CHAPTER - I
INTRODUCTION

1.0.0 INTRODUCTION

Current study entitled ‘Effects of Multimodal Intervention on the Academic and Behavioural Performance on the Children with Attention Deficit Hyperactivity Disorder’ encompasses implementation and evaluation of a multimodal intervention program for children with Attention Deficit Hyperactive Disorder (ADHD), focusing on study skill training to enhance academic learning and performance in the areas of mathematics and reading; regulation of inattentive, impulsive and hyperactive behaviours, through direct intervention with children; and basic behaviour modification training with parents and teachers. The current study is experimental in nature and evaluates the efficacy of proposed intervention programme on the behaviour and academic performance of the children with ADHD, using parent, teacher and researcher’s observations, standardized achievement tests and class based grades.

In this chapter, the details in respect to Diagnostic criteria for ADHD, Prevalence and Associated Problems with ADHD, Academic underachievement in children with ADHD, Current Treatment Procedures, Multimodal Treatment Procedure, Rationale of the Study, Statement of Problem, Objectives, Hypotheses and Delimitations have been given in separate captions.

1.1.0 DIAGNOSTIC CRITERIA

Attention deficit hyperactivity disorder (ADHD) is a complex disorder, where both genetic and environmental influences make a substantial contribution. In the most current assessment guidelines published by the American Psychiatric Association (APA), (1994), Diagnostic and Statistical Manual for Mental Disorder IV (DSM IV), the disorder is known as Attention Deficit Disorder and has several types including : (1) predominantly
inattentive; (2) predominantly impulsive or (3) combined. The diagnosis can be made by "ruling out" other medical or psychiatric causes for the symptoms and by then determining that the patient meets the DSM IV criteria for Attention Deficit Disorder and Attention Deficit Hyperactive Disorder.

The diagnostic criteria for the disorder include either six (or more) of the symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level or 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; and, the symptoms (hyperactive–impulsive or inattentive symptoms) that caused impairment were present before age of 7 years; and some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home). There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning. The symptoms should not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

The features of inattention include that the child often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities; often has difficulty sustaining attention in tasks or play activities; often does not seem to listen when spoken to directly; often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavioural or failure to understand instructions); often has difficulty organizing tasks and activities; often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework); often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools); is often easily distracted by extraneous stimuli; and is often forgetful in daily activities
Symptoms of hyperactivity–impulsivity include that the child often fidgets with hands or feet or squirms in seat; Often leaves seat in classroom or in other situations in which remaining seated is expected; often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness); often has difficulty playing or engaging in leisure activities quietly; is often “on the go” or often acts as if “driven by a motor”; and often talks excessively. Features of impulsivity include that the child often blurts out answers before the questions have been completed; often has difficulty awaiting turn; and often interrupts or intrudes on others (e.g., butts into conversations or games).

There are three codes based on type of disorder, first is 314.01 indicates Attention-Deficit/Hyperactivity Disorder, Combined Type: if both Criteria A1 and A2 are met for the past 6 months; second is 314.00 indicates Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type: if Criterion A1 is met but Criterion A2 is not met for the past 6 months; and third is 314.02 indicates Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive–Impulsive Type: if Criterion A2 is met but Criterion A1 is not met for the past 6 months. For individuals (especially adolescents and adults) who currently have symptoms that no longer meet full criteria, “In Partial Remission” is specified.

Classification of what constitutes ADHD has changed dramatically over the last 20 years, with each successive revision of the Diagnostic and Statistical Manual, the diagnostic criteria used to describe the disorder. Current classification for combined type ADHD given by DSM IV prescribed by American Psychiatric Association (APA, 1994) requires a minimum of six out of nine symptoms of inattention of hyperactivity/impulsivity. In addition there must be some impairment from symptoms in two or more settings (e.g. home and school) and clear evidence of significant impairment in social, school or work functioning. The DSM IV (APA, 1994) also allows the classification of two sub-type disorders: (i) predominantly inattentive where the child only
meets criteria for inattention; and (ii) predominantly hyperactive–impulsive where only the hyperactive–impulsive criteria are met.

1.2.0 PREVALENCE OF ADHD

The relatively prevalence of the disorder is high, affecting approximately 4% of all children, although estimates vary widely from 3% to 11% or more (Malhotra, Kohli, Kapoor and Pradhan, 2009; Zametkin & Ernst, 1999). The disorder usually begins in early childhood and is characterized by excessive activity, even when developmental level and limited behavioural control are taken into consideration. (Elia, Ambrosini & Rappaport, 1999). Szatmari (1992) reviewed the findings of six large epidemiological studies that identified cases of ADHD within these samples. The prevalence found in these studies ranged from a low of 2% to a high of 6.3%, with most falling within the range of 4.2% to 6.3%. Other studies have found similar prevalence rates in elementary school-age children (4–5.5% in Breton et al., 1999; 7.9% in Briggs-Gowan, Horwitz, Schwab-Stone, Leventhal & Leaf, 2000; 5–6% in DuPaul, 1991; and 2.5–4% in Pelham, Gnagy, Greenslade, & Milich, 1992). Lower rates result from using complete DSM criteria and parent reports (2–6% in Breton et al., 1999), and higher ones if just a cutoff on teacher ratings is used (up to 23% in DuPaul, Power, Anastopoulos & Reid, 1998; 15.8% in Nolan, Gadow, & Sprafkin, 2001; 14.3% in Trites, Dugas, Lynch, & Ferguson, 1979). Sex and age differences in prevalence are routinely found in research. For instance, prevalence rates may be 4% in girls and 8% in boys in the preschool age group (Nolan, Gadow & Sprafkin, 2001), yet fall to 2–4% in girls and 6–9% in boys during the 6- to 12-year-old age period based on parent reports (Breton et al., 1999; Szatmari, Offord, & Boyle, 1989). The prevalence decreases again to 0.9–2% in girls and 1–5.6% in boys by adolescence (Breton et al., 1999; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; McGee et al., 1990; Romano, Tremblay, Vitaro, Zoccolillo & Pagani, 2001; Szatmari, Offord & Boyle, 1989). Overall ADHD affects 2% to 10% in school age
children and 3% to 5% in adults (Biederman, 2005; Jindal, 2002; Malhotra, Kohli, Kapoor & Pradhan, 2009).

1.3.0 COMORBID DISORDERS

ADHD appears to be associated with a wide variety of other psychiatric problems, which are often co-morbid with it. Notable associations exist with Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), depression and anxiety. About 50–60% of children with ADHD meet criteria for ODD, even in the pre-school period (Kadesjo, Kadesjo, Hagglof & Gilberg, 2001). Busch et al. (2002) reported that children with ADHD in primary care settings were significantly more likely than non-ADHD clinic controls to demonstrate mood disorders (57%) such as depression, multiple anxiety disorders (31%), and substance use disorders (11.5%)”. However, according to British Child Mental Health Survey (Ford, Goodman & Meltzer, 2003), anxiety was not found to be associated with ADHD when adjustment was made for the presence of a third disorder. Following this criterion, some studies found that 47% children with ADHD have co-morbid ODD (van Lier, van der Ende, Koot & Verhulst, 2007), 27% have anxiety disorder and 7% have mood disorder (Minde et al., 2003). 38% of children with ADHD were found to have CD and 13% have depression (Drabick, Gadow & Sprafkin, 2006). In fact, the vast majority of co-morbidities with ADHD represent functional impairments and symptoms, which are not rooted in specific diseases (Gillberg et al., 2004). Studies of clinic-referred children with ADHD find that between 54% and 67% will meet criteria for a diagnosis of ODD by 7 years of age or later. ODD is a frequent precursor to CD, a more severe and often (though not always) later occurring stage of ODD (Loeber, Burke, Lahey, Winters, & Zera, 2000). The co-occurrence of CD with ADHD may be 20–50% in children and 44–50% in adolescence with ADHD (Lahey, McBurnett, & Loeber, 2000). By adulthood, up to 26% may continue to have CD, while 12–21% will qualify for a diagnosis of antisocial personality disorder (ASPD) (Rasmussen & Gillberg, 2001).
1.4.0 ASSOCIATED PROBLEMS

In addition to associations with other psychiatric disorders children with ADHD are also more likely than their non-ADHD counterparts to experience a substantial array of developmental, social and health risks. It therefore seems important to discuss associated problems along with co-morbidity.

1.4.1 Intelligence Issues

Clinic-referred children with ADHD often present with lower scores on intelligence tests than control groups, specifically verbal intelligence with differences ranging from 7 to 10 standard score points (McGee, Willlians, & Feehan, 1992). Studies with community samples of ADHD children (Sonuga-Barke, Lamparelli, Stevenson, Thompson & Henry, 1994; Peterson, Pine, Cohen & Brook, 2001) have also demonstrated negative associations between ADHD and intelligence.

1.4.2 Motor Coordination

Children with ADHD often demonstrate poor motor co-ordination and balance (Moffitt 1990; Mariani & Barkley 1997). Substantial evidences have been observed for problems in motor development and motor execution in children with ADHD (Kdesjo & Gillberg, 2001). Studies by Kadesjo, Kadesjo, Hagglof & Gillberg (2001) have demonstrated that up to 60% of ADHD children demonstrate problems with motor co-ordination or deficits in developmental co-ordination compared with 35% of control children. As noted by Barkley (2003), children with ADHD display greater difficulties with the development of motor coordination, planning and execution of complex, lengthy tasks, and novel chains of goal directed responses.

1.4.3 Psychosocial Functioning

Children with ADHD demonstrate serious difficulties with psychosocial functioning. Social adjustment is often given little attention on assessment protocols, given its designation as an associated feature of ADHD (APA, 1994). However, the high levels of disruptive behavioural demonstrated by
ADHD children increases the likelihood of negative reactions from parent, teachers and also peers (Cunningham, 1990). In addition, negative social interactions with peers ultimately lead to peer rejection (Olson & Brodfeld, 1991). Because these social difficulties are often resistant to psychosocial and pharmacological treatment (Pelham et al., 1998), they are expected to continue into adolescence, and even adulthood when criteria for the disorder may no longer be met (Slomkowski, Klein & Mannuzza, 1995). The patterns of disruptive, intrusive, excessive, negative, and emotional social interactions that have been found between children with ADHD and their parents have been found to occur in the children’s interactions with teachers (Whalen, Henker, & Dotemoto, 1980) and peers (Clark, Cheyne, Cunningham, & Siegel, 1988; Cunningham & Siegel, 1987; DuPaul, McGoey, Eckert & vanBrakle, 2001; Whalen, Henker, Collins, McAuliffe, & Vaux, 1979). It should come as no surprise, then, that those with ADHD receive more correction, punishment, censure, and criticism than other children from their teachers, as well as more school suspensions and expulsions, particularly if they have ODD/CD (Fischer, Barkley, Fletcher & Smallish, 1993; Whalen, Henker & Dotemoto, 1980). In their social relationships, children with ADHD are less liked by other children, have fewer friends, and are overwhelmingly rejected as a consequence (Erhardt & Hinshaw, 1994), particularly if they have comorbid conduct problems (Gresham, MacMillan, Bocian, Ward, & Forness, 1998; Harvey, Danforth, McKee, Ulaszek & Friedman, 2003; Hinshaw & Melnick, 1995; Johnston & Mash, 2001). A study by Newcorn et al. (2004) demonstrated that the co-occurrence of conduct disorder and anxiety disorder with ADHD in childhood predicted a more severe course for ADHD in adolescence.

1.4.4 Unintentional Physical Injury

Children with ADHD appear to be at a greater risk for unintentional physical injury and accidental poisoning (DuPaul, McGoey, Eckert & vanBrakle, 2001). In one of the first studies of the issue, Stewart, Pitts, Craig,
and Dieruf (1966) found that four times as many hyperactive children as control children (43% vs. 11%) were described by parents as accident-prone. Later studies have also identified such risks; up to 57% of children with hyperactivity or ADHD are said to be accident-prone by parents, relative to 11% or fewer of control children (Mitchell, Aman, Turbott & Manku, 1987; Reebye, 1997). Most studies find that children with ADHD experience more injuries of various sorts than control children. In one study, 16% of the hyperactive sample had at least four or more serious accidental injuries (broken bones, lacerations, head injuries, severe bruises, lost teeth, etc.), compared to just 5% of control children (Hartsough & Lambert, 1985). Jensen, Shervette, Xenakis and Bain (1988) found that 68% of children with DSM-III ADHD, compared to 39% of control children, had experienced physical trauma sufficient to warrant sutures, hospitalization, or extensive/painful procedures. Rowe, Maughan and Goodman (2004) found that children with ADHD were at a greater risk for suffering fractures, most likely as a result of hyperactive and impulsive behavioural. Children with ADHD are also more likely than their non-ADHD counterparts to be injured as pedestrians, to inflict injuries to themselves, to sustain injuries to multiple body regions and to experience head injury (DiScala, Lescohier, Barthel & Li, 1998). Knowledge about safety does not appear to be lower in these children, implying interventions aimed at increasing knowledge about safety may have little impact, rather it was the effect of impulsive actions (Mori & Peterson, 1995).

1.4.5 Sleep Disturbance

Studies report an association between ADHD and sleep disturbances (Gruber, Sadeh & Raviv, 2000; Corkum, Moldofsky, Hogg-Johnson, Humphries & Tannock, 1999). Lam and Yang, 2008 found that sleep problems occurred twice as often in ADHD as in control children. The problems are mainly more behavioural and include settling difficulties, a longer time to fall asleep, instability of sleep duration, tiredness at awakening or frequent night waking. The direction of effect, between ADHD and sleep problems is unclear.
It is possible that sleep difficulties increase ADHD symptoms during the daytime, as the research on normal children implies (Barkley, 2003). Yet some research finds that the sleep problems of children with ADHD are not associated with the severity of their symptoms; this suggests that the disorder, not the impaired sleeping, is what contributes to impaired daytime alertness, inattention, and behavioural problems (Lecendreux, Konofal, Bouvard, Falissard & Mouren-Simeoni, 2000; Lam & Yang, 2008).

1.4.6 ADHD as Lifespan Problem

While originally conceived of as a disorder of childhood and adolescence, evidence suggests scientific merit and clinical value in examining ADHD in adulthood (Weiss, Trokenberg, Hetchman & Weiss, 1999; Faraone et al., 2000) and during the pre-school period (Sonuga-Barke, Auerbach, Campbell, Daley & Thompson, 2005). ADHD symptoms have been shown to persist into later life with up to 40% of childhood cases continuing to meet full criteria in the adult years (Fischer, Barkley, Fletcher & Smallish, 1993). Similar to their childhood counterparts, adults with ADHD display impairment in the interpersonal, vocational and cognitive domains (Biederman, Faraone, Knee & Munir, 1990; Murphy & Barkley, 1996; Schweitzer et al., 2000; Robbins & Harris, 2001). The adult and childhood ADHD also appear to share a common neuropathology (Muglia, Jain, Macciardi & Kennedy, 2000; Hesslinger, Thiel, vanElst, Hennig & Ebert, 2001) and demonstrate a similar response to treatment (Sachdev, 1999).

1.5.0 ACADEMIC UNDERACHIEVEMENT IN CHILDREN WITH ADHD

Children with ADHD commonly present with a wide range of characteristics and problems including academic underachievement, learning disabilities (Corkum, McGonnell & Schachar, 2010) and disruptive and distractible behaviours in classroom setting (Jindal, 2002). Children with ADHD are more likely than their non-ADHD peers to demonstrate difficulties with basic mathematics and pre-reading skills during their first year at school.
Girls with ADHD were found to be less impaired than boys with ADHD (Rucklidge & Tannock, 2002). DuPaul, McGoey, Eckert & vanBrakle (2001) demonstrated that their sample of pre-school children with ADHD demonstrated deficits in pre-academic skills even prior to formal school entry. The pre-school children with ADHD in their sample scored on average one standard deviation lower on the Battelle Developmental Index (Newborg, Stock & Wnek, 1988) than did their non-ADHD control group. Börger and Meere (2000) emphasized the importance of look away behavioural (inattention) as a major reason for poor academic achievement. In some studies, Executive academic functions were found to be core deficits specific to ADHD (Barkley, 2009).

1.6.0 CURRENT TREATMENT PRACTICES FOR ADHD

Although ADHD is one of the most frequently diagnosed and studied clinical disorders in child psychology (Barkley, 2006), very little is known about the efficacy of treatment for children and adolescents with this disorder (Trout, Lienemann, Reid & Epstein, 2007). Investigation on the documented research reveals that the most widely studied, implemented and reported treatment for children and adolescents with ADHD continues to be stimulant treatment (ST), primarily methylphenidate (Ritalin) (Evans, Axelrod & Langberg, 2004). The limitations of psycho stimulant medication have led to the interest in other therapies in the treatment of ADHD. Non medical interventions with ADHD include a variety of cognitive therapies, behavioural treatment procedures/ techniques as well as complementary and alternative treatments such as dietary regulation/ modification, biofeedback, relaxation and meditation (Rhodes, Coghill & Matthews, 2006). Various other methods and modalities of treatment have also been studied and reported in journals and books by several researchers. A wide range of behavioural approaches are used to treat both the core problems (i.e., inattention, impulsivity and hyperactivity) and associated problems (i.e., aggression, academic underachievement, poor peer interaction) of children suffering from ADHD (Barkley, 2003).
suggested by Gupta (2002) children with ADHD often required alternative educational and parenting methods.

After a decade of careful investigation, behavioural therapies—provided only to the children, have not been shown to be helpful, either alone or as an enhancer of the effects of medication (MTA, 1999). Given the limits reported to date, future clinical research should include a full array of the behavioural and cognitive components and look at the specific needs of the child as well as family in order to develop a more individualized program (McBrien, Turk & Letch, 2006), and put a greater emphasis on parent training in order to enhance the treatment program (Colwell, Pike & Dunn, 2006). Several other researchers studied the combination of approaches and intervention strategies. Strong believers in stimulants for ADHD, Murray and Patel (2001) also advocated that a number of behavioural and psychosocial interventions can be used effectively as part of multimodal approach to address many ADHD & related problems. It is suggested that a multimodal treatment approach is preferable to address many symptoms of ADHD and its associated problems for the children, the family, and the school (Corkum, McGonnell & Schachar, 2010).

1.7.0 MULTIMODAL INTERVENTION PROGRAM

Multimodal treatment is a critical part of treatment for ADHD in children and adolescents. According to Du Paul and Stoner (2003), “the scientific literature, the National Institute of Mental Health, US, and many professional organizations agree that behaviorally oriented psychosocial treatments including behavior therapy or behavioural modification, stimulant medication and training of adults dealing with the children, have a solid base of scientific evidence demonstrating their effectiveness”. Treating children with ADHD often involves medical, educational and behavioural interventions. This comprehensive approach to treatment is called "multimodal" and consists of parent and child education about diagnosis and treatment, specific behavioural management techniques, stimulant medication, and appropriate school programming and supports (Saxena and Schwanz, 2008). The severity and type
of ADHD may be factors in deciding which components are necessary. Treatment should be tailored to the unique needs of each child and family (Bramble & Cosgrove, 2002, Gerdes & Hoza, 2006).

The MTA (Multimodal Treatment Approach) results published in December 1999 (MTA, 1999) indicated that long-term combination treatments are significantly superior to intensive behavioural treatments and routine community treatments in reducing symptoms of ADHD. The MTA results also show that these differential benefits extend as long as 14 months. In other areas of functioning (specifically anxiety symptoms, academic performance, oppositionality, parent-child relations, and social skills), the combined treatment approach was consistently superior to routine community care, whereas the single treatments (medication-only or behavioural treatment only) were not.

1.8.0 RATIONALE OF SELECTING THE TOPIC

Multifaceted problems associated with ADHD, increasing prevalence and lack of holistic multimodal interventions have been the basic motivations behind the conceptualization of the study. The current section describes the rationale of selecting the topic.

In 1992, according to Parker, 3% to 5% of school population was suffering from ADHD. In 1998, Bhatara, Gupta & McMillan, reported 8% of school age population diagnosed as ADHD (5% ADHD, 3% ADD). In 1999, according to a report published by the working party of the British Psychological Society (Reason, 1999), 7-9% of school age population is affected by the disorder. More recently, Malhotra, Kohli, Kapoor & Pradhan (2009) report a 10% of incidence rate of ADHD in India in the urban sections.

Although research supports the use of multimodal intervention program for children with ADHD (MTA, 1999; Jensen et al, 2001), most of the studies lack a holistic approach, (Clarke, Barry, McCarthy & Selikowitz, 2001). Review indicates that if the reading achievement has been studied and assessed
for the research purposes but the writing ability has been left in most of the researchers (Cohen, Vallace, Barwick, Menna & Horodezky, 2000); or one aspect is studied and the other one is left as far as the symptomatic and resultant difficulties are concerned (Barkley, 1990). A systematic review of studies by Polderman, Boomsma, Bartels, Verhulst and Huisink (2010) concluded that children with attention problems are at risk for lower academic achievement and interventions in affected children should simultaneously focus on their behavioural and educational development, following a multimodal approach.

In a longitudinal study, by Stipek and Graliuski (1996), it was observed that children with poor scholastic performance (chiefly due to ADHD) are rated negative by the teachers and peers. This turns them to be less task oriented and ego defensive (Poskiparta, Niemi, Lepola, Ahtola & Laine, 2003). It hampers the self-concept and self-esteem of the children, and in turn their performance deteriorates all the more.

Parental depressive symptoms (due to the ADHD of the child) and severity of ADHD of their child, were associated with decreased rates of responses to the treatment of any kind (Owens et al., 2003). Their study concluded that ADHD affects the well-being of the parents of the children. It forces them to bear the stress caused by the poor scholastic achievement, complains from school and parents. Broota (2002) suggested that parents deny the fact that some children require different skills to cope with the daily expectations of life and social development processes. It is very important that parents go through counselling for themselves to overcome their own (causative and resultant) stress, anxiety and depression (Schachar & Wachsmuth, 1990) and to learn how to deal with children with ADHD. Bussing, Zima, Mason, Porter and Garvan (2011) interviewed 168 adolescents and their parents (N=168+168) to understand the perspective of parents and adolescents regarding clinical need for and attitudes toward care for ADHD, and how their views relate to past usage of mental health services. They
concluded that interventions for adolescents with ADHD should include psycho-educational interventions for them and their parents that target treatment receptivity and the stigma related to ADHD.

Teacher training is another important area in changing the level of knowledge, about the causes and possible intervention for the children with ADHD in classroom setting. Vereb and DiPerna (2004) investigated the effect of teachers' knowledge of ADHD, treatments for ADHD, and treatment acceptability on the efficacy of treatment. Relationships were explored between these variables and teachers' training and experience in working with children with ADHD. Results indicated that teachers' knowledge of ADHD, years of teaching experience with students with ADHD, and training demonstrated positive relationships with ratings of treatment acceptability. In addition, teachers' participation in ADHD training was positively correlated with knowledge of ADHD and acceptability of behavior management strategies. The study further elaborates that when children exhibit behaviour problems in school, teachers often are the first to recognize and recommend that they receive a comprehensive assessment. In addition, if a child is diagnosed with a disorder and a treatment plan is established, it may be the responsibility of the teacher to implement an intervention in the classroom. When teachers disagree with a recommended treatment, they may refuse to implement the intervention, may implement it improperly, or may fail to complete treatment (Vereb & DiPerna, 2004).

It can be observed that the multiple studies indicate a need of multimodal treatment for ADHD, and research suggest that non-medicine based interventions are highly in need due to increasing prevalence rate. Research also suggests that effective interventions for ADHD should focus on the academic achievement, social skills, inattention and hyperactivity related behaviours, parent and teacher education and involvement. Current study has tried to encompass all the possible areas. The intervention that was conducted as a part of the study, focuses on academic skill training, increase in attentive
behaviours, reduction in hyperkinetic/hyperactive behaviors, environmental structuring in the classroom setting and parent and teacher training. Academic learning as assessed by the standardized tests of achievement; Academic performance as assessed by Class based grades (% of marks); and Attentive behaviours, impulsive behaviours and hyperactive behaviours, as assessed by researcher’s, parents’ and teachers’ ratings about the child's behaviour were the dependent behaviors.

1.9.0 STATEMENT OF THE PROBLEM

The statement of the problem is worded as: “Effects of Multimodal Intervention on Academic and Behavioural Performance of Children with Attention Deficit Hyperactivity Disorder”.

1.10.0 OBJECTIVES

1. To compare the means of experimental group at pre and post intervention level on all 20 criteria.
2. To compare the means of control group 1 at pre and post intervention level on all 20 criteria.
3. To compare the means of control group 2 at pre and post intervention level on all 20 criteria.
4. To compare the means of the three groups (experimental group, control group 1 and control group 2) at pre intervention level of assessment on all 20 criteria.
5. To compare the means of the three groups (experimental group, control group 1 and control group 2) at post intervention level of assessment on all 20 criteria.
6. To study the effect of multimodal intervention program on academic and behavioural performance, considering the pre multimodal intervention program score as covariate.
7. To study the overall effect of intervention on academic performance, as measured by class-based-grades (marks); academic skill learning as
measured by the standardized achievement tests; behaviours as measured by the teacher, parent and researcher ratings; of the children in the three groups.

1.1.0 HYPOTHESIS

1. There is a significant difference between the pre and post intervention mean scores of experimental group, control group 1 and control group 2; and among the three groups in the mean scores at pre and post intervention on teacher rated measure Attention and Deportment.

2. There is a significant difference between the pre and post intervention mean scores of experimental group, control group 1 and control group 2; and among the three groups in the mean scores at pre and post intervention on parent rated measure Inattention, Aggression and Peer Interaction.

3. There is a significant difference between the pre and post intervention mean scores of experimental group, control group 1 and control group 2; and among the three groups in the mean scores at pre and post intervention on researcher rated measure Inattention, Impulsivity and Hyperactivity.

4. There is a significant difference between the pre and post intervention mean scores of experimental group, control group 1 and control group 2; and among the three groups in the mean scores at pre and post intervention on the class-based-grades (percent of marks) in English Reading, English Writing, English Spelling, Math Calculation and Math Application.

5. There is a significant difference between the pre and post intervention mean scores of experimental group, control group 1 and control group 2; and among the three groups in the mean scores at pre and post intervention on the achievement test WIAT- II in Word Reading, Reading Comprehension, Decoding Skills, Spelling, Written Expression, Math Calculation and Math Reasoning.
6. There will not be a significant effect of pre-assessment scores on the post assessment scores, on all criteria (individually) considering the respective pre-score as covariate.

1.12.0 DELIMITATIONS

The following were the limitations of the study:

1. The study was carried out on a very narrow sample of children between the age range of 7-11 yrs.
2. The study has not considered the children with below average intelligence level nor has taken the children with associated problems, such as oppositional defiant disorder or conduct disorder (two highly co-morbid disorders).
3. The study does not focus on the emotional wellbeing of the students and no data was collected about the perspective of the students (participants) before, during or after the study.
4. The study is not extended for a follow-up on the student behaviour and student academic performance.
5. Although the study addresses the executive functions indirectly, no assessment was made to understand the role-of or effect-on executive functions.

1.13.0 CONCLUSION

Attention deficit hyperactivity disorder is a complex disorder, which can be seen as a disorder of life time, developing in preschool years and manifesting symptoms (full and or partial) throughout the adulthood; therefore, it is not surprising that there are no simple solutions. The aim of this research is to implement and evaluate a multimodal intervention programme to address the multifaceted ADHD effectively chiefly in the area of academic and behaviour impairments in school aged children.