



EFFECTIVENESS OF INTERVENTION PACKAGE ON BEHAVIOUR MODIFICATION OF CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER AMONG THEIR PARENTS AND TEACHERS

E.SRIGNANASOUNDARI ^{*1}, Dr.S.VIJAYALAKSHMI² AND Dr.R. VIJAYARAGHAVAN Ph.D

¹ *Ph.D Scholar of Saveetha University and Associate professor, Adhiparasakthi College of Nursing, Melmaruvathur, Tamilnadu, India*

² *Research guide and Principal, Vignesh Nursing College, Thiruvannamalai, Tamilnadu, India*

³ *Director, Research department, Saveetha university, Thandalam*

ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common psychiatric disorders characterized by inappropriate levels of inattention, hyperactivity and impulsivity. The world wide prevalence of ADHD varies 4% to 8% in U.S, 7.6 to 9.5% in Korea, 10 to 20% in India. The worldwide prevalence of ADHD is 5.2% in 3-4 years and 29.2% in 11-12 years. Aim of the study to assess the behavior of ADHD children before and after the intervention as rated by their parents and teachers and to associate the behaviour of ADHD children with their selected demographic variables. Time series research design was used. The study was conducted at Adhiparasakthi Annai Illam, special school of Melmaruvathur in Kancheepuram district by using total enumerative sampling technique. Conner's parents rating scale and Conner's teacher rating scale was used to assess the behavior of ADHD children among their parents and teachers. Total of 10 ADHD children were selected. In parents rating scale before and after intervention package 50% of children had mild behaviour symptoms, 30% had moderate behaviour symptoms and 20% had severe behaviour symptoms. After the intervention package 70% of children had mild behaviour symptoms, 20% had moderate behaviour symptoms and 10% had severe behaviour symptoms in post test. In teachers rating scale before intervention package 100% of children had severe behaviour symptoms. After the intervention package 40% of children had mild behaviour symptoms, 50% had moderate behaviour symptoms and 10% had severe behaviour symptoms. Over all findings of the study reported that the intervention packages had been effective and brought good changes in the behavior of ADHD children

KEY WORDS: Assess, Effectiveness, Intervention packages, Behavior modification, Attention Deficit Hyperactivity Disorder.



E.SRIGNANASOUNDARI*

Ph.D Scholar of Saveetha University and Associate professor, Adhiparasakthi College of Nursing, Melmaruvathur, Tamilnadu, India

*corresponding author

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INTRODUCTION

Attention deficit hyperactivity disorder is characterized by developmentally inappropriate, persistent problems of inattention, excessive motor restlessness and impulsivity that significantly interfere with function or development. Associated features of ADHD include problems in maintaining positive relationships with friends and co-workers, poor academic performance, poor frustration tolerance and occupational success. The etiology of ADHD is multi factorial. Genetic factors, several genes associated with monoamine and serotonin synthesis and metabolism pathways appear to contribute to the ADHD phenotype. Other causes inclusive of environmental exposure, maternal smoking, very low birth weight, preterm births, lead exposure and exposure to endocrine disrupting chemicals can lead to increased risk for Attention Deficit Hyperactivity Disorder.¹ It is believed to be the most common psychiatric disorder in children, affecting 3 to 5 percentage of school-going population. Recent results from the National Co-morbidity Survey replication study conducted on close to 10,000 people in the United States suggested an adult prevalence rate of 4%.² It is more common in male and the ratio of male to female ratio is 3:1 in community samples.³ The prevalence has ranged from 4% to 12%. Rates are higher in community samples (10.3%) than in school samples (6.9%).⁴

Need for the study

Attention deficit hyperactivity disorder is the most common neuropsychiatric disorder in the paediatric age group, with a worldwide prevalence in the range of 7-17 years of school going children.⁵ Polanczyk and his colleagues completed the first comprehensive meta-analysis of the prevalence of ADHD in children and adolescents. The worldwide prevalence of ADHD was estimated to be 5.29%.⁶ Bener A conducted a study on higher prevalence of Iron deficiency as strong predictor of ADHD in children. Aim of the study was to determine the association between iron deficiency and ADHD in children. The study was conducted at school health and primary health care clinics, Qatar. A total of 630 children with ADHD and 630 children without ADHD were selected. Descriptive univariate and multivariate statistical analysis were performed. Results revealed that mean age for ADHD among experimental and control group were 11.54 and 11.50. There was a statistically significant difference between ADHD and control group for serum ferritin 36.26 and 38.19, serum iron level 82.11 and 85.60, Hb level 12 and 12.89 g/dl. The study indicates that low serum iron, ferritin and Vit D deficiency may be associated with ADHD.⁷ Ozgur Oner reported that effects of Zinc and ferritin levels on parent and teacher reported symptoms scores in ADHD. 118 subjects with ADHD with the age group of 7-14 years had been selected. The relationship between age, gender, ferritin, zinc, hemoglobin, MCV and reticulocyte distribution width and behavioural symptoms of children with ADHD were investigated. Results showed that subjects with lower zinc level had higher Conner's parents rating scale. Conner's teachers rating scale scores were not significantly associated with higher hyperactivity symptoms. Since both zinc and iron have associated with dopamine metabolism. Findings

revealed that low zinc and iron levels might be associated with more significant impairment in dopaminergic transfusion.⁸ Children with Attention Deficit Hyperactivity Disorder frequently have difficulty in organizing tasks, short attention span, and failure to do homework, poor relationship with parents, siblings, teachers and peers. If not found out early, in future children go for conduct disorders. There is a comprehensive interventions are needed for children with Attention Deficit Hyperactivity Disorder in the earlier period to minimize the symptoms and improving their skills in the home and school.^{1-3,5}

METHODOLOGY

Time –series Design with multiple institution of treatment was selected. The investigator introduced the intervention to measure the effectiveness of behaviour modification at the regular intervals. The study was conducted at Adhiparasakthi Annai Illam, special school Melmaruvathur in Kancheepuram District. The population consisted of children diagnosed with ADHD and their parents and teachers in special school at Adhiparasakthi Annai illam, Melmaruvathur. Sample selected was 10 children diagnosed with ADHD and their parents and teachers. Total enumerative sampling technique was used. The researcher selected the ADHD children who are attending special school meeting, the preset inclusion and exclusion criteria was adopted at the time of data collection.

Data collection procedure

The researcher got ethical clearance approval from Institutional ethical committee. After that formal written permission was obtained from Adhiparasakthi Annai Illam, Special school at Melmaruvathur in kancheepuram district. The researcher gave an introduction and the purpose of study was explained to the parents and teachers. Intervention package which includes diet therapy, play therapy and relaxation techniques are given to improve their behavior of ADHD children such as attention span, concentration ability, and normalize the activity level. Pretest was conducted among parents and teachers by using modified Conner's rating scale. After that the Investigator explained the procedure and hand outs were given to the parents and teachers to follow the intervention everyday in the home and school settings respectively. After subsequent follow up at the end of sixth month post test was conducted among parents and teachers by same standardized modified Conner's rating scale.

The tools

The tool has three divisions. Section A : Demographic variables such as age of the children, sex of the children, education of children, education of father, education of mother, religion, place of residence, occupation of father, occupation of mother, monthly income, type of marriage, number of children, type of family, dietary pattern, family history of ADHD. Section B: Assess the level of behaviour modification of ADHD children among their parents by using Conner's parent rating scale. Section C: Assess the level of behaviour modification of ADHD children among their teachers by using Conner's teacher's rating scale

RESULTS AND DISCUSSION

Descriptive (Mean, Standard deviation, standard error of mean) and inferential statistics (paired 't' test and independent 't' test) was used. Section A: Demographic

variables such as age of the children, sex of the children, education of children, education of father, education of mother, religion, place of residence, occupation of father, occupation of mother, monthly income, type of marriage, number of children, type of family, dietary pattern, family history of ADHD.

Table 1
Demographic variable of ADHD children

Demographic variables	Number	Percentage
Age	6-8 Years	8 80.0%
	9-10 Years	0 0.0%
	11-12 Years	2 20.0%
Sex	Male	8 80.0%
	Female	2 20.0%
Class	Primary	10 100.0%
	Middle school	0 0.0%
	Illiterate	0 0.0%
Educational qualification of father	Primary	0 0.0%
	Secondary	2 20.0%
	HSC	3 30.0%
	Graduate	5 50.0%
Educational qualification of mother	Illiterate	0 0.0%
	Primary	0 0.0%
	Secondary	0 0.0%
	HSC	7 70.0%
Religion	Graduate	3 30.0%
	Hindu	9 90.0%
	Muslim	0 0.0%
	Christian	1 10.0%
Place of residence	Others	0 0.0%
	Rural	7 70.0%
	Urban	1 10.0%
	Semi urban	2 20.0%
Occupation of father	Unemployed	0 0.0%
	Daily wages	0 0.0%
	Office job	2 20.0%
	Professional	6 60.0%
Occupation of mother	Own business	2 20.0%
	Home maker	6 60.0%
	Daily wages	1 10.0%
	Office job	3 30.0%
Income	Professional	0 0.0%
	Own business	0 0.0%
	Upto Rs 5000	0 0.0%
	Rs 5001 - Rs 10000	1 10.0%
Type of marriage	Rs 10001 - Rs 15000	6 60.0%
	Above Rs 15000	3 30.0%
	Consanguineous	4 40.0%
No of children	Non Consanguineous	6 60.0%
	One	4 40.0%
	Two	5 50.0%
Order of child	More than 2	1 10.0%
	First	9 90.0%
	Second	1 10.0%
	Third	0 0.0%
Type of family	Above Third	0 0.0%
	Joint	5 50.0%
	Nuclear	5 50.0%
Food type	Extended	0 0.0%
	Vegetarian	1 10.0%
Previous knowledge	Non Vegetarian	9 90.0%
	Yes	1 10.0%
	No	9 90.0%

Section B

Assessment of the behaviour modification of ADHD children among their parents before and after the intervention package by using Conner's rating scale.

Table 2
Pre and post test level behavioral modification of ADHD children -parents rating scale

	Pretest score		Posttest score	
	Frequency	Percent	Frequency	Percent
Mild	5	50.0	7	70.0
Moderate	3	30.0	2	20.0
Severe	2	20.0	1	10.0
Total	10	100.0	10	100.0

Table 2 shows that in pretest, 50% of children had mild behaviour symptoms, 30% had moderate behaviour symptoms and 20% had severe behaviour symptoms. After the intervention package 70% of children had mild behaviour symptoms, 20% had moderate behaviour symptoms and 10% had severe behaviour symptoms in post test.

Graph 1
Pre and post test level behavioral modification of ADHD children - Parents rating scale

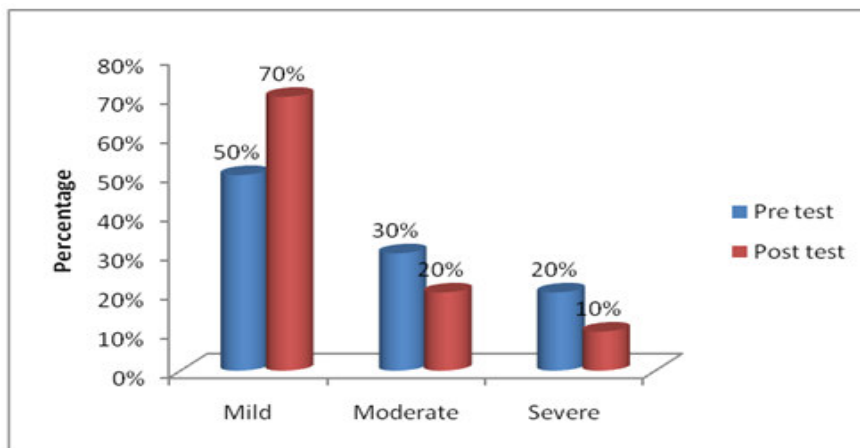


Table 3
Pre and post test mean, standard deviation and standard error of mean by parents rating scale

Paired Samples Statistics			
	Mean	N Std. Deviation	Std. Error Mean
Pre test	83.200010	21.69383	6.86019
Post test	61.700010	31.35832	9.91637

Table 3 shows that in pretest mean are 83.2 with the standard deviation of 21.69. In post test, mean is 61.7 with the standard deviation of 31.36. Standard error mean of pretest and post test of ADHD children is 6.86 and 9.91.

Table 4
Paired Samples Test by parents rating scale

	Paired Differences					t	df	p value
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre and post test	21.500	22.76571	7.19915	5.21439	37.78561	2.986*	9	.015

*significant

Table 4 shows that overall mean and standard deviation of ADHD children is 21.5 and 22.7. Standard error mean is 7.12, t value is 2.986 and p value is 0.015. Statistically there is a significant association between before and after intervention package among behavior modification of ADHD children.

Section C

Assessment of the behaviour modification of ADHD children among their teachers before and after the intervention package by using Conner’s teacher’s rating scale.

Table 5
Pre and post test level behavioral modification of ADHD children -Teacher rating scale

Level of ADHD	pre test score		post test score	
	Frequency	Percent	Frequency	Percent
Mild	0	0	4	40.0
Moderate	0	0	5	50.0
Severe	10	100.0	1	10.0
Total	10	100.0	10	100.0

Table 5 shows that in pretest, 100% of children had severe behaviour symptoms. After the intervention package 40% of children had mild behaviour symptoms, 50% had moderate behaviour symptoms and 10% had severe behaviour symptoms in post test.

Graph 2
Pre and post test level behavioral modification of ADHD children -Teacher rating scale

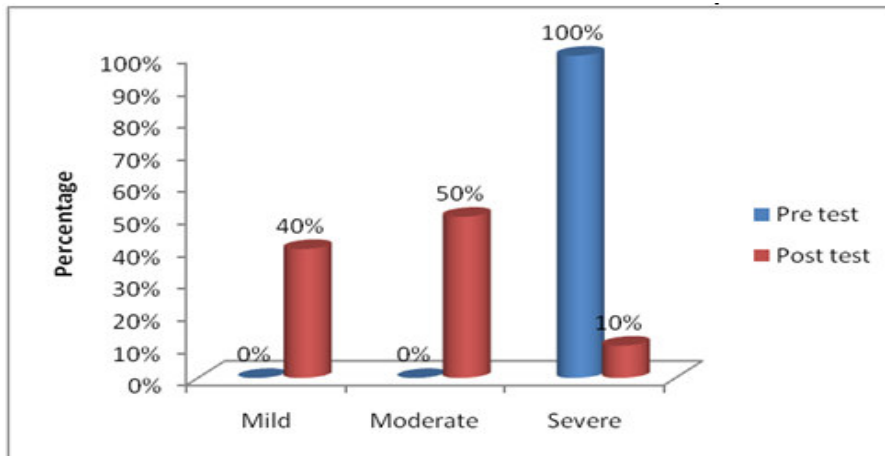


Table 6
Pre and post test mean, standard deviation and standard error of mean by teacher rating scale

	Mean	N	Std. Deviation	Std. Error Mean
Pre test total Teacher	63.6000	10	4.42719	1.40000
Post test total Teacher	41.2000	10	12.25470	3.87528

Table 6 shows that in pretest mean are 63.6 with the standard deviation of 4.42. in post test, mean is 41.2 with the standard deviation of 12.15. Standard error mean of pretest and post test of ADHD children is 1.4 and 3.87.

Table 7
Paired Samples Test by parents rating scale

	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	p value
				Lower	Upper			
Pre test and post test	22.40000	8.99630	2.84488	15.96444	28.83556	7.874	9	p<0.0001

Table 7 shows that overall mean and standard deviation of ADHD children is 22.4 and 8.99. Standard error mean is 2.84 and t value is 7.87, p < 1.000. Statistically there is a significant association between before and after intervention package among behavior modification of ADHD children.

CONCLUSION

Over all findings of the study reported that intervention packages diet therapy, play therapy, and relaxation techniques among behavior modification of ADHD children were effective and brought good changes in the behavior of ADHD children. Both the parents and teachers followed the instruction, after the six month follow up symptoms among ADHD children have been reduced. Health teaching programme was given to the parents regarding importance of elimination diet and supplementation among ADHD children which helps to reduce the behaviour symptoms of children. Similar

study was done by Ghanizadeh A, Haddad B, on overall dietary intervention rather than single nutrients on children with ADHD. Randomized controlled trial was done at a psychiatric clinic in Iran. Totally 106 children were selected. DSM-IV check list was used to identify the symptoms of ADHD. Linear regression analysis was used. Results showed that there was no difference between two groups. Study concluded that effect of ADHD was related to overall dietary characteristics compared to single nutrient on the children diagnosed with ADHD.⁹ Wilkes Gillian reported the study on eighteen-month-follow-up of a play based intervention to improve the social play skills of children with ADHD.

Five children with ADHD and their parents have participated. Children and their playmates attended an 18 months follow up play session and their parents participated in semi-structured interview. Wilcoxon signed – rank and Cohen's were used to measure the effect. Results showed that children's social play outcomes improved the pretest and post test intervention.¹⁰ Sanjiv mehta did a study on multimodal behavior program for yoga, meditation and play therapy implemented by high school volunteers; program combining yoga, meditation, play therapy for 1 hr session during school day. Yoga and meditation performed for 25mts. Postures and simple breathing technique given for children between 6 to12 years. The next 30 mts was devoted for behaviour therapy and 5mts for discussion on the past sessions or any questions child might have. The findings of the study after 6 wk peer-mediated behavioural program that

included yoga, meditation and play gave measurable benefits in children with ADHD. More than 50% of children have improved their academic and behavioral performance.¹¹

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CONFLICT OF INTEREST

Conflict of interest declared none.

REFERENCES

1. Heles R, Yudofsky S, Robert WL. Text book of Psychiatric DSM - 5th ed, Washington: The American psychiatric publishing; 2014.p.252-253.
2. Hechtman I. Attention - Deficit Disorders. In: Benjamin J, Virginia A, editors. Kaplan & Sadock's Comprehensive text book of Psychiatry. 8th ed. Philadelphia: Lippin Cott Williams and Wilkins; 2005.p.3183-3198.
3. Ram JR, Choudhury J. Attention – Deficit/Hyperactivity Disorder. In: Choudhury J, editor. Behavioural problems in children and adolescents. New delhi: Jaypee Brothers medical publishers (p) ltd; 2014.p.84-100.
4. Brown RT, Freeman WS, Perrin JM, Stein MT, Amler RW, Feldman HM, et al. Prevalance and assesment of Attention – deficit hyperactivity disorder in primary care settings. Pediatrics.2001 Mar 1;107(3):E43. Available from: <http://pediatrics.aappublications.org/content/107/3/e43.long>
5. Szatmari P. The Epidemiology of attention - deficit hyperactivity disorders. In: Weiss G, editor. Child and Adolescent Psychiatry Clinics of North America: Attention Deficit disorder. Philadelphia: W.B.Saunders; 1992. p. 361-372.
6. Polanczyk G, de Lima MS, Horta BL, Biederman J, Rohde LA. The worldwide prevalence of ADHD: a systematic review and metaregression analysis. American journal of psychiatry. 2007 Jun 1;164:942-948. Available from: <http://ajp.psychiatryonline.org/doi/pdf/10.1176/ajp.2007.164.6.942>
7. Bener A, Kamal M, Bener HZ, Bhugra D. Higher prevalence of iron deficiency as strong predictor of attention deficit hyperactivity disorder in children. Annals of Medical and Health Sciences Research 2014;4:291-7. Available from: https://www.researchgate.net/publication/267753974_Higher_Prevalence_of_Iron_Deficiency_as_Strong_Predictor_of_Attention_Deficit_Hyperactivity_Disorder_in_Children
8. Oner O, Oner P, Bozkurt OH, Odabas E, Keser N, Karadag H, Kızılgün M. Effects of zinc and ferritin levels on parent and teacher reported symptom scores in attention deficit hyperactivity disorder. Child Psychiatry & Human Development. 2010 Aug 1;41(4):441-7. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3399584/pdf/nihms341255.pdf>
9. Ghanizadeh A, Haddad B. The effect of dietary education on ADHD, a randomized controlled clinical trial. Annals of general psychiatry. 2015 Mar 1;14(1):1. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4357187/pdf/12991_2015_Article_50.pdf
10. Wilkes-Gillan S, Bundy A, Cordier R, Lincoln M. Eighteen-month follow-up of a play-based intervention to improve the social play skills of children with attention deficit hyperactivity disorder. Australian occupational therapy journal. 2014 Oct 1;61(5):299-307. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/1440-1630.12203/epdf>
11. Mehta S, Mehta V, Mehta S, Shah D, Motiwala A, Vardhan J, Mehta N, Mehta D. Multimodal behavior program for ADHD incorporating yoga and implemented by high school volunteers: a pilot study. ISRN pediatrics. 2011 Aug 11; 1-5. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3263567/pdf/PEDIATRICS2011-780745.pdf>