



## EFFECT OF PHYSICAL ACTIVITY PROGRAMME ON ADHD SYMPTOMS IN MODERATE MENTALLY RETARDED CHILDREN

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### ABSTRACT

Mentally retarded children face many behavioural, intellectual, physical, social and health problems. Children with ADHD have a host of impairments in social, school and family domains, which place considerable economic burden on school systems, families, and medical professionals. There is converging evidence that children with ADHD demonstrate poor motor skills, have lower levels of physical fitness, and are at increased risk for obesity in comparison to children without ADHD. For the treatment of Mentally Retarded Children with ADHD physical activity would be a better intervention. The purpose of study was to determine the effect of physical activity programme on ADHD symptoms of moderate mentally retarded children. The subjects for the study were 30 moderate mentally retarded children within the age group of 13 to 18. The subjects were randomly assigned to an experimental group (N=15) and a control group (N=15). The experimental group participated in the physical activity programme thrice a week for a period of 8 weeks and the control group did not participate in any sort of physical activity programme for the same period. Inattentive symptoms, hyperactive symptoms and combined symptoms were the variables selected for the study. The symptoms of ADHD were assessed through DSM IV Disruptive Behaviour Rating Scale. The 8 weeks physical activity programme resulted in significant reduction of inattentive symptoms, hyperactive symptoms and combined symptoms of hyperactivity in moderate mentally retarded children.

**Keywords:** Physical Activity, Moderate Mental Retardation, DSM IV, Inattentive Symptoms, Hyperactive Symptoms

### INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is defined by the Diagnostic and Statistic Manual of Mental Disorders, fourth edition (DSM-IV) as a set of maladaptive behaviours denoting inattention and or impulsivity and hyperactivity that are inconsistent with development and cause impairment in two or more settings (e.g., at school and at home). Such behaviours cause social, academic and or occupational impairment, persist for at least six months, and do not occur exclusively during the course of any psychotic disorder, mental disorder, or pervasive developmental disorder. Symptoms include carelessness during school, work or leisure activities, excessive fidgeting or talking, difficulty in waiting situations, and inappropriate and disruptive behaviours such as blurting out answers before questions have been completed and butting into conversations or games (American Psychology Association, 1994). The symptoms of ADHD are clustered into three main types of the disorder: inattentive type is characterized by forgetfulness, distractibility, and difficulty in focusing and maintaining attention; hyperactive or impulsive type is characterized by a tendency to act or speak before considering consequences, by restlessness, and by difficulty in staying seated, keeping hands to self or resisting the need to constantly move; and combined type is characterized by significant difficulties with both regulating attention and controlling hyperactivity (Spencer and Biederman, Journal of Paediatric Psychology, 2004). Poor motor coordination or motor performance is another frequent coexisting problem in children with ADHD. Recent clinical and experimental evidence suggest a greater role of motor factors in ADHD than was considered before. Many children with ADHD have weak pragmatic motor skills and these may be associated with working memory performance. Structural MRI reports and neuropsychological findings like variability in timing and movement have refocused research on the role of cerebellum in ADHD. Stimulant medication is used to treat the core symptoms of ADHD; however, these treatments are not always effective. More recently, attention has been paid



to the potential link of physical activity with cognitive function and academic performance in children. Employing physical activity as an intervention to address ADHD may be beneficial. The association of physical activity with positive mental health and neurocognitive function in children, the relatively broad ranging effects of physical activity, and the plasticity of the young brain point to physical activity as a potentially valuable intervention for children with ADHD symptoms.

## METHODOLOGY

The study was conducted on 30 moderate mentally retarded children with ADHD within an age group of 13 to 18 years. They were randomly assigned to a control (N=15) and an experimental group (N=15). The experimental group participated in the physical activity programme thrice a week for a period of 8 weeks and the control group did not participate in any sort of physical activity programme for the same period. Inattentive symptoms, hyperactive symptoms and combined symptoms were the variables selected for the study. The symptoms of ADHD were assessed through DSM IV Disruptive Behaviour Rating Scale.

## RESULTS

The pre test, mid test and post test data on Inattentive symptoms of experimental and control group was collected and descriptive statistics such as measures of central tendency (arithmetic mean) and dispersion (standard deviation) were computed to get basic idea of the data distribution. To determine the training effect from pre- mid, mid-post, and pre-post tests paired t-test was used. The details are shown in Table 1.

TABLE 1  
 MEAN SCORE COMPARISON OF EXPERIMENTAL AND CONTROL GROUP  
 IN INATTENTION SYMPTOMS

GROUP		N	MEAN	SD	MD	T	P
EXPERIMENTAL	PRE	15	8.73	0.59	0.07	1.00	0.334**
	MID	15	8.67	0.62	0.07		
	MID	15	8.67	0.62	0.53	4.00	0.001**
	POST	15	8.13	0.83	0.53		
CONTROL	PRE	15	8.73	0.59	0.07	1.00	0.334
	MID	15	8.80	0.68	0.07		
	MID	15	8.80	0.68	0.07	1.00	0.334
	POST	15	8.87	0.83	0.07		
PRE	15	8.73	0.59	0.13	1.00	0.334	
	POST	15	8.87	0.83			0.13

\*\* Significant at 0.01 level of significance

Table 1 clearly reveals the mean difference for the experimental and control group in inattention symptoms. Significant differences were not seen in the control group as the 't' value obtained for pre to mid tests was 1.00 with  $P > 0.05$ , pre to post was 1.00 and mid to post was 1.00. The mean difference of inattention symptoms of experimental group from pre to post was statistically significant as the t value is 4.58 with  $P < 0.01$ , pre to mid was statistically significant as the t value is 1.00 with  $P > 0.01$ , and mid to post was statistically significant as the t value is



4.00 with  $P > 0.01$ . In the experimental group, pre test mean of inattention symptoms are 8.73 with SD 0.59; mid test mean is 8.67 with SD 0.62 and post test mean of 8.13 with SD 0.83. The inference is that physical training significantly decreases the symptoms of Inattention type of ADHD in the experimental group.

The pre test, mid test and post test data on hyperactive symptoms of experimental and control group was collected and descriptive statistics such as measures of central tendency (arithmetic mean) and dispersion (standard deviation) were computed to get basic idea of the data distribution. To determine the training effect from pre- mid, mid-post, and pre-post tests paired t-test was used. The details are shown in Table 2.

TABLE 2  
 DIFFERENCE IN MEAN SCORES OF EXPERIMENTAL AND CONTROL  
 GROUP IN HYPERACTIVE SYMPTOMS

GROUP		N	MEAN	SD	MD	T	P
EXPERIMENTAL	PRE	15	7.80	1.37	0.33	2.65	0.019**
	MID	15	7.47	1.25			
	MID	15	7.47	1.25	0.27	2.26	0.041**
	POST	15	7.20	1.15			
CONTROL	PRE	15	6.13	1.14	0.07	1.00	0.334
	MID	15	6.20	1.42			
	MID	15	6.20	1.42	0.07	1.00	0.334
	POST	15	6.27	1.49			
PRE	15	6.13	1.14	0.13	1.00	0.334	
	POST	15	6.27	1.49			

\*\* Significant at 0.01 level of significance

Table 2 clearly reveals the mean difference for the experimental and control group in hyperactive symptoms. Significant differences were not seen in the control group as the 't' value obtained for pre to mid tests was 1.00 with  $P > 0.05$ , pre to post was 1.00 and mid to post was 1.00. The mean difference of inattention symptoms of experimental group from pre to post was statistically significant as the t value is 3.15 with  $P < 0.01$ , pre to mid was statistically significant as the t value is 2.65 with  $P > 0.01$ , and mid to post was statistically significant as the t value is 2.26 with  $P > 0.01$ . In the experimental group, pre test mean of hyperactive symptoms are 7.80 with SD 1.37; mid test mean is 7.47 with SD 1.25 and post test mean of 7.20 with SD 1.15. The inference is that physical training significantly decreases the symptoms of hyperactive type of ADHD in the experimental group.

The pre test, mid test and post test data on combined symptoms of experimental and control group was collected and descriptive statistics such as measures of central tendency (arithmetic mean) and dispersion (standard deviation) were computed to get basic idea of the data distribution. To determine the training effect from pre- mid, mid-post, and pre-post tests paired t-test was used. The details are shown in Table 3.



TABLE 3  
 DIFFERENCE IN MEAN SCORES OF EXPERIMENTAL AND CONTROL  
 GROUP IN COMBINED SYMPTOMS

GROUP		N	MEAN	SD	MD	T	P
EXPERIMENTAL	PRE	15	16.53	1.68	0.40	3.06	0.009**
	MID	15	16.13	1.68			
	POST	15	15.40	1.64			
	PRE	15	16.53	1.68	0.73	4.04	0.001**
	POST	15	15.40	1.64			
CONTROL	PRE	15	14.87	1.51	0.07	1.00	0.334
	MID	15	14.93	1.53			
	MID	15	14.93	1.53	0.07	1.00	0.334
	POST	15	15.00	1.60			
	PRE	15	14.87	1.51	0.13	1.00	0.334
POST	15	15.00	1.60				

\*\* Significant at 0.01 level of significance

Table: 3 clearly reveal the mean difference for the experimental and control group in combined ADHD symptoms. Significant differences were not seen in the control group as the 't' value obtained for pre to mid tests was 1.00 with  $P > 0.05$ , pre to post was 1.00 and mid to post was 1.00. The mean difference of combined symptoms of experimental group from pre to post was statistically significant as the t value is 6.86 with  $P < 0.01$ , pre to mid was statistically significant as the t value is 3.06 with  $P > 0.01$ , and mid to post was statistically significant as the t value is 4.04 with  $P > 0.01$ . In the experimental group, pre test mean of combined symptoms are 16.53 with SD 1.68; mid test mean is 16.13 with SD 1.68 and post test mean of 15.40 with SD 1.64. The inference is that physical training significantly decreases the combined symptoms of ADHD in the experimental group.

### CONCLUSION

The major findings based on objectives of the study and data analysis are:

The 8 weeks physical activity programme resulted in reduction in inattentive symptoms of ADHD in moderate mentally retarded children.

Hyperactive symptoms of ADHD were reduced significantly in moderate mentally retarded children following 8 weeks physical activity programme.

Significant reduction was seen in combined symptoms of ADHD in moderate mentally retarded children following 8 weeks of physical activity programme.

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