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Research paper

Effectiveness of Dohsa-Hou Rehabilitation on Response Inhibition and Sustained Attention in Children with Attention Deficit Hyperactivity Disorder

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Abstract

This study aimed to evaluate the effectiveness of Dohsa-Hou rehabilitation on response inhibition and sustained attention in children with ADHD. The statistical population included all boys aged 8-12 years with ADHD who had referred to counseling centers and psychological services in Isfahan in 2020. Participants were selected by convenience sampling method and randomly divided into experimental and control groups (n =15 each). The instruments were Conners' Parent Form Questionnaire, Go- No Go Test and Conners' Continuous Performance Test. The results showed that Dohsa-Hou exercises have a positive and significant effect on response inhibition and sustained attention in children with ADHD.

Keywords: Psycho-rehabilitation Dohsa-Hou, Response inhibition, Sustained attention

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common developmental disorders that is associated with decreased attention, increased impulsivity and hyperactivity (Wang, et al., 2021). Although the diagnosis of ADHD is based on behavioral symptoms, research has shown that there are neurological and cognitive underpinnings specific to the disorder. Defective response inhibition is one of the cognitive problems of people with this disorder (Openneer, et al., 2021). Another component that is one of the major neurological impairments associated with ADHD is sustained attention deficit (Hwang, et al., 2020). Recently, new treatments such as Dohsa-Hou which includes two parts, psychological and physiological, based on the close relationship between the development of brain substrates responsible for motor coordination and executive functions has been suggested. Research by Fujino (2017); Nejatifar, et al. (2021); Yazdkhasti, et al. (2012) have shown the effectiveness of Dohsa-Hou intervention. Since Dohsa-Hou rehabilitation is one of the new therapeutic approaches and few studies have investigated its effectiveness on cognitive deficits in children with ADHD. The aim of this study was to evaluate the effectiveness of Dohsa-Hou rehabilitation on response inhibition and sustained attention of children with attention deficit hyperactivity disorder. The hypotheses of the present study were as follows: 1) Dohsa-Hou is effective on response inhibition of children with ADHD. 2) Dohsa-Hou rehabilitation is effective on sustained attention in children with ADHD.

Method

The present study was quasi-experimental with a pretest-posttest design and control group. The statistical population included all boys aged 8-12 years with ADHD who had referred to counseling centers and psychological services in Isfahan in 2020. Thirty children were selected by convenience sampling method and randomly assigned into experimental and control groups. First, a pretest was performed for the subjects, and then the experimental group participated in 8 Dohsa-Hou rehabilitation sessions. After the sessions, a post-test was performed for both groups.

Tools

Canners Parent Rate Scale (CPRS): This 27-item questionnaire was designed by Conners and is used to diagnose ADHD. Conners (1999) reported the reliability of 0.90 for this scale by the retest method. In this study, Cronbach's alpha was 0.86.

Go/No Go Test: This test, designed by Hoffman and used to measure behavioral inhibition, includes two sets of Go-and-No Go stimuli. Ghadiri, et al. (2006) reported the validity of this test as 0.87 and in this study its reliability was 0.89.

Conners Continuous Performance Test: This test is used by Conners to assess sustained attention. The retest coefficient of this test has been reported in the period of one month in different parts in the range of 0.50 to 0.92 (Conners, 2004). The internal consistency of the mentioned tools in the present study was 0.79.

Results

Multivariate analysis of covariance (MANCOVA) was used to determine the effectiveness of Dohsa-Hou rehabilitation. Before performing the analysis of covariance, the normality of data was assessed by Shapiro-Wilk test (P> 0.05) and the homogeneity of variances was assessed by Levin test (P> 0.05). The results of Levin test (P = 0.004, F = 18.3) indicated the assumed resistance of homogeneity of variances. Therefore, the assumptions of the statistical test of analysis of covariance are one-way, the results of which are reported in Table 1.

Table 1. Results of one-way analysis of variance in Go/No Go Test subscales

Go/ No Go test	df	F	P	Eta	Observed Power
Correct answer of Go	1	4.90	0.035	0.196	0.560
Wrong answer of Go	1	4.39	0.048	0.180	0.510
Correct answer of No Go	1	17.99	0.001	0.469	0.975
Wrong answer of No Go	1	17.99	0.001	0.469	0.975
Correct reaction time	1	6.50	0.015	0.245	0.680
Error reaction time	1	8.90	0.005	0.308	0.810

The results of Table 2 show that Dohsa-Hou rehabilitation had the greatest effect on reaction time, elimination response, correct response and finally on response error (P <0.05).

Table 2. Results of one-way analysis of variance in Continuous Performance Test subscales

Continuous performance testing	df	F	P	Eta	Observed Power
Error providing answer	1	5.20	0.031	0.205	0.580
Delete answer	1	7.64	0.011	0.270	0.740
Correct answer	1	7.40	0.012	0.269	0.735
Reaction time	1	13.85	0.001	0.408	0.944

Discussion and Conclusion

The results showed that Dohsa-Hou rehabilitation had a significant effect on response inhibition and sustained attention. Dohsa-Hou intervention increases people's awareness of themselves and others by relaxing and modulating muscles and enhances the child's ability to change attention, which is essential for preventing impulsive behaviors. Dosahoo exercises increase the child's attention to the exercises and focus on more activity. Limitations of the study included lack of a follow-up period after intervention, lack of generalization of results due to the limited population and no random sampling. It is recommended to performing follow-up period, comparing the effect of Dohsa-Hou intervention with other motor interventions, training by non-researchers, using neuroimaging and blood sampling to explain the mechanisms involved in the positive effects of physical exercise.

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Conflicts of interest

Authors found no conflict of interests.