Research Article

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EFFECTIVENESS OF INTERVENTION PACKAGE ON BEHAVIOUR OF CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER IN NORTH TAMILNADU, INDIA

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ABSTRACT

Attention Deficit hyperactivity disorder is a common childhood disorder characterized by inattention, hyperactivity and impulsivity. The average age of ADHD has generally been diagnosed in children between 6-12 years. Aim of the study is to evaluate the effectiveness of intervention package among ADHD children. A Quasi experimental pre-test and post-test research design had been used. 100 ADHD children had been selected from two special schools with total enumerative sampling technique. Pre-test and post-test behaviour of ADHD children had been assessed by Modified Conner's parent and teacher rating scale. The comparison of pre-test and post-test was calculated by Wilcoxon singed rank test. The post-test mean score was 65.98 and 't' test 20.175 which was highly significant at $p< 0.005$. The study reported that the intervention package was highly effective and improved their attention span, concentration and resulting in reduced hyperactivity level among ADHD children

Keywords: Attention Deficit Hyperactivity Disorder, effectiveness, intervention package

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is one of the most frequently diagnosed mental health disorders among children and adolescents and has been considered as a global public health burden. It has been characterised by developmentally inappropriate functioning in the domains of inattention, hyperactivity and impulsivity.[1]

It occurs in childhood and continuing upto adolescence stage and often persisting in adulthood, which causing significant impairment in psychosocial, neurobehavioral and cognitive function.[2] The DSM-IV recognises three subtypes of ADHD depending on the predominance of symptoms: A Predominantly inattentive subtype, hyperactive/ impulsive subtype and combined type. This disorder carries high risk of co-morbidity including learning disabilities, conduct and oppositional deficit, mood and anxiety disorders.[3]

The world wide prevalence rate estimated was 5.29 %.[4] Data from National Health statistics of United States reported that children aged 7 to 17 years by parent- report, 8.9% of children had been diagnosed with ADHD and 24.7 % used at least one type of complementary and alternative medical therapy for the treatment of ADHD.[5] Many parents denied to start medication with the fear of side effects and may seek alternate or natural treatment. The average percentage of children aged 4 to 17 years taking medication for ADHD in America was 4.8 % in 2007 and 6.1 % in 2011.[6]

A survey was conducted by Associated Chambers of Commerce and Industry in 10 major cities of India. Totally thousand school teachers and doctors were selected. Teachers reported that every single classroom has one to three children who diagnosed with ADHD. 46% of doctors or healthcare providers found that the children at least in the age of 4 are more prone to the risk of ADHD.[7] Prevalence of children diagnosed with ADHD has gone up from 4 % to 11% during the past 6 years. Primarily boys are affected by ADHD than girls. In India a study was conducted on screening referrals at a pediatric clinic in Delhi, out of 1,000 children aged 3-12years, 112 were found to be ADHD. The prevalence of ADHD was 5.2% in 3-4 years and 29.2% in 11-12years.[8] Cross sectional study was conducted at selected primary schools of Kancheepuram district in Tamilnadu. Totally 865 children had been selected and assessed by Conner's teacher rating scale. Total number of male was 407, female was 458. ADHD symptoms have been identified in 37(69%) male children and 17(31%) female children. Prevalence of ADHD was more in boys than girls.[9]

The exact etiology of ADHD is unknown and the recent studies reported that the complex interplay of genetic and environmental factors such as prenatal smoking, alcohol and substance abuse, maternal stress, low birth weight and prematurity, lead, artificial food colourings, severe early deprivation and family diversity would be the causes for ADHD among children. Several cross -sectional and case- control studies have reported that the unhealthy dietary patterns have been related to an increased risk of ADHD. [10-13] It is characterized by diet high in sugar, salt, saturated and total fat, low in whole grains, fish, fruits and vegetables, have been associated with increased ADHD symptoms.[14] Many studies reported that supplementation of iron, zinc and omega 3 fatty acid will reduce the symptoms of ADHD with children. [15,16,17,18]

Today's citizens are tomorrow's leaders. The ADHD percentage of Indian population exhibits in the age group of 3 to 12 years. As the percentage of ADHD children is 10 to 20% in India, it is

quite imperative that early detection and prompt treatment should be given to make the children normal. There are multiple interventions available for bringing out the children from the clutched of ADHD. This study is proposed to identify the effectiveness of the different intervention strategies for the positive prognosis of ADHD children. The intervention package will facilitate to improve the attention span, concentration and decrease the level of hyperactivity.

Statement of the problem

Effectiveness of intervention package on behaviour of children with attention deficit hyperactivity disorder in North Tamilnadu, India.

Objectives

- To assess and compare the behaviour of ADHD children before and after the intervention
- To associate the behaviour of ADHD children with their selected demographic variables

Research Hypothesis

- There is a significant difference in behaviour of ADHD children before and after intervention.
- There is a significant association of behaviour of ADHD children with their selected demographic variables.

MATERIALS AND METHODS

A quasi experimental pre and post test design had been used. Totally 100 ADHD children and their parents of both sexes in the age group of 6 to 12 years have been selected. Children with any congenital anomalies and other mental disorders have been excluded in the study. The ADHD children, who are regular to the special schools (Adhiparasakthi Annai Illam, Melmaruvathur, and National institute for empowerment of persons with multiple disabilities (NIPMED), Muttukadu) and who fulfil the inclusion and exclusion criteria had been selected by total enumerative sampling method. Children have been selected from North Tamilnadu including Kanchipuram, Thiruvannamalai, and Chennai district.

Ethical clearance

Ethical clearance was obtained from Institutional Ethics committee of Saveetha University, Tamil Nadu, India. (004/12/2014/IEC/SU dated on 18/12/2014)

Data collection

Permission was obtained from authorities of the special schools to carry out the study. Informed consent was also obtained from the parents of children for their participation in the study. They have been explained about the benefits of the study. After collecting the demographic variables, the pre-test behaviour of ADHD children among their parents had been assessed by using modified Conner's parents rating scale. The rating scale contains 50 items, in which 20 for inattention, 20 for hyperactivity and 10 for impulsivity. The total score was 150. The degree of behaviour symptoms had been assessed, if the score is between 0 – 25% it will be considered as normal, if the score is between 26- 50% considered as mild and if between 51-75% considered as moderate ADHD symptoms and the score of above 75% considered as severe ADHD symptoms. Total score has been recorded.

Interventions included of play therapy, relaxation techniques and diet modification. Detailed demonstrations of relaxation techniques and play therapy have given to the ADHD children in the presence of parents. Each child motivated to do minimum 1hr for 30mts relaxation techniques and 30mts for play therapy at least 5 days a week for the period of 6 months at home. The handouts with detailed information of intervention package with elimination diet and supplementation diet have been distributed to the parents. Every month follow up was done through phone call or inperson. Clarifications have been made as per the need of parents. After 6 months post test behaviour assessment was done on all the 100 ADHD children by using modified Conner's parent rating scale and the total score was recorded.

RESULTS

The data were expressed in mean ± SE, median, Wilcoxon signed rank test and Mann Whitney rank sum test. Figure1 have shown the pre-test and post test scores of behaviour of ADHD children. In pre-test, out of 100 ADHD children, 22 children have exhibited mild symptoms, 56 children have moderate and 22 have exhibited severe symptoms. After the intervention packages, 43 children have turned to mild, 40 children to moderate, 6 children in severe level and 11 children in normal behaviour level. Figure 2 illustrates the total scores of inattention, hyperactivity and impulsivity of parents of boys and girls in pre-test and post test. The middle blue line is the median and the green line is the mean. The pre-test and post-test score have been compared by Wilcoxon signed rank sum test W=300 and p<0.001. Results showed that there was a statistically significant difference between pre and post test score of boys and girls. This study vividly describes that interventions like diet modification, play therapy and relaxation techniques have been found to be highly effective in both boys and girls. Figure 3 shows selected demographic variables of ADHD children.

Table 1: Comparison of pre -test and post -test among behaviour of ADHD children

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	39.97	6.83	0.682	27.82	10.22	1.022	T =1182 P =0.524	T =1130 P =0.293	W=2674 P <0.001	W =325.0 P <0.001
Hyperactivity	36.45	8.78	0.878	26.32	10.43	1.043	T =1242 P =0.873	T =1190 P =0.566	W=2738 P <0.001	W =314 P <0.001
Impulsivity	16.54	4.37	0.437	11.84	4.88	0.488	T =1285 P =0.860	T =1120 P =0.256	W=2449 P <0.001	W =325 P <0.001
Total	93.01	16.85	1.68	65.98	23.60	2.360	T =1202 P =0.633	T =1155 P =0.392	W=2818 P <0.001	W =300 P <0.001

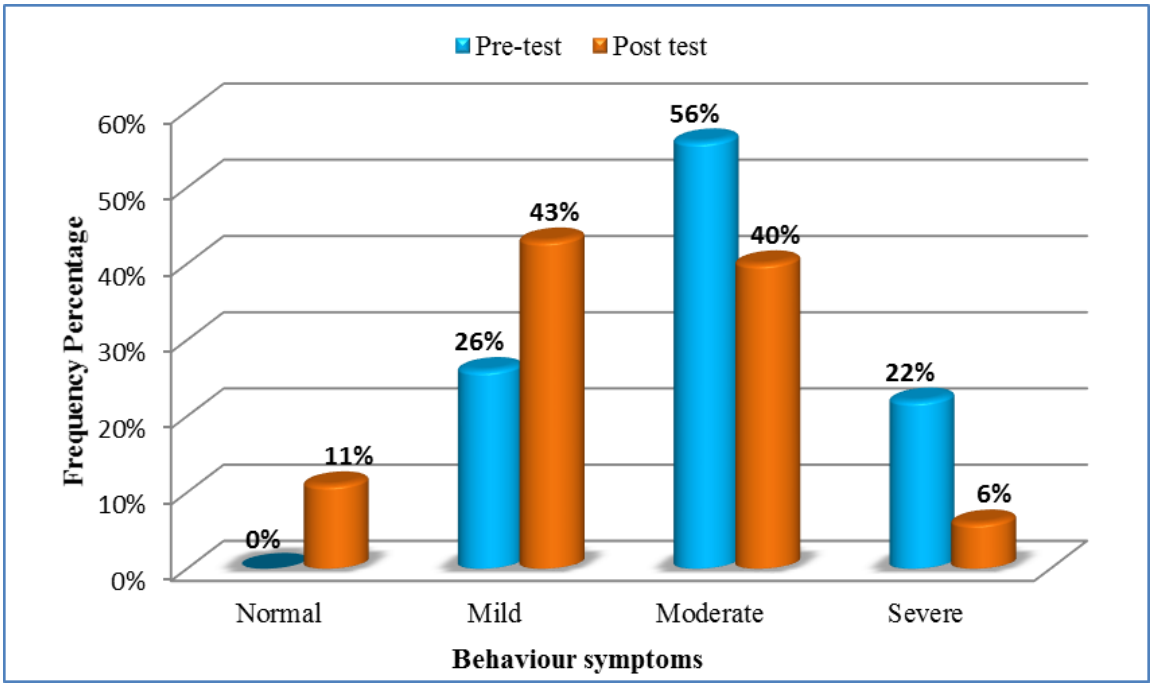

Figure 1: Pre and post test frequency of children with ADHD symptoms

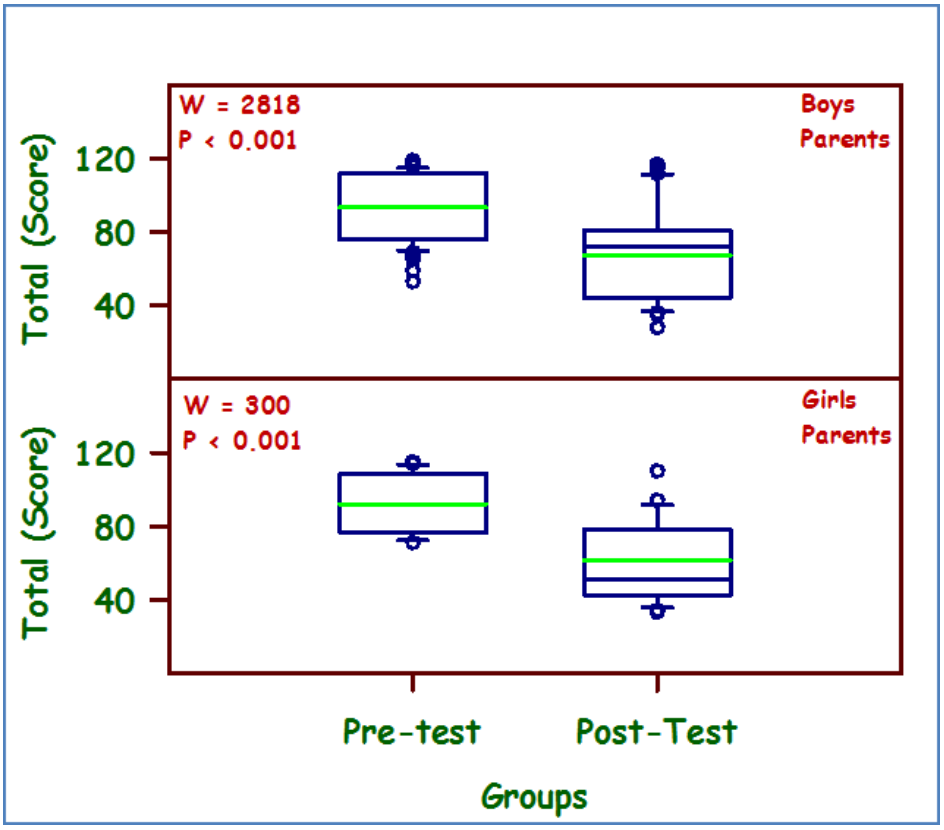

Figure 2: The pre-test and post-test total scores of Inattention, Hyperactivity and Impulsivity of parents of ADHD boys and girls

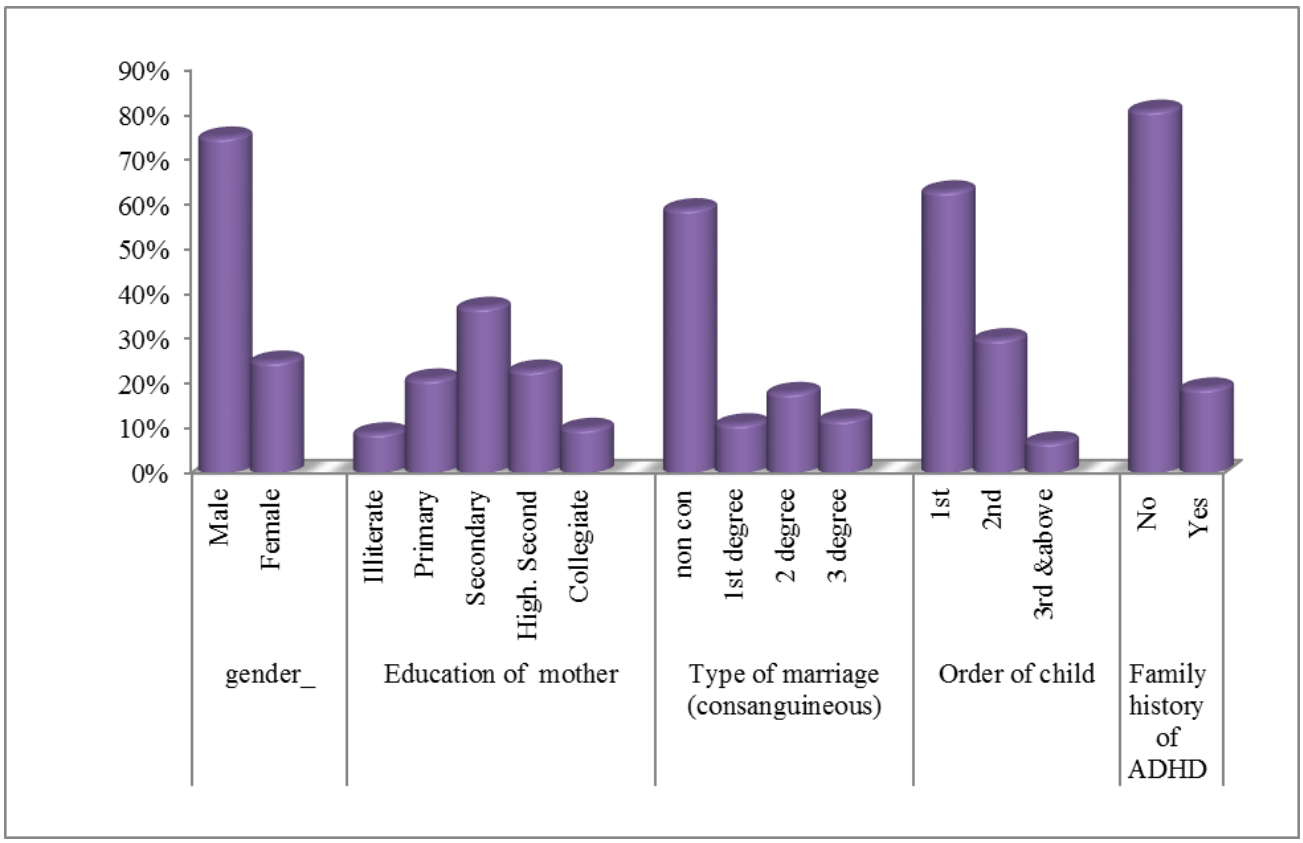

Figure 3: Association between Selected demographic variables with ADHD children

DISCUSSION

In the present study a total of 100 ADHD children have been selected. Out of 100 ADHD children 75 (75%) children were male and 25 (25%) were female. Interventions like play therapy, relaxation techniques and diet modification have been found to be effective and reflected notable changes in behaviour of both boys and girls with ADHD. The parents have been encouraged to continue iron, zinc, vitamins and minerals rich diet to their children and to avoid junk foods, food additives and colouring. The parents have also been motivated to follow the interventions like relaxation techniques and play therapy regularly in home. It helps children improve their attention span, concentration and reduce their hyperactivity level.

A study was conducted on effectiveness of selected exercise program on the executive function of children with ADHD. 40 male students have been selected between the age 7 and 11 years. Sample was randomly assigned into two groups as experimental and control. The experimental group participated in an exercise program for 24 sessions, 90 mts per session. The control group have not been provided with any intervention. Before and after exercises all the male students have been assessed with Stroop & Go –No-Go test. Results have been analysed by using MANCOVA. It showed that the cognitive inhibition of the children in the experimental group was statistically different while comparing with the control group ($p<0.05$). The study concluded that the selected physical activities assisted a lot to improve the executive function of children with ADHD.[19]

A study was aimed to see the effectiveness of play therapy on reducing behavioral problems of children with oppositional defiant disorder. Multistage cluster sampling was selected. 40 children have been randomly selected, according to their parents and teachers. Out of 40, 16 children have shown the symptoms of ADHD and the subjects have randomly been divided into one experimental and control group. Study explained that the play therapy was effective and reduced the severity of ADHD in experimental group. Children`s disobedience can also be reduced by the play therapy.[20]

CONCLUSION

Many of the parents are ignorant about the Hyperactivity Disorder. If not identified early, the children may go for conduct disorder in future. There is a comprehensive intervention which should be given at the initial phase of ADHD in order to minimize the symptoms and to increase attention span, improving their skills in home and school. Many studies reported the effects of single intervention for ADHD children. This study suggested that combined intervention package would be more effective among ADHD children and these intervention package is also simple to follow, readily available to use and easily reachable to many in society.

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