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Original research

The effectiveness of teaching emotion regulation cognitive strategies on the selective attention of children with learning disabilities

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Abstract

Introduction: Today, special attention is paid to the cognitive and emotional performance of children, which is one of the most important goals of the rehabilitation of these people. Children with learning disabilities are also one of these groups. The present study was conducted with the aim of investigating the effectiveness of teaching cognitive strategies of emotion regulation on the selective attention of children with learning disabilities.

Research method: This research was conducted with a semi-experimental method and a pre-test and post-test design with a control group. The population of the current study consists of all children with special learning disabilities in Tehran in 1401, from among the target population, 30 students with special learning disabilities (based on the psychiatric records of the effort center) were selected as the sample group by available sampling method and in the group The experiment (15 people) and the control group (15 people) were randomly assigned. The experimental group was exposed to the training of cognitive strategies of emotion regulation. In order to evaluate selective attention, the test of selective attention, concentration and effort (d2) was used. Analysis of the obtained data using multivariate analysis of variance showed that the components of selective attention were confirmed with a significance level greater than 0.05 ($p>0.05$).

Findings: The results showed that teaching emotion regulation cognitive strategies as an intervention tool was effective in increasing the selective attention of children with learning disabilities.

Conclusion: Therefore, child psychologists and therapists are advised to use the training of cognitive emotion regulation strategies as an intervention tool in increasing the selective attention of children with learning disabilities.

Keywords: attention, cognitive strategies of emotion regulation, selective, worry

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Introduction:

Today, special attention is paid to the cognitive and emotional functioning of children, which is one of the most important goals of the rehabilitation of these people, children with learning disabilities are also one of these groups (1). The injuries of learning disorders can reduce the academic performance of children and also have a direct effect on their self-esteem (2), and the education of such children is considered one of the most challenging areas of study in special education (3). Children and adolescents with learning disabilities experience more cognitive problems than their normal peers (4) and these problems adversely affect their performance in various fields (5). Specific learning difficulties have been known for a long time; two main types of issues have influenced this field (6). One of them is the scientific and clinical interest in understanding people with special disabilities that show inconsistency with their intelligence and other abilities, and the other one, which is more practical, is emphasizing the need to improve services for people who show such disabilities (7). In general, selective attention is focusing on a specific location or stimulus instead of paying attention to other things in a specific and limited time frame. Accordingly, selective attention is a type of skill that shows the ability of a person to filter out irrelevant or distracting information from information that is central or related to the ongoing performance; defines (8). Selective attention is one of the factors explaining the underlying mechanism of working memory. Selective attention refers to our ability to organize our thoughts, emotions and responses, especially in situations of conflict and interference (9). Badali believes that the ability to concentrate the available attention capacity is one of the important features of the central executive component of working memory, and performing complex cognitive tasks largely depends on this ability. Engel and Kaneh (10) consider selective attention as one of the components of the working memory model and believe that most of what we need to know in new situations and the world is based on long-term memory retrieval. This recovery is done automatically under normal conditions and is called only by signs. In this regard, the underlying role of executive attention in the relationship between working memory has been confirmed in the researches of Enthworth, Spillers and Brewer (11), Conway-Kane and Engel (10). However, some research evidence shows; Selective attention function cannot be the only determinant of working memory relationship, but memory-based abilities are important determinants of working memory and play an important role in the predictive power of working memory Callum, Shih and Flores Mendeza (12) concluded in their study that when the joint variance of short-term storage and selective attention is removed from the variance of selective attention, the remaining attention variance cannot predict working memory; Therefore, they concluded that executive attention cannot have an underlying role in relation to working memory and what underlies this relationship is short-term storage. In general, people with high working memory capacity perform better than people with low working memory capacity in controlling their attention to keep information related to the goal active. This becomes more important especially in conditions of high interference or the entry of irrelevant information and leads to a person's successful performance in reasoning situations. Therefore, since there are few studies in the field of selective attention and cognitive functions, in this study, we seek to investigate the relationship between teaching cognitive strategies, emotion regulation, and selective attention in children with learning disabilities. Also, a research like this can take new concepts in order

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to verify the common underlying convergence of cognitive actions by examining executive and cognitive functions on selective attention, and its findings can be used in educational, educational and therapeutic planning, especially cognitive therapies. In this regard and by referring to theoretical models and background studies, the aim of the present study was the role of teaching cognitive strategies of emotion regulation on the selective attention of children with learning disabilities.

Research Method:

The current study is a semi-experimental study with a pre-test and post-test design with experimental and control groups. The current research population consists of all children with learning disabilities in Tehran, of which 30 people were selected as a sufficient sample size using available sampling method and were placed in 2 groups of 15 people, test and control, in such a way that Randomly, 15 participants were assigned to the control group and 15 to the experimental group.

The criteria for entering the research are being 9-11 years old, being diagnosed with learning disorder criteria by a psychologist and willing to participate in the research, and the criteria for leaving the study are also the use of counseling and psychological services from other centers during the implementation of the research, having more absenteeism. It was from two sessions during the implementation of the educational program. The following tool was also used to collect information.

Selective attention, concentration and effort d2 test: The d2 test belongs to a class of tests whose purpose is to measure general psychological function. Among the general functions, this test aims to measure the level of concentration (selective attention) and in addition to the characteristic of concentration, it can also measure the level of effort. The word effort is chosen as an equivalent for the German word Anstrengung and refers to the effort of a person to do the tasks correctly or to research any kind of goal. This word is opposite to procrastination and for this reason, from another point of view, with the help of d2 test, the amount of procrastination of people can also be measured. It is with this goal in mind that the d2 test puts subjects in front of the task of selecting visual target stimuli from among a large number of different visual stimuli that are culturally independent. During the test, a person shows a certain level of attention efficiency, which is affected by coordination in the function of arousal and control. From a psychological point of view, the face validity of the test of concentration and effort can be justified by observing the subjects themselves and their reports after the test. The subjects' reports clearly show that performing the d2 test requires a high degree of selective attention. In addition, d2 test is described as difficult and success in it requires effort. The basic pattern of the d2 test is also very similar to many occupational activities that, according to the general public, require selective attention and concentration. The main sheet of the test consists of drawing 14 horizontal lines of visual stimulation by the subject, each line has 47 different symbols, in the whole test, 16 different symbols are used, which are a combination of two letters p and d and number of 1 to 4 small lines at the top or bottom. These are two letters. Thus, on the main page of the test, there are a total of 658 signs in 280 seconds or 4 minutes and 40 seconds. The time for each 47 signs is 20 seconds. The visual stimuli are divided into

two groups: target and non-target. 21 and in all even rows 22 there are target stimuli. The subject's task during the test is to mark all the letters d.

That there are two fine lines either at the top or at the bottom or at the same time at the top and bottom (13).

1. (KL), efficiency score, concentration including the score of the last visual stimulus hit by the subject minus the type two error (f2) and recorded in the fourth column. Based on the conducted research, the KL index is preferable to judge the general result of attention and is more accurate and resistant to distortion.

2. (F), the error score includes f1 and f2, f1 is the omission error score, which includes what the examinee has omitted and the correct marks that he has not entered, and is recorded in the second column, and f2 is the false error score, which includes the marks that the examinee made wrong and in The third column is recorded.

3. (GZ), the total performance score, is in the first column seen in the test sheet, and its score includes the set of symptoms that the person has checked, regardless of whether they are correct or incorrect, and has made a decision about them.

4. (F), shows the percentage of the subject's error in relation to his total efficiency. The lower this score is, the higher the level of net efficiency, accuracy and compliance of the person.

5. (GZ-F), this score represents the pure efficiency of the subject and has a normal distribution. The most reliable and valid result that the test provides is this variable, and it has a high correlation with other tests that measure attention.

6. (GZ-F1), the score of procrastination or effortlessness or mutation syndrome. When the subject quickly passes over the target stimuli, as a result, a jump score is created, and some kind of excitement prevails in the subject's behavior, and the desire for high speed leads to some kind of procrastination.

For scoring, two special templates are used. At the top and bottom of each template, a line can be seen, which can be used to easily calculate the total efficiency of the subject in each line of GZ based on the set of checked and marked visual stimuli. Template number one enables fast and easy detection of f1 omission errors by counting the number of visual stimuli missed in each row from the last marked stimulus to the previous one. The number of these stimuli is the amount of type 1 error in that row and is inserted in the corresponding column and row. In this template, target stimuli marked by the subject can also be seen; the score of the last stimulus marked is equal to the KL scale and template number two is the false declaration error f2 or what the subject did wrong. The score recorded in the test sheet includes subscales of total efficiency (GZ), error score (F) and concentration efficiency score (KL) which is obtained by the examinees in a period of 280 seconds, which according to the conducted research, the KL index is preferable for judging the public's attention and is more accurate and resistant to distortion. In foreign studies (Germany), the reliability of the questionnaire was obtained using Cronbach's alpha equal to 0.78. In internal research, the reliability of the questionnaire was calculated using Cronbach's alpha coefficient by Bagheri (13) equal to 0.80. In the present study

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Also, the reliability of the questionnaire was obtained using Cronbach's alpha coefficient on the preliminary sample equal to 0.85. In addition, the reliability of the GZ scale was calculated as 0.83, GZ as 0.87, KL as 0.87, F% as 0.80, and F as 0.77.

To carry out the research, the study and psychology clinic was referred to and the d2 test was performed on the subjects. In the next step, the program of cognitive emotion regulation strategies, which is based on Gross and Thomson et al.'s (2007) cognitive and emotion regulation strategies. The training protocol of the cognitive strategies of emotion regulation was implemented for the experimental group in 10 sessions 45 as a group in five weeks and two sessions per week, but the control group did not participate in this program and remained on the waiting list. Explanatory, role-playing and demonstration methods were used to teach the program. In addition, PowerPoint was also used and related images were used in each session according to the purpose and content of the program. After the implementation of the intervention program, a post-test was taken from both groups using the same test (selective attention, concentration and effort d2 test). The content of the sessions of the cognitive emotion regulation strategies program in the experimental group is explained by sessions in Table No. 1.

Table 1. Content of training sessions on cognitive strategies of emotion regulation

Sessions	Component	Content	Target
First	Introduction of cognitive emotion regulation strategies	Introducing different types of emotions, introducing emotional tools on the face, introducing the effect of emotions on creation	Subjects should know their emotions and learn how to express them.
Second	Awareness of feelings and emotions	Introducing the program by explaining its logic and steps, the necessity of emotion regulation and learning skills, correct views about emotion, primary and secondary emotions, getting help from emotions.	Subjects should know their feelings and learn how to express them
Third		Teaching and introducing emotions, identifying and	

	Emotion perception and situation selection skills	naming and labeling emotions, distinguishing between different emotions, identifying emotions in physical and psychological states, success factors in emotion regulation	Subjects should know the skills of emotion perception
Fourth	Emotion regulation	Regulating different emotions, how to behave in different emotional situations	Subjects should know emotion regulation skills and be able to control their emotions.
Fifth	Prevention skills	Self-evaluation with the purpose of knowing one's emotional experiences, self-evaluation with the purpose of identifying the level of emotional vulnerability in a person, self-evaluation with the purpose of identifying self-regulation strategies, cognitive consequences of emotional reactions, physiological consequences of emotional reactions, behavioral consequences of emotional reactions and the relationship between these three, introducing the emotion of anger and ways to overcome it	Subjects should know the behavioral components of excitement
Sixth	Correct position	Preventing social isolation and avoidance, teaching problem solving strategies, teaching interpersonal dialogue skills, asserting	Subjects learn positioning and be able to position.

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		existence and conflict resolution.	
Seventh	Expand attention	Stop rumination and worry, train attention	Subjects learn the component of attention and concentration.
Eighth	Cognitive assessment	The role of the mind in producing, maintaining, increasing or decreasing the emotional response, identifying wrong evaluations and its effect on emotional states, teaching reappraisal strategies	Subjects learn cognitive components.
Ninth	response adjustment	Identifying the extent and manner of using inhibition strategies and examining its emotional consequences, exposure, emotional expression training, behavior modification through changing environmental reinforces, emotional discharge training, relaxation and reverse action.	Subjects should learn emotion management and be able to manage and control their emotions in different situations.
Tenth	Evaluation and application	Evaluating the level of achievement of goals, the application of learned skills in the natural environment outside the intervention session	Subjects remember the functional components of excitement and can express excitement in different situations.

Table 2. Descriptive findings of selective attention and its components in the pre-test and post-test of the experimental group and the control group

	Group	Pre-test		Post-test		
		mean	standard deviation	mean	standard deviation	Adjusted mean
Total Score	Experiment	70/46	3/92	80/26	4/38	79/46
	Control	68/86	3/90	69/53	4/18	70/33
Total Efficiency Score	Experiment	32/27	1/75	37/53	3/09	37/31
	Control	31/87	1/64	31/93	1/62	32/16
Concentration efficiency score	Experiment	38/20	2/93	42/73	3/34	42/25
	Control	37/00	3/89	37/60	3/43	38/08

As the above table shows, the mean and standard deviation of the pre-test of selective attention variable were 70.46 and 3.92 in the experimental group and 68.86 and 3.90 in the control group, respectively. The mean and standard deviation of the post-test of selective attention variable were 80.26 and 4.38 in the experimental group and 69.53 and 4.18 in the control group.

Table 3. Kalmgrove-Smirnoff test to check the assumption of normality of selective attention variable

Variable	Groups	Test	Statistics	Degrees of freedom	Significance level
Selective attention	Experiment	Pre-test	0/15	15	0/20
		Post-test	0/10	15	0/20
	Control	Pre-test	0/12	15	0/20
		Post-test	0/13	15	0/20

The results show that the assumption of normality in the variable of selective attention was confirmed in two groups with a significance level greater than 0.05 ($p>0.05$).

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Table 4. Results of univariate covariance analysis for selective attention variable

dependent variable	Source of changes	sum of squares	Degrees of freedom	mean square	F	meaningful	Effect size	Test might
Selective attention	Pre-test	340/85	1	340/85	55/39	0/001	0/68	1/00
	Group	159/99	1	159/99	89/99	0/001	0/77	1/00
	Error	169679/00	26	6/15				

According to the results of the above table, after adjusting the pre-test scores, the difference between the experimental and control groups in the variable of selective attention is significant with (F = 99/89 P<0.01). The adjusted average of the variable of selective attention in the experimental group was 79.46 and in the control group was 33.70, that in the variable of selective attention, the average of the experimental group was higher than the control group, considering the limitations of the research, it is concluded that the educational intervention Cognitive emotion regulation strategies have the effect of increasing the selective attention of children with learning disabilities.

Discussion and conclusion:

The results of the present study showed that the adjusted average of the selective attention component of the experimental group was lower than the control group, so it can be concluded that the educational intervention based on cognitive emotion regulation strategies was effective in increasing the selective attention of children with learning disabilities. In line with the results of this hypothesis, we can refer to the research of Ghobari and Akbari (14), who admitted that the training of metacognitive strategies was significantly effective in increasing attention. In contrast, Qumrani and Saifi (15), Naderi and Bakhtiarpour (16) stated that emotion regulation skills do not have much effect on increasing children's selective attention. Therefore, in order to explain the findings, it can be acknowledged that emotion regulation training can help a person with a learning disorder to focus on a specific activity from among the set of activities. For example, he can watch an important sports match on TV or study a specific textbook while ignoring other environmental stimuli. And also to give the child with learning disabilities the ability to choose from a variety of solutions to solve different problems. Children with learning disabilities have academic problems. Maybe this is one of the bold choices for this problem, which other issues are less considered. So that in addition to academic problems, this group can also experience disability and inadequacy, which is sometimes considered as the basis of learning and academic problems from theories, Among these cases, we can mention the social-emotional problems of these students, although the issue of social-emotional status and cognitive-academic problems in children with learning disabilities is controversial among researchers, but in relation to the importance of social-emotional abilities for this disorder,

There is agreement that the academic problems of children with learning disabilities are associated with a wide variety of psychosocial problems, Such as fear of failure, depression, anxiety, loneliness, these children show all kinds of external and internal behavioral disorders, which can often limit their ability to work effectively in the educational environment. Children with learning disabilities experience more depression, aggression, loneliness anxiety and feelings of rejection by their peers and feelings of anger and confusion in class than normal children. They also have poor social skills and insufficient emotional vocabulary, and as a result, they have difficulty identifying their own and others' emotions (14).

Ethical Considerations: After the necessary approvals and obtaining permission from the university, in order to complete the questionnaires, the goals and working methods were explained to all the people participating in the study, and their consent was obtained and they were assured that the results of the research will be available to them if they wish. They will be placed. Also, people were assured that they are free to participate or not participate in the research, and in case of non-participation and cooperation, their treatment or care will not be effective and will be followed up as usual. People were assured that they can decide to withdraw from the research at any stage of the research and this will not have any negative consequences for them.

Limitations of the research: Like other researches, this research had limitations, and one of these limitations was the psychological and emotional state of the participants when answering the questions, which may affect the correctness and accuracy of their answers, and this limitation was uncontrollable.

Conflict of interest: The authors hereby declare that this work is the result of an independent research and does not have any conflict of interest with other organizations and individuals.

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