



IMPACT OF DISCRIMINATION BASED COGNITIVE RETRAINING ON ATTENTION SPAN IN A CHILD WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

C. K. Dhanapandian*

Assistant Professor in Rehabilitation Psychology, Department of Clinical Psychology, National Institute for Empowerment of Persons with Multiple Disabilities (Divyangjan), East Coast Road, Muttukadu, Kovalam Post, Chennai, Tamil Nadu, India.
*Corresponding Author

C. N. Ram Gopal

Professor of Counseling Psychology, Faculty of Allied Health Sciences (FAHS), Chettinad Hospital and Research Institute (CHRI), Chettinad Academy of Research and Education (CARE), Kelambakkam, Chennai, Tamil Nadu, India.

S. N. Anjali

M Phil Research Scholar, Department of Clinical Psychology, National Institute for Empowerment of Persons with Multiple Disabilities (Divyangjan), East Coast Road, Muttukadu, Kovalam Post, Chennai, Tamil Nadu, India.

ABSTRACT Attention Deficit Hyperactivity disorder (ADHD) is a chronic mental condition that includes difficulties in attention, hyperactivity behaviour and impulsive character. Cognitive retraining is on the technique that can used in the therapeutic intervention in the clinical set up to improve the attention span of the individual with ADHD. In this study 8 years old child with average intelligence fulfilling ADHD-IA criteria according to DSM-IV TR was chosen and given discrimination based cognitive retraining for the period of 3 months that the pre and post assessment was done by using Malin's Intelligence Scale for Indian Children (MISIC) (1969), Vanderbilt Attention Deficit Behaviour Rating Scale (VADDBRS) (2011), Digit Vigilance Test (1995). The results indicate that discrimination based cognitive retraining was effective in improving attention span of child with ADHD- IA type.

KEYWORDS : ADHD, Attention span, Cognitive retraining, Intervention

INTRODUCTION AND BACKGROUND :

Attention Deficit Hyperactivity disorder (ADHD) is characterised by developmentally inappropriate symptoms of inattention, hyperactivity and impulsivity causing significant impairment in multiple domains of functioning (Barkley, 2006). Neuropsychological interventions involve various direct and indirect therapeutic approaches like neurobehavioral management, cognitive retraining and others which are comprehensive rehabilitation paradigms involving management of either or both cognitive and behavioural deficits. Neuropsychological interventions for cognitive deficits generally fall into one of three realms:

(i) Environmental interventions that provide contextual support in the area of impaired ability (audio taping books for individuals with reading disabilities), (ii) Interventions aimed at compensating for the deficit in ability (use of memory notebooks or watches with alarms for an individual with memory impairment) and (iii) The use of direct interventions aimed at improving the underlying cognitive process and eliminating or reducing the deficit itself (Mateer et al., 1996).

Direct intervention is largely done through Cognitive Retraining (CR) which seeks to directly improve and restore cognitive functions utilizing a variety of pen and paper or computerized tests or games requiring cognitive skills such as attention, planning, problem-solving, and/or memory (Valligan et al., 2006). It is a teaching process that targets areas of neuropsychological functioning involved in learning and basic day to day functioning. Thus, a more comprehensive definition of cognitive retraining can be, therapeutic interventions involving activities that improve a brain injured person's higher cerebral functioning or help the patient to better understand the nature of those difficulties while teaching him/her methods of compensation. A number of CR methods have been utilized, many of which use specially designed computer software, and are called computer assisted cognitive rehabilitation (CACR). The empirical evidence for CACR seems to indicate a potential for improving cognitive functions (Tajik-Parvinchi et al., 2014)

The wide- spread use of computer assisted cognitive retraining procedures is largely because the computers allow accurate timing of stimulus presentation. Further, it is possible to regulate time of stimulus presentation based on individual's performance. However, the drawback of these programs is their rigidity which may be incongruent with patient's need. The floor and ceiling level along with the task content are relatively fixed. Further, the cost of cognitive retraining soft wares is another major limitation. Manualized

retraining programs overcome these limitations though at the cost of precision. However, studies have reported no difference in outcome between computer-assisted and manualized cognitive retraining programs (Batchelor et al., 1990).

Discrimination is the ability to perceive and respond to differences among stimuli. It is considered a more advanced form of learning than generalization, the ability to perceive similarities. There are very few studies which have studied the effects of cognitive retraining interventions in children with ADHD (Mateer & Mapou, 1996). There are almost no reported Indian studies which have studied the above effects of manualized CR in ADHD. Hence This study is an attempt in this direction. ADHD-IA is one of the subtype that includes children with no hyperactivity and children who still manifest clinically significant hyperactive symptomatology but not meeting the DSM criteria.

METHODOLOGY :

Aim

To find the impact of discrimination based cognitive retraining on attention span in a child with attention deficit hyperactivity disorder.

Hypotheses

There will be a significant impact of discrimination based cognitive retraining on attention span in a child with attention deficit hyperactivity disorder.

Research design

Single case experimental design

Sampling

Based upon purposive sampling technique, 8 years old child with average intelligence fulfilling ADHD-IA criteria according to DSM-IV TR was chosen from NIEPMD for the present study.

INCLUSION

- (i) Child with ADHD-IA
- (ii) Child with average intelligence

EXCLUSION CRITERIA

- (i) Child does not have any other medical condition
- (ii) Family history of any psychiatric illness
- (iii) Sibling with any other disability

Tools used

- (i) Malin's Intelligence Scale for Indian Children (MISIC) (1969)
- (ii) Vanderbilt Attention Deficit Behaviour Rating Scale (VADBR) (2011)
- (iii) Digit Vigilance Test (1995)

Intervention Techniques

Discrimination based cognitive retraining

Activities in area of sustained attention was adapted from various cognitive rehabilitation therapy software programs and used in manualized forms. Activities used for involved visual, auditory and both modality also involved various adaptations of cancellation tasks, vigilance tasks and discrimination in the presence of distracters.

Procedure

The study was conducted in NIEPMD, Chennai, Tamil Nadu. The child with ADHD-IA was selected for the intervention. The study was designed for 3 months, consists of 24 sessions that is, twice in a week. During the first phase pre-test was administered. After that discrimination based cognitive retraining was started with five different visual-auditory physical based activities. Which were continued for 8 sessions. Then five different auditory based activities, that is subject was blind folded, was added in to the session along with previous activities, which was continued for another 8 sessions. Then the researcher was administered the tests to check the improvement. And the last 8 sessions were followed by five different paper-pencil activities which were considered to be difficult along with previous activities. Finally the post test was administered by the researcher. After each activity one minute break were given to the subject as a social reinforcement.

RESULTS:

On MISIC his Verbal Quotient (VQ) was 118 and performance Quotient (PQ) was 116 with corresponding Intelligence Quotient of 117, indicating Above average Intellectual Functioning. (Table)

On Vanderbilt Attention Deficit Behaviour Rating Scale (VADBR), he scored significant score on Attention Deficit Hyperactivity Disorder-Inattentive subtype.

Table 1 Pre-Post Test Results On Number Of Activity, Attention Span, Errors Committed

Dimensions	Pre-test assessment	Post-test assessment
Number of activity completed (NA)	4 (with distraction)	14 (without distraction)
Attention Span (AS)	12 sec	160 s
Errors committed (EC)	15	3

Table 1 shows pre and post test results of attention span, errors committed and number of activity completed. In table 1 it is seen that in pre-intervention the number of activity completed by the subject was 4 and his attention span was 12 seconds and committed error was 15. In post-test, number of activity completed was 14, attention span was 160 seconds and errors committed are 3 respectively.

DISCUSSION :

Neuropsychological intervention through Cognitive Retraining techniques (CRT) have been reported to produce improvements in cognitive functioning of patients of traumatic brain injury schizophrenia, epilepsy, substance abuse and learning disability (Malhotra et al., 2009). Discrimination is the ability to perceive and respond to differences among stimuli. It is considered a more advanced form of learning than generalization, the ability to perceive similarities. The present study was focus on the Impact of discrimination based cognitive retraining on attention span in a child with Attention Deficit Hyperactivity Disorder- IA. In the recent years, children with ADHD have been reported to be having various neuropsychological deficits including primary deficit in the ability to sustain attention over time. In this study, subject was given 24 sessions of manualized discrimination based Cognitive Retraining over a period of 3 months. This manualized Cognitive Retraining module developed for the study largely included activities for the various sub domains of cognitive skill of attention particularly for discrimination ability, sustained attention and self-regulation. Based on Piaget's Cognitive Development Theory these activities with graded difficulty level were included and were associated with concrete and abstract functioning. From table 1 there are differences in number of activities completed, attention span and errors committed. With respect to various components of attention, there is increase in number of

activities, attention span and significant reduction in the number of errors committed. It was also observed that there was a reduction in both the number of omissions as well as commissions.

Clinical Observation

During the pre-test assessments the child was shown increased level of inattention non-cooperation towards the therapist. But in post-test assessments he was very cooperative and followed instructions given by the therapist, indicating that improvement in attention span contribute self-regulatory behaviours. A study by Reid & Borkowski (1987) suggesting that attention could be brought under some degree of voluntary control by self-instructional procedures.

CONCLUSION

Discrimination based cognitive retraining was effective in improving attention span of child with ADHD- IA type. It can be concluded that cognitive retraining is effective in remediating inattention faced by children with ADHD-IA.

LIMITATION

Single case design cannot be generalised

RECOMMENDATIONS

Cognitive retraining is effective in remediating inattention faced by children with ADHD-IA. So recommend to test in large group for effectiveness of the training.

REFERENCES :

1. Barkley, R. A. (2006). Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment (3rd ed.). Guilford Press.
2. Batchelor, T. T., Mulholland, P., Neyns, et al. (2013). Phase III randomized trial comparing the efficacy of cediranib as monotherapy, and in combination with lomustine, versus lomustine alone in patients with recurrent glioblastoma. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*, 31(26), 3212-3218.
3. E. Kiker K. (2011) Vanderbilt Parent Assessment Scales. In: Goldstein S., Naglieri J.A. (eds) *Encyclopedia of Child Behavior and Development*. Springer, Boston, MA
4. Lezak M. D. (1995). *Neuropsychological Assessment*, 3rd Edn New York, NY: Oxford University Press
5. Malin AJ: Manual for Malin's Intelligence Scale for Indian Children (MISIC). Lucknow: Indian Psychological Corporation; 1969.
6. Mateer, C. A., Kerns, K. A., & Eso, K. L. (1996). Management of Attention and Memory Disorders Following Traumatic Brain Injury. *Journal of Learning Disabilities*, 29(6), 618-632.
7. Mateer, C. A., & Mapou, R. L. (1996). Understanding, evaluating and managing attention disorders following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 11, 1-16.
8. Tajik-Parvinchi, D., Wright, L., & Schachar, R. (2014). Cognitive Rehabilitation for Attention Deficit/Hyperactivity Disorder (ADHD): Promises and Problems. *Journal of the Canadian Academy of Child and Adolescent Psychiatry = Journal de l'Academie canadienne de psychiatrie de l'enfant et de l'adolescent*, 23(3), 207-217.
9. Velligan, D. I., Kern, R. S., & Gold, J. M. (2006). Cognitive rehabilitation for schizophrenia and the putative role of motivation and expectancies. *Schizophrenia bulletin*, 32(3), 474-485.