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Comparing the Effectiveness of Reality Therapy and Cognitive Rehabilitation on Strengthening Attention and Self-Control of Children with Autism

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Abstract

Purpose: This research was conducted with the aim of comparing the effectiveness of reality therapy and cognitive rehabilitation on strengthening attention and self-control of children with autism. **Method:** The current research is semi-experimental (pre-test, post-test and follow-up test design with a control group) and the statistical population of the research is made up of all children with autism who refer to medical centers in Tehran. A number of 42 children were selected by available sampling method and randomly placed in the attention enhancement group (14 people), self-control group (14 people) and control group (14 people). The tools used in the research are the Cambridge Neuropsychological Test and the Connors Child and Adolescent Neuropsychological Scale (2004). Independent variables were performed for two experimental groups. The first and second experimental groups received cognitive rehabilitation and reality therapy. The third group was placed on the waiting list as a control group and did not receive any treatment during the study. The data was analyzed based on variance analysis with repeated measurements. **Findings:** The findings show that the average of the variables is still high even in the follow-up phase in addition to the post-test. **Conclusion:** The effectiveness of both approaches has had an effect size of 44% on increasing self-control of children with autism and 21% on strengthening attention.

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Introduction

Autism spectrum disorders include a wide range of broad neurodevelopmental disorders that are characterized by permanent deficits in establishing mutual social interaction and communication and repetitive and stereotyped limited patterns in behavior, activities and interests (1). This disorder has four main characteristics of failure in social, communication, cognitive and behavioral functioning. In new theories, autism is classified as a disorder with a neurological biological basis, which includes neuroanatomical and neurochemical changes in the brain (2). Children with autism show disorders in the cerebellum and frontal lobe, i.e. effective areas in planning, organization, decision making, time perception, memory, inhibition and thinking (3). The common features of autism disorder include occurrence in the early years of childhood, impairment in interactions and social relationships, stereotyped patterns of behavior, speech and language impairment, anxiety symptoms, symptoms similar to hyperactivity disorders, obsessive-compulsive forms, cognitive limitations, backward Mental retardation is the inability to directly understand the thoughts and feelings of others, the lack or weakness in attention and the inability to understand and interpret the emotional and social

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signs of the environment among this group (4). Attention is a fundamental part of human biology that is present even at birth. Orientation reflexes that help humans determine which events in the environment should be attended to; something that is necessary for survival. There are different types of attention, including: sustained attention, Attention Shift, selective attention, and divided attention (5). Attention is known as an executive function and is one of the most important basic functions in the human brain, whose components are the basis for other cognitive processes, and therefore, the integrity of the attention system is necessary for the functioning of all other high-level cognitive systems (6).

Among the areas that cause problems for children with autism is the disorder in their self-control and executive functions. It can be said that most of the psychopathology of these children is related to lack of self-control. The concept of self-control refers to a person's management of their behavior and executive functions. Usually, this term refers to the ability to inhibit impulsive behavior by inhibiting immediate and immediate desires (7). Self-control is the ability and capacity of people's nature to ignore or change their inclinations in response to dominant stimuli. In order for a person to be able to control his behavior, he must first understand the cause of the behavior and then realize that the consequence of that behavior is the result of an action that he can largely control (8). Absence or weakness in self-control may have negative consequences for people's mental health. Research has shown that there is a negative relationship between psychological problems and self-control; That is, people with more mental problems have poor self-control. This is why people who have less control over their executive functions and emotions face many problems (9).

The chronicity of this disorder, its severity and the high prevalence of autism in recent years highlight the need to pay more attention to this disorder and it is necessary to solve these problems by adopting an effective treatment method (10). Cognitive rehabilitation or neuropsychological rehabilitation is a systematic intervention method to restore the functions of cognitive problems of the brain with the aim of treating behavioral problems, which uses the strategies of training, repetition and practice abundantly (11). Methods based on cognitive rehabilitation can be effective in strengthening the mental functions and attention of people with autism through influencing rumination, emotion regulation and access to long-term memory information storage (12).

Reality therapy is one of the newest efforts of therapists to describe human beings, determine behavioral rules and how to achieve satisfaction, happiness and success. In this method of treatment, facing the reality, accepting responsibility and moral judgment about the rightness and wrongness of the behavior and as a result achieving the identity of success are emphasized (13). The goal of reality therapy is to foster acceptance of responsibility in the individual. A person should identify the behavior that he is trying to correct, pay all his attention to it and not make excuses to deny his responsibility (14).

In their research, Darvishi et al. (2022) compared the effectiveness of cognitive rehabilitation and social emotional skills on improving theory of mind in autistic children. The statistical results of multivariate covariance analysis (MANCOVA) and Sheffe's post hoc test showed that the amount of theory of mind in autistic children increased after applying only cognitive rehabilitation, and both groups had a higher average level of total theory of mind than the control group. Experiment 1 (cognitive rehabilitation) groups had higher averages in levels 1, 2 and total theory of mind than the control group, and the difference in averages was significant at the 0.05 level. The second test group (social emotional skill) had a higher mean at level 3 than the control group, and the difference between means was significant at 0.05 level. It can be concluded that cognitive rehabilitation is a suitable intervention method for educators and therapists of autistic children to promote theory of mind (15).

In a research, Yamani et al. (2020) investigated the effectiveness of cognitive rehabilitation based on emotional recognition on behavioral problems and theory of mind of children with autism spectrum disorder. Their findings showed that the cognitive rehabilitation method based on emotional recognition had a positive effect on the improvement of behavioral problems, theory of mind level one, theory of mind level two and the total score of theory of mind; But it has not had a significant effect on level three theory of mind. According to the results of the research, it can be concluded that training to recognize and properly recognize emotions through cognitive rehabilitation (substitution) can improve behavioral problems and improve levels of theory of mind (16).

Ebrahimi et al. (2019) investigated the effectiveness of reality therapy on the emotional regulation and resilience of mothers of autistic children in Sari city. The results showed that there is a statistically significant difference between the post-test averages in the experimental and control groups in terms of emotional regulation and resilience. Also, the results indicate that the effect of reality therapy on the two components of equal control and reduction of suppression was greater than other variables. Conclusion: The results showed that emotional

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regulation and resilience scores can be significantly increased by using reality therapy training (17).

Dolcos and colleagues (2019) concluded that exercises based on strengthening attention can have a positive role on cognitive functions such as emotion regulation. Methods based on cognitive rehabilitation can be effective in strengthening the mental functions and attention of people with autism through influencing rumination, emotion regulation and access to long-term memory information storage (18).

Lee and colleagues (2017) in their review research investigated the effectiveness of mindfulness-based intervention on improving attention in patients with attention deficit hyperactivity disorder. They examined 152 studies. The results showed that the intervention based on mindfulness significantly improves attention in patients with attention deficit hyperactivity disorder (19).

The method research:

This research is a type of semi-experimental research (pre-test, post-test and follow-up test with control group). The statistical population of the research includes all autistic children referred to medical centers in Tehran. From the total population, 42 children were selected by available sampling method and randomly placed in the attention enhancement group (14 people), self-control group (14 people) and control group (14 people). The research measurement tool is described as follows:

Cambridge Neuropsychological Test Automated Battery (CANTAB): This series was presented by the University of Cambridge in 1980, and since then, this university is developing its software, and it is considered one of the most reliable cognitive tests (20). . This computer set for cognitive assessment is simple, flexible and easy to implement, and it allows subjects to use a touch screen (21). This culture- and language-related test provides the possibility of examining different areas of executive function separately through 5 sub-tests. In this research, the sub-test "attention shift" was used. This test has been used in many cases to evaluate cognitive items in patients with autism spectrum disorder and its validity has been confirmed (22). In the subtest "attention shift" which is sensitive to the function of the frontal lobe and examines executive dysfunction; the ability to measure a set of changes in attention is evaluated. In children aged 4 to 12 years, a high internal consistency has been reported for all CANTAB sub-tests in the range of 0.73 to 0.95 (21).

Conners Neuropsychological Scale for Children and Adolescents: This test was developed by Conners (2004) in order to evaluate neuropsychological skills including attention, memory, sensory-motor activities and visual-spatial processing in four spectrums has been make for children aged 5 to 12 years. This test is used for different groups and disorders such as learning disorders, attention deficit/hyperactivity disorder, conduct disorder, and disobedience disorder. Jadidi and Abedi (2011) reported internal reliability coefficients ranging from 0.75 to 0.90 and retest reliability coefficients with an interval of 8 weeks from 0.60 to 0.90 (23).

The participants in the cognitive rehabilitation group were trained in 18 one-hour sessions (2 sessions per week). Reality therapy with a childlike and soft expression was performed individually during 18 one-hour sessions (2 sessions per week) on the experimental group. During this period, the control group did not receive any treatment intervention.

Descriptive and inferential statistics indices were used. In descriptive statistics, frequency tables, mean and standard deviation, and in inferential statistics using analysis of variance with repeated measurement of research hypotheses were evaluated. All data were analyzed by spss statistical software.

The results of Research:

The mean and standard deviation of the pre-test, post-test and follow-up test of the research variables are reported in Table 1.

Table 1. Mean and standard deviation of pre-test, post-test and follow-up test of variables

Variable	group	Pre test	Post-test	Follow up
		M	M	M
Strengthening attention	Control	50.58 (8.15)	51.25 (8.15)	51.38 (6.03)
	Experiment 1	53.83 (7.76)	63.26 (7.53)	62.76(12.51)
	Experiment 2	51.19 (8.83)	62.54 (6.67)	63.22 (9.06)
Self-control	Control	80.58 (4.86)	80.45 (4.79)	81.18 (6.55)
	Experiment 1	77.69 (7.39)	93.19 (11.60)	90.82 (11.81)
	Experiment 2	81.33 (5.91)	92.54 (8.00)	92.76 (7.86)

Examining the average of the variables shows that:

- Strengthening attention in the group of experiment 1 with cognitive rehabilitation, from 53.83 (7.67) in the pre-test to 63.26 (7.53) in the post-test. So that in the follow-up stage, the average is still higher than the pre-test with the amount of 62.76 (12.51).

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- Strengthening attention in the group of experiment 2 with reality therapy, from 51.19 (8.83) in the pre-test to 62.54 (6.67) in the post-test. So that in the follow-up stage, the average is still higher than the pre-test with the amount of 62.76 (12.51).

- Self-control in the group of experiment 1 with cognitive rehabilitation has reached from 77.69 (7,39) in the pre-test to 93.19 (11.60) in the post-test. So that in the follow-up stage, the average is still higher than the pre-test with the amount of and 90.82(11.81).

- Self-control in the group of experiment 2 with reality therapy increased from 81.33 (5.91) in the pre-test to 92.54 (8.00) in the post-test. So that in the follow-up phase, the average is still higher than the pre-test with a rate of 92.76 (7.86).

In Table 2, the analysis of variance with repeated measurements is presented to compare the pre-test, post-test and follow-up test of the research variables in the experimental and control groups.

Table 2. Analysis of variance with repeated measurements to compare pre-test, post-test and follow-up test

Scale	The source of the effect	sum of squares	Degrees of freedom	mean square	F	meaningfulness	Eta squared
Self-control	the level	2123.33	2	1055.72	61.054	0.001	0.610
	Group stage	1100.99	4	276.34	14.518	0.001	0.450
	error	1345.06	80	15.074			
	group	675.30	2	336.71	14.10	0.001	0.442
	error	845.49	40	20.28			
Strengthening attention	the level	1486.65	2	747.38	13.38	0.001	0.274
	Group stage	655.15	4	162.38	2.456	0.013	0.141
	error	3914.99	80	47.20			
	group	502.20	2	250.16	4.584	0.007	0.213
	error	1829.96	40	44.156			

Considering the significance of the stage effect, there is a significant difference between the pre-test, post-test and follow-up test scores of the variables of attention enhancement and self-control in the experimental and control groups ($P<0.05$). Therefore, it can be said with 95% certainty that the effectiveness of both approaches has had an effect of 44% on increasing self-control and 21% on strengthening attention.

Discussion:

The present study was conducted in order to compare the effectiveness of reality therapy and cognitive rehabilitation on strengthening attention and self-control of children with autism. Similar research shows that either of these two methods can have positive effects on enhancing attention and self-control in children with autism, but their effectiveness may depend on the children's individual characteristics, the severity of autism, and how the treatment is implemented [14, 17]. The research findings are presented as follows:

- The average attention enhancement is increased with cognitive rehabilitation; So that in the follow-up phase, the average is still higher than the pre-test.

- The average attention enhancement is increased with reality therapy; So that in the follow-up phase, the average is still higher than the pre-test.

- The average self-control has increased with cognitive rehabilitation; So that in the follow-up phase, the average is still higher than the pre-test.

- The average self-control has increased with reality therapy; So that in the follow-up phase, the average is still higher than the pre-test.

- The effectiveness of rehabilitation based on two approaches, with an effect size of 44% on increasing self-control and 21% on strengthening attention.

These findings show the efficiency and effectiveness of these two therapeutic approaches to improve cognitive and behavioral skills in people and emphasize the importance of using targeted interventions to develop mental and behavioral abilities (7).

Conclusion:

Cognitive rehabilitation increases the flexibility of brain neurons in the place of executive functions. This means that training, especially at a young age, creates new synaptic connections between the neural networks related to the task, which ultimately leads to the improvement of the individual's ability in that field. Programs such as the rehabilitation used in this research work according to the principle of brain plasticity and self-repair; this means that by successively stimulating the less active areas in the brain, it creates stable synaptic changes in them. Reality therapy is also a way that people choose their behaviors. In this method, people are helped to make appropriate choices and manage their behavior (11).

One of the most important limitations of this research is the use of available sampling method, the limitation of subjects to the city of Tehran, and the limitation of communicating with the statistical

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population. It is suggested that more variables and the statistical population of other cities be used in future researches.

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None

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