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Original Research Article

Effectiveness of Intervention Package on Behaviour Modification of Children with Attention Deficit Hyperactivity Disorder among Their Teachers at Selected Special Schools at Kancheepuram District

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ABSTRACT

Attention Deficit hyperactivity disorder refers to developmentally inappropriate degree of inattention, impulsiveness and hyperactivity. It was diagnosed in children between 6-12 years. Aim of this study was to evaluate the effectiveness of intervention package on behaviour modification of children with ADHD. A pre experimental pre-test and post-test research design was used. 100 ADHD children were selected from two special schools by total enumerative sampling technique. Pre-test and post-test behaviour of ADHD children was assessed by Modified Conner's teachers rating scale. The comparison of pre-test and post-test was calculated by Wilcoxon singed rank test. Post-test mean score was 65.98 and 't' test 20.175 was highly significant at $p< 0.005$. The study reported that intervention package was highly effective and improved their attention span, concentration and reduced hyperactivity level among ADHD children

Keywords: Attention Deficit Hyperactivity Disorder, effectiveness, intervention package, teachers, behaviour modification

INTRODUCTION

Attention deficit hyperactivity disorder is a symptom complex characterized by poor ability to attend to a task, motor over activity and impulsivity. These children are fidgety, have a different time remaining in their seats in school, easily distracted, have difficulty in waiting their turn, impulsively blurt out answers to questions, have difficulty in following the instructions and sustaining attention, shift rapidly from one uncompleted activity to another, talk excessively, intrude on others, often seem not to listen to what is being said, lose items frequently and often engage in physically dangerous activities. [1]

ADHD is the most common neurobehavioral disorder of children, occurring in 3% to 9.5% of children 4-17 years.[2]The ADHD worldwide- pooled prevalence was estimated at 5.29 %.[3] According to predominant symptoms The Diagnostic and statistical manual of the American Psychiatric Association recognises 3 subtypes of ADHD: A Predominantly inattentive, predominantly hyperactive/ impulsive subtype and combine type. [4]

ADHD is a impact on society is enormous in terms of financial cost, stress on families, interference with academic and vocational activities, as well as burden of

disease among children. [5] It is diagnosed approximately 3 times more often in boys than in girls. There is a powerful genetic predisposition and underlying problem is a dysfunction on brain neurons circuits that rely on dopamine transmitter and which control self monitoring and self control. [6, 7]

Cross sectional study was conducted at selected primary schools of Kancheepuram district in Tamilnadu. Totally 865 children were selected and assessed by Conner's teacher rating scale. Total number of males was 407, females was 458. ADHD symptoms were identified 37(69%) male children and 17(31%) female children. Prevalence of ADHD was more in boys than girls.[8]

A survey was conducted by Associated Chambers of Commerce and Industry in 10 major cities of India. Totally 1000school teachers and doctors had been selected. Teachers revealed that every single classroom has 1to 3 children who were diagnosed with ADHD. 46% of doctors or healthcare providers reported that the children at least in the age of 4 years are more prone to risk of ADHD. [9]

The exact etiology of ADHD is unknown. Recent studies reported that the complex interplay of genetic and environmental factors such as prenatal smoking, alcohol and substance abuse, maternal malnutrition, low birth weight and prematurity, lead, artificial food colourings, severe early deprivation and family diversity would be the causes for ADHD among children. Lead can produce a broad range of toxic effects, especially during development both prenatal and post natal toxic lead exposure can proceed ADHD and other cognitive deficits. [10]

Several cross -sectional and case-control studies have explained that the unhealthy dietary habits are related to an increased risk of ADHD. [11-14] It is reported that diet high in sugar, salt, saturated and total fat, low in whole grains, fish, fruits and vegetables, was associated with increased ADHD symptoms. [15] Many studies proven that supplementation of iron, zinc and omega 3 fatty acid will reduce the symptoms of children with ADHD. [16-19]

Children with ADHD frequently have difficulty in organizing tasks, short attention span, and low academic performance, failure to do home work, poor relationship with the parents, siblings, teachers and peers. It is difficult to deal with ADHD child for their parents and teachers. If not found out early, the children may go for conduct disorders in the future. There is an urgent need for comprehensive interventions which should be given at initial phase of ADHD in order to minimize the symptoms, increase attention span, improving their skills in the home and school. Improvement and a good outcome would be possible if parents and teachers understand the problems and provide proper guidance to preserve the child's self-esteem.

MATERIALS AND METHODS

A pre- experimental pre and post test design was used. 100 ADHD children of both sexes in the age group of 6 to 12 years and 10 teachers of ADHD children were included in this study. The ADHD children and their teachers were selected from two special schools of Kancheepuram district, Tamil Nadu, India, by total enumerative sampling method. Permission was obtained from the authorities of special schools to carry out the study. Benefits of the study had been explained to the teachers. Totally 10 teachers had participated in the study among them, 7 teachers from Adhiparasakthi Annai Illam, Melmaruvathur and 3 teachers from NIPMED, Muttukadu. Informed consent and oral consent was obtained from teachers of ADHD children. After collecting the demographic variables, the pre-test behaviour of ADHD children among their teachers assessed by using modified Conner's teacher rating scale. The rating scale contains a total of 25 items in which 10 for Inattention, 10 for hyperactivity and 5 for impulsivity. The total score was 75. Each item was scored on the 4 levels of severity / frequency of ADHD symptoms, ie not true at all (0), just

a little true(1), pretty much true(2) and very much true(3). Score 0 for child would never exhibit any behaviour symptoms, score 1 for the child would occasionally exhibit the symptoms, score 2 for the child would exhibit the symptoms frequently, score 3 for very frequently would exhibit the symptoms. The score was divided into four categories based on the scores obtained. The degree of behaviour symptoms was assessed, if the child score is between 0 – 25% it would be considered as normal, if the score is between 26- 50% considered as mild ADHD symptoms, 51-75% considered as moderate ADHD symptoms and the score of above 75% considered as severe ADHD symptoms.

Interventions included diet modification, relaxation techniques and play therapy. Interventions and benefits were explained to the teachers. Detailed demonstration of relaxation techniques and play therapy were given to the ADHD children with their teachers and parents. Each child motivated to do minimum 1hr for 30mts relaxation techniques and 30mts play therapy at least 5 days a week for the period of 6 months. The handouts with detailed information of intervention package with elimination diet and supplementation diet were distributed to the teachers and parents of ADHD children. Every month follow up was done through phone call or directly. Clarifications were given as per need of teachers. Instructions were given to the teachers to motivate the parents to follow the intervention regularly in the home and school settings. After 6 months post test behaviour assessment was done on all the 100 ADHD children by using modified Conner's teachers rating scale. Total score was recorded.

Ethical consideration

This study got the approval of Institutional Ethics committee of Saveetha University, Tamil Nadu. (004/12/2014/IEC/SU dated on 18/12/2014). At any time during the study, participants have the right to withdraw from to participate. Their personal information was kept confidential.

RESULTS

The data had been illustrated in mean ± SE, median, Wilcoxon signed rank sum test, Mann Whitney rank sum test used to assess the effectiveness of intervention package on behaviour modification of children with ADHD among their teachers.

Table 1 Pre -test and post -test behaviour of ADHD children n:100

ADHD Symptoms	pretest		Post test	
	frequency	percentage	frequency	percentage
Normal	-	-	11	11.0
Mild	22	22.0	43	43.0
Moderate	56	56.0	40	40.0
Severe	22	22.o	6	6.0
total	100	100.0	100	100.0

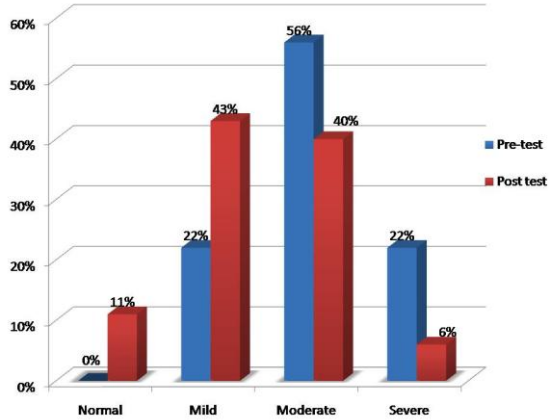

Fig 1: Explained the Pre& Post-test behaviour of ADHD children after the intervention package.

Table 2: Mean and standard deviation of behaviour ADHD children n:100 Boys:75 Girls:25

Parameters	Pre-test			Post-test			Mann Whitney rank sum test		Wilcoxon signed rank sum test	
	Mean	S.D	S.E	Mean	S.D	S.E	Male & female Pre-test	Male & female Post test	Male Pre-test & Post test	Female Pre-test& Post test
Inattention	21.3	4.018	0.402	15.72	4.72	0.472	T =1216 P =0.710	T =1129 P =0.288	W=2813 P <0.001	W =323.0 P <0.001
Hyperactivity	20.4	5.059	0.505	14.01	4.74	0.474	T =1093 P =0.176	T =1107 P =0.216	W=2840 P <0.001	W =300 P <0.001
Impulsivity	9.96	2.597	0.259	6.24	2.80	0.280	T =1408 P =0.246	T =1226 P =0.770	W=2775 P <0.001	W =276 P <0.001
Total	51.79	9.648	0.964	35.67	10.76	1.07	T =1187 P =0.547	T =1146 P =0.352	W=2848 P <0.001	W =375 P <0.001

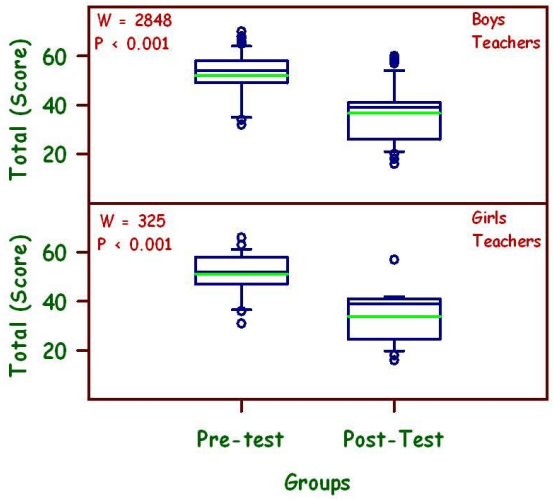

Figure 2: The Pearson correlation of total score of parents and teachers of boys and girls in pre-test and post-test.
N – Boys = 75; girls = 25.

There is a significant correlation between pre-test and post-test of boys among parents and teachers
Pre-test r = 0.757, p<0.001 Post-test r = 0.714, p<0.001
There is a significant correlation between pre-test and post-test of girls among parents and teachers
Pre-test r = 0.743, p<0.001 Post-test r = 0.590, p<0.001

Table 3: Spearman correlation of total score of parents and teachers (pre-test and post test of boys and girls)

S.No	Parameter	groups	Boys pre-test	Girls pre-test	Boys post test	Girls post test
	Total score of parents and teachers	Boys pre-test	0.698 P<0.001	-	-	-
		Girls pre-test	-	0.748 P<0.001	-	-
		Boys post test	-	-	0.671 P<0.001	-
		Girls post test	-	-	-	0.564 P<0.001
N= 100 . Boys -75, girls 25.						

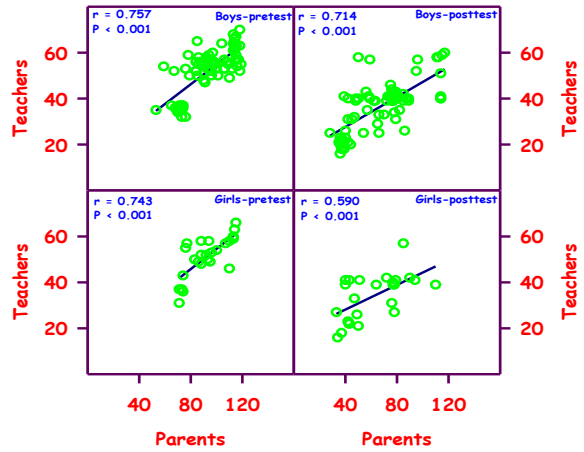

Figure 3: The Pearson correlation of total score of parents and teachers of boys and girls in pre-test and post-test.

DISCUSSION

Table 1 showed the pre-test and post test scores of behaviour of ADHD children. In pre-test score out of 100 ADHD children, 22 children have exhibited mild symptoms, 56 children were moderate and 22 have exhibited severe symptoms. Fig 1 illustrated the post-test behaviour of ADHD children 43 children were mild, 40 children were moderate, 6 children were in severe level and 11 children were in normal behaviour level after the intervention package.

Table 2 explained the total scores of inattention, hyperactivity and impulsivity of teachers of boys and girls in pre-test and post test. The mean, Standard deviation and standard error values of the total scores of inattention, hyperactivity and impulsivity scores of teachers of boys and girls in pre test and post test. The pre-test and post-test are compared by Wilcoxon signed rank sum test p<0.001. Results showed that there was a statistically significant difference was found between pre and post test of boys and girls. This study explained that interventions like diet modification, relaxation techniques and play therapy were found to be highly effective in both boys and girls.

Figure 2 had been shown as a box plot. This figure shows mean, median,

25 percentile, 75 percentile, minimum value, maximum value and the outliers. Since it is a discrete variable and a scored data with a wide range non-parametric statistics was carried out by using the medians. The median score of boys and girls in the pre-test were 54.0 and 52.0 respectively. It was not statistically significant (P=0.547) Where as in the median scores of post test of boys and girls decreased and was found to be statistically significant (p<0.001). The post test score of boys and girls were equal but it was not found to be significant (P=0.352). This shows that the interventions like play therapy, relaxation techniques and diet modification were found to be highly effective in both boys and girls.

Table 3 showed that Spearman correlation of total score of parents and teachers. The results revealed that there was a significant improvement was found in the behaviour of children among their parents and teachers. This study suggested that if the parents continue the intervention regularly, the behaviour of ADHD children would be improved significantly.

Figure 3 explained the Pearson correlation of total score of parents and teachers of boys and girls in pre-test and post-test. There is a significant correlation between pre-test and post-test of boys among parents and teachers pre-test r = 0.757, P<0.001 Post-test r = 0.714, P<0.001. There is a significant correlation between pre-test and post-test of girls among parents and teachers Pre-test r = 0.743, P<0.001 Post-test r = 0.590, P<0.001

A study conducted on relaxation training and its relationship to hyperactivity in boys. 10 male Caucasians, who range from 6 to 12, were given 10 neutral treatment sessions and 10 relaxation training sessions. Behaviour observation, Psychology test and parental rating were taken before and after both neutral treatment and relaxation training. After the intervention relaxation techniques used was effective and muscle tension was reduced. There was no change in neutral treatment. [20]

A study conducted on play based intervention for children with ADHD. A proposed study compared the two groups of children between 5 to11 years. Experiment and control group design was selected. The test of playfulness was administered. Results showed that the play was effective to reduce the symptoms of ADHD. [21] The results revealed that there was a significant improvement was found in the behaviour of children among their parents and teachers. This study suggested that if the parents continue the intervention regularly, the behaviour of ADHD children would be improved significantly.

CONCLUSION

Today's citizens are tomorrow's leaders. Every five days a week, children spend most of the time in the classroom or school setting. There, they are expected to follow rules, behave in socially appropriate ways and participate in social activities and not to disrupt the learning process or activities of others. Teachers have to impart the skills and knowledge as part of their curriculum and become part of the learner's own competence and also teach the learners to behave in a manner that meets the organizational, cultural and social expectations. There are multiple interventions available for bringing out the children from the clutches of ADHD. This study suggested that multiple intervention packages are more effective among ADHD children. The intervention package will facilitate and improve the attention span, concentration and decrease the level of hyper activity. It is simple to follow, readily available to use and easily reachable to many in society.

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