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Research Article

Development of a Cognitive Empowerment Training Package Based on The Executive Functions of The Brain And Its Effectiveness on The Cognitive Empathy of Underachieving Gifted Students of Sixth Grade Elementary

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Abstract

Aim: The present study was conducted to development of a cognitive empowerment training package based on the executive functions of the brain and its effectiveness on the cognitive empathy of underachievement gifted students of sixth grade elementary.

Methods: The research method was qualitative, Theme analysis according to Attride-Stirling (2001), and the research method in the quantitative part was semi-experimental with a pre-test-post-test design with a control group and a two-month follow-up period. The statistical population of the research included underachievement gifted students studying in the sixth grade of gifted elementary schools in Tehran in the academic year of 2021-2022. The sample in this study included 36 underachievement gifted students who were selected by purposeful sampling and randomly assigned to experimental and control groups (18 students in the experimental group and 18 students in the control group). The students in the experimental group received the cognitive empowerment training package based on the executive functions of the brain during 10 weeks in 10 sessions of 90 minutes. The applied questionnaire in this study included Cognitive Empathy Questionnaire (EQ) (Jolliffe, Farrington, 2006). The data from the study were analyzed through mixed variance analysis via SPSS23 software.

Results: The results showed that the cognitive empowerment training package based on the executive functions of the brain has sufficient content validity according to experts. Also, this training package had an impact on the ac cognitive empathy ($F=43.91$; $Eta=0.56$; $P<0.001$) of underachievement gifted students.

Conclusion: Based on this, cognitive empowerment training package based on the executive functions of the brain can be used as an efficient method to improve cognitive empathy of underachievement gifted students through employing techniques such as increasing attention, concentration and accurate, organizing activities, avoiding response, controlling impulsivity and planning training

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1. Introduction

Today, students are the most important part of the pillar to conduct research because the future is in their hands (Hu et al., 2024). But the focus was on students who were smarter and more efficient than others. Intelligent students are those who use similar environments and similar experiences better than their peers and show more intelligence and talent in doing things (Wu & Qin, 2025). But sometimes some of these scholars are highly intelligent in the field of compassionate teaching and learning that has become a major challenge for schools with brilliant talents (Steenbergen-Hu et al., 2020). The term compulsion refers to the difference between a person's performance at school and his or her actual abilities (Oluseyi, 2021). Based on previous research, high-intelligence scholars had less-developed stable mental beliefs compared to intelligence, Calgary (discouragement of mistakes, doubts about practices and personality standards), lower scores of organizedness, and less self-organization/motivation than high intelligence in academic success (Mofield & Parker, 2019). These findings suggest that underdeveloped high-intelligence scholars have abundant academic, personality, and introspective problems that provide the ground for other cognitive and psychological problems (Grüneisen et al., 2023).

One of the important factors in academic progress and student success can be cognitive empathy, so it can be said that the school, by establishing sympathetic institutions, plays a pivotal role in developing the student's personality and causes students to show better academic performance (Musavian et al., 2019). Cognitive empathy is a constituent and a vital concept in social life, allowing people to make sense of other people's behavior and be able to respond appropriately to their emotions (Kaji Isfahani et al., 2017). Cognitive empathy is the behavior in which a person puts himself in a different position in terms of feelings, thoughts, and behaviors and is able to understand and respect that person's point of view and, accordingly, treat that person (Blasberg et al., 2025). However, cognitive empathy is an individual's understanding of emotions, thoughts, attitudes, and experiences that puts themselves in their place. Compassion means understanding others emotionally (Atan, 2018). People with higher cognitive empathy have more grace and kindness in their lives, which can create peaceful relationships and mercy for others (Vera Cruz & Mullet, 2019).

Various and wide-ranging interventions have not been used to improve the cognitive, psychological, and educational skills of underachieving gifted students. But one of the intervention methods that can be used for these scientists is intervention based on the executive functions of the brain. Because Manani et al. (2019) showed that underdeveloped high-intelligence scholars have weak neuroscience skills and executive functions. Therefore, the current research has taken the initiative to compile a cognitive empowerment training package based on the executive functions of the brain. The results of the research of Farahzadi et al. (2023); Gandomi et al. (2021); Azadfar et al. (2021); Dehghani and Hekmatiyan Fard (2019); Wang Feng (2024); Kupczyszyn et al. (2024); Ruffini et al. (2023); Kontostavlou and Drigas (2022); Viana-Saenz et al. (2020); and Sulik et al. (2020) have shown that executive-based interventions can enhance the academic, psychological, and emotional environment of students in their academic environments.

Executive functions are sets of cognitive processes that are essential for controlling behavior and cognition and monitoring behaviors that facilitate the achievement of chosen goals (Aminian & Asli Azad, 2023). Executive roles play an important role in the academic

advancement of learners (Visier-Alfonso et al., 2020). Based on research results, executive performance training can be achieved with brain training programs, which aim to improve basic brain function (Kontostavlou & Drigas, 2022). A cognitive empowerment training package based on the executive functions focuses on neuropsychological theories that involve excellent functioning of the cognitive system and sets of high-level cognition processes and helps individuals decide what activities and tasks to undertake, how they organize their behavior over time, and relinquish their desires to long-term goals (Azadfar et al., 2021). Executive functions can be known as the core of cognitive and social abilities. On this basis, executive functions such as behavioral discretion, flexibility, information organization, targeting, and self-observation provide a pathway to children's academic and social success (Dehghani & Hekmatiyan Fard, 2019).

In the need to do this research, it should be said that high-intelligence scholars are less advanced compared to their peers, report less motivation, less academic self-esteem, have lower cognitive arousal and empathy, and also have a higher source of external control. These problems in underdeveloped high-intelligence learners can ultimately lead to psychological, emotional, and academic difficulties in them that are costly for society. Therefore, conducting intervention studies that can reduce the problems of these scholars have the importance and need for extensive research. On the other hand, it can be said that the lack of progress is one of the biggest problems posed in relation to intelligent people and their families, and having a strong academic performance in the school is a prerequisite for participating in specific programs of intelligent learners and pursuing success in the university and the success of the next words. But sometimes underachievement gifted students show contradictory performance, raising concerns for teachers, parents, counselors, and school psychologists. In addition to addressing the need for research, it is also useful to state the research gap. This process can be examined from two perspectives. As underachievment gifted students include a group of students for whom significant intervention research has not yet been applied. This trend indicates that effective cognitive and psychological treatments can be used for this group of students so that in the future, by comparing the effectiveness of these interventions, a more effective method can be identified and presented. In addition, it should be said that cognitive empowerment based on executive functions, despite its appropriate clinical efficacy in improving behavioral, cognitive, and social components such as improving self-control skills, empathy, and social adaptation of other students, has not been used clinically for the underachievment gifted students. Therefore, conducting research that can contribute to underachievement gifted students in this field has the importance and need of extensive research

The aim of the current research is the development of the cognitive empowerment training package based on the executive functions of the brain and its effect on the cognitive empathy of underachievement gifted students of the primary sixth foundation.

3. Methods

3.1. Sample and Procedure

This research was done in two stages. In the first part, the research method was qualitative, theme analysis according to Attride-Stirling (2001), and in the second part, the research method in the quantitative part was semi-experimental with a pre-test-post-test design with a control group and a two-month follow-up period. The statistical population of the

research included underachieving gifted students studying in the sixth grade of gifted elementary schools in Tehran in the academic year of 2021-2022. In this study, purposeful sampling methods were used. Thus, by visiting the primary schools of the 12th, 13th, and 14th districts of Tehran (8 schools), students of the sixth grade were identified who did not have academic progress like the rest of their peers and classmates. Then 40 students who were selected to study were randomly placed into experimental and control groups (20 students in the experimental group and 20 students in the control group). To determine the sample size in the quantitative section, G*Power software was used, which determined the number of samples in each group to be 20 students. The margin of error was also considered to be 0.05, and the confidence level was 0.95. The effect size was also obtained to be 0.99. Then, the underachieving gifted students in the experimental group received the training intervention related to the cognitive empowerment training package based on the executive functions of the brain once a week. It was in the meantime that the underachieving gifted students present in the control group did not receive any intervention during the investigation and were available in anticipation of intervention. After the post-test was completed, and two months later, the follow-up phase was followed. During the intervention, 2 students in the experimental group and 2 students in the control group withdrew from the study. Based on this, 36 underachieving gifted students remained in the study (18 students in the experimental group and 18 in the control group). In order to comply with the ethical principles in the research, the consent of the students to participate in the intervention program was obtained, and they were informed about all the stages of the intervention. Also, the students in the control group were assured that after completing the research process, they would also receive these interventions. Besides, the students present in both experimental and control groups were assured that their information would remain confidential, and there is no need to include their names. The entries to the research included dealing with intelligence over 120 using the Wechsler Intelligence Test (according to the academic file and academic counselors), meaningful discrepancies between intelligence and educational progress of students using the descriptive handbook of students and the report of teachers and parents, being aged 12 to 14, tending to participate in the research, and not receiving psychological intervention simultaneously. The outcome of the study also included absence of more than two sessions, irregular attendance at treatment sessions, lack of cooperation with the researcher, and failure to respond to the research questionnaire during one of the follow-up or follow-ups.

3.2. Research Tools

Empathy Questionnaire (EQ): The empathy questionnaire was created by Jolliffe and Farrington (2006). The psychological features of this questionnaire were evaluated by Albiero et al. (2009) among students. The questionnaire is rated on a 5-degree scale, with answers ranging from 1 (I totally disagree) to 5 (I completely agree). The scores for this question range from 20 to 100. Higher scores indicate more empathy. A study by Albiero et al. (2009) found 0.87 for the full-scale alpha coronavirus. They were also used for the determination of questioning. They combined a basic empathy test with the Emotional Empathy Questionnaire (Mehrabian, 1996) with the Interpersonal Action Index (Davis, 1980) and prosocial scale (Capra et al, 2005) and achieved meaningful synergies that

represented constructive tendencies. These scales have demonstrated acceptable validity coefficients in previous research: Emotional Empathy Questionnaire r = 0.50–0.70, Interpersonal Reactivity Index subscales r = 0.30–0.60, and Prosocialness Scale r ≈ 0.40–0.60, supporting construct validity. Jafari et al. (2017) also that the end of the questionnaire is Cronbach's alpha 0.80 and re-test 0.72. On the other hand, Kaji Isfahani et al. (2017) calculated the ratio of the questionnaire at 0.94 and with Cronbach's alpha at 0.89, which represents the turn and end of the question. From this final questionnaire this survey was obtained in the current study with Cronbach's alpha 0.88.

3.3. Ethical Considerations

In order to comply with the ethical principles in the research, the consent of the students to participate in the intervention program was obtained and they were informed about all the stages of the intervention. Parents also agreed to their child's participation in the present study. Also, the students in the control group were assured that after completing the research process, they will also receive these interventions. Also, the students present in both experimental and control groups were assured that their information will remain confidential and there is no need to include their names.

3.4. Process of research

The implementation method in the qualitative section (development of a cognitive empowerment training package based on the executive functions of the brain) with the study and analysis of the article in the method of Attride-Stirling (2001) 31 articles related to the following description of the quantitative analysis: In the first stage, signs, specifications, constituent items, and cognitive empowerment techniques were identified. In the second stage, the theoretical bases and published articles in the field of executive functions of the brain, as well as the cognitive needs of the studied underachieving gifted students and the constituent dimensions of executive functions, were determined. In the third stage, the materials collected in the first and second stages were categorized into content and conceptual-content subgroups focused on the items constituting the two approaches of cognitive empowerment and executive functions of the brain were formed. In the fourth phase, the conceptual subgroups - content formed in the first and second phases - turned into 10 to 12 skill areas required by underachieving gifted students and the theoretical foundations and components forming the cognitive capability and executive function towards the initial editing of the cognitive empowerment training package based on the executive functions of the brain on the basis of the educational arts extracted from resources. In the fifth phase, the initial cognitive empowerment training package based on the executive functions of the brain was presented to 15 child and adolescent psychology specialists, and they were asked to study the structure, process, and content of each session and its relationship. There was also a questionnaire with a written training package available to each of the experts. In addition, an open response statement form was provided to provide suggestions and corrective opinions to each of the specialists in order to enhance the content, structure, and process of the cognitive empowerment training package based on the executive functions of the brain. In the sixth phase, the expert opinions of 15 experts were reviewed, and their corrective opinions were prepared on the cognitive

empowerment training package based on the executive functions of the brain and the final training package. In the seventh phase, the cognitive empowerment training package based on the executive functions of the brain was presented again to 15 specialists along with the final survey form, and after the survey form was collected, the consensus of specialists was calculated using the content validity ratio (CVR) and content validity index (CVI) on the process, structure, and content of the educational package. The results showed that the cognitive empowerment training package based on the executive functions of the brain has sufficient content validity according to psychology experts. Because the content credibility ratio of the cognitive empowerment training package based on the executive functions of the brain using the content validity ratio (CVR) and content validity index (CVI) in the order of 0.86 and 0.93. The content validity of the expression in the qualitative section was obtained according to the experts' comments at 0.89. In a quantitative part, also, after obtaining the required licenses and completing the sampling process (as mentioned above), the selected underachievement gifted students (40 students) were randomly classified in experimental and control groups (20 underachievement gifted students in the experimental group and 20 underachievement gifted students in the control group). The intervention experimental group received the cognitive empowerment training package based on the executive functions of the brain for 10 sessions of 90 minutes, one session per week for 10 weeks in groups of 5 people. This is while underachievement gifted students present in the control group did not receive any interventions during the study. During the intervention, 2 students in the experimental group and 2 students in the control group withdrew from the study. Based on this, 36 underachievement gifted students remained in the study (18 students in the experimental group and 18 in the control group).

Table 1: Summary of training package sessions cognitive empowerment training package based on the executive functions of the brain

Session	Purpose of session	Summary of session
The first	introduction	Knowledge and metrics, explanation of group rules and regulations, initial and simple explanations for introducing cognitive abilities and brain function, schedule and list of upcoming meetings.
The second	Strengthen working memory and inhibitory control	First step (working memory): The first step of the session focused on enhancing spatial perceptual memory. For this purpose, the test was used to hit the course block. Second step (inhibitory control): In this test, a series of specific questions were asked to be answered clearly. But he was told that he had to answer every question reversely. If the answer is yes, say yes, and if the response is no say yes.
The third	Increase attention and mind flexibility.	During this session, the purpose of test was used to train specific attention and cognitive flexibility. Exercising and repeating this test can help with disturbance of attention and distraction. The test is in the form of five kinds of cards named one of the colors blue, red, yellow, green and black, written on each card with a particular color, a specific color.
The Fourth	inhibitory control	During this session, the test of small frogs was used for the training of inhibitory control. This test is carried out in order to enhance the ability of the student to respond to motion-visual responses.
The Fifth	Training spatial memory and cognitive flexibility.	To train spatial memory and cognitive flexibility, the matris path test was used. This test is carried out to enhance spatial memory as well as cognitive flexibility in the test. In this test, this reinforcement is done by evaluating the ability to update spatial information based on verbal commands in short-term memory and practicing and repeating these to the updates in the experimental mind.
The sixth	working memory	For the training of working memory in this session was used the back-to-back blocking test. This test is similar to the Course Block Shock Test, but the way it is performed has changed in a way that, in addition to enhancing working memory, enhances the ability to update and change the visual-working memory by asking the child to retain and collect perceptual-visual information.

The Seventh	Training for inhibitory control, concentration and cognitive flexibility	During this session, training was used for control, concentration and cognitive flexibility of the Sit down - stand up game. In this test, the examiner is placed in a situation that requires control of his or her behavior against orders. The test has helped to strengthen discretionary control skills as well as enhance cognitive flexibility when listening to a command and performing the opposite behavior, in the course of repetition and practice of the test.
The eighth	Inhibition response Training	During this session, strong response skills training and interference control of the interrogation test (Neptunian test) were used. This test is carried out in order to strengthen intelligence control in test subjects.
The ninth	Training cognitive flexibility and attention.	The session was used to train cognitive flexibility and attention from the touch test of numbers. In this test, colored counting cards are used to enhance the test memory.
The tenth	Active memory training to improve concentration	The session was used for active memory training in order to improve the concentration of the safe movement test. The test enhances the construction of different path of movement, spatial memory, and focus in the experiment, as well as helps to strengthen planning on the experimental path.

The study used two levels of descriptive and comparative statistics to analyze data. At the level of descriptive statistics, mean and standard deviation, and at the level of inferential statistics, Shapiro-Wilk test to check the normality of the distribution of variables, Levine's test to check the equality of variances, Mauchly's test to check the assumption of sphericity of the data, as well as mixed variance analysis and test Bonferroni's post hoc test was used to test the research hypothesis. The data was analyzed using the statistical standard SPSS editing 24.

4. Results

Demographic information showed that the average age in the experimental group was 13.76 ± 1.25 years and in the test group 14.12 ± 1.74 years. The results also showed that the majority of underachievement gifted students subjects in the experimental group (11 people or 61.11 percent) and the control group (10 people or 55.55 percent) were boys. The results of the comparison of demographic variables including the age and gender of the students, between the two experimental and control groups using the variance analysis and chi-square indicated that there is no significant difference between the two groups in these variables, and based on this, there is no need to separate the effects of these variables. The standard variable averages and deviations depend on research in the pre-test phases, then test and follow-up, are presented to separate the two test groups and certificates in Table 2.

Table 2: Mean and standard deviation of cognitive empathy in two experimental and control groups

Groups	Pre-test		Post-test		Follow-up	
	Mean	standard deviation	Mean	standard deviation	Mean	standard deviation
experimental and control groups	46.61	6.77	59.11	11.82	57.94	1.60
	46.22	5.18	44.61	5.44	45.77	6.12

The results of the descriptive table in Table 2 indicate that the level of cognitive empathy of underachievement gifted students who were present in the experimental group has increased compared to the control group, which will be further examined for significance using inferential statistics. Before presenting the results of the mixed analysis of variance, the assumptions of the parametric tests were evaluated. Based on the results of the

Shapiro-Wilk test, it was indicated that the assumption of normal distribution of sample data in the cognitive empathy variable (p=0.20; p=0.11) holds. Additionally, the assumption of homogeneity of variances was assessed by the Levene's test, the results of which were not significant, indicating that the assumption of variance homogeneity in the cognitive empathy variable (p=0.32; p=0.40) was met. Meanwhile, the results of the Mauchly's test indicated that the assumption of sphericity in the cognitive empathy variable (p=0.44; Mauchly's W=0.94) was met.

Table 3: Analysis of mixed variance analysis for examining within and between group effects on cognitive empathy variable.

	Sum of Squares	df	Means Square	F	Sig	Partial Eta Squared	Observed Power
Factor1	707.79	2	353.89	30.18	<.0.001	0.47	1
Groups	2196	1	2196	24.37	<.0.001	0.43	1
Factor*group	1033.02	2	516.51	44.05	<.0.001	0.56	1
error	787.18	68	11.72				

The results of the mixed variance analysis in **Table 3** show that based on the calculated F coefficients, the factor of time or evaluation stage had a significant impact on the cognitive empathy scores of underachievement gifted students, explaining 47% of the variance difference in the cognitive empathy scores of underachievement gifted students. In addition, group membership factor (executive function-based cognitive empowerment training package) or the type of treatment received has had a significant impact on the cognitive empathy of gifted underachieving students and has been able to explain 43% of the difference in cognitive empathy scores of gifted underachieving students. On the other hand, the results showed that the type of intervention received (cognitive empowerment training package based on the executive functions of the brain) had a significant impact on cognitive empathy in different stages of evaluation for underachievement gifted students, and was able to explain 56% of the difference in cognitive empathy scores for underachievement gifted students. A observed power of 100% indicates a high level of statistical accuracy and an adequate sample size for evaluating the impact of group interaction and time on the cognitive empathy of gifted underachieving students. Next, pairwise comparison of the mean cognitive empathy scores of the participants by evaluation stage using the Bonferroni post-hoc test is presented in **Table 4.**

Table 4: Pairwise comparison of the mean cognitive empathy scores of participants based on the evaluation stage.

Variable	Baseline stage (average)	Comparison Stage (Average)	Difference between averages	Deviation error	Statistical significance
Cognitive empathy	Pre-test	Post-test	-5.44	1.06	<.0.001
		Follow-up	-5.34	0.86	<.0.001
	Post-test	Pre-test	5.44	1.06	<.0.001
		Follow-up	0.10	0.28	0.63

The results of Table 4 showed that there is a significant difference between the average scores of pre-test, post-test, and follow-up in the cognitive empathy variable. This means that the cognitive empowerment training package based on the executive functions of the brain has significantly changed the post-test and follow-up scores of cognitive empathy compared to the pre-test stage. Another finding of this study showed that there was no significant difference between the average scores of post-test phase and cognitive empathy follow-up. This finding can be summarized as follows: the cognitive empathy scores of underachievement gifted students, who had experienced a significant change in the post-test phase, were able to maintain this change during the follow-up period.

5. Discussion

The present study was conducted with the aim of developing a cognitive empowerment training package based on the executive functions of the brain and investigating its effectiveness on the academic competence of underachieving gifted students. The results showed that the cognitive empowerment training package based on the executive functions of the brain is considered to have sufficient content validity by experts. Similarly, this educational package has a significant impact on the cognitive empathy of gifted underachieving students. In this way, this intervention was able to improve the cognitive empathy of gifted underachieving students. This finding is consistent with previous research results. For example, Farahzadi et al. (2023) showed that executive functions training has an effect on self-control and social competence in children with low self-control. Gandomi et al. (2021) also reported that a cognitive empowerment package based on executive functions is effective on the academic performance of late-learning students. Azadfar et al. (2021) also found that an educational package on executive functions improves the academic emotions of sixth-grade students. Additionally et al.(2024) reported that executive functions are effective on emotional understanding, social relationships, and academic performance of elementary school children. The report by Kupczyszyn et al. (2024) also indicated that teaching executive functions has an impact on the cognitive creativity of elementary school children. Ruffini et al. (2023) also found that teaching executive functions is effective in improving the academic and cognitive performance of students. The findings of Kontostavlou and Drigas (2022) also showed that teaching executive functions is effective in self-regulation and academic adaptability of gifted students. Finally, Viana-Saenz et al. (2020) and Sulik et al. (2020) have reported that executive functions have an impact on the verbal ability and academic progress of gifted students.

In the present study, it has been found that the effectiveness of a cognitive empowerment training package based on the executive functions of the brain on the cognitive empathy of gifted underachieving students. Initially, it should be noted that academic progress, knowledge, or skills are general or specific acquisitions in academic subjects that can be considered as the result of learning (Hu et al., 2024). Academic progress is influenced by various factors, and individual and environmental conditions can impact it (White et al., 2018). When gifted students make little progress due to various challenges, they may not be able to achieve the necessary academic success. In this regard, they may not feel academic competence, and this process can lead to other problems, such

as a decrease in empathy. Therefore, methods that solve psychological problems can also help to improve cognitive empathy. Since the educational package of cognitive empowerment has an effect on the function of active memory, sustained attention, and inhibition and helps to strengthen them (Ghandami et al., 2021), in this way, it can increase the student's ability to understand each other by improving these functions. By improving their communication performance, it will increase their perception of cognitive empathy. The results presented by Kontostavlou and Drigas (2022) show that executive functions play an important role in students' mutual understanding. In this way, the cognitive rehabilitation package based on executive functions can be used as an intervention method to increase self-control and behavioral organization in order to improve the social and communication performance of students, and this improvement in the cognitive performance of students can increase cognitive empathy in underachieving gifted students. In another explanation, it should be said that using interventions based on executive functions helps students to become aware of their strengths and weaknesses by being aware of the fundamental components of executive functions and by activating and empowering these functions. Integrated in order to achieve a specific goal (Viana-Saenz et al., 2020). Therefore, by improving cognitive abilities and skills in underachieving gifted students, the feeling of inability to establish social and environmental communication is reduced, and this process makes these students able to improve cognition and cognitive and behavioral processes. Gain self-mastery and, as a result, by improving their social performance, realize higher cognitive empathy. Also, using interventions based on executive functions helps underachieving gifted students to initiate active behavior, not passive, because the executive functions regulate and direct behaviors in a voluntary and purposeful manner; for this reason, in some definitions, it is also referred to as self-control with self-regulation (Kupczyszyn et al., 2024). Therefore, the promotion of executive functions provides the basis for organizing social behaviors in order to achieve the goal (constructive social interaction). In other words, executive functions are a type of superstructure that includes problem solving skills, planning, organization, and behavior control, which can improve students' social skills, and as a result, they gain higher cognitive empathy.

6. Limitation and Recommendation

The limited scope of the research to underachieving gifted students of the sixth grade of elementary school in Tehran, the lack of control of environmental, family, and social variables affecting the academic competence of underachieving gifted students, and the lack of using a random sampling method were the limitations of the present study. It is suggested to increase the power of generalization at the research level. This research in other educational levels, other cities and regions and societies with different cultures, other age groups, and other psychological disorders, such as students with emotional dysregulation disorder, learning disorder, and internalized and externalized behavior disorder, and control of the mentioned factors should be implemented. Considering the effectiveness of the cognitive empowerment training package based on the executive functions of the brain on the cognitive empathy of underachieving gifted students, it is suggested that at the practical level, the cognitive empowerment training package based on

the executive functions of the brain by preparing brochures and scientific booklets for counselors, the experts of counseling centers, and sixth-grade teachers of gifted schools should be presented to take practical steps using the content of this intervention in order to improve the cognitive empathy of underachieving gifted students. In addition, it is suggested that due to the weakness of underachievement in gifted students in cognitive empathy, the education counseling expert should identify these children and expose them to appropriate education

7. Conclusion

Based on results, cognitive empowerment training package based on the executive functions of the brain can be used as an efficient method to improve cognitive empathy of underachievement gifted students through employing techniques such as increasing attention, concentration and accurate, organizing activities, avoiding response, controlling impulsivity and planning training.

8. Author Contributions

Hanieh Yavari, submission and correction, comparison of approaches, conclusions. Kamran Sheivandi Cholicheh, collaboration in general framework planning, selection of approaches. Fariborz Dortaj, final review, data analysis. Saeid Rezaei, general framework planning, content editing and analyzing, Hassan Asadzadeh, Selection of research method and sampling method. All authors discussed the results, reviewed and approved the final version of the manuscript.

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10. Conflict of Interest

In this study, no conflict of interest was reported by the authors.

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