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Investigating the Effectiveness of Mental Learning Skills on Self-Control in Children Referred to Treatment Clinics with Attention Deficit Disorder

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Abstract

Objective: The purpose of this study is to investigate the effectiveness of mental learning skills on self-control in children referred to treatment clinics with attention deficit disorder.
Methods: This study was a semi-experimental study with a pre-test and post-test design with a control group. The statistical population of the study included children referred to treatment clinics in Isfahan with attention deficit disorder. 30 people were selected through convenience sampling and randomly assigned to two groups of 15 people each for mental learning skills training and control. The tools used to collect data were the Cambridge Neuropsychological Test Set and the Connors Child and Adolescent Neuropsychological Scale (2004). Univariate analysis of covariance and LSD post hoc test were used to analyze the collected data.
Results: The results show that training mental learning skills has a significant effect on strengthening attention and improving self-control in children referred to treatment clinics with attention deficit disorder. In addition, the findings indicate that strengthening attention in training mental learning skills has a greater effect on self-control in children with attention deficit disorder.
Conclusion: Teaching mental learning skills helps improve the physical and mental health of children with attention deficit disorder, improves self-control, and strengthens attention in these children

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Introduction

One of the most common childhood disorders that has attracted the attention of experts is attention deficit hyperactivity disorder. The onset of this disorder is in childhood; that is, the general symptoms of attention deficit, hyperactivity, and impulsivity begin in childhood and continue into adulthood (1). Children with attention deficit disorder due to hyperactivity and impulsivity have restless hands and feet, run or climb on things in inappropriate situations, are fidgety and talk excessively, often have difficulty waiting their turn, and are disruptive to others. Therefore, they create problems at home, at school, or in some social situations. These children have difficulty paying close attention, maintaining attention to tasks or activities, and completing homework (2). Attention is one of the most important higher functions of the mind and is itself a major aspect of cognitive structure, which plays an important role in the structure of intelligence, memory, and perception (3). Children's attention deficits take

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away from the ability to process, store, and recall information. Children with ADHD often find it difficult to maintain attention in play and on homework, and they have difficulty focusing their attention to complete tasks (4).

On the other hand, children with attention deficit/hyperactivity disorder (ADHD) typically have low self-control and are unable to control themselves most of the time. Self-control is the ability of an individual to recognize and use the talents to control feelings and emotions, behavior, and needs in relation to themselves and society (5). This term is usually used to refer to the ability to control impulsive behavior through the skill of short-term desires. With the help of behavioral self-control, children control their behavior and, as a result, become less dependent on external support, such as teacher reinforcement and parents (6). If peer reinforcement is present in one session but not in another, it may not make much difference, because it is self-reinforcement that influences behavior. Behavioral self-control equips children with the best practices for real-world behavior and makes them feel responsible for their behavior (7).

These disorders damage the development of mental abilities and mental learning skills in affected children. Accordingly, training in mental learning skills can be an effective way to reduce the problems caused by this disorder. The ability to understand that others have mental states that may differ from one's own mental states or reality, and that human actions are motivated by internal mental states such as beliefs, desires, and intentions, requires training in learning mental skills (8). The acquisition of social skills and theory of mind skills is an important area of everyday relationships for children. And learning theory of mind tasks helps children prepare for successful lives (9). Recent research on false belief understanding and theory of mind development is associated with increased social skills as well as decreased antisocial skills (10).

In their research, Keramati et al. (2022) designed a game model based on children's interpersonal skills (individual abilities, effective communication, psychological adjustment, and emotional intelligence). Findings show that interpersonal skills are one of the tools that enable an individual to adapt socially, establish and maintain interpersonal relationships, which are learned from the first years of life and have short-term and long-term effects throughout the individual's life. People whose interpersonal skills develop achieve self-satisfaction and are socially responsible and useful individuals (11).

Vahid et al. (2021) presented a study titled "The Effectiveness of Computer-Based Cognitive Intervention on Theory of Mind in Children with Attention Deficit/Hyperactivity Disorder." The results of the analysis of covariance showed that computer-based cognitive intervention had a positive and significant effect on the theory of mind of students with attention deficit/hyperactivity disorder. According to the findings of this study, it can be concluded that modifying theory of mind can be highly effective in improving the problems and interactions of students with attention deficit hyperactivity disorder and reduce their academic problems (12).

Hoseinpour et al. (2021) conducted a study to examine the effectiveness of executive function training on self-control in children with attention deficit hyperactivity disorder. The results showed that executive function training has a significant effect on self-control in children with attention deficit hyperactivity disorder. Based on the findings of the present study, it can be concluded that executive function training using organization training, increasing concentration and accuracy, strengthening working memory, and response inhibition can be used as an efficient method to increase self-control in children with attention deficit hyperactivity disorder (13).

Dolcos and colleagues (2019) concluded that attention-enhancing exercises can have a positive effect on cognitive functions such as emotion regulation. Cognitive rehabilitation-based methods are effective in enhancing the mental and attentional functions of individuals with autism by influencing rumination, emotion regulation, and access to long-term memory information stores (14).

Methods

The present study was a quasi-experimental study with a pre-test and post-test design. The statistical population of the study consisted of children referring to treatment clinics in Isfahan with attention deficit disorder. 30 people were selected through convenience sampling and randomly assigned to two groups of 15 people each for mental learning skills training and control. The measurement tools used in the study are:

Cambridge Neuropsychological Test Automated Battery (CANTAB) : This test was introduced by the University of Cambridge in 1980, and since then the university has been developing its software, and it is considered one of the most valid cognitive tests (15). This computer-based cognitive assessment suite is designed to be simple, flexible, and easy to administer, and allows subjects to use a touch screen (16). This culture- and language-dependent test allows for the separate assessment of different domains of executive function through five subtests, of which the “attention shifting” subtest was used in this study. This test has been used in many cases to assess cognitive items in patients with autism spectrum disorder and its validity has been confirmed (17). In the “attention shifting”

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subtest, which is sensitive to frontal lobe function and examines executive dysfunction, the ability to measure a series of attention shifts is assessed. In children aged 4 to 12 years, high internal consistency has been reported for all subtests of the CANTAB, ranging from 0.73 to 0.95 (16).

Conners Neuropsychological Scale for Children and Adolescents: This test was developed by Conners (2004) to assess neuropsychological skills including attention, memory, sensory-motor activities, and visuospatial processing in four ranges 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 oppositional defiant disorder. Jadidi and Abedi (2011) reported internal reliability coefficients ranging from 0.75 to 0.90 and test-retest reliability coefficients with an 8-week interval ranging from 0.60 to 0.90 (18).

After the necessary arrangements and selecting the sample and randomly placing them in the experimental and control groups, the parents of the selected individuals were contacted to attend the intervention sessions. Thus, for the experimental group, the intervention was held for 9 sessions, 3 sessions per week for one hour. The research questionnaires were given to them both in the pre-test stage and after the completion of the sessions as a post-test. The collected data were analyzed using SPSS-22 software and the multivariate analysis of covariance (MANCOVA) method.

Results

First, before analyzing the research hypotheses, it was ensured that the research assumptions were estimated using the multivariate analysis of covariance method; the Kolmogorov-Smirnov test was performed to check the normality of the research variables, and the Levine test was performed to check the homogeneity of the variances of the dependent variable between the control and experimental groups. Considering that the assumptions related to the analysis of covariance were fulfilled, the univariate analysis of covariance test was used to evaluate the effectiveness of the intervention method.

Table 1. Descriptive indices of dependent variables in the experimental and control groups

Components	Control group				Mental learning skills training			
	Pre-test		Post-test		Pre-test		Post-test	
	M	SD	M	SD	M	SD	M	SD
Self-control	46.51	5.12	47.66	5.55	48.71	8.99	69.96	11.35
Attention enhancement	53.71	6.99	55.22	6.98	45.59	7.57	55.97	12.35

Table 2. Between-subject effects of tests for attention enhancement

Source of variation	Sum of squares	Degree of freedom	Mean squares	F	P	η
Pre-test effect	593.627	1	593.627	62.737	0.001	0.711
Group effect	204.627	2	410.955	21.162	0.001	0.629
Error	244.495	26	۹/۰۵۸			
Total	9649	30				

Table 3. Between-subject effects of tests for children's self-control

Source of variation	Sum of squares	Degree of freedom	Mean squares	F	P	η
Pre-test effect	35.744	1	35.744	8.191	0.001	0.599
Group effect	201.422	2	132.434	29.411	0.001	0.612
Error	108.476	26	7.678			
Total	7451	30				

The mean and (standard deviation) self-control of children in the experimental group in the pre-test phase was 48.71 (8.99), which increased to 69.96 (11.35) in the post-test phase. The mean and (standard deviation) of the attention enhancement of the experimental group in the pre-test phase was 45.59 (7.57), which increased to 55.97 (12.35) in the post-test phase. While not much change was observed in the control group.

According to the results obtained, it can be concluded that by considering the pre-test scores of attention enhancement as a dependent variable, the experimental group and the control group have a significant difference in attention enhancement and the experimental intervention has been able to create significant changes in this dependent variable (F=21.162 and P=0.001).

According to the results obtained, it can be concluded that, considering the children's pre-test scores of self-control as a dependent variable, the experimental and control groups have a significant difference in attention enhancement, and the experimental intervention has been able to create significant changes in this dependent variable (F=29.411 and P=0.001).

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Table 4. Results of the post hoc test to compare the mean scores of attention enhancement between the two experimental groups (mental learning skills training) and the control group

Groups		Difference in averages	Standard error	P
Mental Learning Skills Training	Control	11.118	1.418	0.001
Control	Mental Learning Skills Training	11.118	1.418	0.001

Table 5. Results of the post-test to compare the mean scores of children's self-control between the two experimental (mental learning skills training) and control groups

Groups		Difference in averages	Standard error	P
Mental Learning Skills Training	Control	6.91	2.419	0.001
Control	Mental Learning Skills Training	6.91	2.419	0.001

In order to accurately determine the difference between the groups, the LSD post hoc test was used, the results of which are presented in Table 4.

The results show that in terms of attention enhancement, the mental learning skills training group (experiment) has a significant difference with the control group.

The results show that in children's self-control, the mental learning skills training group has a significant difference from the control group.

In addition, the findings show that strengthening attention in mental learning skills training has a greater effect on children's self-control (the difference in means is greater).

Discussion

The present study aimed to investigate the effectiveness of mental learning skills on the self-control of children referred to treatment clinics with attention deficit disorder. The findings are presented as follows:

The results of the study on the enhancement of attention resulting from the implementation of mental learning skills training show that this method is effective in enhancing the attention of children referred to treatment clinics with attention deficit disorder.

Also, regarding the level of self-control of children referred to treatment clinics with attention deficit disorder, the results indicate an increase in the level of self-control of the children studied with the implementation of this intervention (13). The results show that in children's self-control, the mental learning skills training group has a significant difference from the control group, and the experimental intervention has been able to create significant changes in this variable.

In addition, the findings show that strengthening attention in training mental learning skills has a greater effect on self-control in children referred to treatment clinics with attention deficit disorder (the difference in means is greater).

Conclusion

The hallmarks of attention deficit disorder are manifested by erratic and intolerable behaviors that cause these children's peers and those around them to avoid them. Therefore, the presence of skill problems is common in them, which requires attention and treatment based on improving skills. Mental learning skills training is designed to help improve the physical and mental health of these individuals by encouraging them to pay attention to planning skills and attitudes, creativity, and divergent thinking. The basic principles of this therapy indicate that internal thoughts, factors, images, and behaviors must be externalized and then the human mind must be activated in the face of these internal factors. According to research findings, strengthening these beliefs and skills helps improve self-control and attention control in the children studied with attention deficit disorder (15).

Among the limitations of the research, we can mention the difficulties in cooperating with the statistical sample in answering the questions. For future research, it is suggested that the gender and age characteristics of the children be taken into account. It is also suggested that this therapeutic approach be compared with other treatments used in this field.

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Authors Contributions

The author contributed to the data analysis. Drafting, revising and approving the article, responsible for all aspects of this work.

Ethical Consideration

The research data and literature have not been copied from any worksauthor upon reasonable request.

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