% of boys and 5% to 17% of girls manifested hyperactive-impulsive behaviours. In the same study approximately 1% to 18% of girls aged two to eleven and approximately 1% to 14% of boys were reported with “inattentive behaviours”. The variations in these data make it difficult to draw conclusions or to generalize to a larger population.

In a study by Glass and Wegar (2002), teacher perceptions of the incidence of ADHD suggest that teachers believe rates to be much higher. Only 28% of the teachers believed their classroom incidence of ADHD to be 5% or less. Thirty-six percent identified 6-15% as having ADHD; 23% identified 16-25% as having; and 13% identified an incidence of 26% or more. Physicians estimate that one-half of the children diagnosed with ADHD were first referred by a teacher or other school employee.

Guardiola,(2000) investigated ADHD prevalence in first grade 484 children with DSM IV criteria. The prevalence of ADHD was 18 per cent among the children and it was higher among older children. Mukhopadhya,(2003) stated that ADHD is one of the most commonly diagnosed behaviour disorders of childhood. The sample included 238 children referred, among them 37 were diagnosed as ADHD. The prevalence of ADHD in paediatric clinic was 15.5 per cent but the inattention subtype was predominant. Benjasuwantep (2004) examined the prevalence of ADHD among 1st to 6th grade students in Bangkok.

Parents suggested the diagnosis in about one-third of the referred children (Sax & Kautz, 2003). In the DSM-IV field trials, symptoms of ADHD are apparent in most cases before the age of 7 years with median age of onset of the first symptoms at one year and median age of impairment at 3.5 years. The mean age for the onset of the hyperactive or impulsive subtype was 4.21 years; combined type 4.88 years; and inattentive type was 6.13 years (Applegate et al., 1997). These findings suggest that the diagnosis of ADHD, using standard clinical guidelines, can be reliably made in many preschool children, particularly the hyperactive/impulsive or combined type. Early hyperactivity is associated with continuing school difficulties, problems with attention, and poor reading in adolescence (McGee, Prior, Williams, Smart, & Sanson, 2002).

Early identification and treatment should ameliorate later impairment in social behaviors and poor school performance. Lesesne, Visser, and White (2003) found that age-specific rates of ADHD were higher in the older age groups with 5.4% in 4-11 year-olds and 7.5% in 12-17 year olds. Although it was previously thought that ADHD remitted before or after adolescence, it is estimated that more than 70% of children with hyperactivity continue to meet criteria for ADHD as adolescents and up to 65% do as adults (Goldman, 1998). Studies done in South Africa indicated the prevalence of approximately 4 % to 5% of children in Primary Schools exhibiting ADHD behaviour (Brauer, 1991).

The behaviour of children with ADHD at different age was naturally different in frequency, severity and type, although most children with ADHD will have problems throughout their lives, but their symptoms tend to decline in prevalence and intensity as they grow older, because inattention and hyperactivity-impulsivity decline in all children in the process of socialization (Hart, 1996).

During elementary school, oppositional deficient behaviour may develop in as many as 40 to 70 per cent of children with ADHD (Barkley, 1990). But during 8 to 12 years of age deficient hostile behaviour may take the form of serious problems such as lying and aggression in as many as half of the children with ADHD increasingly takes its toll on children's overall adjustment and functioning as they experience problems with self-care, personal responsibility, chores, trustworthiness, independence, social relationships and academic performance (Barkley, 1996; Hinshaw, 1993; Stein, 1995). The prevalence of ADHD at different ages might prove to be more stable if the number and or type of symptoms required for the diagnosis were adjusted for age (Barkley, 1996).

In India, Oomen (1990) in her sample of 80 hyperactive with simple hyper kinetic conduct disorder, conduct disorder was found in three fourth of the sample. The problems occurred between the ages of one and 3 years. While for the rest, problems started between five and seven years of age. The simple hyperkinetic and hyperkinetic, conduct disorder children were significantly younger than conduct disorder group. In the usual development of ADHD, the child's hyperactive and impulsive symptoms appears first usually at 3 to 4 years of age and continue throughout early and middle childhood (Hart, 1996). The symptoms of hyperactivity/impulsivity decline with age during the elementally school years, but inattention remains relatively stable.

ADHD are likely to show some decline by adolescence. By the time children with ADHD are of 5 to 7 years, they begin to encounter difficulties with sustained attention (Hart, 1996). Barkley (1996) revealed that the hyperactive and impulsive behaviour were present in preschool continue with some decline, during the years of age, continue through grade school manifesting in low academic productivity, distractibility, poor organization, trouble in meeting deadlines and an inability to follow through on social promises or commitments to peers. Although hyperactive-impulsive behaviour decline significantly by the time the child with ADHD reaches adolescence, this behaviour still occur at a level higher than in 95 per cent of same age pears (Barkely, 1996). The disorder continuous into adolescence for as many as 50 per cent to 80 per cent of clinic referred elementary school children (Barkley, 1990; Weiss and Hechlman, 1993). About three out of 4 boys diagnosed with ADHD at ages 7 to 12 year meet diagnostic criteria at ages 10 to 15 years (Barkely, 1990; Hart, 1996). Childhood symptoms of hyperactivity-impulsivity are generally resulted to adolescent outcomes (Barkley, 1996).

2.2.3e Effects of ADHD from an Educational Perspective

Many studies (for example, Barkley, 1990) have noted that children with ADHDachieve lower grades in academic subjects than their peers. More recently this trendhas been found for children with teacher-identified ADHD characteristics (Merrell &Tymms, 2001; McGee, 2002). Such children, identifiedat the end of their first year at school, have significantly lower reading and mathematicsattainment at that point than children with no observed behavioural problems.By the end of primary school they have fallen even further behind, in particular thosechildren with symptoms of inattention. Wolraich and colleagues (2003) also suggest thatinattention is a key ingredient of poor academic achievement.

Using rating scales based on the diagnostic criteria published in DSM-IV-TR, theproportion of children observed by their class teachers to be inattentive, hyperactiveand/or impulsive in the classroom has been estimated to be between 8.1 and 17%(Wolraich, 1996; Gaub & Carlson, 1997; Merrell & Tymms, 2001; Wolraich, 2003). A later study by Wolraich and colleagues (2004) found that teachers'screening of elementary pupils gave a higher estimate of 25% of their pupils havinga high risk of ADHD.When children start school, aged 4 or 5 years, their teachers could be very wellplaced to identify ADHD characteristics. The challenges of the school setting arelikely to make those difficulties more obvious and may be picked up by teachers whoare experienced in observing a wide range of children's behaviour. However, Bailey(2006) warns that inattentive, hyperactive and impulsive behaviour could be a reactionto the expectations and constraints of the school environment, and it is importantto bear in mind that this might be the case for some children.

Theoretically, once children with ADHD symptoms have been identified, furtherassessment can be undertaken and interventions put in place at an early stage,although Tymms and Merrell's (2006) research did not support screening. Early

interventionscan be successful in reducing behavioural problems and negative outcomesand the earlier they are implemented, the better (Farrington, 1994). O'Shaughnessyand colleagues (2003) have suggested that coordinated school-wide identification andinterventions for children with behavioural problems increase the likelihood ofimproving their outcomes. Even though many studies have found that classroombasedinterventions have a positive impact on the behaviour of children with ADHDand to a lesser extent on their academic progress (Purdie, 2002), at the presenttime teachers in England are not systematically trained to use these classroommanagement and teaching strategies.

All children and young people, including those with ADHD, have the right to aschool experience that provide a broad, balanced and relevant curriculum, includingthe National Curriculum, which is appropriately differentiated according to theirneeds. This has implications for the provision of initial teacher training and in-serviceprofessional development. Furthermore, a whole school approach to promotingpositive behaviour outside as well as inside the classroom is desirable; therefore trainingshould extend to non-teaching members of staff. Severalstudies have shown that teachers' and student teachers' perceived competence in themanagement of children with ADHD in the classroom is variable and is correlatedwith their professional knowledge and experience (Avramidis, 2000; Bekle, 1994).

Studies found that pupils with ADHD, compared to pupils without ADHD, had persistent academic difficulties that resulted in the following: lower average marks, more failed grades, more expulsions, increased dropout rates, and a lower rate of college undergraduate completion (Weiss & Hechtman as cited in Johnston, 2002; Ingersoll, 1988). The disruptive behaviour sometimes associated with the disorder may make pupils with ADHD more susceptible to suspensions and expulsions. A study by

Barkley and colleagues (1990) found that 46 percent of their pupils study group with ADHD had been suspended and 11 percent had been expelled.

ADHD's core symptoms—inattention, hyperactivity, and impulsivity—make meeting the daily rigors of school challenging (Zentall, 1993). Difficulty sustaining attention to a task may contribute to missing important details in assignments, daydreaming during lectures and other activities, and difficulty organizing assignments. Hyperactivity may be expressed in either verbal or physical disruptions in class. Impulsivity may lead to careless errors, responding to questions without fully formulating the best answers, and only attending to activities that are entertaining or novel. Overall, pupils with ADHD may experience more problems with school performance than their nondisabled peers.

Although speech and learning disorders are common in children with ADHD, the disorder does not affect intelligence. People with ADHD span the same 1Q range as the general population. In an extensive research conducted over 5 to 10 years demonstrated that as many as 35% - 50% of all children with ADHD also have other specific learning disabilities in the areas of reading, writing, language, or mathematics (Hook & DuPaul, 1999; Kazdin, 1982, 2000; Zentall, 1993; Dykman, Akerman, & Raney, 1994). One study suggested, however, that 90% of ADHD children were underachievers and that half were held back at least once. Some evidence suggests that inattention may be a major factor in low academic performance in these children. Furthermore, Barkley, 1998; Green & Chee, 1997 in their research showed that although these students are most often of average to above-average intelligence, they are also at a very high risk for academic underachievement, especially if their ADHD is unrecognised and not managed appropriately.

ADHD therefore, is a particularly serious problem because pupils with core difficulties of inattentions, hyperactivity/impulsivity may lead to poor attainment in school. Impulsivity and hyperactivity may lead to difficulties making and maintaining appropriate peer relationship and developing a supportive group. According to Hinshaw (1994) when children with ADHD become aware of their difficulties with regulating attention activity and impulsivity and the failure that these difficulties lead to within the family, peer group and school, pupils with ADHD may develop low self-esteem and depression. The earlier it is diagnosis the better the chance of avoiding complicating difficulties.

2.3 Theoretical Framework

2.3.1Operant Conditioning (B. F. Skinner)

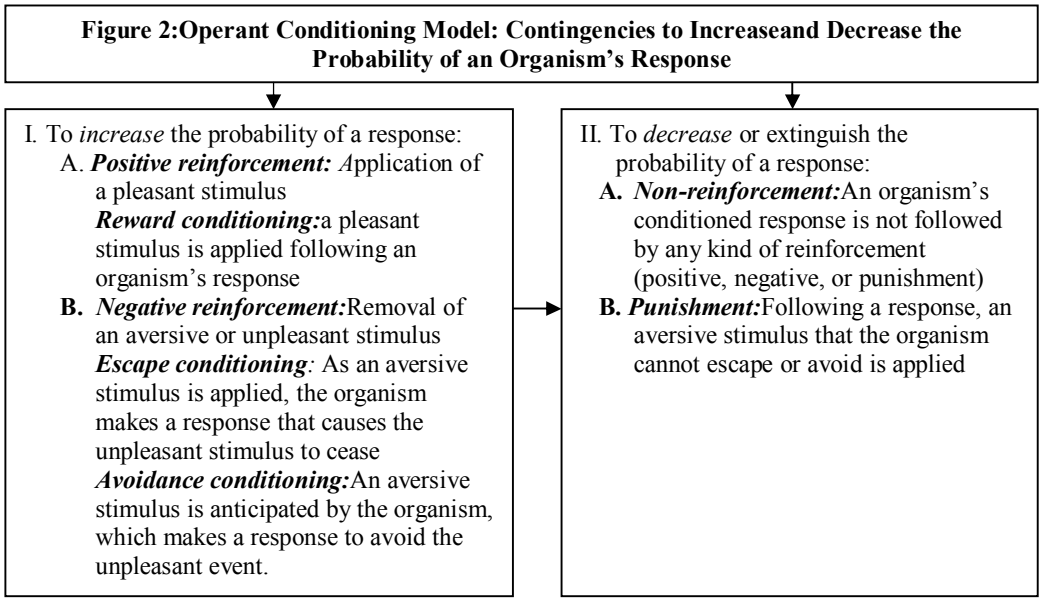
Operant conditioning is awidely recognized approach tolearning developedlargely by B. F. Skinner (1974),which was established from Thorndike's law of effect in his theory of Connectionism (1942). Operant conditioning focuses on the behaviour ofthe organism and the reinforcement that occursafter the response. A reinforcer is a stimulus orevent applied after a response that strengthensthe probability that the response will be performedagain. When specific responses are reinforcedon the proper schedule, behaviours can beeither increased or decreased.

Skinner revolted against the no stimulus-no response mechanism in the evolution of behaviour. He argued that in practical situations in our life, we cannot always wait for things to happen in the environment. Man is not a victim of the environment. He may often manipulate the environment with his own initiative. Therefore, it is not always essential that there must be some known stimuli or cause for evoking a response. Quite often, most of our responses cannot be attributed to the known stimuli. The organism itself initiates the behaviour, for example a child or an

individual 'does' something, 'behaves' in some manner, and 'operates' on the environment which in turn responds to the activity. The environment is responding to the activity, rewarding or otherwise largely determines whether the behaviour will be repeated, maintained or avoided.Skinner concluded that 'behaviour is shaped and maintained by its consequences. It is operated by the organism and maintained by its result'.

Operant conditioning refers to a kind of learning process where a response is made more probable or more frequent by reinforcement. It helps in the learning of operant behaviour, the behaviour that is not necessarily associated with a known stimulus. The operant condition is found on the belief that responses can be increase or decrease by consequences that are rewarding or punishing. The figure below summarizes the principal waysto increase and decrease responses by applyingthe contingencies of operant conditioning.Understanding the dynamics of learning presented in this figure can prove useful in assessingand identifying ways to change individuals'behaviours in the classroom setting.

Figure 2:Operant Conditioning Model: Contingencies to Increaseand Decrease the Probability of an Organism's Response



The key is tocarefully observe individuals' responses to specificstimuli and then decide the best reinforcementprocedures to use to change behaviour.Two methods to *increase* the probability of aresponse are to apply positive or negative reinforcementafter a response occurs. According toSkinner (1974), giving positive reinforcement(i.e., reward) greatly enhances the likelihoodthat a response will be repeated in similar circumstances.

A second way to increase a behaviour is byapplying negative reinforcement after a responseis made. This form of reinforcement involves theremoval of an unpleasant stimulus througheither escape conditioning or avoidance conditioning.The difference between the two typesof negative reinforcement relates to timing.

In *escape conditioning*, as an unpleasant stimulusis being applied, the individual responds in someway that causes the uncomfortable stimulation tocease. Suppose, for example, that whenan ADHD child is being chastised in frontof the class for being inattentive and disruptive,he says something humorous. The class teacher stops criticizing him and laughs. Because theuse of humor has allowed the child toescape an unpleasant situation, chances are thathe will employ humor again to alleviate a disruptive encounter and thereby deflect attention fromhis problem behaviour.

In *avoidance conditioning*, the unpleasant stimulusis anticipated rather than being applieddirectly. Avoidance conditioning has been used to explain some people's tendency to become illso as to avoid doing something they do not want to do. For example, a child fearing a teacher or test may tell his mother that he has a stomach-ache. If allowed to stay home from school, the child increasingly may complain of sickness to avoid unpleasant situations. Thus, when fearful events are anticipated,

sickness, in this case, is the behaviour that has been increased through negative reinforcement.

According to operant conditioning principles, behaviours also may be *decreased* through either non-reinforcement or punishment. Skinner (1974) maintained that the simplest way to extinguish a response is not to provide any kind of reinforcement for some action. Keep in mind, too, thatdesirable behaviour that is ignored may lessen aswell.If non-reinforcement proves ineffective, thenpunishment may be employed as a way todecrease responses, although there are risks inusing this approach. Under punishment conditions,the individual cannot escape or avoid anunpleasant stimulus.

The problemwith using punishment as a technique forteaching is that the learner may become highlyemotional and may well divert attention awayfrom the behaviour that needs to be changed.Some people who are being punished become soemotional (sad or angry) that they do notremember the behaviour for which they are beingpunished. One of the cardinal rules of operantconditioning is to "punish the behaviour, not theperson."

If punishment is employed, it should beadministered immediately after the responsewith no distractions or means of escape. Moreover, punishment should not beprolonged (bringing up old grievances or complaining about unwanted behaviour at every opportunity),but there should be a time-out followingpunishment to eliminate the opportunity forpositive reinforcement. The purpose of punishmentis not to do harm or to serve as a release foranger; rather, the goal is to decrease a specificbehaviour and to instill self-discipline.The use of reinforcement is central to the successof operant conditioning procedures. Foroperant conditioning to be effective, it is necessaryto assess what kinds of reinforcement arelikely to increase or decrease behaviours for

eachindividual. A second issue involves the timingof reinforcement. Through experimentationwith animals and humans, it has been demonstratedthat the success of operant conditioningprocedures partially depends on the schedule ofreinforcement. Initial learning requires a continuousschedule, reinforcing the behaviour quickly every time it occurs. If the desiredbehaviour does not occur, then responses thatapproximate or resemble it can be reinforced,gradually shaping behaviour in the direction ofthe goal for learning.

According to Skinner, what children learn depend upon differential reinforcement and non-reinforcement. It means that, all those sub-parts of the complex concepts and skills should be specified and arranged. The teacher needs to provide instructions and arrangement of appropriate cues or ideas in the learning process. He also has to think not only of the final performance but foresees the consequences of only partially correct responses which eventually lead to final performance. Similarly the teacher should be prompted to give all the reward in formulating feedback at hand. The incorrect response that may likely result in the process of teaching and learning should be eliminated by non-reinforcement at times or in certain situations by punishment (Lawal, 2011).

The success of operant conditioning is dependent on the right choice of a reinforcement schedule. The appropriate reinforcement of behaviour under schedules of reinforcement was evidence for Skinner's claim that using operant conditioning, he could obtain 'control over behaviour' in a way that rendered the theoretical disputes of contemporary comparative psychology obsolete. Schedules of reinforcement are the rules for how a reinforcer is presented following a behavior. They can be defined in

terms of time (interval) or number of responses (ratio). These schedules of reinforcement include fixed ratio, fixed interval, variable ratio and variable interval.

a) Fixed IntervalReinforcement Schedule

In this schedule, the organism is rewarded for a response made only after a set interval of time, e.g. every 3 or 5 minutes. How many times he has given correct responses during this fixed interval of time does not matter, it is only at the expiry of the fixed interval that he is presented with some reinforcement. For example, a pupil is rewarded at the end of every class period for good behavior.

b) Fixed RatioReinforcement Schedule

In this schedule, the reinforcement is given after a fixed number of responses. A student may be properly rewarded after he answers a fixed number of questions say three or five. The key here is to seek the right amount of work given the reward schedule. Normally a ratio schedule produces consistent work. For example, a pupil is rewarded for every homework assignment turned in.

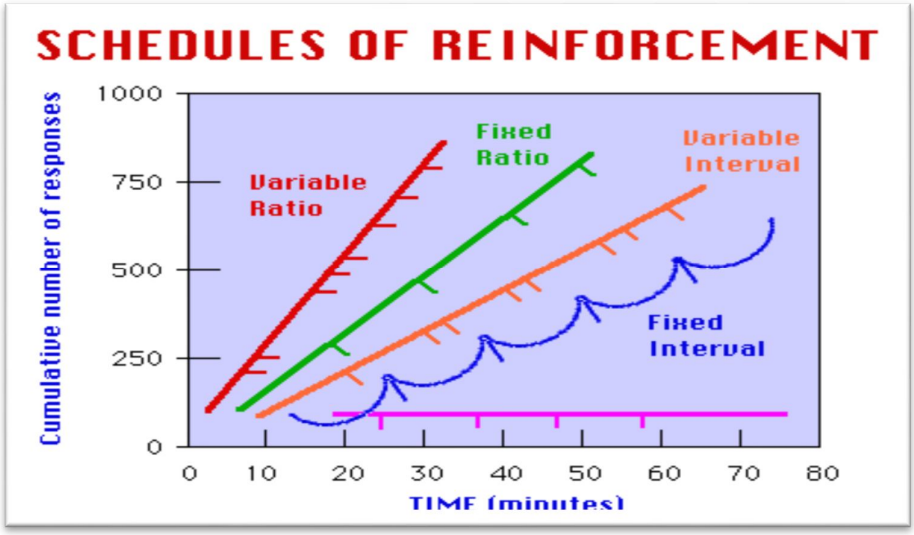
c) Variable IntervalReinforcement Schedule

Reinforces behavior at various time intervals randomly, the student's behavioral performance is higher and steadier because he cannot determine the next time interval that will be used to make the reinforcement available. Consequently the individual remains motivated throughout the learning process in the hope of reinforcement. For example, a pupil is rewarded at different times of the day for good behaviors.

d) Variable RatioReinforcement Schedule

Reinforces behavior after various numbers of responses randomly, it is done in such a manner that the reinforcer is not predictable, so the student maintains or even

increases the pace of his output.



Successive approximation of the desired behaviour called shaping may result in learning of the most complex behaviour. The techniques of operant conditioning have been found to be quite useful in the field of behaviour modification, programmed learning and computer-assisted instruction.

2.3.2 Theory of Trial and Error Learning (Edward L. Thorndike)

The famous psychologist Edward L. Thorndike (1874-1949) was the initiator of the theory of trial and error learning based on the findings of his experiments on chickens, rats and cats. Thorndike conceived learners to be empty organism who responded to stimuli more or less randomly and automatically. A specific response is connected to specific stimulus when it is rewarded. In this situation the stimulus, S, is entirely under the control of the experimenter or teacher, and in large measure so is the response, R, for all the experimenter has to do to connect the particular R to a particular S is to reward R when the organisms happens to make it. This association between sense impressions and impulses to action came to be known as a bond or a connection. Thus, Thorndike's system has sometimes been called bond psychology or connectionism, and was the original stimulus response.

In one of the experiments, for instance, he put a hungry cat in a puzzle box. There was only one door which could be opened by correctly manipulating a latch. A fish was placed outside the box. The smell of the fish acted as a strong motive for the hungry cat to come out of the box. The situation is described by Thorndike himself as: 'It tries to squeeze through every opening; it claws and bites at the bars or wires, it thrusts its paws through any opening and claws at everything it reaches'.

In this way, it made a number of random movements and in one of the random movements, the latch was manipulated accidently. The cat came out and got its reward. Thorndike emphasizes that in trying to learn a correct behaviour, one tries hard in so many ways and may commit so many errors before striking upon a chance success. On subsequent trials we may learn to avoid the mistakes, repeat the correct moves and finally learn the proper way. Thorndike propounded the following laws of learning on the basis of his theoretical notions about the learning process.

a) The law of readiness: This law is indicative of the learner's state to participate in the learning process. Readiness, according to Thorndike, is preparation for action. It is essential for learning. If the child is ready to learn, he learns more quickly, effectively and with greater satisfaction than if he is not ready to learn. This shows us not to force the child to learn if he is not ready but to also not miss any opportunity of providing learning experiences if the child is prepared to learn. The right moments concerning the learning situation and the learner's state of mind should be recognized and maximum use should be made of this knowledge by the teacher. He should also make an attempt to motivate the students by stimulating their attention, interest and curiosity.**b) *The Law of effect:*** Thorndike states that: 'when a modifiable connection between stimulus and response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased. When made and accompanied or followed by an

annoying state of affairs, its strength is decreased'.This law emphasizes the role of rewards and punishment in the process of learning. Getting a reward as a result of some learning motivates and encourages the child to proceed with increased intensity and enthusiasm while punishment of any kind discourages him and creates distaste for that learning. Thorndike, after 1930 realized that this law was not correct. From this he concluded that while reinforcements in the form of reward or incentives increase the strength of the S-R connection, unpleasant experiences in the form of pain or punishment do not necessarily weaken it. Thorndike's views regarding the effectiveness of negative measures like punishment in the breaking of undesirable habits and behaviour modification revolutionized the task of rearing and education of children.

c) ***The law of Exercise:*** This law has two sub-parts: the law of use and the law of disuse:

i. The law of use:'When a modifiable connection is made a situation and response that connection's strength is, other things being equal, increased'.

ii.The law of disuse:When a modifiable connection is not made between a situation and response during a length of time, that connection's strength is decreased'.

As will be seen, the law of use refers to the strengthening of a connection with practice and the law of disuse to the weakening of connection or forgetting when the practice is discontinued. It can be said in short, that the law of exercise as a whole emphasizes the need for repetition.

All these three laws are significant in many kinds of learning in our life. The laws may be applied to the following proverbs and maxims: 'You can lead a horse to the water but you cannot make it drink.' 'Nothing succeeds like success.' 'Practice makes a man perfect'. In addition to the laws of readiness, exercise and effect,

Thorndike's idea of connectionism led to the enunciation of the following important laws (Mangal, 2010):

a) Law of multiple response or varied reaction: This law implies that when an individual is confronted with a situation he response in a variety of ways, trying first one response and then another before arriving at the correct one.

b) Law of attitude: Learning is guided by a total attitude or 'set' of the organism. Learner performs the task properly if he has developed a healthy attitude toward the task.

c)Law of analogy: An individual responds to a new situation on the basis of the responses made by him in similar situations in the past, i.e he makes responses by comparison or analogy. This law led to the famous 'identical elements theory' of the transfer of learning or training which states that 'transfer from one situation of learning to another depends upon the extent and number of element or components which are common to both situations. It also matches the concept of generalization according to which the similarity of the learning situations or elements increases the likelihood of similar responses.

d)Law of associative shifting: This law states that 'any response may be elicited from the learner, of which he is capable, in association with any situation to which he is sensitive'. In other word, any response which is possible can be linked with any stimulus.

In short, Thorndike's theory of trial and error learning and his laws of learning have been a significant contribution to the field of learning. It has made learning purposeful and goal directed and has emphasized the importance of motivation. It has also given an impetus to drill and practice and highlighted the psychological importance of reward and praise in the field of learning.

2.3.3Social Learning Theory (Albert Bandura)

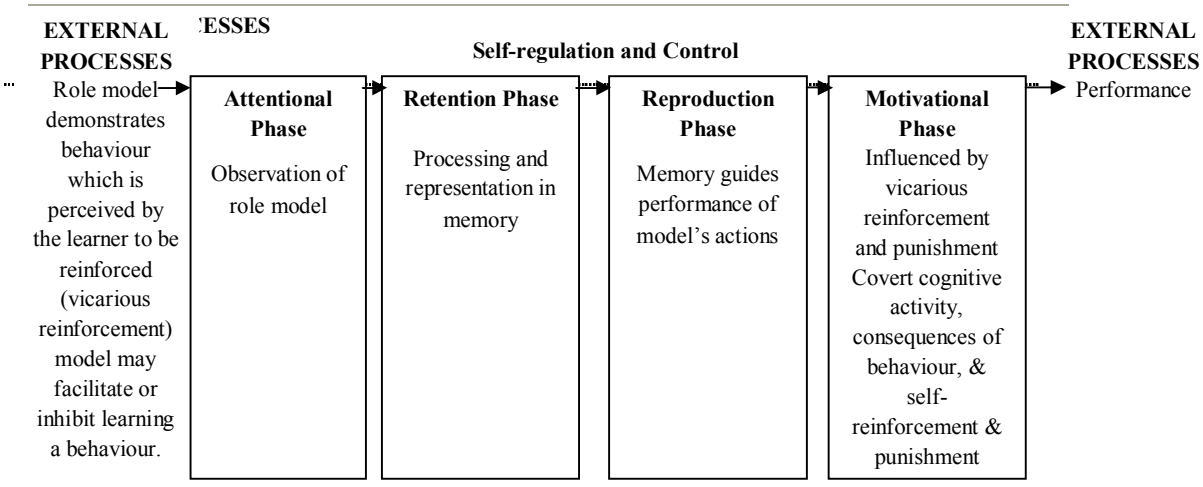
Social learning theory is largely the work ofAlbert Bandura (1977), who mapped outa perspective on learning that includes considerationof the personal characteristics of thelearner, behaviour patterns, and the environment.The theory has gone through several "paradigmshifts". In early formulations, heemphasized behaviorist features and the imitationof role models; next the focus was on cognitiveconsiderations, such as the attributes ofthe self and the internal processing of thelearner. More recently, his attention turned tothe impact of social factors and the social contextwithin which learning and behaviour occur.As the model has evolved, the learner hasbecome viewed as central (what Bandura calls a"human agency"), which suggests the need to identify what learners are perceiving and howthey are interpreting and responding to socialsituations.

One of Bandura's early observations was thatindividuals need not have direct experiences tolearn; considerable learning occurs by takingnote of other people's behaviour and what happensto them. Thus, learning is often a socialprocess and other individuals, especially significantothers provide compelling examples orrole models for how to think, feel, and act. *Rolemodelling* is a central concept of the theory. As anexample, a more experienced teacher who demonstratesdesirable professional attitudes and behaviours sometimes is used as a mentor for a lessexperienced teacher. Research indicates that teachers' attitudes and actions—ensuringsafety, integrating knowledge with practice,sharing feelings, challenging other teachers andstudents, and their competence and willingnessto provide guidance to others—influence theoutcomes of the classroom teaching and learning process(Berggren& Severinsson, 2006). How teacher mentors perceive their role is an important considerationin the leadership selection process(Neary, 2000).

Vicarious reinforcement is another concept fromthe social learning theory and involves determiningwhether role models are perceived asrewarded or punished for their behaviour. Rewardis not always necessary, however, and the behaviour of a role model may be imitated even whenno reward is involved for either the role model orthe learner. In many cases, however, whether themodel is viewed by the observer as rewarded orpunished may have a direct influence on learning.

While social learning theory is based partiallyon behaviorist principles, the self-regulation andcontrols that the individual exerts in the processof acquiring knowledge and changing behaviour are considered more critical and are more reflectiveof cognitive principles. Bandura (1977) outlineda four-step, largely internal process thatdirects social learning, as can be seen in **Figure below**.

Figure 3: Bandura's Four-steps Process



First is the attentional phase, a necessary condition for any learning to occur. Research indicates that role models with high status and competence are more likely to be observed, although the learner's own characteristics (needs, self-esteem and competence) may be the more significant determiner of attention. Second is the retention phase, which involves the storage and retrieval of what was observed. Third is

the reproduction phase, where the learner copies the observed behaviour. Mental rehearsal, immediate enactment, and corrective feedback strengthenthe reproduction of behavior. Fourth is the motivationalphase, which focuses on whether thelearner is motivated to perform a certain type ofbehavior. Reinforcement or punishment for arole model's behavior, the learning situation, andthe appropriateness of subsequent situationswhere the behavior is to be displayed all affect alearner's performance (Bandura, 1977; Gage &Berliner, 1998).

Although social learning theory is an extension of operant conditioning, it assumes that behavior is a function of consequence; it also acknowledges the existence of observational learning and the importance of perception in learning. People respond to how they perceive and define consequences, not to the objectives of the consequences themselves. The theory has a great potential for widening our understanding of how people learn not only practical skills and abilities, but also how attitudes, values, and ideas are passed from one person to the next.

The relevance of the operant conditioning theory to this study is that, learning is dependent on its consequences; this means behaviours which are reinforced are likely to be repeated and those which are not reinforced are unlikely to be repeated. In other word, the operant conditioning theory features that reinforcing and punishing consequences have effect on behavior change.

While the Thorndike theory of trial and error learning is relevant as it emphasizes the psychological importance of reward and praise in the field of learning.On the other hand, the social learning theory of Bandura believed that, we can learn not only through our own direct experiences with repetition and reward, but also by watching what happens to other people. The theory assumes that: (1) behaviour is a

function of consequence, (2) acknowledges the existence of observational learning and the importance of perception in learning.

From these three assumptions of the theories, the study is theoretically anchored to operant conditioning theory which features that reinforcing and punishing consequences have significant effects on behaviour change.

2.4 Behavioral Interventions

A basic assumption of the behavioral interventions is that most problematic cognitions, emotions, and behaviors are learned and that new learning can modify them. Although this modification process is often called "therapy," it is more properly an educational experience in which individuals are involved in a teaching/learning process. There are many parallels between counselling and education. Both Counsellors and psychologists believed that both normal and abnormal behaviors are learned and that the difference between the two is a matter of frequency or rate of occurrence. According to behavioral perspective, school failure is caused by learned abnormal behavior and strategies can be used to phase out inappropriate learned behavior and replace it with behavior that leads to school success. Studies supporting the use of behaviour modification techniques demonstrate that innate responses, or those behaviours that are automatic reactions to eliciting stimuli, can be produced by other stimuli.

The use of behavior modification as a treatment option for children with ADHD has a history dating back more than 25 years (e.g.O'Leary, Vivian,& Nisi, A., 1985) as it was used to treat disruptive, aggressive, and conduct disordered children prior to the widespread use of the ADHD diagnosis. Since this time, a rich literature describing the implementation and efficacy of behavior modification for the treatment of ADHD has developed. The use of traditional, outpatient based clinical behavior modification

typically involves behavioral parent training and behavioral interventions in classroom settings via consultation with teachers.

Behavioral approaches represent a broad set of specific interventions that have the common goal of modifying the physical and social environment to alter or change behavior (AAP, 2001). They are used in the treatment of ADHD to provide structure for the child and to reinforce appropriate behavior. Those who typically implement behavioral approaches include parents as well as a wide range of professionals, such as psychologists, counsellors, school personnel, community mental health therapists, and primary care physicians. Types of behavioral approaches include behavioral training for parents and teachers (in which the parent and/or teacher is taught child management skills), a systematic program of contingency management (e.g. positive reinforcement, "time outs," response cost, and token economy), clinical behavioral therapy (training in problem-solving and social skills), and cognitive-behavioral treatment (e.g., self-monitoring, verbal self-instruction, development of problem-solving strategies, self-reinforcement) (AAP, 2001; Barkley, 1998; Pelham, Wheeler, & Chronis, 1998). In general, these approaches are designed to use direct teaching and reinforcement strategies for positive behaviors and direct consequences for inappropriate behavior.Behavioral treatments are utilized to change unwanted behaviors through the manipulation of environmental antecedents and consequences. Behavioral antecedents (setting events for behavior) are identified and then modified or replaced by new, more adaptive ones.

There are differing techniques in behaviour modification and Gelfand et al. (1988) suggest that the three most frequently used include a positive reinforcement for on-task behaviour, a response cost (loss of reinforcement) for inappropriate behaviours and a cognitive behaviour modification, which emphasizes self-control, and self-

reinforcement. Similarly, Smith and Cooper (1996) suggest that a behavioural approach will involve 'identifying appropriate forms of rewards and sanctions and specifying individual programmes or 'contracts'.

In the first study, Shelton, Barkley, Crosswat, Moorehouse, Fletcher, Barrett, Jenkins, and Metevia (2000) research the effect of an intervention focused on children who demonstrate early disruptive behaviours. The intervention was implemented in an intensive, full-day, multi-method program that spanned an entire kindergarten school year. In addition there was a parent-training program created to increase the lasting effects of the intervention. Luman, Oosterlaan and Sergeant (2008) follow with the exploration of reinforcement to determine the effects on children with ADHD. Specifically, what were the results of an intervention that utilized reinforcement of positive behaviours, and were they sustainable? Each study was critically analyzed to determine if these behavioural interventions resulted in a sustainable increase in academic performance of children with ADHD.

Shelton (2000) conducted a quantitative study that explored the effects of an intervention for children with early disruptive behaviours (i.e. hyperactive, non-compliant and aggressive behaviours). The children selected were considered by the authors to be too young for a diagnosis of ADHD, and therefore, were considered children with early disruptive behaviors. It was thought that preschool children with high levels of DB have considerable risk for maladjustment throughout childhood. The guiding question of the research was: What are the lasting effects of a full-year behavioural intervention that utilized parent training, behavioural treatments, and a combined parent training and behavioural treatment intervention. The lasting effect this study were determined by the data collection and analysis 2 years after the original study.

The original behavioural treatment interventions were implemented in kindergarten classrooms on 258 participants. The participants were children with DB and their parents. The students were transported by school district bussing to the specific classrooms that were conducting the interventions. The parent-training program, in a 10-week group format, taught parents about their child's disruptive behaviours and effective ways to manage those behaviours. At the 2-year follow-up, only 142 original participants were located and willing to continue with the study. At this time there was an extensive list of measures used for the data collection of the study. To name a few: a clinical diagnostic interview was conducted by the first author, the parents and teachers conducted the DSM-IV questionnaire that is used as a diagnostic tool for ADHD as well as 4 more questionnaires. The children participated in psychological and psycho educational testing that checked for the presence and severity of symptoms, as well as, 2nd grade skill development and knowledge. Research assistants, who were blind to the prior study, conducted behavioural observations of the children.The idea that the home and school connection is one to be nurtured. Hinshaw, Owens, Wells, Kraemer, Abikoff, Arnold, Conners, Elliott, Greenhill, Hechtman, Hoza, Jensen, March, Newcorn, Pelham, Swanson, Vitiello, and Wigal (2000) start the analysis with a study that questions how a behavioural-medication intervention would change the parenting practices within the home. In the second study, Odom (1996) explored the impact that educating mothers about the symptoms and management of ADHD would have on their feelings of parental competence or self-esteem.

Lovey (1998) advises that a child with ADHD should be viewed in the same light as any child with special educational needs, whose education requires being catered for in an individual way. She suggests various ideas and strategies for managing a child with ADHD. Classroom observation is recommended as a means of establishing

the main area of concern. Once this has been identified, targets can be set for improving the unacceptable behaviour. Clarke (1999) advocates observation and note taking as important tools in behaviour intervention and modification. Careful monitoring is then required and Lovey (1998) advises that a form of reward should be given to the child for improving their behaviour. If, on the other hand, the behaviour shows no improvement after two phases of the behaviour modification, then the child will need to be reassessed. Robards (1994), as cited in Isberg and Kjellman (1999), additionally recommends, for the successful assessment of a child, a multidisciplinary approach which directly includes the significant people in that child's life, with 'day-to- day management and support.' Such techniques, as employed by Lovey (1998), can be classified as behaviour modification techniques, which can be utilized both in the home and in the classroom.

2.4.1 School Interventions

Research has shown that utilizing non-traditional teaching strategies is an important tool in increasing the academic achievement of children with ADHD (Luman, Oosterlaan & Sergeant, 2007). The following quantitative study by Miranda, Presentacion and Soriano (2002) utilized a non-traditional teaching strategy that questioned the effect teachers had on the inhibitory control, memory, perceptual-motor control and the attention of students with this disorder. The author's theory was that long-term academic success is not likely unless children are taught the skills they need. Conducted in Valencia, Spain, 52 teachers of students between the ages of 8-9 years participated in this study. The criterion stated that the teacher had a child in his or her classroom that was diagnosed with ADHD. In addition, most of these students were from low socioeconomic backgrounds. To conduct this study the first 30 teachers from an alphabetically organized list were placed in the experimental group with the

remaining 22 placed in the control (no treatment) group. Ten doctoral degree students conducted the pre-treatment assessments, the teacher training sessions and the post treatment assessments. The assessments consisted of behavioural observations of the children in their classrooms; behaviour rating scales filled out by parents and teachers; and a questionnaire designed to assess the teacher's knowledge of and management procedures for children with ADHD.

Furthermore, 5 team members who conducted the training sessions interviewed the teachers weekly to assist them with application of the management strategies. During the 4-month period, teachers from the experimental group attended 8 training sessions of approximately 3 hours each. The sessions focused on the latest research driven strategies for teaching students with ADHD. These strategies included: general knowledge about this disorder; behaviour modification procedures, positive reinforcement, token systems, etc.; instructional management procedures, classroom accommodations, presentation of explanations or use of directions and feedback; and cognitive behavioural techniques, the use of self-instruction and reinforced self-evaluation (Miranda, Presentacion & Soriano, 2002). One weakness to this study appeared in the comparison between the authors' theory and the findings. The authors had noted that the lasting effects of an intervention would not be obtainable if the students were not taught the skills they need. The authors did not follow this up with analysis about the lasting effects of this intervention. This was disappointing because the focus of this paper is to determine an intervention that would effectively teach students with ADHD to manage their own behaviours in order to improve their academic success.

The data analysis showed significant differences in the sustained attention of the children in the experimental group, $t = 2.5$, $p < 0.05$ (Miranda, Presentacion &

Soriano, 2002). Another interesting finding was that at the baseline, the experimental and control groups had similar levels of academic achievement in mathematics and language. But the post assessment results showed the experimental group experienced significant improvements in mathematics, natural sciences and language, while the control group did not show any such improvements. Rather, the control group stayed consistent in their level of academic achievement. This implies that adjustments in the teaching techniques and procedures resulted in successful improvements in academic achievement.

The fact that a teacher-training program could result in significant improvements of the sustained attention and academic achievement of children with this disorder is promising. This implies that while these children typically have low levels of academic achievement, a teacher could utilize techniques and procedures within the classroom that assist in improving those symptoms and level of achievement. So with this perceived notion, it is now proposed to look at some of the strategies available to teachers for managing the condition ADHD. There are various types of interventions, with perhaps the use of medication being most commonly recognized. It is probably also the most controversial; as many parents and teachers believe the intention is to sedate a child just to make the lives of everyone else easier. Those teachers, however, who have witnessed children with ADHD in their class both on and off medication, are invariably amazed at the differences in concentration and behaviour.

The use of medication is, of course, a decision made by the child's parents or guardians and while a teacher may be required to offer an opinion it is really a medical intervention and not an educational one. However, the effects of the medication have serious implications for the management of a child in the classroom. Green and Chee (1997) in discussing the benefits of using a stimulant medication for ADHD state that it

can, '…reduce restlessness, keep the child focused on a task, and improve classroom productivity, increase self-monitoring and accuracy.' Holowenko (1999) also reports that better attention and reduced distractibility can be the outward signs of a child taking medication for ADHD. If such an intervention is to be utilized and improvements in concentration are achieved then one would expect that the management of the child in this classroom would become much less of a problem and perhaps not even an issue at all.

The idea behind teachers' intervention is that even though there is something wrong with the brain of the child who has been diagnosed with ADHD, when the child is adequately motivated, s/he can in part make up for any deficit. In other words a pupil who is suffering from hyperactivity will try his best to sit still, listen and think before acting. More often one therapy, treatment or intervention will not alleviate ADHD symptoms in a pupil. It is better to have a combination of tools and positive intervention that can make remarkable differences in these pupils and their lives in our society. ADHD children are all over the place and there is need to make conscious effort to assist them to make living and learning less stressful (Abikwi, 2007).The teacher can help the ADHD child by talking to the parents in the following manner:

1. The teachers can develop a positive and not adversarial relationship with the pupil and be prepared to assist.
2. The teacher must acknowledge both child and parent's situation.
3. Frequent briefing and conversations with parents can be helpful. It can lead to co-ordination of efforts particularly if they provide reciprocal information about progress or setbacks.
4. Ensure that the ADHD pupil is placed in the front seat away from distractions.

5. Love and care for the ADHD pupils and engage the ADHD pupils with other intervention strategies.
6. The learning environment should be very conducive for the ADHD pupil. The classroom should be free from distracting objects.
7. Vary the instructional methods to include the ADHD pupils as well as other pupils in the class.
8. The teacher should be aware of co-existing conditions of the pupils such as learning disabilities as well as reinforcing the importance of classroom and instructional structure.

2.4.2 Instructional Strategies for ADHD Intervention

(A) Giving Directions

The teacher has to maintain eye contact during verbal instruction. Directions need to be given clearly and concisely through multiple channels. Make sure the pupils comprehend the instructions before beginning the task. Repeat instructions in a calm, positive manner whenever necessary. For instance, the teacher should clearly give the directions as well as write it or represent it in pictorial forms. Finally ask the pupil to repeat it to you.

(B) Giving Assignments

In giving assignments the teacher should make sure that the pupil is writing down assignments correctly each day. When a pupil is in-capable due to age or other factors, the teacher should assist in providing a record of assignments for the pupil to take home, modify assignments to suit the capacity of the pupil and give extra time for certain tasks. Pupils with ADHD may work slowly do not penalize them for the needed extra time. The teacher should bear in mind that stress, frustration; fatigue can set in

quicker than expected with ADHD pupils. Develop a plan to determine specified strengths and weakness of pupils.

(C) Assistance

The teacher can help the ADHD pupils feel comfortable asking for assistance. To effectively do this the teacher should apply the wide range of teaching methods to be class centred instead of individual centred in other words let your instructional method apply to all pupils do not single out ADHD pupils. Develop and discuss with the ADHD pupils private cues that can be used during a given lesson. For instance the teacher can quietly touch the pupil's shoulders to remind her/him to get back or refocus on task.

(D) Test Taking

Pupils with ADHD may need more time to complete tests. The teacher must ensure that the directions are clearly understood and the pupil is able to carry out the given task. Some pupils may need to be clarified while others need modification in the way the test is to be done. Some test could be done orally while others could be written. Whatever method the teacher deems fit to use, unique and individual needs must be considered at all times.

(E) Self Monitoring

The teacher should ensure that most programmes are pupils centred. Pupils with ADHD can often participate in planning for improvement in their own behaviour. Encourage them to experience more ownership for positive changes and also make effort to accomplish given tasks. Pupils need to understand or be aware of the problem behaviour and the control they can exhibit to improve the situation. To begin this intervention, the teacher would select behaviour and explain to the pupils the nature of the problem and what will constitute improvement. (For example a pupil who never

completes a given task or activity). Teachers can assist the pupils to develop a rating scale to rate behaviour and document improvement. The pupils will need to learn how to use the rating scale, which should be appropriate to the pupil's age. Every completed task is scored fully (10 marks) while uncompleted task is scored half (5marks) and a task not done gets zero (0). At the end of the day, the total scores are recorded. For a high score the pupil could get a praise e.g. well done, you have done very well etc or a packet of biscuit as it applies to the age or both. Self-monitoring can be gradually faced out as the pupil makes progress in that behaviour while in other circumstances self monitoring may continue for a longer time.

2.5:Summary of Empirical Studies on ADHD

The use of behavior modification has been successfully implemented in the classroom setting for children with ADHD symptoms and has produced marked reductions in off task and disruptive behavior as well as marked improvements in academic productivity (DuPaul & Eckert, 1997; Pelham, Schnedler, Bologna, & Contreras, 1980). In fact, Pelham and colleagues (1998) identified at least 23 studies supporting the efficacy of behavioral interventions in the classroom setting and consider behavioral interventions in this setting to more clearly meet criteria for well-established treatment than the use of parent training. In the classroom setting, it is often that therapists and/or consultants provide instruction, demonstration, and feedback for teachers to illicit and refine the use of evidence-based classroom management techniques. Consistent with behavioral parent training, teachers are taught to reinforce positive, pro-social behavior (using praise, token rewards, or daily report card) while providing negative consequences for inappropriate behavior (using planned ignoring, loss of privileges, or time out from positive reinforcement). Several behavioral

treatment techniques have been found successful in school settings such as daily report cards, token reinforcement programs, response-cost procedures, and time-out from positive-reinforcement (DuPaul, 2003).

Many researchers have found that token economies increase desirable behavior, as well as improve academic performance, in children with ADHD by reducing activity level and increasing time on task (Pfiffner & O'Leary, 1987; Pfiffner, Rosen, & O'Leary, 1985. Barkley (1998) has suggested that the following can be used as effective reinforcers: homework passes, removing lowest grade or making up missing grade, grab bag with small toys or school supplies, free time, computer time, stickers/stamps, running errands, helping the teacher, earning extra recess, playing special games, and art projects.Pfiffner & O'Leary, (1987) found that third graders with ADHD completed more daily teacher-made vocabulary assignments and passed more standardized weekly reading tests when a token economy system was in place. Pfiffner et al. (1985) also found that second and third graders with behaviour problems increased their academic productivity and on-task behavior when a token economy system was implemented.

While the above studies on token economies emphasize individual rewards, Rosenbaum, O'Leary, and Jacob (1975) investigated the effects of group reward and individual reward for 10 male hyperactive elementary school students. The participants were divided into two groups (individual reward program and group reward program) to allow maximum balancing with regard to age, grade in school, and score on the Conner's abbreviated scale. The student's teacher rated the participant four times daily on individually determined target behaviors. At the end of the day, the student could exchange his tokens (in this experiment cards were used) for candy, either for himself (individual reward) or for himself and the entire class (group reward). Teachers

completed the Conner's Teacher Rating Scale four times during the course of the study, and they completed the Problem Behavior Report at the end of each week. Results indicated a significant treatment effect, but no difference was found between groups. Maintenance effects continued four weeks post intervention. Teachers also completed a questionnaire to assess teacher satisfaction with the interventions. Results suggested that the teachers preferred the group intervention procedure ($X2$ (1) = 9.60, p<.005).

The prevalence of ADHD among school children accordingto studies conducted in Africa ranges between 5.4% and8.7%.7,12,13,14. The studies coming from South Africadocumented a prevalence of about five percent, whichconcurred with the finding of a prevalence of about fivepercent in the meta-analysis study of word-wide prevalence of ADHD. The only epidemiologicalstudy among school children coming from the DemocraticRepublic of Congo documented a prevalence of 6.0%, whilethe only epidemiological study coming from Nigeria amongschool children revealed a prevalence of 8.7%.

Ahmed (2013) investigated the effects of positive reinforcement on the levels of absenteeism among secondary school students in Daura zonal Inspectorate of education of Katsina state. 40 samples participated in this study using pre-test-post-test design. Findings revealed that positive reinforcement is effective in reducing absenteeism among secondary school students; also the finding shows that the technique is not gender sensitive.

Similarly, Adebayo (2010) investigated the effect of group counselling using positive reinforcement and self-control interventions in remedying truancy among school-going adolescents in Ilorin-Nigeria. The results using ANOVA has shown that the technique is effective in reducing truancy among secondary school students.

Luka (2010) examined the effects of positive reinforcement and premack techniques in reducing truancy among secondary school students in Kaduna state-Nigeria. 30 samples were used using pre-test-post-test design; results were obtained using t-test and ANOVA. The results indicated that the two techniques are effective and also the techniques are not gender sensitive.

A variety of behavioral techniques have been used to improve children's attentive behaviors, advance academic performance, and support social behavior. Across behavioral techniques, response cost appears to be one powerful approach for establishing behaviors that are conducive to classroom learning (DuPaul, Guevremont, & Barkley, 1992; Gordon, Thomason, Cooper, & Ivers, 1991; Sullivan & O'Leary, 1990). Response cost involves losing privileges in response to inappropriate behaviors (Fiore, Becker, & Nero, 1993). Interventionists tend to pair positive reinforcement for appropriate behaviors with those that include loss of privileges for the occurrence of inappropriate behaviors.

Sullivan and O'Leary (1990) compared the effects of response cost and rewards on maintaining high rates of on-task behavior after fading an intervention. Results showed that all 10 children maintained their rates of on-task behavior after fading the response cost, and half of the children continued to do so after the reward system was terminated. In another study, response cost was compared with token reinforcement (McGoey & DuPaul, 2000). Both strategies were effective in reducing disruptive behavior, but teachers had more favorable comments about response cost.

Kelly and McCain (1995) compared the utilization of home-school notes with and without response cost to increase academic productivity and appropriate behavior. Findings indicated that home-school notes with response cost were more efficacious than notes without response cost.

Three studies compared the effects of response cost and non-reward conditions (Carlson & Tamm, 2000; Carlson, Mann & Alexander, 2000, Solonto, 1990). Teo studies reported improved performance under response cost compared to non-reward across groups; one study revealed no main effects of reinforcement condition (Carlson, Mann & Alexander, 2000). In both studies, response cost was found to 'normalize' performance of children with ADHD.

Pelham, Milich & Walker (1986) compared performance of children with attention deficit receiving methylphenide and placebo, under both reward and non-reward conditions. Performance improved under reward compared to non-reward and with methylphenide compared to placebo. No differential effects of reinforcement condition were revealed for children with attention disorder on or off medication.

Solanto (1990) conducted an intervention study with 20 preschoolers with ADHD to investigate the effects of: a) rewards on students' abilities to wait before responding (delayed response) and b) response cost on children's impulsiveness. Findings indicated that there were no statistically significant differences in the effects of rewards and response cost in decreasing children's impulsiveness albeit a slight positive change was observed under the response cost condition.

In another study, Carlson, Mann, and Alexander (2000) examined the effects of response cost and rewards on the ability of 40 middle school age students with ADHD to finish assignments and correctly complete problems. Results revealed that response cost was more effective than rewards in improving the students' academic performance. Additionally, "neither reward nor response cost negatively affected self-reported performance perceptions or motivation, or a behavioral measure of intrinsic motivation" (Alexander, 2000).

The researchers did note that response cost had more of an impact on the students' intrinsic motivation than rewards. The modest results of these two studies suggest a need for additional group design studies to assess the efficacy of response cost and positive reinforcement on motivation and on other problem areas characteristic of ADHD.

Some research indicates that while contingent positive reinforcement should be the main component of behaviorally based interventions for students with ADHD symptoms, solely relying on positive reinforcement may divert the child from the task at hand (DuPaul, 1994). Therefore, researchers have investigated the effects of using positive, as well as negative reinforcement, to increase the on-task behavior and academic accuracy of students with ADHD (Abramowitz, O'Leary, & Rosen, 1987). Abramowitz et al. (1987) examined the effects of positive and negative teacher attention on students' off-task behavior and academic accuracy. Their study involved a reversal design in which students with behavioral and/or academic difficulties who were involved in a remedial summer program participated in an experiment that compared either reprimands or encouragement with no-feedback conditions. Findings suggested that reprimands were more effective in reducing off-task behavior than the no-feedback condition, with encouragement yielding inconsistent results. Additionally, there were no significant differences among the three conditions on the amount of work completed correctly.

A substantial body of research documents the effectiveness of response cost in the classroom (Kazdin, 1982). One of the earliest studies (Rapport, Murphy, & Bailey, 1982) compared response cost and stimulant medication for task-related behaviour in a group of hyperactive boys. The response cost procedure resulted in significant increases in on-task behaviour and academic performance. Stimulant medication was notably less

effective. Pfiffner and colleagues (1985) found that response cost in the form of lost recess was more effective than reprimands in maintaining on-task behaviour. Response cost has also been compared with reward alone. Both conditions resulted in a twofold increase in academic output or reduction in inappropriate classroom behaviour and a corresponding increase in on-task behaviour. Children often do not show a differential preference for either reward or response cost procedures (Iwata & Bailey, 1974), but they appear to maintain treatment gains better during fading and withdrawal of response cost than they do in response to traditional rewards (Sullivan & O'Leary, 1990).

Research regarding home-based contingencies has demonstrated great improvements in student behavior. Ayllon, Garber, and Pisor (1975) cited in Faraone (2009) implemented a token economy and response-cost system in a third grade classroom with students with severe disruptive behaviors. While these procedures were beneficial in immediately decreasing inappropriate behaviors, appropriate behavior was not maintained. Therefore, a school-home motivational system was added in which a "Good Behavior" letter was sent home if the child met the criteria for appropriate conduct. Parents provided their child with consequences if a letter was sent home or not. Results suggest that the average level of disruptive behavior decreased from 90% at baseline to 10% during the 12 day implementation of the intervention; however, long term effects were not reported.

Many researchers have found that combining token economies with response cost has been proven to be beneficial in increasing on-task behavior, productivity, academic accuracy, and improving attention of children with ADHD (DuPaul, Guevremont, & Barkley, 1992; DuPaul & Stoner, 1994). As with other punishment procedures, response cost has been proven to be most effective when it is applied right away, unemotionally, and consistently (Barkley, 1998). It is suggested that when

combining token economies with response cost, the chance to earn tokens or points should be greater than the possibility of losing them to avoid negative earnings (Barkley, 1998).

Paul, Guevrement and Barkley (1992) investigated the efficacy of response cost contingencies alone and in combination with directed rehearsal procedures. Response cost contingencies were found to result in marked improvements in each student's task-related attention and reductions in adverse ADHD symptoms. Another study investigating the effects of a classroom response cost management approach reported that five of six ADHD elementary school children demonstrated clear improvements in on-task behaviour that generally dissipated upon conclusion of the programme (Gordon, Thomason, Cooper & Ivers, 1991).

McGoey and DuPaul (2000) examined the effects of a token reinforcement intervention and a response cost intervention on the disruptive behavior of preschool children. Four preschoolers (two males and two females) participated in this single subject withdrawal design counterbalanced between participants. The token reinforcement intervention consisted of earning buttons to be displayed on a chart for following classroom rules (stay in the area, keep hands and feet to yourself, quiet listening when the teacher is talking, finish your work [stay on-task], or raise your hand to talk).

Again, at the beginning of the day, the teacher reminded the children of the rules and about losing buttons. At the end of each activity, if the child kept at least three small buttons, they retained the large button. At the end of the day, if the child retained three large buttons, s/he was rewarded (e.g., stickers, hand stamps). Both the response cost and token reinforcement interventions decreased student's aggressive behavior.

However, while the teachers rated both interventions as acceptable, they preferred the response cost procedure.

ADHD (as defined in DSM-IV-TR) is a common disorder. In the UK, a survey of10,438 children between the ages of 5 and 15 years found that 3.62% of boys and0.85% of girls had ADHD (Ford et al., 2003).Extensive research has been conducted on boys with ADHD, but comparable studies of girls with the disorder are infrequent, possibly due to the challenges of recruiting sufficient samples of girls with the disorder (Arnold, 1996). Studies on ADHD specific to gender disparity have often been epidemiological in nature (e.g., Barkley, 1989; Berry, Shaywitz, & Shaywitz, 1989; Faraone, Biederman, Keenan, & Tsuang, 1991; James & Taylor, 1990; McGee, Williams, & Silva, 1987). Studies have found more similarities than differences in girls and boys with ADHD, and a number of studies have found no gender differences in the number, or severity, of ADHD symptoms as a function of gender (Berry et al., 1985; Brown et al., 1991; Horn, Wagner, & Ialongo, 1989; James & Taylor, 1990; Kashani et al., 1979; Silverthorn, Frick, Kuper, & Ott, 1996). However, some gender differences related to ADHD have been identified. Seidman and colleagues (1997) found that, in contrast to research findings of impaired executive function in boys with ADHD, girls with ADHD did not demonstrate significant executive function deficits. Other research has found that girls with ADHD show more severe visual-spatial, cognitive, and language deficits than boys with ADHD (Berry et al., 1985; Breen, 1989; Brown et al., 1991; Gordon & Mettelman, 1994; James & Taylor, 1990; Kashani et al., 1979; Taylor, 1986).

Lesley (2008) reported the prevalence and behavioural differences of ADHD as much more common among malethan female. It is estimated that boys are two to three times more likely to have ADHD than girls. They are up to nine times more likely

than girls to be referred for evaluationand treatment. The difference in referral rates between ADHD boys and girls is likely due to ADHD boys having more behavior problems than ADHD girls. Studies have found that ADHD girls tend to have more internalizing behaviors such as anxiety, social withdrawal, and depression. Most girls diagnosed with ADHD, tend to cluster in the inattentive subtype. Because they are not a behavior problem, their difficulties are often overlooked. Boys diagnosed with ADHD are usually clinic-referred because of oppositional, aggressive, and conduct behaviors. They tend to be very disruptive in the classroom, drawing the attention of their teachers. Some researchers have found that ADHD girls referred for treatment have more attention difficulties than ADHD boys, though they are less hyperactive. Findings regarding intellectual functioning have been inconsistent. A few researchers have found that girls diagnosed with ADHD tend to score lower on IQ tests. However, these studies have been highly criticized because of where the children were recruited. Compared to non-ADHD children, one study has found that ADHD is associated with earlier sexual activity in girls and later sexual activity in boys. Within the ADHD, predominately inattentive subtype, girls tend to experience more peer rejection than boys. Mothers tend to be more critical of their ADHD daughters than ADHD sons(Lesley, 2008).

Levy, Hay, Bennett, & McStephen, (2005) examined whether gender moderated the association of ADHD types with comorbidity in a large sample of Australian twins and their siblings. The results did not find significant gender differences among ADHD types in terms of comorbidity for externalizing disorders. Graetz, Sawyerand Baghurst (2005) reported that among children who were identified a nationally representative sample of Australian children, boys and girls who met symptom criteria for DSM-IV ADHD did not differ on core symptoms of the disorder. One group of researchers believes that girls with ADHD have a higher rate of having a

first-degree relative with ADHD than do boys with ADHD. Additional studies are needed to support this.

The available research on gender differences has revealed some differences with regard to the referral process for boys and girls. Kashani and colleagues (1979) found that females with ADHD were usually referred for learning problems rather than behavior problems, whereas boys identified as hyperactive were more frequently referred for behavior problems than learning problems. This would be consistent with the research findings that girls with ADHD tend to have more comorbid internal manifestations of the disorder, whereas boys with ADHD have been noted to express more aggressive overt types of behavior (Breen & Altepeter, 1990; Brown, Abramowitz, Madan-Swain, Eckstrand, & Dulcan, 1989; deHaas, 1986; Gordon & Mettelman, 1994). Thus, gender-correlated behavioral patterns may be more frequently identified as ADHD in boys than in girls due to the frequency of disruptive classroom behavior exhibited by boys (Breen & Altepeter, 1990).

One important caution to keep in mind is that gender differences may vary as a function of the sample used. For example, Gaub and Carlson (1997) found a trend for greater severity of inattention among females, but comparable levels of hyperactivity in females and males, in a clinically referred sample. However, this pattern was not evident among nonreferred children.

It has been suggested that one cause for the gender disparity in referrals for ADHD may rest in the scales used as part of the diagnostic process, and the use of general norms as opposed to gender-specific norms (Barkley, 1996). Gender differences have been noted on rating scales used to assess children suspected of having ADHD. Based on information provided in the manual for the (Behavior Assessment System for Children, 'BASC'); Reynolds & Kamphaus, 1992), for the standardization sample,

males were rated one third to one half of a standard deviation higher than females on hyperactivity, attention problems, and other subscales. For this reason, the BASC manual includes separate norm tables for males and females, as well as a combined norm table, and recommends that the same-sex norms be used for clinical diagnosis in order to identify those children whose ratings are significant for both their age and gender. Similarly, DuPaul and colleagues (1997) reported significant differences across gender on composite inattention and hyperactivity scores based on normative data from the ADHD-IV Rating Scale-School Version (ARS; DuPaul, Power, Anastopoulous, & Reid, 1998). DuPaul et al. (1998) provided separate norms for males and females.

In contrast, Silverthorn and colleagues (1996) concluded that separate norms by gender were not warranted based on their finding that girls and boys with ADHD did not differ on measures of severity and that diagnostic cut-scores identified boys and girls with equivalent levels of impairment. They further argued that to use separate norms might artificially reduce the difference in prevalence rates for ADHD for girls and boys. Gordon (1996) argued that boys are more often identified with ADHD because they are more likely to demonstrate the severity of symptomatology to warrant this diagnosis; therefore, gender referencing is not appropriate. Alternatively, the possibility has been suggested that ADHD manifests differently in girls as compared to boys (Barkley, 1996; Gordon & Mettelman, 1994).

When considering the possibility of differences in ADHD symptomatology across gender, ethnicity is a factor that should also be considered. Serious concerns have been expressed regarding the assessment of ADHD with children from ethnic minorities (Bauermeister, Berrios, Jimenez, Acevedos, & Gordon, 1990) and the use of behavior rating scales with these children (Reid, 1995). However, ADHD among ethnic minorities remains an understudied area. Studies that have used behavior rating scales have reported significant differences between Caucasian (see Note) and African American students (e.g.,

DuPaul et al., 1997; Epstein, March, Conners, & Jackson, 1998; Jarvinen & Sprague, 1995; Lambert, Sandoval, & Sassone, 1978; Reid et al., 1998; Waechter, Anderson, Juarez, Langsdorf, & Madrigal, 1979). However, it is uncertain whether these differences were due to real differences in behavior among groups, rarer bias due to ethnicity and/or socioeconomic factors, or a combination of the two. Only one study to date has addressed the issue of rarer bias. This study found evidence that ethnic status appeared to bias behavior ratings (Sonuga-Barke, Minocha, Tayor, & Sandberg, 1993). Because ethnic minorities constitute a large portion of the population, and because research has demonstrated convincingly that there are interethnic differences on behavior rating scales, we should attend to ethnicity as a factor in gender differences.

Researches provide evidence that there are more boys than girls diagnosed with ADHD. In the clinical setting, the ratio of boys to girls varies from 6:1 to 12:1. In larger population samples, the male-to-female prevalence ratio is estimated at 3:1, raising the concern that ADHD may be under-diagnosed in girls. ADHD with hyperactivity/impulsivity affects boys more often than girls, but girls are more likely to demonstrate the inattentive subtype (Gaub & Carlson, 1997). Girls are less likely to exhibit disruptive behavior and manifest more emotional distress with higher rates of depression and anxiety (Greene, Biederman, & Faraone, 2001). Hence, girls are not diagnosed until middle school or later when academic and social demands for autonomous functioning increase.

The prevalence of ADHD in population is 5-10 per cent among school age children and it was reported that males to be more often affected than females, with male and female ratio ranging from 3:1 to 9:1(Bener, 2006). In community samples, boys are 3 times more likely to be diagnosed as having ADHD than are girls. This discrepancy is even greater in clinic populations, where boys outnumber girls by a ratio of 6:1 or higher. Boys with ADHD are probably referred to clinics most frequently than

girls. In fact one study found that once the antisocial symptoms are controlled for statistically, the frequency of ADHD in boys and girls is about the same (Szatmari, 1992). It is possible that ADHD in girls may go unrecognized and it is under reported. Teachers usually fail to recognize and report inattentive pattern of behaviour unless they are also accompanied by the disruptive symptoms which normally associated with boys (McGee and Fehan, 1992).

Girls with ADHD are a highly under studied group, although the way in which the disorder is expressed and the severity of most symptoms are similar for boys and girls (Silverthron, 1996). Boys and girls with ADHD do not differ in impulsivity academic performance, social functioning or fine motor skills and they display comparable patterns of parent-child interactions, have similar rates of ADHD in relatives and showed the same response to stimulant medications (Befera and Barkley, 1984; Faraons, 1991, Hinshaw, 1994). When gender differences are found, boys show more hyperactivity, more accompanying aggression and antisocial behaviour and greater impairment in executive functions and girls show greater verbal and non-verbal intellectual impairment (Gaub and Carlson, 1997; Seidman, 1997).

Harvey,(1999) studied the ADHD in Australian primary school children they found the gender difference between boys and girls was 5:1, and also the boys were rated higher than girls by both parents and teachers. Lumley,(2002) examined sex difference in a mostly clinic referred sample of 125 children comprising 24 girls and 101 boys, age ranged from 3 years, 10 months to 7 year 10 months. The result revealed that, teachers reported that boys with ADHD were more inattentive, hyperactive/impulsive than girls with ADHD. Young girls and boys who meet DSM IV criteria were more similar, but boys tend to display more symptoms of ADHD particularly in school.

The prevalence of ADHD symptoms in Nigeria was 8.7%, the prevalence of the sub-types was: predominantly Inattentive 4.9%, predominantly hyperactive/impulsive 1.2% and combined 2.6%. The male to female ratio was 2:1 for all the subtypes of ADHD except the hyperactive/impulsive which was 3.2:1. The co-morbid conditions include oppositional defiant disorder (ODD – 25.8%), conduct disorder (CD – 9.3%) and anxiety/depression (20.6%). While ODD and CD were associated with the hyperactive/impulsive subtype, anxiety/depression was associated with inattentive subtype (Abiodun & Oluwole, 2007).

Mukhopadhya,(2003) investigated ADHD among 234 children of 5 – 12 years 27 children were identified as ADHD disorder. The male to female ratio was 6.4:1 and also male children were more impaired by ADHD than girl. He further found that the mean age of boys and girls with ADHD was 8.49 years and 6.82 years respectively and 27 per cent of children had developmental problems. ADHD at different age varied with more symtomological predominance in 6 to 12 years children. Quinn *et al.* (2006) conducted a study on the perceptions of gender difference in ADHD. They interviewed 541 parents of children with ADHD, 550 teachers and 346 children of 12 to 17 years with ADHD (TN=1177 adult). They found that most of teacher thinks boys with ADHD were more likely than girls to have behavioural problem. Parents think girls with ADHD were more likely to remain undiagnosed. This difference revealed that responses by ADHD patients demonstrated gender specific difference in the personal experience of the condition.

Bauermeister,(2007) assessed possible gender differences in ADHD and its sub types among 1896 children of 4 to 17 years in a representative community sample. They found that ADHD was 2.3 more common in boys than girls, but with one exception there was little evidence that the pattern of associations of ADHD with

correlates were different for boys than girls. Gender interactions were found in ADHD sub types and boys were more lively to be comorbid with mood disorders than girls. For inattentive type, girls were more likely to be comorbid with anxiety disorders than boys.

A study by Bennett (2006) found that in a class of thirty children in the USA, there were approximately two to four children with ADHD. The National Institute on Mental Health (2003) also asserted that in a classroom of twenty five to thirty children, it is likely that at least one will have ADHD. This constitutes 3-5 % or approximately 2 million children in the United States. ADHD affects an estimated 2-11 % or more, of school age children worldwide (Zametkin & Ernst, 1999). Parker also estimated that from 3-10 % of American population have a condition known as attention deficit hyperactivity disorder. ADHD is estimated to affect one in ten boys and one in thirty girls in the United Kingdom (Holford, 2006).

Leung,(1996) reported that the prevalence of ADHD symptoms in Chinese school boys. The sample included 3,069 Chinese school boys they were screened by questionnaire and 611 were identified as ADHD children. Prevalence rates for hyperkinetic disorder, ADD and ADHD were 0.78 per cent, 6.1 per cent and 8.9 per cent, respectively. Pineda,(1999) studied prevalence of ADHD in 4 to 17 year old, 540 Pre-school and school children living in Manizales Colombia. The prevalence rate was 19.8 per cent in boys and 12.3 per cent in girls.

The prevalence of ADHD symptoms in primary school students was 6.5 per cent. The ratio of male to female was 1:1.09. Cuffectoal (2005) assessed the prevalence and correlates of ADHD symptoms in the National Health Interview Survey (NHIS). NHIS included 10,367 children aged 4 to 17. Prevalence of clinically significant ADHD symptoms was 4.19 per cent (males) and 1.77 percent (females). Abdelaul (2006) estimated ADHD among primary school children comprising of 112 boys and 33 girls.

They found that ADHD was a common problem among 25 per cent school children and they had poor performance in the school compared to normal children.

Bener,(2006) conducted a study on prevalence of ADHD symptoms among primary school children in an Arabian society. A total of 2000 primary school students, aged 6 to 12 were selected and 1541 students had given consent to participate in study. The data revealed that 112 boys (14.1%) and 33 girls (4.4%) scored above the cut off for ADHD symptoms, thus prevalence rate was 9.4 per cent in the children.

Abiodum,(2007) adjudged the prevalence of ADHD symptoms in a sample of 1112 primary school children aged 7-12 year in Nigeria. The prevalence of ADHD symptoms was 8.7 per cent. The prevalence of the subtypes was predominantly inattentive 4.9 per cent, predominantly hyperactive/impulsive 1.2 per cent and combined 2.6 per cent. The male to female ratio was 2:1 for all the subtypes of ADHD except the hyperactive/impulsive, which was 3:2.1.

Egbochukwu & Abikwi (2007) studied the prevalence of ADHD symptoms among primary school pupils in Nigeria. The sample included 94 (23.15%) ADHD children between 5 to 12 year and with mean age of 9.13 year of which 45 (47.87%) had the hyperactivity type, 20 (21.28%) had the inattention type and 29 (30.83%) had ADHD combined type. they revealed that 94 out of the 406 pupils had scores that met the criteria for a diagnosis of ADHD, giving a prevalence rate of 23.15%. This confirms the existence of Attention Deficit/ Hyperactivity Disorder among primary school pupils in the study population. The result confirmed that pupils in primary schools suffer more from ADHD hyperactivity type than inattention and the combined type. The sex ratio for combined type and inattention is 2:1, while hyperactivity is about 1:1.The results of the study revealed that more boys are diagnosed with ADHD than girls. The prevalence among boys is 24.58% while that of girls is 22.18%.

In response to the question whether ADHD symptoms differs in occurrence with class level of pupils according to gender, Egbochukwu & Abikwi (2007) proved that the prevalence across the class according to gender differs among primary 1, 2, 3, 4 and 5, while in primary 6 the percentage occurrence is the same for boys and girls. In primary 1 the prevalence among boys is 22.64% while that of girls is 30.43% this shows a significant difference in the occurrence of ADHD among gender in that class. In primary 2, the prevalence percentage for boys is 25.00% and 21.34% for girls; primary 3 shows 25.00% for boys and 9.30% for girls, primary 4 has a prevalence of 20.00% for boys compared to girls with 22.22% and primary 5 has 19.23% for boys and 18.18% for girls, The above result shows that there is a difference in the occurrence of ADHD symptoms among gender in primary 1, 2, 3 and 4. The result for primary 5 shows no significant difference with boys scoring 19.23% and 18.18% for girls however the result for primary six shows the same degree of occurrence 35.71% for both boys and girls.

Darma (2010) reports the prevalence of ADHD symptoms among selected primary schools in Kano Metropolitan as 9 to 13 percent in a classroom of between 76 to 88 pupils were diagnosed as having ADHD. She further revealed that a combination of behaviour therapy and nutritional supplements proved significantly effective in ameliorating dysgraphia among the sample of pupils with ADHD symptoms in selected primary schools in Kano Metropolis.

Hinshaw (2002) investigated preadolescent girls with the intention of filling this prominent gap in the literature. The focus of data analysis was to examine differences between girls with ADHD, Combined Type; girls with ADHD, Inattentive Type; and comparison girls without ADHD. Relative to comparison girls, girls with both ADHD subtypes had significantly higher rates of special education placement

(28% for both ADHD subtypes vs. 3.5% for the comparison group. Girls with ADHD were more likely to have experienced speech/language problems (Combined type 25.6%; Inattentive type 29.8%; Comparison 7%). Rates of co-occurring disruptive behaviors such as ODD and CD were equivalent to rates reported in samples of boys with ADHD. Rates of ODD with the combined subtype were 71%; with Inattentive subtype 47%; and comparison group 7%. Rates of CD with Combined subtype were 27%; Inattentive Type 11%; and comparison 0%. The percentage of girls with anxiety disorder and combined subtype was 31%; Inattentive Type 19%; and comparison group 3%. Those identified with depression and Combined subtype were 10%; Inattentive Type 4%; and comparison 0%. Girls with the Combined Type of ADHD were least liked by their peers, while girls with the Inattentive Type were more likely to be seen as socially isolated. These findings corroborate the importance of community systems becoming better informed about the manifestations of ADHD in girls, so that the greater tendency for girls to go undiagnosed and untreated is brought to an end.

Gross-Tsur *et al.* (1996) conducted a study on socio-economic status of ADHD children. The sample included 25 ADHD children of 11 years old. They found that socio-economic status of ADHD children was significantly lower than that of rest. Mukhopadhya(2003) studied a sample consisted of 37 ADHD children between 5 and 12 years old. The results revealed that majority of ADHD children were from middle socio-economic status and belonging to Hindu families.

Maedgen & Carlson (2000) examined whether children with different subtypes of ADHD differ in the primary reason for social difficulties. Children with ADHD, Combined Type, were less popular with peers according to parents and teachers and were seen as less liked than children with Inattentive type. Children diagnosed with ADHD, Combined Type, were rated as more likely to enact aggressive behavior, thus

exhibiting social performance deficits. Children with ADHD, inattentive type also exhibited social performance deficits and were more likely to respond in passive ways (i.e. just letting things go without taking steps to deal with the situation). Children with the inattentive type of ADHD were slightly less knowledgeable about the most socially appropriate ways to respond (deficit in social knowledge). Children with the combined subtype are more prone to intense displays of negative emotion and have difficulty regulating their negative emotions. Problems with emotion regulation could contribute to being disliked by peers. One limitation of research on improving peer relationships for children with ADHD is that findings focus on improving children's overall standing in peer groups, rather than helping them develops a single close friendship.

The ADHD prevalence as reported in the studies that used the "or rule" from Nigeria – West Africa and Maracaibo – Venezuela are as follows; predominantly inattentive subtype and combined subtype (38, 39, respectively). While the combined and inattentive subtypes were found as the prevalent subtypes, hyperactive impulsive subtype was found to be the least frequent in the most of epidemiological studies (17). Different from ADHD literature, the hyperactive/impulsivity subtype of ADHD was found to be the most common subtype in our study similarly to the study of Erşan et al. from Turkey (11). It is obvious that there are many variables affecting the subtype distribution; however differences in expectations and patterns related to age and situation appropriate behaviours could be an explanation for those high rates of the hyperactive impulsive subtype of ADHD in Turkey (Adewuya & Famuyiwa, 2007) cited in Darma (2010). Pfiffner, O'Leary, Rosen, and Sanderson (1985) evaluated the effects of response cost and verbal reprimands on ADHD children's off-task classroom behaviours. They found that the continuous use of response cost was the most effective treatment for disruptive and off-task behaviour. Use of negative consequences in

conjunction with positive consequences has been found be an effective way to maintain on-task behaviour (Pfiffner & O'Leary, 1987). In general, the use of response cost in the classroom to improve the behaviours of children with ADHD has been well supported (DuPaul, Guevremont, & Barkley, 1992; Firestone & Douglas, 1977).

Biederman and colleagues(2005) examined gender effects in a nonreferredsample of siblings of probands with ADHDand non-ADHD comparison children. No significantgender differences were reported in psychiatric comorbidity,treatment history, and psychosocial variables.The authors concluded that boys and girlswith ADHD present similar clinical profiles andsuggested that gender differences reported in treatmentsamples may be related to referral biases.

Two other studies of children from the generalpopulation found similar results. Graetz, Sawyer,and Baghurst (2005) reported that among childrenwho were identified from a nationally representativesample of Australian children, boys and girls whomet symptom criteria for DSM-IV ADHD did notdiffer on core symptoms of the disorder, comorbidity,or impairment. The only exceptions were that girlswith ADHD received higher ratings of somatic complaintsand better school functioning. However, onimpairment measures of social problems, schoolworkdifficulties, and self-esteem, girls were lessimpaired than boys in the CT and HIT groups butequally or more impaired than boys in the IT group.

The second study of children from the generalpopulation (Levy, Hay, Bennett, & McStephen, 2005)examined whether gender moderated the associationof ADHD types with comorbidity in a large sample ofAustralian twins and their siblings. They did not findsignificant gender differences among ADHD types interms of comorbidity for externalizing disorders, butthey did find that gender interacted with comorbidityof the

IT group with separation anxiety disorder (SAD)and of the CT group with generalized anxiety disorder(GAD) these disorders were higher in females.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter presents the research design; the population, sample and sampling technique. The description of the research instrument, the validity and reliability of the instrument and how it was administered and scored wasdiscussed. Procedure for data collection; procedures for intervention and procedure for data analysis were also explained.

3.2 Research Design

The design for this study was the quasi experimental design involving the pre-test-post-test control group design. The pre-test/post-test designis widely used in behavioural research, primarily for the purpose of comparing groups and/or measuring change resulting from experimental treatments(Gay, 2009). In this form of design, sample respondents were randomly selected and were assigned to the experimental and the control group. Both the experimental and control group were pretested. The

experimental group received treatment for a period of six weeks, while the control group received normal classroom instructions for same period. Six weeks after the treatments, the experimental and control groups were post-tested. The premise behind the selection of this design was based on the fact that it has the advantage of testing the results obtained from the post-test in order to analyze the effectiveness or otherwise of the treatment when compared with the control group(Gay, 2009). The design can be modeled thus: Experimental Group O_1 X O_2

Control GroupO_3 O_4

Source: Cohen, 2007

Where:
O_1& O_3 – Observations before treatment (Pre-test)
O_2& O_4 – Observations after treatment (Post-test)
X – Treatment

3.3 Population of the Study

The population of the study comprises of allthe primary 5pupils studying in public primary schools in Kano metropolis. Kano metropolis consisted of eight (8) local governments namely: Dala, Fagge, Gwale, Kano Municipal, Kumbotso, Nassarawa, Tarauni and Ungogo local government. According to the annual school census results (2013/2014) obtained from the Department of Research and Statistics (SUBEB) there are a total of 104,081 primary 5 pupils in Kano metropolis. From this number 51,366are male while 52,715 are female.Threelocal governments were selected randomly and represent 31% ofprimary 5 pupils in Kano metropolis. From each of thethree local governments, one schoolwas randomly selected. The three schools havethe following population of primary 5 pupils: Chiranchi (Male - 528, Female- 596 = 1,124), Dorayi (Male - 515, Female - 454 = 969) and Rijiyar Zaki primary school (Male - 335, Female – 307 = 642) making a total of 2,735. From the population of 2,735, sixty one (61) pupils were identified to have exhibited the symptoms of ADHD, hence the population

(units of analysis) of the study. This population consisted of male and female with an average age ranging from 10-13 years, they are predominantly Muslims.

Table 3.3.1 Summary of School Populationand ADHD Pupils

		SCHOOL POPULATION			ADHD PUPILS		
S/N	SCHOOL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
1	Chiranchi P. S.	528	596	1,124	14	06	20
2	Dorayi P. S.	515	454	969	12	06	18
3	Rijiyar Zaki P. S.	335	307	642	11	12	23
	Total	**1,378**	**1,357**	**2,735**	**37**	**24**	**61**

Source: Department of Research & Statistics (SUBEB, 2013/2014)

3.4 Sample Size and Sampling Technique

The sample of thirty six (36) primary 5ADHD pupils out of sixty one (61) pupilswho met the criteria for selection based on DSM-IV-TR, 2000 were selected for the study. Primary five pupils were selectedbecause at this age level ADHD symptoms were highly manifested as shown in the literature.Secondly, they were not occupied with the preparation for common entrance examination and can understand spoken and written English for effective communication during the treatment sessions.

Thesampleof 36 was drawn from the threerandomly sampled schools (Rijiyar Zaki, Dorayi Karama and Chiranchi primary schools). In each of the three schools, one intact class of primary five was purposely selected for the study. Two schools were purposively assigned to experimental group - Dorayi Karama and Chiranchi primary school with nine (9) respondents each andRijiyar Zaki primary school served as the control group with eighteen (18) ADHD pupils. The sample of 36 ADHD pupils was considered appropriate for there was no consensus for a particular number of people that are deemed appropriate for a group counselling session. Although Makinde (1984), Denga (1986) & Okobia (1991), suggested a minimum of 4 clients, Kolo (1992) is of the view that the numbers may vary from 3 to 12 persons. According to Alao (1982) preventive and remedial intervention is highly successful with smaller groups just as Trotzer (1977), in his own contribution also, favours the use of smaller group. Trotzer

believed that, the smaller the group the more unique the power of cohesiveness, unique sense of belonging and higher success in remedying the problem. Also Gay (2009) recommends that a minimum of thirty (30) respondents is adequate for experimental research.

Purposive sampling technique was used in selecting the sample for the study. In purposive sampling researchers handpick the cases to be included in the sample on the basis of their judgement of their typicality or possession of the particular characteristics being sought. In this way, they build up a sample that is satisfactory to their specific needs (Cohen, 2007). Gay (2009) states that, researchers using this technique select sample using their experience and knowledge of the group to be sampled.

Table 3.3.2: Distribution of Samples by School

S/N	SCHOOL	TREATMENTS	NUMBER
1.	Dorayi Karama Pri. Sch.	PR	9
2.	Chiranchi Pri. School	RC	9
3.	Rijiyar Zaki Pri. Sch.	CG	18

36

3.5 Conceptual Model

The conceptual model deals with the specification of research variables and their inter-relationships. Since this is an experimental research study, the variables involved are the independent, dependent and extraneous otherwise known as intervening variables. In an experimental research, the independent variable is manipulated and its effect (s) on the dependent variable is observed by the researcher. The intervening variables on the other hand are those factors that could prevent the researcher from attributing the changes observed in the dependent variable solely to the independent variable. Thus, for a researcher to justifiably consider the changes observed in the dependent variable as a function of the independent variable, the possible effects of the intervening variables on the dependent variable must be controlled by the researcher.

In this study, positive reinforcement and response cost counselling techniques are the independent variables while attention deficit hyperactivity disorder is the dependent variable. The intervening variables are testing twice, instrumentation, selection bias, absence from treatment sessions and language effects on the test takers.The study variables and their interactions are illustrated below:

Table 3.5.1 Research Variables and their Interaction

Independent Variables	***Intervening Variables***	***Dependent Variable***
Positive reinforcement & Response cost counselling techniques	Interaction, instrumentation, testing twice, selection bias, absence from treatment sessions and language effects on the test takers	ADHD symptoms of inattentiveness, hyperactivity & impulsivity

3.6. Control of Intervening Variables

In order to isolate the effect of the independent variable on the dependent variable, studies must rule out alternative explanations. The term extraneous variable is used to refer to any other factor that might compound the treatment effect on the dependent variable. The present study therefore, utilized the following ways to control extraneous variables:

1. **Interaction:** In order to control this variable, the thirty six (36) respondents were randomly shared to the three schools; Pupils who exhibited ADHD symptoms in Dorayi primary school received positive reinforcement treatment while those in Chiranchi primary school received response cost techniques whereas Rijiyar Zaki remained as the control group. The three schools belonged to different local government area as such the respondents do not know each other.
2. **Instrumentation:** This refers to the changes in the measuring instrument which may produce changes in the scores that will be obtained. To avoid this effect, the

same instrument was used for both pre-testing and post-testing. In addition, all the items in the instrument were objectively constructed and validated by both the author and research supervisor. The researcher only scored it in line with DSM-IV-TR, 2000.

4. **Testing Twice:** This refers to the effects of first testing upon the scores of a second testing. To control this, the test items of the 'ASC' were framed in such a way that the respondents of the three sampled schools responds in the same manner as they did at the first and second administration.

5. **Selection Bias:** To control bias resulting from differential selection of subjects for the control and experimental groups, the researcher based the selection of subjects on the pre-test results as well as willingness of the respondents to participate in the experiment. In other words purposive sampling of respondents was effectively randomized.

6. **Absentism and Absentmindedness:** In order to ensure that respondents attended the treatment sessions physically and psychologically,the researcher presented the treatments during the usual school hours after breakfast in their normal classroom settings to avoid environmental effects. From the onset the researcher appealed to the respondents to fill free and relate positively with one another.

7. **Language effects on the Respondents:** Despite the fact that 'ASC'was originally constructed in English language. The researcher engagedin an interactive session with the primary 5 teachers to facilitate their understanding on its content. Equally the researcher used simple, clear words/phrases and paraphrasesduring the sessions.

3.7 Instrumentation

The research instrument was an adapted instrument titled 'ADHD Symptom Checklist' (ASC). It was used to identifypupils with ADHD symptoms and to measure

the level of respondents' symptoms of inattentiveness, hyperactivity and impulsivity in both the pre-test and post-test.The scale was developed basedon the DSM-IV-TR, 2000 published by the American Psychiatric Association (APA, 2000).

3.7.1 Description of the Instrument

The ASC consisted of eighteen (18) itemsthat measure characteristics of ADHD subtypes: (1)the inattentive type with nine (9)items, (2) the hyperactive type with six (6) items (3) the impulsive type consisted of three (3) items. The scale was delineated on a four point Likert scale,ranging from 0 (never), 1 (sometimes), 2 (often)&3 (very often).With the highest ADHD symptoms scores indicative of greater ADHD related behaviour.Respondents are required to tick one of the four responses as applied to pupil's behaviour over at least the past six months. (See appendix three, ASC).

Therefore, the highest possible ADHD symptoms scores a respondent will get in scale A is (27 i.e 3x9), while the lowest ADHD symptoms score is (0 i.e 0x9).The range is 27 i.e maximum score (27) minus the minimum score (0); the mid-point of the range is (14) while the cut-off is 27 and 14, i.e the maximum score (27) minus the mid-point of the range 14 or the minimum score (0) plus the mid-point of the range (14) which in either case is 14. Thus, respondents who obtained ADHD symptoms scores from 14 to 27 were considered as having symptoms of inattentiveness,while ADHD symptoms scores below 14 indicates no symptoms of inattentiveness.

In scale B, the highest ADHD symptoms scores is (18 i.e 3x6), and the lowest is (0 i.e 0x6), the range is 18 i.e maximum score (18) minus the minimum score (0), the mid-point of range is (9) while the cut-off point is 18 and 9 i.e the maximum score (18) minus the mid-point (9) or the minimum score (0) plus the mid-point of the range (9) in which either case is 9. Thus, respondents with ADHD symptoms scores of 9 to 18 were

considered as having symptoms of hyperactivity, while respondents with ADHD symptoms scores below 9 were considered as having no symptoms of hyperactivity.

While in scale C, the highest ADHD symptoms scores is (9 i.e 3x3) and the lowest is (0 i.e 0x3). The range is 9 i.e the maximum score (9) minus the minimum score (0), the mid-point of range is (4.5) while the cut-off point is 9 and 4.5 i.e the maximum score (9) minus the mid-point (4.5) or the minimum score (0) plus the mid-point of the range (4.5) in which either case is 4.5. Thus, respondents with ADHD symptoms scores from 5 to 9 were considered as having ADHD symptoms of impulsivity, while respondents with ADHD symptoms scores below 5 were considered as having no symptoms of impulsivity.

The overall ADHD symptoms scores a respondent will score from the three scales is 54 while the lowest ADHD symptoms score is 0. The range is 54 i.e the maximum scores (54) minus the minimum score (0), the mid-point of range is (27), while the cut-off is 54 and 27 i.e the maximum scores (54) minus the mid-point of the range (27) or the minimum score (0) plus the mid-point of the range (27) in which either case is 27. Thus, respondents who obtained scores from 27-54 were considered as having symptoms of ADHD, while scores below 27 were considered as having no symptoms of ADHD.

3.7.2 Validity of the Instrument

DuPual, Power, Mcooey, Ikeda & Anastopoulos (1998) reported that the scale has established construct and concurrent validity measures as it was only adapted for used in the present study. The adaptation of the instrument was because of its ability to discriminate the three subtypes of ADHD, culture fairness, language applicability and it provides direct rating of the essential symptoms of the disorder as per the DSM-IV-TR, 2000. Furthermore, the instrument was re-validated by the Research Supervisors and

some experts in the Department of Educational Psychology and Counselling, ABU, Zaria. Based on that, the face and content validity of the instrument was established.

3.7.3 Reliability of the Instrument

The instrument has an established test-retest and internal consistency reliability. Homidi (2010),established an internal consistency of the instrument (Cronbach alpha)of 0.91.In addition,Darma (2010) reported the coefficient of stabilityof the instrument as 0.73. The researcher further obtained 0.85as the coefficient of stability of the instrument. Based on these coefficients the instrument was statistically adjudged to be reliable andappropriate for the study.

3.8Procedures for Data Collection

The researcher had contacted head masters of the three schools andexplained the purpose of the study. They were requested to give the permission to collect thedata from the class teachers of primary 5. The head masters of the three sampled schools granted permission to the researcher to collect the data from the class teachers. Each classteacher of primary 5 was contacted and explained the purpose of the study and also theirrole of evaluation in the research work. Each class teacher was requested to read the‘ADHD Symptoms Checklist’and to assess a girl or a boy who has been expressing inattentive or disruptivebehaviours in the class. A total of one hundred (100) ADHD symptoms checklist was given to the class teachers. From the analysis of the completed ‘ADHDsymptoms scale’ (ASC) a total of sixty one (61) primary 5 pupils were identified to have exhibit at least 60% of the ADHD symptoms in line with diagnostic and statistical manual for mental disorders (DSM IV-TR, 2000). The thirty six (36) primary 5 pupils identified with ADHD symptoms were randomly assigned to experimental and control group respectively.

On the course of data collection the researcher faced the problem of delay in collecting back the filled ASC's from primary 5 class teachers. As such, the researcher has to go back again and again to collect the completedASC's.

3.9 Procedures for Intervention

The intervention procedures were divided into three phases as follows: pre-treatment phase, treatment phase and post-treatment phase.

3.9.1 Pre-Treatment Phase

At the pre-treatment phase the researcher engaged in an interactive session with the thirty six (36) sampled ADHD pupils with the assistance of the class teachers. During the session, the respondents' consent was seeks to participate in the study. The researcher then explained to them what the study is all about and the expectation on the class teachers. Later, the class teachers were given the 'ASC' and requestedthem to read and understand the contents before filling it. They were instructed to select the single response for each item that best described the frequency of the specific behaviour displayed by the pupils over the past 6 months.

The pretesting was donein their normal classroom settingsby the class teachers. An interval of one week was given to the class teachers to complete the ASC's for their pupils. The completed ASC were later collected, scored and analyzed by the researcher. The result of the pre-test was kept for future comparison with the post-test result in order to determine the effectiveness or otherwise of the treatment.

3.9.2 Treatment Phase

The treatment session involved basically the provision of counselling interventions usingpositive reinforcement and response cost technique on ADHD pupils. The treatmentssessions were conducted for a period of six weeks consecutively. Two schools received treatment while the third one received normal classroom

instruction without using reinforcement and response cost technique. There were six sessions in each school which lasted for about 25-30 minutes. There was a session in every week for the three schools on Monday's, Wednesday's & Friday's.

A detailed description of each therapy and a systematic outline of each session's activities for both positive reinforcement and response cost counselling techniques are stated in appendices 1 and 2.

3.9.3 Post-Treatment Phase

The treatments were evaluated by administering the ASC instrument on ADHD symptoms pupils to determine the differential effects of the two techniques. The results of the pre-test (before treatment) and that of the post-test (after treatment) were compared for differences. The extent of the differencein the ADHD symptoms mean scores determines the significant effects of the treatments given during interventions.The less the ADHD symptoms mean scores the effectiveness of the treatment.

3.9 Procedures for Data Analyses

The data generated were into the software (SPSS 16 Version) for statistical analyses. Means and standard deviation were used to answer the research questions. T-test for independent samples was used for hypotheses 1, 2, 3, 4 and 5, t-test for dependent samples was used for hypotheses 7, 8, 9, 10, 11 and12and ANOVAfor hypothesis 6. All tests were 2-tailed and the level of significance was set at $P < 0.05$.

T-test was chosen because it is the appropriate statistical test for determining the significance of the difference between means of two groups (Gay, 2009). While analysis of variance (ANOVA) is premised on the same assumptions as t-tests, that is random sampling, a normal distribution of scores, parametric data and it can be used with three or more groups (Cohen, 2007).

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The purpose of this chapter is to present the analysis of the data obtained from the study. The chapter presents answers to the research questions using descriptive statistics and tested the null hypotheses. Hypotheses 1, 2, 3, 4 and 5 were analyzed using t-test for independent samples;while t-test for dependent samples was used for hypotheses 7, 8, 9, 10, 11and12whereas one way analysis of variance (ANOVA) was used for hypotheses6. The basis for rejection or acceptance of the hypotheses is 0.05 levels of significance. The chapter is therefore presented in the following order: introduction, data presentation, answers to research questions, hypotheses testing, summary of major findings and discussions.

4.2 Data Presentation

The data collected for the study cover the following: distribution of subjects into groups, distribution of subjects into two treatment groups, distribution of subjects by gender and distribution of experimental groups by gender. It is therefore presented in tables below.

'**able 4.1:**Distribution of respondents into groups

Groups	Frequency	Percentage
Experimental	18	50.0%
Control	18	50.0%

Table 4.1 shows the distribution of respondents into groups. The experimental group consisted ofeighteen (18) respondents representing 50% and same number and percentage for the control group.

'**able 4.2:**Distribution of respondents into two treatment groups

Groups	Frequency	Percentage
Positive Reinforcement	09	25.0%
Response Cost	09	25.0%

Table 4.2shows the distribution of respondents into two treatments group. Eighteen (18) respondents were used as experimental groups representing 50%. From the table,nine (09) pupils were treated using positive reinforcement technique which represents 25.0% while anothernine (09) respondents were treated with response cost technique representing 25.0%.

'**able 4.3:**Distribution of respondents by gender

Gender	Frequency	Percentage
Male	18	50.0%
Female	18	50.0%

Table 4.3 above shows the distribution of respondents based on gender. Eighteen (18) male participated in this study representing 50.0% while anothereighteen (18) respondents were female representing 50.0%.

'**able 4.4:**Distribution of experimental groups by gender

Gender	Frequency	Percentage
Male	09	50.0%
Female	09	50.0%

Table 4.4 above shows the distribution of experimental groups by gender. A total of eighteen respondents constituted the experimental groups. From this number nine (09) respondents were male representing 50.0% and anothernine (09) respondents were female representing 50.0%.

4.3 Answers to Research Questions

The twelve research questions raised in chapter one were answered below using meanand standard deviations of the groups.

Question One: What effect would the positive reinforcement counselling technique have on inattentive, hyperactive and impulsive symptoms of the respondents?

Table 4.5: Pre-test and post-test ADHD symptomsmean scores of positive reinforcement&control group

	Treatments	N	Mean	Std. Deviation
Pre-test Inattentiveness	Positive Reinforcement	9	20.22	3.153
	Control Group	18	20.06	2.262
Pre-test Hyperactivity	Positive Reinforcement	9	12.78	3.833
	Control Group	18	12.61	3.680
Pre-test Impulsivity	Positive Reinforcement	9	5.222	1.716
	Control Group	18	6.222	1.517

Post-test Inattentiveness	Positive Reinforcement	9	12.22	.4409
	Control Group	18	19.83	1.505
Post-test Hyperactivity	Positive Reinforcement	9	7.778	.6667
	Control Group	18	12.72	2.164
Post-test Impulsivity	Positive Reinforcement	9	3.333	.5000
	Control Group	18	6.056	1.109

This question was asked to find out if the positive reinforcement counselling technique would be effective on ADHD symptoms mean scores of the respondents. Table 4.5 above shows thepre-test and the post-test ADHD symptoms mean scores of the positive reinforcement and the control group. From the post-test symptoms mean scores for the control group (19.83, 12.72 & 6.056) in the three behavioural characteristics of ADHD symptoms are higher than the mean scores of experimental group (12.22, 7.778 & 3.333). This has shown that positive reinforcement technique had the effect of reducing the symptoms mean scores of the treatment group as compared with the control group; the lesser the mean the higher the effectiveness of the treatment.

Figure 4: Line graph showingpost-test ADHD symptoms scores ofPR and CG

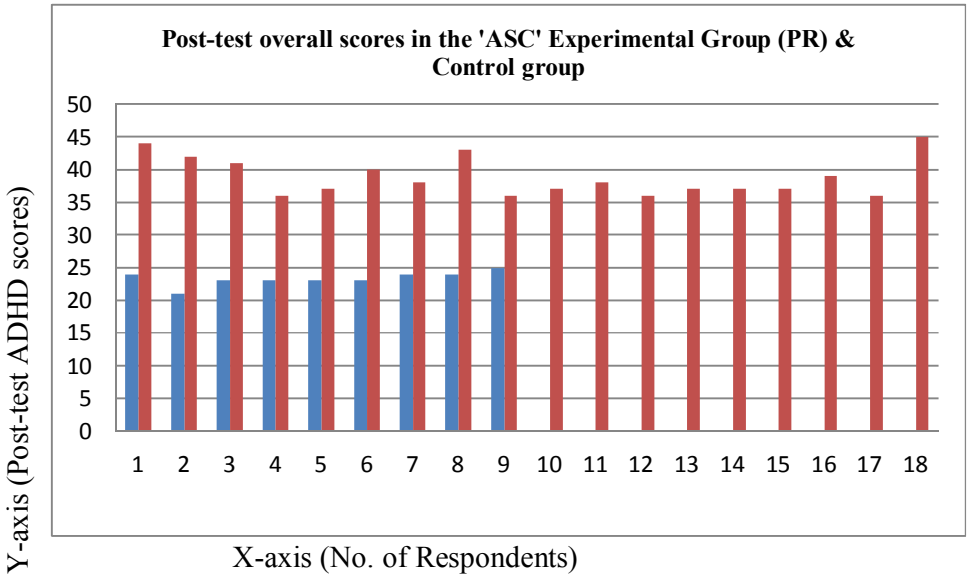


Figure 4 above shows the post-test scores of the positive reinforcement and the control grouprespectively. The X-axis represents the number of respondents in the

study, while the Y-axis represents the post-test ADHD symptoms scores of each respondent.From the figure, the experimental group were nine (9) in numberwithanoverall scores of 24, 21, 23, 23, 23, 23, 24, 24 and 25 respectively, while the control group are eighteen (18) and have the scores that ranges from 44 to 45. It can therefore, be observed that none of the respondents in the experimental groupthat exhibits the presence of ADHD symptoms after the treatment.

Question Two: What is the effect ofthe response cost counselling techniqueoninattentive, hyperactive and impulsive symptoms of the respondents?

Table 4.6: Pre-test and post-test ADHD symptomsmean scores of positive reinforcement & control group

	Treatments	**N**	**Mean**	**Std. Deviation**
Pre-test Inattentiveness	Response Cost	9	20.44	3.206
	Control Group	18	20.06	2.262
Pre-test Hyperactivity	Response Cost	9	11.22	3.528
	Control Group	18	12.61	3.680
Pre-test Impulsivity	Response Cost	9	5.556	2.007
	Control Group	18	6.222	1.517
Post-test Inattentiveness	Response Cost	9	12.44	.7265
	Control Group	18	19.83	1.505
Post-test Hyperactivity	Response Cost	9	7.111	1.167
	Control Group	18	12.72	2.164
Post-test Impulsivity	Response Cost	9	3.667	.5000
	Control Group	18	6.056	1.109

This question was asked to find out the effect of the response cost counselling techniqueon ADHD symptoms of the respondents. Table 4.6 above shows the pre-test and post-test ADHD symptoms mean scores of the response cost and the control group. From the post-test mean, the control group means of 19.83, 12.72, &6.056 are higher when compared with that of the experimental group (12.44, 7.111& 3.667) in the three symptom areas of ADHD.The difference in the means was attributed to the treatment effect. This hasindicatedthat the response cost counselling technique had the effect of reducing the ADHD symptoms among primary school pupils in Kano metropolis.

Figure 5: Line graph showingpost-test ADHD symptomsscores ofRCand CG

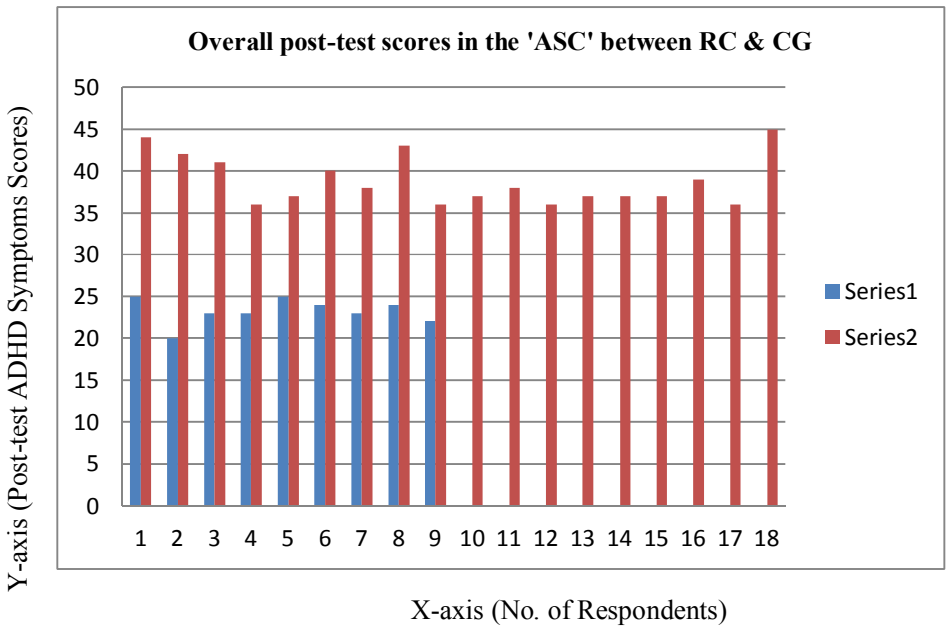


Figure 5 above shows the post-test scores of the response cost and the control group respectively. The vertical axis represents the number of respondents while the

horizontal axis indicates the post-test ADHD symptoms scores of each respondent.From the figure, the experimental group was nine (9) in number withthe overall scoresof 25, 20, 23, 23, 25, 24, 23, 24 and 22, while the control group iseighteen (18)respondents withthe scores thatrange from 44 to 45. It can therefore be concluded that in line with the DSM-IV TR-2000none of the respondents in the experimental group demonstrate the presence of ADHD.

Question Three: What is the differential effect of positive reinforcement and the response cost counselling techniques on the inattentive, hyperactive and impulsive symptoms of the respondents?

Table 4.7: Post-test inattentive, hyperactive and impulsive symptoms mean scores ofrespondents exposed to positive reinforcement and response cost techniques

	Treatments	**N**	**Mean**	**Std. Deviation**
Post-Inattentiveness	Positive Reinforcement	9	12.22	.4409
	Response Cost	9	12.44	.7264
Post-Hyperactivity	Positive Reinforcement	9	7.778	.6667
	Response Cost	9	7.111	1.167
Post-Impulsivity	Positive Reinforcement	9	3.333	.5000
	Response Cost	9	3.667	.5000

This question was asked to find out whether the two techniques (PR & RC) will have differential effect on ADHD symptoms of the respondents. Table 4.7 had shown the post-test ADHD symptoms mean scores of the two techniques after the treatments.

From the means, it can be observed that the two techniques (PR & RC)are not significantly different in ADHD symptomsmean scores across the scales of ADHD.

Figure 6: Line graph showing post-test ADHD symptomsscoresofPR and RC

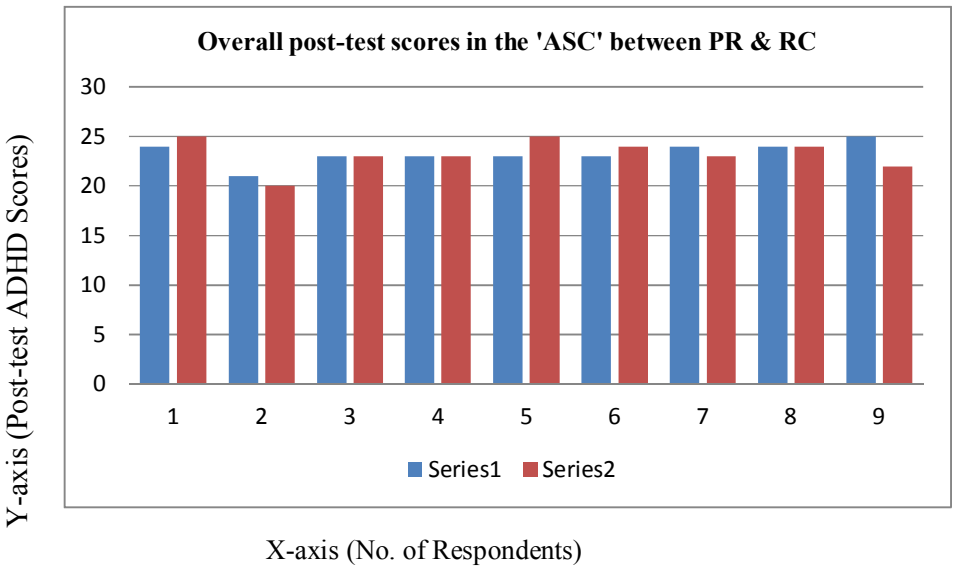


Figure 6 above shows the overall post-test scores of the two experimental groups (positive reinforcement & response cost) respectively. The vertical axis represents the number of respondents while the y-axis indicates the post-test ADHD symptoms scores of each respondent.From the figure,series 1 represents the positive reinforcement group with nine (9) respondents and had the posttest scores of 24, 21, 23, 23, 23, 23, 24, 24 and 25 while series 2 represents the response cost group with the posttest scores of 25, 20, 23, 23, 25, 24, 23, 24 and 22. Based on the scores, it can be concluded that the two groups do not differ significantly in the reduction of ADHD symptoms.

Question Four: What is the differential effect of positive reinforcement counselling technique on the ADHD symptoms of the male and the female respondents?

Table 4.8: Post-test ADHD symptoms mean scores ofmale and femalerespondents exposed to positive reinforcement technique

	Gender	N	Mean	Std. Deviation
Post-testADHD Mean Scores	Male	4	23.50	.5774
	Female	5	23.20	1.4832

Result on table 4.8showthe mean scores of maleand female respondents on ADHD symptoms after the treatmentof positive reinforcement technique. From the means, it can be observed that male and female respondents having the mean scores of (23.50 & 23.20) do not differ as measured by ASC.This has shown that, the positive reinforcement counselling techniqueisnot gender sensitive.

Figure 7: Line graph showingpost-test ADHD symptomsscores ofmale andfemale respondents exposed to positive reinforcement technique

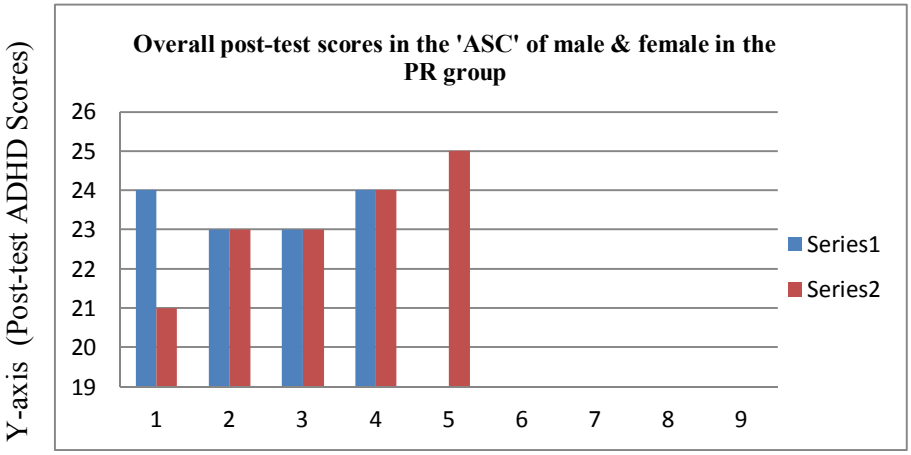


Figure 7 above shows the overall post-test ADHD symptomsscores of the male and female respondents exposed tothe positive reinforcement technique. The X-axis represents the number of respondents while the Y-axis presented the post-test ADHD symptoms scores of each respondent.From the figure,series 1 represents the male with

four (4) respondents with the following posttest scores 24, 23, 23and 24 while series 2 represents the female respondents(5) with the post-testscores of 21, 23, 23, 24 and 25 respectively. Based on the post-test ADHD symptoms scores, it can be concluded that,boththe male and the female respondents do not differ significantly in the reduction of ADHD symptoms.

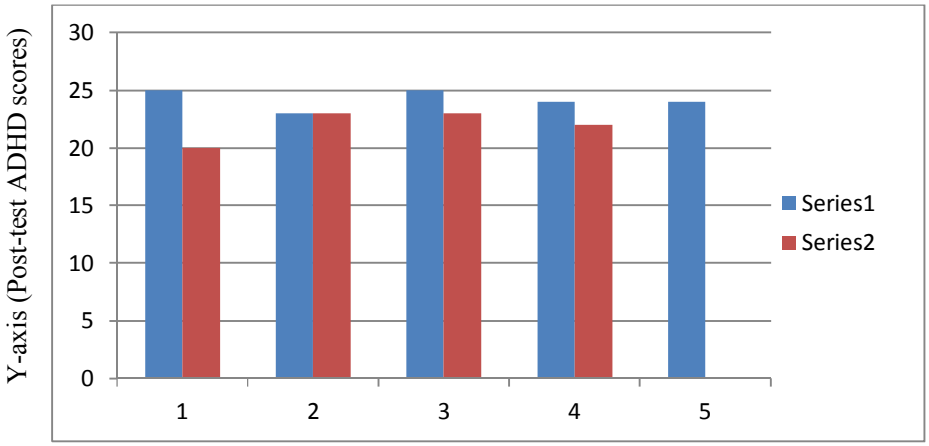
Question Five: What is the differential effect of response cost counselling technique on the ADHD symptoms of the male and the female respondents?

Table 4.9: Post-test ADHD symptoms mean scores and standard deviation of male and female respondents exposed to response cost technique

	Gender	N	Mean	Std. Deviation
Post-testADHD Mean Scores	Male	5	24.20	.8367
	Female	4	22.00	1.414

Table 4.9 above, showsthe means and standard deviation of maleandfemale respondents on ADHD symptoms scores after the treatments using response cost technique. From the post-test ADHD symptoms meanscores, it can be observed that the male respondents mean score is higher than that of the female respondents. Hence, the technique is more effective onfemale respondents than the male.This has shown that the response costcounselling technique is gender sensitive.

Figure 8: Line graph showing post-test ADHD symptomsscores ofmale and female exposed to response cost technique



X-axis (No. of Respondents)

Figure 8 above shows the overall post-test ADHD symptoms scores of the male and the female respondents exposed to the response cost technique. The x-axis represents the number of respondents while the y-axis represented the ADHD symptoms scores of each respondent.From the figure,series 1 represented the malerespondents(5) with the following posttest scores 25, 23, 25, 24 and 24 while series 2 represented the female respondents (4) with the post-test scores of 20, 23, 23 and 22 respectively. Based on the scores, it can be concluded that the mean scores for the female respondents are less than that of the male respondents, meaning response cost is more effective on the female respondents;hence the difference.

Question Six: What is the difference in the post-test inattentiveness, hyperactivity and impulsivitysymptoms of the respondents exposed to positive reinforcement,the response cost and the control group?

Table 4.10: Post-test inattentiveness, hyperactivity and impulsivitysymptoms mean scores ofpositive reinforcement, response cost and the control group

ADHD Symptoms	Treatment	N	Mean	Std. Deviation
Post-test Inattentiveness	PR	9	12.22	.4409
	RC	9	12.44	.7265
	CG	18	19.83	1.505
Post-test Hyperactivity	PR	9	7.778	.6667
	RC	9	7.111	1.167
	CG	18	12.72	2.164
Post-test Impulsivity	PR	9	3.333	.5000
	RC	9	3.667	.5000
	CG	18	6.056	1.109

Table 4.10 above, shows the post-test inattentiveness, hyperactivity and impulsivity symptoms mean scores of the positive reinforcement, the response costand the control group. From the means, it can be observed that the two treatment groups do

not differ across the three symptoms of the ADHD but when compared with the control group significant difference was observed. Hence, the two techniques are effective in reducing ADHD symptoms among primary school pupils in Kano metropolis.

Figure 9: Line graph showingpost-test scoresof the PR, the RC &the CG

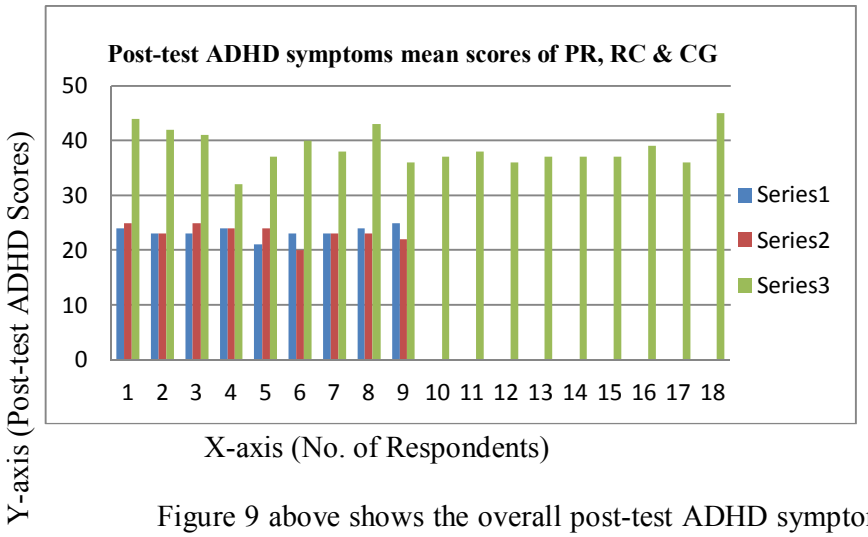


Figure 9 above shows the overall post-test ADHD symptoms scores of the positive reinforcement, the response cost and the control group. The x-axis represents the number of respondents while the y-axis represented the scores of each respondent.From the figure,series 1 represents thepositive reinforcement group(9) with the following post-test ADHD symptoms scores 24, 21, 23, 23, 23, 23, 24, 24 and 25 while series 2 represents the response cost group (9) with the post-test ADHD symptoms scores of 25, 20, 23, 23, 25, 24, 23, 24 and 22 respectively. Whereas series 3 represents the control group with post-test ADHD symptoms scores that ranges from 44-45. Based on the post-test ADHD scores, it can be concluded that the post-test ADHD scores for treatment groups are less than that of the control group, meaning the positive reinforcement and the response cost are effective in reducing ADHD symptoms among primary school pupils in Kano metropolis.

Question Seven: What isthe effect of positive reinforcement counselling technique on the inattentiveness symptoms of the respondents?

Table 4.11: Pre-test and post-test inattentiveness symptoms mean scores

	Group	N	Mean	Std. Deviation
Inattentiveness	Pre-test	9	20.22	3.158
	Post-test	9	12.22	.4409

Table 4.11 above, shows the mean scores and the standard deviation of the respondents on inattentiveness symptomsin both the pre-testand the post-test. From the two means (20.22 and 12.22) it can be observed that,the pre-test meanscore is higher than that of the post-test mean. Hence, the positive reinforcement technique is effective in reducing inattentiveness symptoms among the respondents.

Figure 10: Line graph showing pre-test & post-test inattentiveness symptoms scores (PR)

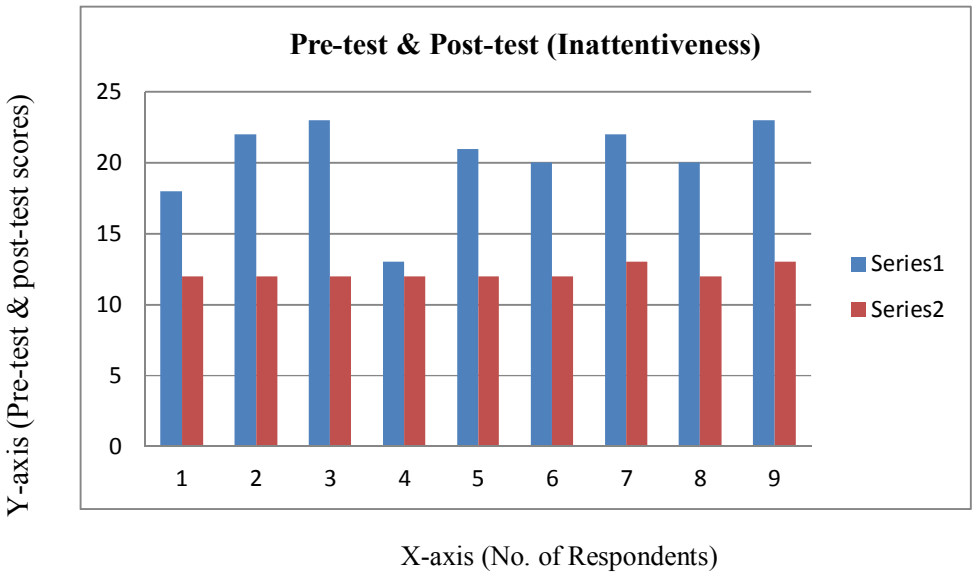


Figure 10 above shows the inattentiveness symptomsscores in both pre-test and post-test. The x-axis represents the number of respondents while the y-axis represented the scores of the respondents in the two testing conditions.From the figure,series 1 represents thepre-testgroup(9) with the following inattentiveness symptoms scores18,

22, 23, 13, 21, 20, 22, 20 and 23 while series 2 represents the post-testgroup (9) with the scores of 12, 12, 12, 12, 12, 12, 13, 12 and 13 respectively.From the scores it can be concluded that the post-test inattentiveness scores are less than that of the pre-test, meaning the positive reinforcement is found to be effective in reducing the symptoms of inattentiveness among primary school pupils in Kano metropolis.

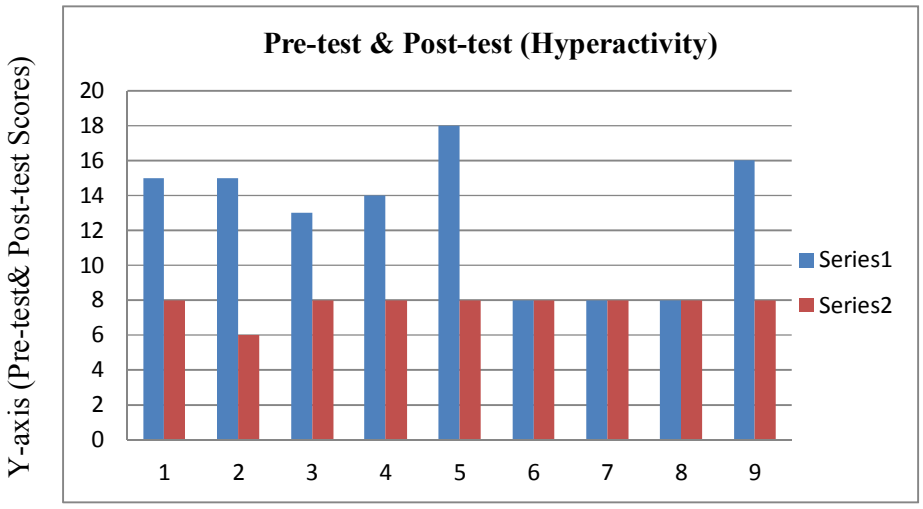
Question Eight: What is the effect of positive reinforcement counselling technique on the hyperactivity symptoms of the respondents?

Table 4.12: Pre-test and post-test hyperactivity symptoms mean scores

	Group	N	Mean	Std. Deviation
Hyperactivity	Pre-test	9	12.78	3.833
	Post-test	9	7.778	.6667

Table 4.12 above, shows the pre-testand the post-test hyperactivity symptoms mean scores and the standard deviation of the respondents exposed to the positive reinforcement technique. From the two means (12.78 and 7.778) it can be observed that the pre-test mean score is higher than that of the post-test mean. Hence, the positive reinforcement technique has positive effect onhyperactive symptoms mean scores of the respondents.

Figure 11: Line graph showing pre-test post-test hyperactivity symptoms scores (PR)



X-axis (No. of Respondents)

Figure 11 above shows the hyperactivity symptoms scores in both the pre-test and the post-test. The x-axis represents the number of respondents while the y-axis represented the scores of the respondents in the two testing conditions.From the figure,series 1 represents thepre-test group(9) with the following inattentiveness symptoms scores15, 15, 13, 14, 18, 8, 8, 8 and 16 while series 2 represents the post-test group (9) with the scores of 8, 6, 8, 8, 8, 8, 8, 8 and 8 respectively. From the scores it can be concluded that the post-test hyperactivity scores are less than that of the pre-test, meaning positive reinforcement is effective in reducing the hyperactivity symptoms.

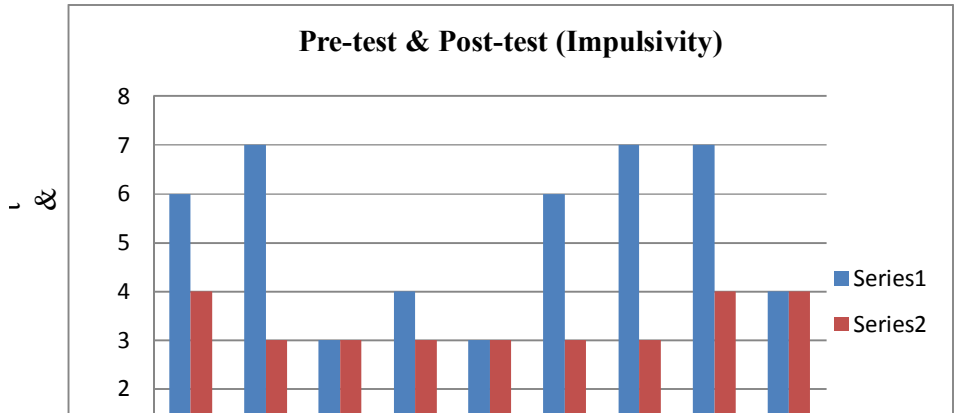
Question Nine: What effect would positive reinforcement counselling technique have on the impulsivity symptoms of the respondents?

Table 4.13: Pre-test and post-test impulsivity symptoms mean scores

	Group	N	Mean	Std. Deviation
Impulsivity	Pre-test	9	5.222	1.716
	Post-test	9	3.333	.5000

Table 4.13 above, shows the pre-testand post-test impulsivity symptoms mean scores and the standard deviation of the respondents exposed to the positive reinforcement technique. From the two means (5.222 and 3.333) it can be observed that the pre-test mean score is higher than that of the post-test mean. Hence, the positive reinforcement counselling technique has positive effect on impulsivity symptoms mean scores of the respondents.

Figure 12: Line graph showing pre-test & post-test impulsivitysymptoms scores (PR)



X-axis (No. of Respondents)

Figure 12 above shows the impulsivity symptoms scores in both the pre-test and the post-test. The x-axis represents the number of respondents while the y-axis represented the scores of the respondents in the two testing conditions.From the figure,series 1 represents thepre-test group(9) with the following inattentiveness symptoms scores6, 7, 3, 4, 3, 6, 7, 7 and 4 while series 2 represents the post-test group (9) with the scores of 4, 3, 3, 3, 3, 3, 3, 4 and 4 respectively. From the scores it can be observed that the post-test impulsivity scores are less than that of the pre-test, this means positive reinforcement is effective in reducing the impulsivity symptoms.

Question Ten: What is the effect ofresponse cost counselling technique onthe inattentiveness symptoms of the respondents?

Table 4.14: Pre-test and post-test inattentiveness symptoms mean scores

	Group	**N**	**Mean**	**Std. Deviation**
Inattentiveness	Pre-test	9	20.44	3.206
	Post-test	9	12.44	.7265

Table 4.14 above, shows the mean and the standard deviation in both the pre-testand the post-test inattentiveness symptoms of the respondents exposed to the response cost technique. From the two means (20.44 and 12.44) it can be observed that the pre-test mean score is higher than that of the post-test mean. Hence, the response cost counselling technique is effective on reducing inattentiveness symptoms mean scores of the respondents.

Figure 13: Line graph showingpre-test & post-test inattentiveness symptoms scores (RC)

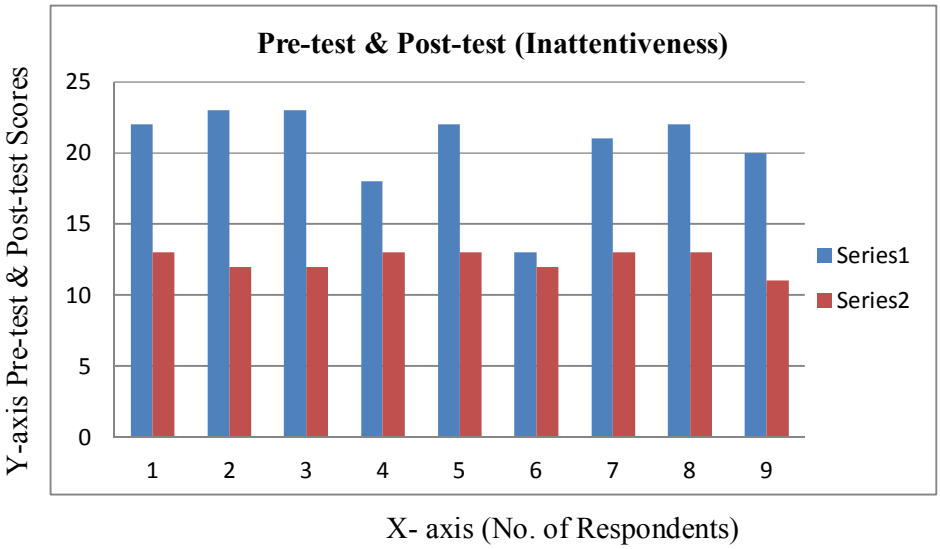


Figure 13 above shows the inattentiveness symptoms scores in both pre-test and post-test. The x-axis represents the number of respondents while the y-axis represented the scores of the respondents in the two testing conditions.From the figure,series 1 represents thepre-test group(9) with the following inattentiveness symptoms scores22, 23, 23, 18, 22, 13, 21, 22, and 20 while series 2 represents the post-test group (9) with the scores of 13, 12, 12, 13, 13, 12, 13, 13 and 11 respectively. From the scores it can be observed that the post-test inattentiveness scores are less than that of the pre-test, this means response cost is effective in reducing the inattentiveness symptoms.

Question Eleven: What is the effect of response cost counselling technique on the hyperactivity symptoms of the respondents?

Table 4.15: Pre-test and post-test hyperactivity symptoms mean scores

	Group	N	Mean	Std. Deviation
Hyperactivity	Pre-test	9	11.22	3.528
	Post-test	9	7.111	1.167

Table 4.15 above, shows the mean and the standard deviation of the respondents in both the pre-testand the post-test hyperactivity symptoms. From the two means (11.22 and 7.111) it can be observed that the pre-test mean score is higher than that of

the post-test mean. Based on the difference in the two mean scores, response cost counselling technique was found to be effective in reducing hyperactivity symptoms among the respondents.

Figure 14: Line graph showingpre-test & post-test hyperactivity symptoms scores (RC)

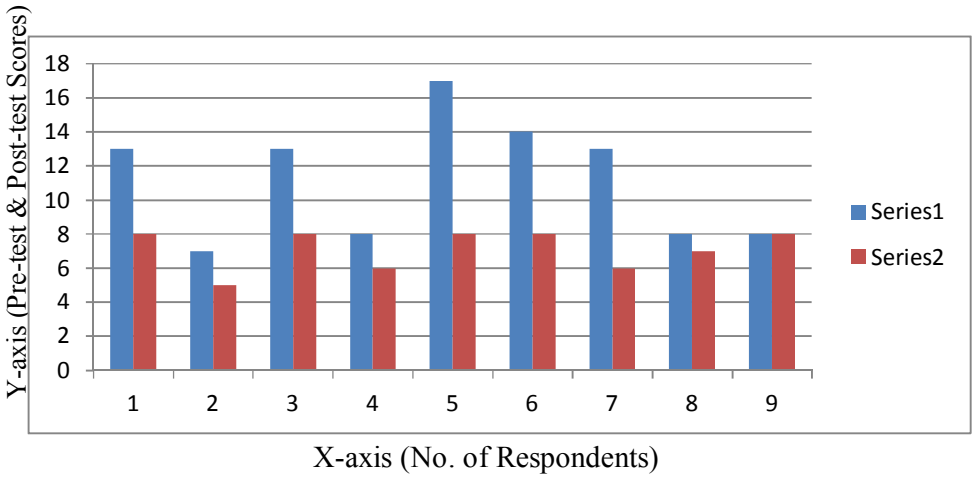


Figure 14 above shows the hyperactivity symptoms scores in both pre-test and post-test. The x-axis represents the number of respondents while the y-axis represented the scores of the respondents in the two testing conditions.From the figure,series 1 represents thepre-test group(9) with the following hyperactivity symptoms scores13, 7, 13, 8, 17, 14, 13, 8, and 8 while series 2 represents the post-test group (9) with the scores of 8, 5, 8, 6, 8, 8, 6, 7 and 8 respectively. From the scores it can be observed that the post-test hyperactivity scores are less than that of the pre-test, this means response cost is effective in reducing the hyperactivity symptoms.

Question Twelve: What is the effect ofresponse cost counselling technique on the impulsivity symptoms of the respondents?

Table 4.16: Pre-test and post-testimpulsivity symptoms mean scores

	Group	N	Mean	Std. Deviation
Impulsivity	Pre-test	9	5.556	2.007
	Post-test	9	3.667	.5000

Table 4.16 above, showmean and the standard deviation in the pre-testand post-test impulsivity symptoms of the respondents exposed to response cost technique. From the two means (5.556 and 3.667) it can be observed that pre-test mean score is higher than the post-test mean. Based on the difference in the two mean scores, response cost counselling technique was found to be effective in reducing impulsivity symptoms among the respondents.

Figure 15: Line graph showingpre-test & post-test impulsivity symptoms scores (RC)

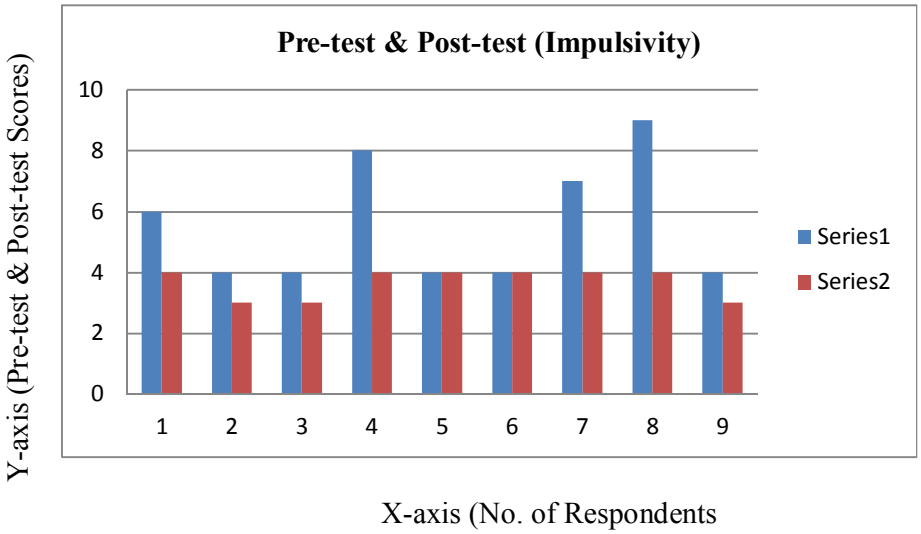


Figure 15 above shows the impulsivity symptoms scores in both the pre-test and post-test. The x-axis represents the number of respondents while the y-axis represents the scores of the respondents in the two testing conditions.From the figure,series 1 represents thepre-test group(9) with the following impulsivity symptoms scores6, 4, 4, 8, 4, 4, 7, 9, and 4 while series 2 represents the post-test group (9) with the scores of 4, 3, 3, 4,4, 4, 4, 4 and 3 respectively. From the scores it can be observed that the post-test

impulsivity scores are less than that of the pre-test, this means response cost is effective in reducing the impulsivity symptoms.

4.4: Hypotheses Testing

Twelvehypotheses were formulated and tested at 0.05 level of significance using t-test for independent samples, t-test for dependent samples and analysis of variance (ANOVA).

HO_1: There is no significant difference in the pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms ofrespondents exposed to the positive reinforcement technique and the control group.

Table 4.17:T-testfor independent samples betweenPRand control group

	Treatment	N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Pre-test Inattentiveness	PR	9	20.22	3.153	1.051	.158	25	.876
	Control	18	20.06	2.262	.5330			
Pre-test Hyperactivity	PR	9	12.78	3.833	1.278	.109	25	.914
	Control	18	12.61	3.680	.8674			
Pre-test Impulsivity	PR	9	5.222	1.716	.5719	1.55	25	.134
	Control	18	6.222	1.517	.3575			
Post-test Inattentiveness	PR	9	12.22	.4409	.1469	14.73	25	.000
	Control	18	19.83	1.505	.3547			
Post-test Hyperactivity	PR	9	7.778	.6667	.2222	6.64	25	.000
	Control	18	12.72	2.164	.5101			

	Treatment	N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Post-test Impulsivity	PR	9	3.333	.5000	.1667	6.96	25	.000
	Control	18	6.056	1.109	.2616			

❖ Sig. at P≤ 0.05

Table 4.17 above showsthe calculated t-values of 14.73, 6.64, 6.96 respectively and p-value of .000, tested at α level of 0.05. The p-value is less than the α level. Therefore the null hypothesis which states that there is no significant difference in the pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms mean scores ofthe respondents exposed to positive reinforcement technique and those in the control group is rejected. This implies that the differences in the meanswere significant between those in the treatment and those in the control group in favour of the treatment group as measured by ASC.

HO_2: There is no significant difference in the pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms of respondents exposed to response cost technique and those in the control group.

Table 4.18: T-test for independent samples between RC and control group

	Treatment	N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Pre-test Inattentiveness	RC	9	20.44	3.206	1.069	.366	25	.717
	Control	18	20.06	2.262	.5330			
Pre-test Hyperactivity	RC	9	11.22	3.528	1.175	.937	25	.358
	Control	18	12.61	3.680	.8675			
Pre-test Impulsivity	RC	9	5.556	2.007	.6689	.967	25	.343
	Control	18	6.222	1.517	.3575			
Post-test Inattentiveness	RC	9	12.44	.7265	.2422	13.85	25	.000
	Control	18	19.83	1.505	.3547			
Post-test Hyperactivity	RC	9	7.111	1.167	.3889	7.22	25	.000
	Control	18	12.72	2.164	.5101			
Post-test Impulsivity	RC	9	3.667	.5000	.1667	6.11	25	.000
	Control	18	6.056	1.109	.2616			

❖ Sig. at P≤ 0.05

From table 4.18, the calculated t-values of 13.85, 7.22 and 6.11 with degree of freedom 25 were significant at .000. The p-value of .000 is less thanα 0.05 level of significance, hence the null hypothesis which states that there is no significant difference in the pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms mean scores of respondents exposed to response cost technique and those in the control group is rejected. This implies that there exists enough evidence to conclude that there is a difference in the post-test means of experimental and control group in favour of experimental group exposed to response cost technique as measured by ASC.

HO_3: There is no significant difference betweenpost-test inattentiveness, hyperactivity and impulsivity symptoms ofthe respondents exposed tothe positive reinforcement and those inthe response costtechnique.

Table 4.19: T-test for independent samples between PR and RC

	Treatment	N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Post-test Inattentiveness	PR	9	12.22	.4409	.4409	.784	16	.444
	RC	9	12.44	.7264	.2422			
Post-test Hyperactivity	PR	9	7.778	.6667	.2222	1.49	16	.156
	RC	9	7.111	1.167	.3889			
Post-test Impulsivity	PR	9	3.333	.5000	.1667	1.41	16	.176
	RC	9	3.667	.5000	.1667			

❖ NS at P≤ 0.05

Table 4.19 shows the post-test ADHD symptoms of the experimental groups (positive reinforcement and response cost techniques). The t-values of .784, 1.49 and 1.41 respectivelywere not significant at the p-values of .444, .156 and .176with degree of freedom 16. Hence, the null hypothesis which states that there is no significant

difference between the post-test ADHD symptoms means score of therespondents exposed to the positive reinforcement technique and those in the response cost techniqueis therefore retained.

HO_4: There is no significant difference in the post-test ADHD symptoms mean scores ofmale and female respondentsexposed to the positive reinforcementcounselling technique.

Table 4.20: T-test for independent samples between male and female respondents exposed to PR

	Gender	N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Post-test ADHD symptoms scores	Male	4	23.50	.5773	.2887	.378	7	.717
	Female	5	23.20	1.483	.6633			

❖ NS at P≤ 0.05

Table 4.20 shows the post-test ADHD symptoms ofmale and female respondents exposed to the positive reinforcement technique. Thet-valueof .378 is not significant at .717with degree of freedom 7. Thus, the null hypothesis which states that there is no significant difference between the post-test ADHD symptoms mean scores of male and female respondents exposed to positive reinforcement is therefore retained, meaningno significant difference was observedbetween male and female respondents on ADHD symptoms mean scores.

HO_5: There is no significant difference in the post-test ADHD symptoms of male and female respondents exposed to the response cost counselling technique.

Table 4.21: T-test for independent samples between male and female respondents exposed to RC

	Gender	N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Post-test ADHD symptoms scores	Male	5	24.20	.8367	.3742	2.93	7	.022
	Female	4	22.00	1.414	.7071			

❖ Sig at P≤ 0.05

Table 4.21shows a calculated t-value of 2.93 and p-value of .022, tested at α level of 0.05 with degree of freedom 7. Since the p-value of .022 is less than α level of 0.05.The null hypothesis which states that there is no significant difference between the post-test ADHD symptoms means scores ofmale andfemale respondents exposed toresponse costis therefore rejected, meaning significant difference was observedbetween male and female respondents on ADHD symptoms mean scores in favour of female respondents.

HO_6: There is no significant difference in thepost-test inattentiveness, hyperactivity and impulsivity symptoms of the positive reinforcement, the response cost and the control group.

Table 4.22a: Descriptive statistics onthe post-test ADHD symptoms of positive reinforcement, response cost and control group

	Treatments	N	Mean	SD	Std Error
Post-test Inattentiveness	PR	9	12.22	.4409	.1469
	RC	9	12.44	.7265	.2422
	CG	18	19.83	1.505	.3547
Post-test Hyperactivity	PR	9	7.778	.6667	.2222
	RC	9	7.111	1.167	.3889
	CG	18	12.72	2.164	.5101
Post-test Impulsivity	PR	9	3.333	.5000	.1667
	RC	9	3.667	.5000	.1667
	CG	18	6.056	1.109	.2616

Table 4.22a above shows the post-test ADHD symptomsof positive reinforcement, response cost and control group. From the post-test means scores

significant difference was observed among the groups especially between the treatment groups and the control group in favours of the treatment groups.

Table 4.22b: Analysis of Variance for the post-test ADHD symptoms ofpositive reinforcement, response cost and control group

		Sum of Squares	Df	Mean Square	F	Sig.
Post-test Inattentiveness	Between Groups	506.472	2	253.24	188.7	.000
	Within Groups	44.278	33	1.342		
	Total	**550.750**	**35**			
Post-test Hyperactivity	Between Groups	252.694	2	126.35	44.33	.000
	Within Groups	94.056	33	2.850		
	Total	**346.750**	**35**			
Post-test Impulsivity	Between Groups	59.278	2	29.639	39.21	.000
	Within Groups	24.944	33	.756		
	Total	**84.222**	**35**			

The means difference is significant at the 0.05 level.

Table 4.22b above shows that the treatment group as main factor had a significant effect on ADHD symptomsbetween the experimental groups and control group. The F-values of 188.7, 44.33 and 39.21 are significant at .000level of confidence. This suggests that the null hypothesis of no significant difference inthe post-test ADHD symptoms means scores ofpositive reinforcement;response cost and control group is therefore rejected. This result shows that positive reinforcement and response cost treatments are effective in reducing ADHD symptoms when compared with the control group. Below is the post hoc comparison (Scheffe test)on the post-test in the three dimensions of the ADHD symptoms.

Table 4.22c: Post Hoc Comparisons(Scheffe Test)

Dependent Variable	(I) Treatment	(J) Treatment	Mean Difference (I-J)	Std. Error	Sig.
Post-test Inattentiveness	PR	RC	-.22222	.54605	.921
		CG	-7.61111*	.47289	.000
	RC	PR	.22222	.54605	.921
		CG	-7.38889*	.47289	.000
	CG	PR	7.61111*	.47289	.000
		RC	7.38889*	.47289	.000
Post-test Hyperactivity	PR	RC	.66667	.79585	.707
		CG	-4.94444*	.68922	.000
	RC	PR	-.66667	.79585	.707
		CG	-5.61111*	.68922	.000
	CG	PR	4.94444*	.68922	.000
		RC	5.61111*	.68922	.000
Post-test Impulsivity	PR	RC	-.33333	.40985	.721
		CG	-2.72222*	.35494	.000
	RC	PR	.33333	.40985	.721
		CG	-2.38889*	.35494	.000
	CG	PR	2.72222*	.35494	.000

	RC	2.38889*	.35494	.000

*. The mean difference is significant at the 0.05 level.

Table 4.22c above extended the analysis of variance by examining ways of making comparisons within a set of means. A significant *F* in an analysis of variance is simply an indication that not all the population means are equal. It does not tell us which means are different from which other means. So the post hoc (Scheffe test)above presented a group comparison of experimental groups (positive reinforcement&response cost) and the control group in eighteen (18) instances across the three symptoms of ADHD. From the mean difference it can be observe that any comparison involving control group the p-value is smaller than the significance level of 0.05, meaning, there is a significant difference between the experimental groups and control group in favours of experimental groups.

HO_7: There is no significant difference between the pre-test and the post-test inattentiveness symptoms of the respondents exposed topositive reinforcement counselling technique.

Table 4.23: T-testfor dependent sample pre-test andpost-test inattentiveness

Group	N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Pre-test scores	9	20.22	3.153	1.051			
Inattentiveness					8.00	8	.000
Post-test scores	9	12.22	.4409	.1469			

Table 4.23 shows the pre-test and post-test inattentiveness symptoms of respondents exposed topositive reinforcement counselling technique. The t-value of 8.00 is significant at .000with degree of freedom 8. Thus, the null hypothesis which states that there is no significant difference between pre-test and post-test inattentiveness symptoms means score ofthe respondents exposed to positive reinforcement is therefore rejected.Meaning, significant difference was

observedbetween pre-test and post-test mean scores oninattentiveness symptoms in favour of post-test scores.

HO_8: There is no significant difference between pre-test andpost-test hyperactivity symptoms ofthe respondents exposed topositive reinforcement counselling technique.

Table 4.24: T-testfor dependent sample pre-test andpost-test hyperactivity

Group		N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Hyperactivity	Pre-test scores	9	12.78	3.833	1.2778	3.72	8	.006
	Post-test scores	9	7.778	.6667	.22222			

Table 4.24 presentsa calculated t-value of 3.72 and p-value of .006 tested at α 0.05 level ofsignificance with degree of freedom 8. The p-value is less than α 0.05. Therefore the null hypothesis which states that there is no significant difference between pre-test and post-test hyperactivity symptoms ofthe respondents exposed to positive reinforcement counselling techniqueis rejected.Meaning, there is significant difference in the pre-test and post-test hyperactivity symptoms of the respondents in favour of post-test scores.

HO_9: There is no significant difference between pre-test and post-test impulsivity symptoms of therespondents exposed to positive reinforcement counselling technique.

Table 4.25: T-testfor dependent sample pre-test andpost-test impulsivity

Group		N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Impulsivity	Pre-test scores	9	5.222	1.716	.5719	3.35	8	.010
	Post-test scores	9	3.333	.5000	.1667			

Result on table 4.25 show a calculated t-value of 3.35 and p-value of .010, tested at α 0.05 level of significance with degree of freedom 8. The p-value is less than α level. Therefore the null hypothesis which states that there is no significant difference

between pre-test and post-test impulsivity symptoms of the respondents exposed to positive reinforcement counselling techniqueis rejected.Meaning,the pre-test and post-test impulsivity symptoms mean scores significantly differ in favour of post-test.

HO_{10}: There is no significant difference between pre-test and post-test inattentiveness symptoms ofthe respondents exposed to response cost counselling technique.

Table 4.26: T-testfor dependent sample pre-test andpost-test inattentiveness

Group		N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Inattentiveness	Pre-test scores	9	20.44	3.206	1.069	7.59	8	.000
	Post-test scores	9	12.44	.7265	.2422			

Table 4.26 showspre-test and post-test inattentiveness symptoms of respondents before and after the treatment of response cost counselling technique. The t-value of 7.59is significant at .000level of confidence with degree of freedom 8. Thus, the null hypothesis which states that there is no significant difference between pre-test and post-test inattentiveness symptoms of the respondents exposed to response cost counselling technique is therefore rejected.Meaning, pre-test andpost-test inattentiveness symptoms differ in favour of post-test scores.

HO_{11}: There is no significant difference between pre-test and post-test hyperactivity symptoms of the respondents exposed toresponse cost counselling technique.

Table 4.27: T-testfor dependent sample pre-test andpost-test hyperactivity

Group		N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Hyperactivity	Pre-test scores	9	11.22	3.528	1.176	4.09	8	.004
	Post-test scores	9	7.111	1.167	.3889			

Table 4.27 shows the pre-test and post-test hyperactivity symptoms ofrespondents exposed to response cost counselling technique. The calculated t-value of 4.09 is significant at .004level of confidence with degree of freedom 8. Thus, the null

hypothesis, which states that there is no significant difference between pre-test and post-test hyperactivity symptoms of the respondents exposed to response cost counselling techniqueis therefore rejected.Meaning, significant difference was observedbetween pre-test and post-test hyperactivity symptoms of the respondents in favours of post-test scores.

HO_{12}: There is no significant difference between pre-test and post-test impulsivity symptoms of the respondents exposed toresponse cost counselling technique.

Table 4.28: T-testfor dependent sample pre-test andpost-test impulsivity

Group		N	Mean	S.D	Std. Error Mean	t-cal	Df	P-Value (2-tailed)
Impulsivity	Pre-test scores	9	20.44	3.206	1.069	3.21	8	.012
	Post-test scores	9	12.44	.7265	.2422			

Table 4.28 shows pre-test and post-test impulsivity symptoms of the respondents exposed toresponse cost counselling technique. The calculated t-value of 3.21 with degree of freedom 8 is greater than the t-critical 2.31 at α 0.05 level of significance. While the p-value of .012 is also less than the alpha level. Therefore the null hypothesis which states that there is no significant difference between pre-test and post-test impulsivitysymptoms of the respondents exposed to response cost counselling techniqueis rejected. Meaning,the pre-test and post-test impulsivity symptoms differ in favour of the post-test scores.

4.5 Summary of Findings

From the results of the analysis presented in table 4.5 to 4.28 above, the findings of this study are thus summarized with the direct reference to t-values, p-values, f-value and theα level.

1. The positive reinforcement counselling technique had effect on reducing the ADHD symptoms among the treatment group, the t-values of 14.73, 6.64 and 6.96 are significant even at .000levels of significance.
2. The response cost counselling technique had effect on reducing the ADHD symptoms among the treatment group, thet-values of 13.85, 7.22 and 6.11 which are significant at .000 levels of confidence.
3. The positive reinforcement and the response cost counselling techniques have similar effect on the post-test ADHD symptoms of the respondents in the two treatment groups. Thus the observed t-values of .784, 1.49 and 1.41 respectively were not significant at 0.05 level of confidence.
4. The positive reinforcement counselling technique had similar effect on the ADHD symptoms mean scores of the male and the female respondents of the treatment group. Thus, the observed, t-value of .378 signifies no gender difference in the effect of the treatment.
5. The response costcounselling technique had significant effect on the ADHD symptoms mean scores of the male and female treatment group. The observed t-value is 2.93, thus indicating significant gender difference in the effect of the treatment in favour of female respondents.

6. The positive reinforcement and the response cost counselling techniques had similar effect in reducing inattentiveness, hyperactivity and impulsivity symptoms among primary school pupils in Kano metropolis. The observed F-values are 188.7, 44.33 and 39.21 were significant at.000 levelsof confidence. Hence, the difference in the means between the experimental groups (PR & RC) and the control group is statistically significant in favour of the experimental groups.
7. The positive reinforcement counselling technique had effect onreducing inattentiveness symptoms among the primary school pupils. The calculated t-value is 7.54, thus,signifying difference between pre-test and post-test scores on inattentiveness. The difference was in favour of the post-test scores.
8. The positive reinforcement counselling technique had effect on reducing hyperactivity symptoms among the primary school pupils. The calculated t-value is 3.72 which indicate significant difference between pre-test and post-test scores on hyperactivity symptoms. The difference favours the post-test scores.
9. The positive reinforcement counselling technique had significant effect on impulsivity symptoms reduction. The obtained t-value is 3.35, which indicates significant difference between pre-testand post-test scores on impulsivity symptoms. The observed difference is in favour of the post-test group.
10. The response cost counselling technique had effect on reducing inattentiveness symptoms among the primary school pupils. The obtained t-value is 7.59, which indicates significant difference between pre-test and post-test scores on inattentiveness symptoms. The difference is in favour of the post-test scores.
11. The response cost counselling technique had effect on reducing hyperactivity symptoms among the primary school pupils. The calculated t-value is 4.09 which

indicate significant difference between pre-test and post-test scores. The difference is in favour of the post-test scores.

12. The response cost counselling technique had significant effect onimpulsivity symptoms reduction among the primary school pupils in Kano metropolis. The observed t-value is 3.21, which indicate significant difference between pre-test and post-test scores. The difference was in favour of the post-test scores.

4.6 Discussions

The study sets out mainly to investigate the effects of positive reinforcement and response cost counselling techniques on attention deficit hyperactivity disorder (ADHD) symptoms among primary school pupils in Kano metropolis.

The major findings of this study shows that positive reinforcement and response cost counselling techniques had the effects of reducing the inattentiveness, hyperactivity and impulsivity symptoms of ADHD as measured by the ASC. The findings is in line with the initial assumptions of this study that the techniques will have the effect of either reducing or increasing the ADHD symptoms mean scores of the treatment groups.

Theoretically the findings were supported by Thorndike's law of effect,Ivan Pavlov and social learning theory.The law of effect states that,'When a modifiable connection between stimulus and response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased. When made and accompanied or followed by an annoying state of affairs, its strength is decreased'. While Pavlovstates that 'most of our learning is associated with the process of conditioning from the beginning and the process of conditioning not only helps us in learning what is desirable but also helps in eliminating, avoiding or unlearning of undesirable habits, unhealthy attitudes, superstitions, fear and phobias through de-conditioning'. According to social learning theory, all behaviours are learned through a

combination of positive and negative reinforcement and modelling. Within this theory learning takes place indirectly by receiving information, observing others or modelling.

The finding is in line with Sullivan and O'Leary (1990) who compared the effects of response cost and rewards on maintaining high rates of on-task behavior after fading an intervention. Results showed that all the 10 children maintained their rates of on-task behavior after fading the response cost, and half of them continued to do so after the reward system was terminated.

The finding is also in line with McGoey&DuPaul (2000) in which response cost was compared with token reinforcement. Both strategies were effective in reducing disruptive behaviour.The finding is also in line with Luka (2010) in which reinforcement was compared with premack counselling techniques in truancy reduction among secondary school students in Kaduna state. Results showed that the two techniques are effective in reducing truancy among secondary school students in Kaduna state.

Ahmed's (2013) findings also supported this finding.He investigated the effects of positive reinforcement on the levels of absenteeism among secondary school students in the Daura zonal inspectorate of education of Katsina state. Results indicated that the technique is effective in reducing absenteeism among secondary school students.

The finding is contrary to that of Darma (2010) in which she compared behaviour therapy with nutritional supplement on the handwriting skills of children with attention deficit disorder. The finding reveals that nutritional supplements are significantly more effective than behaviour therapy. From the forgoing, the researcher assumed that the effects of the treatments might be due to the fact that during the treatment sessions, material/monetary rewards were used in order to reinforce positive behaviour among the respondents.

The study also raised the question of whether the two techniques will have differential effects on the ADHD symptoms mean scores of the respondents in the treatment group.Findingsrevealedno significant difference between the positive reinforcement and the response cost in the post-test ADHD symptoms mean scores of the two treatment groups. This means both techniques were effective in reducing ADHD symptoms. Theoretically, the finding is supported by B.F. Skinner's postulation of operant conditioningthat 'responses can be increased or decreased by consequences that are rewarding or punishing'. The theory which features reinforcing and punishing consequences to effect behavior change are the bases for behavioural intervention with exceptional students.

The findingis supported byMcGoey and DuPaul (2000).They examined the effects of a token reinforcement intervention and a response cost intervention on the disruptive behaviour of pre-school children. Findings show that both interventions decreased student's aggressive behaviour on the same level. The finding is also supported bySolanto (1990) who conducted an intervention study with 20 pre-schoolers with ADHD to investigate the effects of: a) rewards on students' abilities to wait before responding (delayed response) and b) response cost on children's impulsiveness. Findings indicated that there were no significant differences in the effects of rewards and response cost in decreasing children's impulsiveness.

The finding is also supported by Pfiffner, O'leary, Rosen and Sanderson (1985), they evaluated the effects of response cost and verbal reprimands on ADHD children off-task classroom behaviours. They found that the continuous use of response cost was the most effective treatment for hyperactive and off-task behaviour.

The findingiscontrary to Carlson, Mann and Alexander (2000); they examined the effects of response cost and rewards on the ability of 40 middle school-age students

with ADHD to finish assignments and correctly complete problems. Results revealed that response cost was more effective than rewards in improving the students' academic performance.The literature further supported this finding that the use of response cost in the classroom to improve the behaviour of children with ADHD has been well supported (DuPaul, Guevremont & Barkley, 1992).

The finding is also contrary to that of Rapport, Murphy and Bailey (1982); they compared the effects of medication to the behaviour modification technique of response cost in order to reduce off-task behaviour and increase the academic performance of two grade males diagnosed with an ADHD according to DSM –III criteria. Results indicated that both response cost and psycho-stimulants were effective in increasing the off-task behaviour and the academic performance of the participants, with response cost procedure having an ever greater effect.The findingsarealso contrary to the finding of Luka (2010) who reports that positive reinforcement is more effective in reducing truancy than premack.

This may be attributed to the fact that pupils with the ADHD symptoms perform better when there is structure in the classroom as postulated by Abramowitz & O'Leary, 1991; Barkley, 1998; DuPaul & Stoner, 1994; Gardill, 1996). They suggested that posting rules as well as providing pupils with a daily schedule so that they know what to expect for the day.

The study raised the question of whether positive reinforcement technique will have differential effects on the ADHD symptoms mean scores of male and female respondents of the treatment group. Finding shows that the treatment had similar effects on the ADHD symptoms mean scores of male and female respondents who received treatments. Their mean difference is less than 0.5 score; in fact the reduction was almost equal.

The literature supported this finding for example, Befera and Barkley, 1984; Faraons, 1991, Hinshaw, (1994) reported that boys and girls with ADHD symptoms do not differ in academic performance, social functioning or fine motor skills and they display comparable patterns of parent-child interactions, have similar rates of ADHD in relatives and showed the same response to stimulant medications.However, this finding rejects the assumption of this study that positive reinforcement technique will have differential effects on the ADHD symptoms mean scores of males and females respondents of the treatment group.

The finding is in line with Luka (2010) who reports that reinforcement and premack counselling techniques are not gender sensitive in reducing truancy among secondary school students in Kaduna state. Similarly, Ahmed (2013) reports no significant gender difference in the effects of positive reinforcement in reducing absenteeism among secondary school students in Daura zonal inspectorate of education of Katsina state.

The finding confirmed Graetz, Sawyer & Baghurst (2005) study which reported that among children who were identified from a nationally representative sample of Australian children, boys and girls who met symptom criteria for DSM-IV did not differ on the core symptoms of the disorder.

Contrary to this finding Gaub and Carlson, (1997); Seidman, (1997) reported that when gender differences are found, boys show more hyperactivity, more accompanying aggression and antisocial behaviour and greater impairment in executive functions and girls show greater verbal and non-verbal intellectual impairment.

Also contrary to this finding Harvey,(1999) studied the ADHD symptoms in Australian primary school children they found the gender difference between boys and girls was 5:1, and also the boys were rated higher than girls by both parents and

teachers. Similarly, Lumley,(2002) examined sex difference in a mostly clinic referred sample of 125 children comprising 24 girls and 101 boys, age ranged from 3 years, 10 months to 7 year 10 months. The result revealed that, teachers reported that boys with ADHD were more inattentive, hyperactive/impulsive than girls with ADHD.

The researcher's position on this, is that it may be attributed to the fact that, the respondents by virtue of similarity of their socio-cultural environment, similarity of age and were treated in mixed-sex group interaction.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presentsthe summary of the entire research study;it also included conclusions drawn from the findings of thestudy. Suggestions and recommendationsfor further research studieswere also made based on the findings of the study.

5.2 Summary

The researcher was moved by the fact that ADHD children are associated with core symptoms of inattentiveness, hyperactivity and impulsivity had a variety of disruptive classroom behaviours such as leaving seat, easily distracted by outside stimuli, interrupting others in classroom activities and have personality traits that interfere with their daily lives, their education, their social interactions and their relationships with friends and family members.The researcher then wanted to see how positive reinforcement and response cost counselling techniques can be used to reduce the symptoms of ADHD among primary school pupils in Kano metropolis. To test the effectiveness of these techniques on ADHD symptoms mean scores of the respondents, the research was guidedby twelve objectives with corresponding research questionsand twelve hypotheses.

From the twelve hypotheses tested, ten were rejected and two were accepted. Hypotheses 1, 2, 5,6, 7, 8, 9, 10, 11 and 12 were rejected as differences were observed between the groups whereas hypotheses 3 and 4 were retained as no difference was observed between the groups.

Chapter two,deals with review of related literature, the concept of ADHD and its related areas were discussed extensively, the concepts of positive reinforcement, the response cost were also discussed, theoretically the study was guided by the theoretical postulations of B.F. Skinner's theory of operant conditioning, trial and error learning theory of E.L. Thorndike and social learning theory by Albert Bandura).Empirical studies were reviewed and summary of the literature reviewed was also presented.

However, chapter three focuses on describing the type of design, which was quasi experimental design using pre-test and post-testcontrol group design. The population comprises of sixty one (61) ADHD pupils from three randomly selected schools: Chiranchi primary school, Dorayi primary and RijiyarZaki primary school out of which thirty six (36) were used as the sample for the study. The samples were assigned to treatments (PR & RC) and control group. The instrument for data collection was described and the detailed procedures for treatments were explained and the procedures for data analysis were presented.

Chapter four focuses on the analysis of data obtained from the study. It involves data presentation, hypotheses testing, summary of findings and discussions on the findings.Twelve research questions were answered using mean scores and standard deviations of the respondents, while t-test for independent sample was used for hypotheses 1, 2, 3, 4 and 5whereas t-test for dependent samples was used for hypotheses 7, 8, 9, 10, 11& 12 and one way Analysis of variance was used for hypothesis 6.

Finally, chapter five presents summary of the five chapters, conclusions drawn from the findings of the study, recommendations based on the findings, suggestions for further studies and the limitations of the study were all presented in the chapter.

5.3 Conclusions

Evidence from this study shows that positive reinforcement and response cost techniques significantly reduce ADHD symptoms among primary school pupils. Therefore, the use of positive reinforcement and response cost techniques are effective in the behavioural symptoms of inattentiveness, hyperactivity and impulsivity as measured by the ASC. It was concluded based on this central finding that the positive reinforcement and the response cost counselling techniques as utilized in this study are effective counselling strategies for reducing the inattentiveness, hyperactivity and impulsivity symptoms of ADHD among primary school pupils.This is evidently clear from the ADHD symptoms mean scores in which significant difference was observed between the two experimental groups and the control group across the three sub-types of the ADHD symptoms.

On the finding in relation to the differential effect of the treatments on the respondents, it was concluded that the two techniques (positive reinforcement and response cost) had no differential effects in reducing ADHD symptoms of inattentiveness, hyperactivity and impulsivity among primary school pupils in Kano metropolis. Based on this, it was concluded that the two techniques have effects on reducing the three core symptoms of ADHD (inattentiveness, hyperactivity and impulsivity) among primary school pupils.This is evidently clear from the pre-test and post test mean scores.

Considering the finding in relation to the differential effectof the treatments another conclusion was reached. That isthe positive reinforcement had no differential effect between male andfemale respondents on ADHD symptoms mean scores. This pointed that, the positive reinforcement technique was not gender sensitive in the effect on ADHD symptoms scores. However, the response cost counselling technique had

differential effect betweenmale and female respondents on ADHD symptoms mean scores in favour of female respondents.

In relation to the finding on the effects of positive reinforcement on the pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms. It was concluded that the treatments was found to be effective on the post-test scores of the respondents in both the three symptoms scale.

Finally, another conclusion was reached in relation to the effects of response cost counselling technique on pre-test and post-test inattentiveness, hyperactivity and impulsivity symptoms. The conclusion was that the technique was found to be effective on the post-test scores of the respondents.

5.4 Recommendations

Consequently upon the findings of this study, it is recommended as follows.

1. Since the findings of this study reveal that the two techniques were found to be effective on ADHD symptoms reduction. School counsellors should utilize the techniques in their counselling practice either through individual or group counselling.
2. The pupils who manifestedthe ADHD symptoms should not be punished or bullied by teachers andpeers' rather behavioural interventions such as positive reinforcement and response cost is required during teaching and learning process.
3. Since the two techniques have no differential effects on ADHD symptoms mean scores across the three behavioural characteristics of inattentiveness, hyperactivity and impulsivity, teachers and school counsellors should utilize the technique of positive reinforcement in rewarding desired behaviour and the response cost inpunishing unwanted behaviours displayed by pupilsduring classroom instructioninstead of physical punishment.

4. Teachers should be made aware of the symptoms of ADHD (inattentiveness, hyperactivity and impulsivity) for early referral and diagnosis. In addition, they should be trained on classroom management of ADHD children.
5. Parents training programs should be developed to increase parenting skills. These should focus on increasing parents' skills in managing their child'sbehaviour, facilitating social skills development, and encouraging parents' positive interaction with their child.

5.5 Suggestionsfor Further Studies

Based on the methodology and findings of this study, the following suggestions were made for further studies.

1. The scope of this study covered only public primary schools. It is therefore suggested that similar study be replicated to cover private schools. To know whether the same results will be obtained so that generalization could be made about the findings on all primary schools pupils in Kano metropolis.
2. The population for this research was only primary five pupils. It is recommended that this study be replicated to cover other primary schools levels.In this way more variables could be involved in the study such as class level, parental socio-economic status and educational background etc.
3. The present study used positive reinforcement and response cost techniques, a similar study could be carried out using other behavioural techniques.
4. While this study used mixed grouping (males and females). A similar study is recommended using single sex grouping for treatment purpose.

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APPENDIX ONE: TREATMENT PACKAGE

(Positive Reinforcement Counselling Technique)

The objective of the treatment package is to improve attention and focus on assignments and classroom instructions, maintain organized and neat work and also reduce disruptions to class by raising hand, waiting to be called on, thinking and pausing before doing etc.

Session 1

i. The researcher welcomed the respondents warmly and introduces himself to them in order to establish rapport between them. The researcher asked them to introduce themselves one after the other.

ii. The first and foremost step in the treatment is identification of target problem behaviours which includes: inattentive, blurts out, off task, excessive movement, out of seat, fidgeting, disruptive behaviours and unprepared work, no materials or books etc.

iii. The researcher explained to the respondents that those behaviours listed above are the ones that should be avoided during the classroom interactions, also the subject (English) to be taught, time, day and number of sessions were clearly explained to the respondents. The programme lasted for six weeks; every session lasted for 25-30 minutes on Monday's after breakfast.

Session 2:

i. The researcher welcomed the respondents and presented the topic (Reading passage based on observing and reporting things).

ii. The researcher read the passage to the class and at the same time class teacher assist in observing pupils' behaviour.

iii. The researcher asked the pupils to look carefully at the passage and report what they were able to observe from the passage.

iv. The respondents were allowed to make oral reports of observations they made.

v. Respondents who reported accurately observed things/events were rewarded with social reinforcement like praise, clapping of hands etc.

Session 3:

i. The researcher welcomed the respondents and review of the previous session was done.

ii. The researcher introduced the topic (composition involving expression of personal opinion, such as 'I like living in the city better than in a village).

iii. The researcher discussed the topic using various pictures showing places of interest in both city and in the village.

iv. The researcher asked the pupils to express their personal opinion on what they like most in school.

v. Respondents who conducted themselves in orderly manner during the session were rewarded with secondary reinforcer (₦20).

vi. A home work was given to the respondents to write five things (5) they like most in their live.

Session 4:

i. As usual the researcher welcomed the respondents.

ii. The researcher collected and marked the homework in the class.

iii. Areas of corrections were highlighted.

iv. At this point the researcherpresented a reinforcer (two exercise books and a pencil) to the respondents who completed and performed well in the homework.

v. While those whose home works were not neatly done were asked to emulate their colleagues.

vi. At this session, the researcher reminded the respondents of how much time is left, what task is next.

Session 5:

i. The researcher welcomed the respondents and introduced the topic (Family basic needs).

ii. The researcher discussed the basic needs of the family such as food, housing, clothing, healthcare, education etc using relevant pictures/objects.

iii. The researcher guidedthe respondents to use appropriate format for presenting their own family basic needs.

iv. Then the researcher allowed them to come outand mention some of the basic things they need from their parents to the hearing of the entire class.

v. A firm redirection was given to those who were unable mention some of the things they need from their parents.

vi. A recess was given to those who answered the question accurately.

Session 6:

i. The researcher welcomed the respondents and praised them for their cooperation up to this stage.

ii. The researcher reviewed the five sessions and allowed the respondents to express their feelings about the sessions.

iii. The researcher encouraged the respondents to avoid those behaviours listed during the first session of the programme.

iv. The respondents were informed that today marked the end of our contacts.

v. The school head and members of staff were also been informed and appreciated for their cooperation and understanding.

vi. An interval of six weeks was observed before the post test.

APPENDIX TWO: TREATMENT PACKAGE

Response Cost Counselling Technique

The objective of the treatment package is also to improve attention and focus on assignments and classroom instructions, maintain organized and neat work and also reduce disruptions to class by raising hand, waiting to be called on, thinking and pausing before doing etc.

Session 1:

i. The researcher welcomed the respondents warmly and introduces himself to them in order to establish rapport between them. The researcher asked them to introduce themselves one after the other.

ii. The first and foremost step in the treatment is identification of target problem behaviours which includes: inattentive, blurts out, off task, excessive movement, out of seat, fidgeting, disruptive behaviours and unprepared work, no materials or books etc.

iii. The researcher explained to the respondents that those behaviours listed above are the ones that should be avoided during the classroom interactions, also the subject (English) to be taught, time, day and number of sessions were clearly explained to the respondents. The programme lasted for six weeks; every session lasted for 25-30 minutes on Wednesday's after breakfast.

iv. The researcher informed them that for every session a reward is attached to it mainly for desired behaviours.

v. The researcher also informed them that any unwanted behaviour exhibited during the session will cause a respondent to lose a privilege such as losing of 5 minutes during short break.

Session 2:

i. The researcher welcomed the respondents and presented the topic (Reading passage based on observing and reporting things).

ii. The researcher read the passage to the class and at the same time observed pupils' behaviour.

iii. The researcher asked the pupils to look carefully at the passage and report what they were able to observe from the passage.

iv. During the observation, three (3) respondents tried to disrupt the classroom atmosphere and this caused them to lose one of the five chocolates set aside for each respondents.

v. A home work was given to the respondents to write those things they observed in their houses.

Session 3:

i. The researcher welcomed the respondents and a review of the previous session was done.

ii. The researcher collected the assignment and marked it in the class, corrections were made.

iii. Based on the corrections, four (4) respondents earned ₦30 each while three (3) earned ₦20 and one (1) respondent ended up with ₦5only.

iv. The researcher reviewed the major activity of the day which is more of reporting accurately those things around us.

Session 4:

i. As usual the researcher welcomed the respondents and reminded them of what happened during the last session.

ii. The researcher introduced the topic (composition involving expression of personal opinion, such as 'I like living in the city better than in a village).

iii. The researcher discussed the topic using various pictures showing places of interest in both city and in the village.

iv. During the presentation the researcher observed that three (3) respondents were distractible and this led them to lose one exercise notebook set for the session.

v. At this session, the researcher reminded the respondents of how much time is left, what task is next.

Session 5:

i. The researcher welcomed the respondents and introduced the topic (Family basic needs).

ii. The researcher discussed the basic needs of the family such as food, housing, clothing, healthcare, education etc using relevant pictures/objects.

iii. Two respondents were reminded that they need to raise their hands before talking out in class.

iv. The researcher guidedthe respondents to use appropriate format for presenting their own family basic needs.

v. The two respondents repeated the action and they were punished by losing two chocolates from the five chocolates set aside for the day.

vi. The researcher reviewed the major activities of the day which is more of reporting accurately basic family needs.

Session 6:

i. The researcher welcomed the respondents and praised them for their cooperation up to this stage.

ii. The researcher reviewed the major activities during the programme from all the sessions and asks some questions.

iii. The researcher asked the respondents a question on the reason why they lose a privilege?

iv. The respondents answered the question in an orderly manner by saying 'it is because of our failure to follow the instruction'.

v. The researcher then reviewed the major activities during the sessions and encouraged them to strictly adhere to the behaviour change plans as discussed in the sessions and always remember the implications of not following the instructions.

vi. The respondents were formally informed that today's contact marked the end of our meetings.

vii. The school head and members of staff of the schools were also informed and appreciated for their cooperation and understanding.

APPENDIX THREE: ADHD SYMPTOMS CHECKLIST 'ASC'

INTRODUCTION: Dear Respondent. I am a Postgraduate student of the Department of Educational Psychology and Counselling at Ahmadu Bello University, Zaria. I am pursuing my PhD in Guidance and Counselling, and my area of research is 'Effects of positive reinforcement and response cost counselling techniques on attention deficit hyperactivity disorder (ADHD) symptoms among primary school pupils in Kano State.

INSTRUCTION: You are requested to, please; give your frank and honest response to each of the statements. When filling this checklist, think about the behaviour of the child over at least the past six months. You are to tick against one of the four options. All information provided will be treated with utmost confidentiality and will be used purely for research purpose.

Thanks for your cooperation.

Name of School……...……**Class**…….

Name of Pupil ……...**Sex**……...……Male/Female

S/N	Symptoms of Inattention	Never (0)	Sometimes (1)	Often (2)	Very Often (3)
1	Fails to give close attention to details or makes careless mistakes in school work or other activities.				
2	Has difficulty sustaining attention in tasks or play activities.				
3	Does not seem to listen when spoken to directly.				
4	Does not follow through on instructions & fails to finish schoolwork, chores, or duties In the workplace.				
5	Has difficulty organizing tasks & activities.				
6	Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as homework).				
7	Loses things necessary for tasks or activities (toys, school assignments, pencils or books).				
8	Is easily distracted by outside stimuli.				
9	Is forgetful in daily activities.				
S/N	**Symptoms of Hyperactivity**	**Never (0)**	**Sometimes (1)**	**Often (2)**	**Very Often (3)**
1	Fidgets with hands or feet or squirms in seat.				
2	Leaves seat in classroom or in other situations where seating is expected				
3	Runs about or climbs too much in situations where it is inappropriate.				

4	Has difficulty in playing quietly.				
5	Is 'on the go' or acts as if 'driven by a motor.				
6	Talks too much.				
S/N	**Symptoms of Impulsivity**	**Never (0)**	**Sometimes (1)**	**Often (2)**	**Very Often (3)**
1	Burt out answers before questions has been completed.				
2	Has difficulty in waiting for his/her turn.				
3	Interrupts or intrudes on others (such as butting into conversations or games).				

APPENDIX FOUR: ADHD SYMPTOMS IDENTIFICATION RESULTS

S/N	SCHOOL	GENDER	CLASS	QUALIFIED	SCALE	N.Q
1	1	1	5D	✓	All	
2	1	2	5D	✓	B	
3	1	1	5G	✓	A & B	
4	1	1	5A			✓
5	1	2	5D			✓
6	1	2	5G	✓	All	
7	1	1	5A	✓	A	
8	1	2	5D	✓	A	
9	1	1	5C			✓
10	1	1	5A	✓	B	
11	1	1	5A			
12	1	1	5B	✓	All	
13	1	1	5A	✓	C	
14	1	1	5A	✓	B & C	
15	1	1	5C	✓	A	
16	1	2	5A			✓
17	1	1	5B			✓
18	1	2	5D			✓
19	1	2	5B	✓	C	
20	1	1	5C	✓	A &C	
21	1	1	5A	✓	C	
22	1	1	5B	✓	A & B	
23	1	1	5C			✓
24	1	2	5B			✓
25	1	2	5B	✓	B	
26	1	1	5D	✓	All	
27	1	1	5D	✓	All	
28	1	1	5D	✓	All	
29	1	2	5B	✓	C	
30	1	1	5A			✓
31	2	1	5C	✓	A	
32	2	1	5C	✓	B	
33	2	2	5C	✓	All	
34	2	1	5C	✓	A & B	
35	2	1	5C			✓
36	2	2	5B			✓
37	2	1	5A			✓
38	2	2	5A	✓	All	

39	2	2	5A	✓	C	
40	2	2	5A			✓
41	2	1	5B			✓
42	2	1	5D			✓
43	2	1	5C	✓	A	
44	2	1	5B	✓	B	
45	2	2	5A	✓		✓
46	2	1	5A	✓	B	
47	2	1	5B	✓	A & C	
48	2	1	5C	✓	B	
49	2	2	5D			✓
S/N	**SCHOOL**	**GENDER**	**CLASS**	**QUALIFIED**	**SCALE**	**N.Q**
50	2	1	5D			✓
51	2	1	5B	✓	A	
52	2	2	5C	✓	A	
53	2	2	5A	✓	B	
54	2	1	5A	✓	B	
55	2	1	5A	✓	C	
56	2	1	5B			✓
57	2	2	5A			✓
58	2	1	5A	✓	A & B	
59	2	2	5A			✓
60	2	2	5A			✓
61	3	2	5B	✓	C	
62	3	1	5B	✓	A	
63	3	1	5A	✓	C	
64	3	2	5A	✓	All	
65	3	2	5A	✓	A & C	
66	3	1	5A	✓	C	
67	3	1	5A			✓
68	3	1	5B			✓
69	3	1	5A	✓	B	
70	3	1	5D	✓	All	
71	3	1	5D	✓	All	
72	3	1	5C			✓
73	3	1	5B			✓
74	3	1	5A			✓
75	3	1	5D	✓	C	
76	3	2	5A	✓	All	
77	3	2	5A	✓	A	
78	3	2	5D	✓	All	
79	3	2	5B	✓	C	
80	3	2	5B	✓	B	
81	3	2	5B	✓	All	
82	3	1	5B	✓	All	
83	3	1	5B			✓
84	3	2	5A			✓
85	3	2	5A	✓	A	
86	3	2	5A	✓	A & B	
87	3	2	5B	✓	All	
88	3	1	5D	✓	C	
89	3	1	5C	✓	B & C	
90	3	1	5B	✓	A	

91	3	1	5B			✓
92	3	1	5A			✓
93	3	1	5B			✓
94	3	1	5D			✓
95	3	1	5D			✓
96	3	1	5C			✓
97	3	2	5B			✓
98	3	1	5A			✓
99	3	2	5C			✓
100	3	1	5A			✓

APPENDIX FIVE: PRE-TEST RESULTS

S/N	SCH.	GROUP	TREATMENT	GENDER	INATT	HYPER	IMPUL	TOTAL
1	1.0	2.0	1.0	2.0	20.0	18.0	9.0	47.0
2	1.0	2.0	1.0	2.0	21.0	16.0	7.0	44.0
3	1.0	1.0	1.0	1.0	22.0	13.0	6.0	41.0
4	1.0	2.0	1.0	2.0	22.0	16.0	8.0	46.0
5	1.0	2.0	1.0	1.0	17.0	8.0	6.0	31.0
6	1.0	1.0	1.0	1.0	18.0	15.0	6.0	39.0
7	1.0	1.0	1.0	2.0	23.0	7.0	4.0	34.0
8	1.0	1.0	1.0	1.0	20.0	13.0	4.0	37.0
9	1.0	1.0	1.0	2.0	20.0	17.0	6.0	43.0
10	2.0	1.0	2.0	2.0	21.0	8.0	7.0	36.0
11	2.0	1.0	2.0	1.0	20.0	13.0	6.0	39.0
12	2.0	1.0	2.0	2.0	22.0	15.0	7.0	44.0
13	2.0	1.0	2.0	1.0	23.0	13.0	4.0	40.0
14	2.0	1.0	2.0	2.0	18.0	13.0	6.0	37.0
15	2.0	1.0	2.0	2.0	18.0	8.0	8.0	34.0
16	2.0	1.0	2.0	1.0	23.0	13.0	3.0	39.0
17	2.0	1.0	2.0	1.0	23.0	14.0	4.0	41.0
18	2.0	1.0	2.0	1.0	13.0	14.0	4.0	31.0
19	3.0	2.0	3.0	1.0	21.0	8.0	7.0	36.0
20	3.0	2.0	3.0	2.0	21.0	18.0	3.0	42.0
21	3.0	2.0	3.0	1.0	22.0	17.0	4.0	43.0
22	3.0	2.0	3.0	1.0	22.0	8.0	4.0	34.0
23	3.0	2.0	3.0	2.0	20.0	15.0	6.0	41.0
24	3.0	2.0	3.0	1.0	13.0	14.0	4.0	31.0
25	3.0	2.0	3.0	1.0	20.0	8.0	6.0	34.0
26	3.0	2.0	3.0	2.0	21.0	13.0	7.0	41.0
27	3.0	2.0	3.0	1.0	20.0	12.0	8.0	40.0
28	3.0	2.0	3.0	1.0	22.0	8.0	9.0	39.0
29	3.0	2.0	3.0	1.0	21.0	16.0	8.0	45.0
30	3.0	2.0	3.0	2.0	20.0	8.0	6.0	34.0
31	3.0	2.0	3.0	1.0	22.0	8.0	7.0	37.0
32	3.0	2.0	3.0	2.0	20.0	8.0	7.0	35.0
33	3.0	2.0	3.0	1.0	22.0	8.0	6.0	36.0
34	3.0	2.0	3.0	2.0	20.0	8.0	4.0	32.0
35	3.0	2.0	3.0	2.0	23.0	16.0	4.0	43.0
36	3.0	2.0	3.0	1.0	13.0	16.0	4.0	33.0

APPENDIX SIX: POST-TEST RESULTS

S/N	SCH.	GROUP	TREATMENT	GENDER	INATT	HYPER	IMPUL	TOTAL
1	1.0	1.0	1.0	1.0	13.0	8.0	3.0	24.0
2	1.0	1.0	1.0	2.0	12.0	8.0	4.0	24.0
3	1.0	1.0	1.0	2.0	12.0	8.0	3.0	23.0
4	1.0	1.0	1.0	1.0	12.0	8.0	3.0	23.0
5	1.0	1.0	1.0	1.0	12.0	8.0	3.0	23.0
6	1.0	1.0	1.0	1.0	12.0	8.0	4.0	24.0
7	1.0	1.0	1.0	2.0	12.0	8.0	3.0	23.0
8	1.0	1.0	1.0	2.0	13.0	8.0	4.0	25.0
9	1.0	1.0	1.0	2.0	12.0	6.0	3.0	21.0
10	2.0	1.0	2.0	2.0	12.0	5.0	3.0	20.0
11	2.0	1.0	2.0	1.0	13.0	8.0	4.0	25.0
12	2.0	1.0	2.0	2.0	13.0	6.0	4.0	23.0
13	2.0	1.0	2.0	1.0	12.0	8.0	3.0	23.0
14	2.0	1.0	2.0	2.0	11.0	8.0	3.0	22.0
15	2.0	1.0	2.0	2.0	13.0	6.0	4.0	23.0
16	2.0	1.0	2.0	1.0	12.0	8.0	4.0	24.0
17	2.0	1.0	2.0	1.0	13.0	8.0	4.0	25.0
18	2.0	1.0	2.0	1.0	13.0	7.0	4.0	24.0
19	2.0	2.0	3.0	1.0	21.0	11.0	6.0	38.0
20	3.0	2.0	3.0	2.0	20.0	12.0	4.0	36.0
21	3.0	2.0	3.0	1.0	18.0	13.0	6.0	37.0
22	3.0	2.0	3.0	1.0	20.0	13.0	4.0	37.0
23	3.0	2.0	3.0	2.0	21.0	12.0	5.0	38.0
24	3.0	2.0	3.0	1.0	22.0	14.0	7.0	43.0
25	3.0	2.0	3.0	1.0	19.0	12.0	6.0	37.0
26	3.0	2.0	3.0	2.0	18.0	13.0	6.0	37.0
27	3.0	2.0	3.0	1.0	22.0	10.0	7.0	39.0
28	3.0	2.0	3.0	1.0	21.0	14.0	6.0	41.0
29	3.0	2.0	3.0	1.0	18.0	8.0	6.0	32.0
30	3.0	2.0	3.0	2.0	19.0	17.0	8.0	44.0
31	3.0	2.0	3.0	1.0	20.0	15.0	7.0	42.0
32	3.0	2.0	3.0	2.0	20.0	12.0	5.0	37.0
33	3.0	2.0	3.0	1.0	19.0	15.0	6.0	40.0
34	3.0	2.0	3.0	2.0	20.0	10.0	6.0	36.0
35	3.0	2.0	3.0	2.0	17.0	13.0	6.0	36.0
36	3.0	2.0	3.0	1.0	22.0	15.0	8.0	45.0

APPENDIX SEVEN: SPSS RESULT FOR HYPOTHESIS ONE

Group Statistics

	Treatment	N	Mean	Std. Deviation	Std. Error Mean
Pre-test Inattentiveness	Positive Reinforcement	9	20.2222	3.15348	1.05116
	Control Group	18	20.0556	2.26150	.53304
Pre-test Hyperactivity	Positive Reinforcement	9	12.7778	3.83333	1.27778
	Control Group	18	12.6111	3.68046	.86749
Pre-test Impulsivity	Positive Reinforcement	9	5.2222	1.71594	.57198
	Control Group	18	6.2222	1.51679	.35751
Post-test Inattentiveness	Positive Reinforcement	9	12.2222	.44096	.14699
	Control Group	18	19.8333	1.50489	.35471
Post[test Hyperactivity	Positive Reinforcement	9	7.7778	.66667	.22222
	Control Group	18	12.7222	2.16403	.51007
Post-test Impulsivity	Positive Reinforcement	9	3.3333	.50000	.16667
	Control Group	18	6.0556	1.10997	.26162

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	Df	Sig. (2-tailed)
Pre-test Inattentiveness	Equal variances assumed	1.098	.305	.158	25	.876
	Equal variances not assumed			.141	12.262	.890
Pre-test Hyperactivity	Equal variances assumed	.004	.953	.109	25	.914
	Equal variances not assumed			.108	15.522	.915
Pre-test Impulsivity	Equal variances assumed	1.187	.286	-1.547	25	.134
	Equal variances not assumed			-1.483	14.435	.160
Post-test Inattentiveness	Equal variances assumed	8.561	.007	-14.729	25	.000
	Equal variances not assumed			-19.823	21.963	.000
Post-test	Equal variances assumed	7.018	.014	-6.640	25	.000

Hyperactivity	Equal variances not assumed			-8.887	22.355	.000
Post-test Impulsivity	Equal variances assumed	1.234	.277	-6.960	25	.000
	Equal variances not assumed			-8.776	24.888	.000

APPENDIX EIGHT: SPSS RESULT FOR HYPOTHESIS TWO

Group Statistics

	Treatment	N	Mean	Std. Deviation	Std. Error Mean
Pre-test Inattentiveness	Response Cost	9	20.4444	3.20590	1.06863
	Control Group	18	20.0556	2.26150	.53304
Pre-test Hyperactivity	Response Cost	9	11.2222	3.52767	1.17589
	Control Group	18	12.6111	3.68046	.86749
Pre-test Impulsivity	Response Cost	9	5.5556	2.00693	.66898
	Control Group	18	6.2222	1.51679	.35751
Post-test Inattentiveness	Response Cost	9	12.4444	.72648	.24216
	Control Group	18	19.8333	1.50489	.35471
Post[test Hyperactivity	Response Cost	9	7.1111	1.16667	.38889
	Control Group	18	12.7222	2.16403	.51007
Post-test Impulsivity	Response Cost	9	3.6667	.50000	.16667
	Control Group	18	6.0556	1.10997	.26162

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	Df	Sig. (2-tailed)
Pre-test Inattentiveness	Equal variances assumed	1.406	.247	.366	25	.717
	Equal variances not assumed			.326	12.123	.750
Pre-test Hyperactivity	Equal variances assumed	.007	.934	-.937	25	.358
	Equal variances not assumed			-.950	16.744	.355
Pre-test Impulsivity	Equal variances assumed	2.394	.134	-.967	25	.343
	Equal variances not assumed			-.879	12.733	.396
Post-test Inattentiveness	Equal variances assumed	3.904	.059	-13.845	25	.000
	Equal variances not assumed			-17.204	24.999	.000

Post-test Hyperactivity	Equal variances assumed	1.935	.176	-7.224	25	.000
	Equal variances not assumed			-8.748	24.742	.000
Post-test Impulsivity	Equal variances assumed	1.234	.277	-6.108	25	.000
	Equal variances not assumed			-7.701	24.888	.000

APPENDIX NINE: SPSS RESULT FOR HYPOTHESIS THREE

Group Statistics

	Treatment	N	Mean	Std. Deviation	Std. Error Mean
Post-test Inattentiveness	Positive Reinforcement	9	12.2222	.44096	.14699
	Response Cost	9	12.4444	.72648	.24216
Post-test Hyperactivity	Positive Reinforcement	9	7.7778	.66667	.22222
	Response Cost	9	7.1111	1.16667	.38889
Post-test Impulsivity	Positive Reinforcement	9	3.3333	.50000	.16667
	Response Cost	9	3.6667	.50000	.16667

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Post-test Inattentiveness	Equal variances assumed	4.172	.058	-.784	16	.444	-.22222	.28328
	Equal variances not assumed			-.784	13.190	.447	-.22222	.28328
Post-test Hyperactivity	Equal variances assumed	5.934	.027	1.488	16	.156	.66667	.44790
	Equal variances not assumed			1.488	12.721	.161	.66667	.44790
Post-test Impulsivity	Equal variances assumed	.000	1.000	-1.414	16	.176	-.33333	.23570
	Equal variances not assumed			-1.414	16.000	.176	-.33333	.23570

APPENDIX TEN: SPSS RESULT FOR HYPOTHESIS FOUR

```
T-TEST GROUPS=Gender (1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Post-test ADHD Scores
  /CRITERIA=CI (.9500).
```

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Post-testADHDScores	Male	4	23.5000	.57735	.28868
	Female	5	23.2000	1.48324	.66332

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Post-testADHDScores	Equal variances assumed	1.337	.285	.378	7	.71666	.30000	.79373	-1.57686	2.17686
	Equal variances not assumed			.415	5.400	.69433	.30000	.72342	-1.51889	2.11889

APPENDIX ELEVEN: SPSS RESULT FOR HYPOTHESIS FIVE

```
T-TEST GROUPS= Gender (1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Post-test ADHD Scores
  /CRITERIA= CI (.9500).
```

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Post-testADHDScores	Male	5	24.2000	.83666	.37417
	Female	4	22.0000	1.41421	.70711

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Post-testADHDScores	Equal variances assumed	.733	.420	2.925	7	.022	2.20000	.75214	.42147	3.97853
	Equal variances not assumed			2.750	4.642	.044	2.20000	.80000	.9494	4.30506

APPENDIX TWELVE: SPSS RESULT FOR HYPOTHESIS SIX

```
ONEWAY PreInatt, PreHyp, PreImp, PosInatt, PosHyp, PosImp by Treatments
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS.
```

Descriptive

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Pre-test Inattentiveness	Positive Reinforcement	9	20.2222	3.15348	1.05116	17.7982	22.6462	13.00	23.00
	Response Cost	9	20.4444	3.20590	1.06863	17.9802	22.9087	13.00	23.00
	Control Group	18	20.0556	2.26150	.53304	18.9309	21.1802	13.00	23.00
	Total	36	20.1944	2.67068	.44511	19.2908	21.0981	13.00	23.00
Pre-test Hyperactivity	Positive Reinforcement	9	12.7778	3.83333	1.27778	9.8312	15.7243	8.00	18.00
	Response Cost	9	11.2222	3.52767	1.17589	8.5106	13.9338	7.00	17.00
	Control Group	18	12.6111	3.68046	.86749	10.7809	14.4414	8.00	18.00
	Total	36	12.3056	3.63176	.60529	11.0767	13.5344	7.00	18.00
Pre-test Impulsivity	Positive Reinforcement	9	5.2222	1.71594	.57198	3.9032	6.5412	3.00	7.00
	Response Cost	9	5.5556	2.00693	.66898	4.0129	7.0982	4.00	9.00
	Control Group	18	6.2222	1.51679	.35751	5.4679	6.9765	4.00	9.00
	Total	36	5.8056	1.70410	.28402	5.2290	6.3821	3.00	9.00
Post-test Inattentiveness	Positive Reinforcement	9	12.2222	.44096	.14699	11.8833	12.5612	12.00	13.00
	Response Cost	9	12.4444	.72648	.24216	11.8860	13.0029	11.00	13.00
	Control Group	18	19.8333	1.50489	.35471	19.0850	20.5817	17.00	22.00
	Total	36	16.0833	3.96683	.66114	14.7412	17.4255	11.00	22.00
Post-test Hyperactivity	Positive Reinforcement	9	7.7778	.66667	.22222	7.2653	8.2902	6.00	8.00
	Response Cost	9	7.1111	1.16667	.38889	6.2143	8.0079	5.00	8.00
	Control Group	18	12.7222	2.16403	.51007	11.6461	13.7984	8.00	17.00
	Total	36	10.0833	3.14756	.52459	9.0184	11.1483	5.00	17.00
Post-test Impulsivity	Positive Reinforcement	9	3.3333	.50000	.16667	2.9490	3.7177	3.00	4.00
	Response Cost	9	3.6667	.50000	.16667	3.2823	4.0510	3.00	4.00
	Control Group	18	6.0556	1.10997	.26162	5.5036	6.6075	4.00	8.00

Descriptive

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Pre-test Inattentiveness	Positive Reinforcement	9	20.2222	3.15348	1.05116	17.7982	22.6462	13.00	23.00
	Response Cost	9	20.4444	3.20590	1.06863	17.9802	22.9087	13.00	23.00
	Control Group	18	20.0556	2.26150	.53304	18.9309	21.1802	13.00	23.00
	Total	36	20.1944	2.67068	.44511	19.2908	21.0981	13.00	23.00
Pre-test Hyperactivity	Positive Reinforcement	9	12.7778	3.83333	1.27778	9.8312	15.7243	8.00	18.00
	Response Cost	9	11.2222	3.52767	1.17589	8.5106	13.9338	7.00	17.00
	Control Group	18	12.6111	3.68046	.86749	10.7809	14.4414	8.00	18.00
	Total	36	12.3056	3.63176	.60529	11.0767	13.5344	7.00	18.00
Pre-test Impulsivity	Positive Reinforcement	9	5.2222	1.71594	.57198	3.9032	6.5412	3.00	7.00
	Response Cost	9	5.5556	2.00693	.66898	4.0129	7.0982	4.00	9.00
	Control Group	18	6.2222	1.51679	.35751	5.4679	6.9765	4.00	9.00
	Total	36	5.8056	1.70410	.28402	5.2290	6.3821	3.00	9.00
Post-test Inattentiveness	Positive Reinforcement	9	12.2222	.44096	.14699	11.8833	12.5612	12.00	13.00
	Response Cost	9	12.4444	.72648	.24216	11.8860	13.0029	11.00	13.00
	Control Group	18	19.8333	1.50489	.35471	19.0850	20.5817	17.00	22.00
	Total	36	16.0833	3.96683	.66114	14.7412	17.4255	11.00	22.00
Post-test Hyperactivity	Positive Reinforcement	9	7.7778	.66667	.22222	7.2653	8.2902	6.00	8.00
	Response Cost	9	7.1111	1.16667	.38889	6.2143	8.0079	5.00	8.00
	Control Group	18	12.7222	2.16403	.51007	11.6461	13.7984	8.00	17.00
	Total	36	10.0833	3.14756	.52459	9.0184	11.1483	5.00	17.00
Post-test Impulsivity	Positive Reinforcement	9	3.3333	.50000	.16667	2.9490	3.7177	3.00	4.00
	Response Cost	9	3.6667	.50000	.16667	3.2823	4.0510	3.00	4.00
	Control Group	18	6.0556	1.10997	.26162	5.5036	6.6075	4.00	8.00
	Total	36	4.7778	1.55124	.25854	4.2529	5.3026	3.00	8.00

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Pre-test Inattentiveness	Between Groups	.917	2	.458	.061	.941
	Within Groups	248.722	33	7.537		

	Total	249.639	35			
Pre-test Hyperactivity	Between Groups	14.250	2	7.125	.526	.596
	Within Groups	447.389	33	13.557		
	Total	461.639	35			
Pre-test Impulsivity	Between Groups	6.750	2	3.375	1.174	.322
	Within Groups	94.889	33	2.875		
	Total	101.639	35			
Post-test Inattentiveness	Between Groups	506.472	2	253.236	188.736	.000
	Within Groups	44.278	33	1.342		
	Total	550.750	35			
Post-test Hyperactivity	Between Groups	252.694	2	126.347	44.330	.000
	Within Groups	94.056	33	2.850		
	Total	346.750	35			
Post-test Impulsivity	Between Groups	59.278	2	29.639	39.210	.000
	Within Groups	24.944	33	.756		
	Total	84.222	35			

APPENDIX THIRTEEN: SPSS RESULT FOR HYPOTHESIS SEVEN

```
T-TEST GROUPS=Treatment (1 2)
  /MISSING=ANALYSIS
```

/VARIABLES=Pre-test Inattentiveness Post-test Inattentiveness
/CRITERIA=CI(.9500).

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test Inattentiveness	20.2222	9	3.15348	1.05116
	Post-test Inattentiveness	12.2222	9	.44096	.14699

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-test Inattentiveness Post-test Inattentiveness	8.00000	3.00000	1.00000	5.69400	10.30600	8.000	8	.000

APPENDIX FOURTEEN: SPSS RESULT FOR HYPOTHESIS EIGHT

T-TEST GROUPS=group(1 2)
/MISSING=ANALYSIS

/VARIABLES=pre-test hyper post-test hyper
/CRITERIA=CI(.9500).

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test Hyperactivity	12.7778	9	3.83333	1.27778
	Post-test Hyperactivity	7.7778	9	.66667	.22222

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-test Hyperactivity - Post-test Hyperactivity	5.00000	4.03113	1.34371	1.90140	8.09860	3.721	8	.006

APPENDIX FIFTEEN: SPSS RESULT FOR HYPOTHESIS NINE

T-TEST GROUPS=group(1 2)
/MISSING=ANALYSIS
/VARIABLES=pre-test Impul post-test Impul

/CRITERIA=CI(.9500).

T-Test

Group Statistics

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Impulsivity	Pre-test Group	9	5.2222	1.71594	.57198
	Post-test Group	9	3.3333	.50000	.16667

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Impulsivity	Equal variances assumed	31.640	.000	3.171	16	.006	1.88889	.59577	.62592	3.15186
	Equal variances not assumed			3.171	9.349	.011	1.88889	.59577	.54880	3.22898

APPENDIX SIXTEEN: SPSS RESULT FOR HYPOTHESIS TEN

T-TEST GROUPS=Treatment (1 2)
/MISSING=ANALYSIS
/VARIABLES=Pre-test Inattentiveness Post-test Inattentiveness

/CRITERIA=CI(.9500).

T-Test

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Inattentiveness	Pre-test Group	9	20.4444	3.20590	1.06863
	Post-test Group	9	12.4444	.72648	.24216

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Inattentiveness	Equal variances assumed	5.708	.030	7.301	16	.000	8.00000	1.09573	5.67716	10.32284
	Equal variances not assumed			7.301	8.819	.000	8.00000	1.09573	5.51354	10.48646

APPENDIX SEVENTEEN: SPSS RESULT FOR HYPOTHESIS ELEVEN

T-TEST GROUPS=Treatment (1 2)
/MISSING=ANALYSIS
/VARIABLES=Pre-test Hyper Post-test Hyper

/CRITERIA=CI(.9500).

T-Test

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Hyperactivity	Pre-test Group	9	11.2222	3.52767	1.17589
	Post-test Group	9	7.1111	1.16667	.38889

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hyperactivity	Equal variances assumed	19.907	.000	3.319	16	.004	4.11111	1.23853	1.48555	6.73667
	Equal variances not assumed			3.319	9.729	.008	4.11111	1.23853	1.34106	6.88117

APPENDIX EIGHTEEN: SPSS RESULT FOR HYPOTHESIS TWELVE

T-TEST PAIRED=Treatment (1 2)
/MISSING=ANALYSIS
/VARIABLES=Pre-test Imp Post-test Imp

/CRITERIA=CI(.9500).

T-Test

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Impulsivity	Pre-test Group	9	5.5556	2.00693	.66898
	Post-test Group	9	3.6667	.50000	.16667

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Impulsivity	Equal variances assumed	21.354	.000	2.740	16	.015	1.88889	.68943	.42737	3.35041
	Equal variances not assumed			2.740	8.989	.023	1.88889	.68943	.32901	3.44876