




Comparison of the Effectiveness of Pars and Parisa Cognitive Rehabilitation Programs on Inhibitory Control of Students with ADHD

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Abstract

The aim of the present study was to compare the effectiveness of Parisa and Pars cognitive rehabilitation programs on the inhibition control of students with ADHD. The method was a semi-experimental type of pre-test and post-test with a control group, a follow-up period of 45 days. 33 male students aged 9-12 years with ADHD were selected by purposive sampling method and placed in 3 groups (2 experimental, 1 control). In each experimental group, one of Parisa or Pars programs was used in 14 sessions of 45 minutes. The control group did not receive any intervention. The instruments were: Stroop and Go-no-Go tests. The results showed that both programs were effective. The follow-up showed the stability of the effectiveness of both programs.

Keywords: Attention deficit/hyperactivity disorder (ADHD), cognitive rehabilitation program of Parisa and Pars, inhibitory control

Introduction

Attention Deficit/Hyperactivity Disorder (ADHD) is a common and damaging psychiatric disorder that occurs in 2.7% of people and is characterized by a persistent pattern of decreased attention, increased impulsivity and hyperactivity (American Psychiatric Association, 2022). Inhibitory control is the salient feature of ADHD and the core is to prevent the collapse of processing operations into executive functions. Cognitive rehabilitation focuses on the structures and functions involved in ADHD (Jalili, et al., 2019). Behavioral patterns, and structured exercises lead to neural flexibility in the structure and organization of the central nervous system. They create new paths and arrange and expand them in the brain (Crepaldi, et al., 2020) and improve executive functions. According to the studies and the importance of cognitive rehabilitation in improving executive functions, it will be useful to develop cognitive rehabilitation programs, Because the effectiveness of these programs on inhibitory control has not been compared. The present study follows the hypothesis that there is a difference between the effectiveness of the two rehabilitation programs in Inhibitory Control of students with ADHD.

Method

This quasi-experimental research with experimental and control group was done in the pre-test, and post-test stages. The statistical population was 9-12-year-old male students with ADHD in the third to fifth grades of Shabestar, Iran, in the academic year of 2020-2021. Ethical principles (confidentiality, free withdrawal from the research and consent) were observed. 33 people were selected by purposive sampling and randomly placed into 2 experimental groups and 1 control group. Intelligence above 80, Absence of sensory, nervous, emotional and behavioral disabilities, physical disability and absence of more than 2 sessions were the entry and exit criteria. In the experimental groups, 14 intervention sessions, 45-minute each, twice weekly were conducted using Parisa and Pars. In all groups, pre-test, post-test and follow-up (45 days) tests were performed.

Tools

Connors Parent Rating Scale (CPRS-48): The 48 questions are completed by parents. Its reliability was found to be 0.61 by Bustani-Kashani, et.al. (2014).

Tehran-Stanford-Bineh Intelligence Test: The fifth version of this scale was compiled in Iran in 2008 after translation. The reliability coefficients of the test areas are reported between 0.83 and 0.90 (Kamkari, 2011).

Stroop-Color-Word Test: This is one of the inhibitory control tests. The pen-paper type was used. The reliability of the test was reported by Qadiri et.al., (2006) as 0.6, 0.83, and 0.97, for all three attempts (Ramazannia, et.al., 2017).

Go-No-Go Test: the software version of the test, which was prepared in 2018 at the Behavioral Neuroscience Research Center, was used to measure response inhibition. The reliability and retest coefficients of this test are reported to be above 0.8 (Ramazannia, et.al., 2017).

Program for attentive rehabilitation of inhibition and selective attention (PARISA): This program was prepared at the Behavioral Neuroscience Research Center. The reliability and validity of this program has been measured by Nejati and the research shows the effectiveness of this program (Ghodrati, et.al., 2021).

program for attention training and strengthening (PARS): This program was prepared in the Behavioral Neuroscience Research Center. The reliability and validity of this package has been measured by Nejati on different groups (Ramazannia, et.al., 2017).

Results

Considering that the general and specific assumptions of multivariate covariance analysis was achieved ($P \geq 0.05$). Multivariate covariance analysis was used to analyze the data. The groups had a significant difference from each other in the weighted composition of inhibition control components according to Pillai's trace and Wilk's Lambda ($P \geq 0.01$). Univariate covariance analysis showed that the

3groups were significantly different from each other in most of the components in the post-test and follow-up($P \geq 0.05$).

Data in Table1 showed that in most components the inhibitory control components the difference in performance in groups, were significant in the post-test and follow-up. The Parisa group had a better performance in reaction time.

Table 1. Pairwise comparison of the means of inhibitory control components in test stages

Variables & components	group	group	Mean differences		Std. Error		Sing.		
			post-test	Follow-up	post-test	Follow-up	post-test	follow-up	
Stroop-color-word	Error correction	Parisa	Pars	0.85	-1.45	1.16	0.93	0.47	0.13
			Control	-2.50	-3.87	1.14	0.91	0.04	0.00
		Pars	Control	-1.65	-2.41	1.16	0.93	0.17	0.02
	errors	Parisa	Pars	0.03	-0.04	0.72	0.44	0.96	0.94
			Control	-1.65	-1.88	0.71	0.43	0.03	0.00
		Pars	Control	-1.62	-1.84	0.72	0.43	0.03	0.00
Reaction Time(s)	Parisa	Pars	-19.84	-16.88	15.43	17.13	0.21	0.33	
		Control	-58.17	-32.01	15.19	16.86	0.00	0.08	
	Pars	Control	-38.33	-15.14	15.46	17.16	0.02	0.39	
Go-no go	correct answer (Go)	Parisa	Pars	-1.03	-0.96	3.11	2.99	0.74	0.75
			Control	8.89	12.09	3.29	2.17	0.01	0.00
		Pars	Control	9.93	13.05	3.08	2.98	0.00	0.00
	Correct answer (No Go)	Parisa	Pars	0.54	1.88	2.40	2.35	0.82	0.45
			Control	13.18	14.63	2.53	2.48	0.00	0.00
		Pars	Control	12.64	12.77	2.38	2.33	0.00	0.00
reaction Time(s)	Parisa	Pars	-0.07	0.04	0.05	0.05	0.16	0.44	
		Control	-0.10	-0.07	0.05	0.06	0.07	0.20	
	Pars	Control	-0.03	-0.12	0.05	0.06	0.59	0.04	

Discussion and Conclusion

The findings showed that both programs were effective in controlling the inhibition and the Parisa program had a better performance in the response time. The child's effort to regulate performance in attractive tasks of cognitive rehabilitation programs can cause structural and functional changes in brain cells. The flexibility of the nervous system allows the person to organize the neural networks by learning new skills. Cognitive rehabilitation restores neurons responsible for executive functions including inhibitory control. According to evidence and theoretical foundations, it is possible to succeed in improving inhibitory control in the subsequent development of superior cognitive functions and executive functions. The generalizability of the results to other pediatric disorders was limited. Sampling may be disrupted due to COVID-19. Due to the online presentation of Parisa and the possibility of children working at home under the supervision of cognitive rehabilitation center therapists, they should use this program.

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Conflicts of interest

Authors found no conflict of interests.



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