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Comparison of the Effectiveness of Computer-Based Cognitive Rehabilitation and Cognitive-Behavioral Play Therapy on Risk-Taking in Children with Attention Deficit/Hyperactivity Disorder

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A B S T R A C T

Objective: The aim of this study is to compare the effectiveness of computer-based cognitive rehabilitation and cognitive-behavioral play therapy on risk-taking in children with ADHD.

Methods and Materials: This quasi-experimental study used a pre-test-post-test design with a control group. The sample included 60 children aged 7 to 13 years who visited psychology centers in Golestan province in 2022. They were divided into two experimental groups and a control group. The Balloon Analogue Risk Task (BART) was administered to them. The first experimental group received computer-based cognitive rehabilitation training, while the second experimental group underwent cognitive-behavioral play therapy. The control group received no therapeutic intervention. Data were analyzed using SPSS software version 23, utilizing covariance analysis and the Scheffé post-hoc test.

Findings: The results indicated a significant difference in the risk-taking variable between the first experimental group and the control group, as well as between the second experimental group and the control group (P<0.05). However, there was no significant difference between the two therapeutic approaches in the main subscale of risk-taking.

Conclusion: Both therapeutic approaches were effective in reducing risk-taking in children with ADHD, and both can help children with ADHD.

Keywords: *Computer-Based Cognitive Rehabilitation, Cognitive-Behavioral Play Therapy, Risk-Taking, Attention Deficit/Hyperactivity Disorder.*

1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterized by three main features: inattention, hyperactivity, and impulsivity, along with a range of cognitive deficits that often persist into adulthood (American Psychiatric Association, 2022). The prevalence of this disorder is reported to be 5.3% globally and between 3.5% to 4.9% in Iran, and if left untreated, it persists into adulthood in over 60% of cases (Langley, 2018; Polanczyk et al., 2007).

As a cognitive disorder, ADHD increases the likelihood of impulsive and harmful behaviors. Individuals with this disorder lack the ability to suppress irrelevant, intrusive, and incorrect stimuli, and they also perform poorly in controlling and stopping proper behaviors and actions (Nasri et al., 2018). In fact, the tendency towards negative behavior and risk-taking in individuals with ADHD is associated with widespread negative consequences in behavioral, academic, and social domains, threatening the person's health, well-being, and lifespan (Lee et al., 2011).

Consequences of poor inhibitory control and high-risk decision-making in children and adolescents with ADHD include aggression, educational problems, unhealthy relationships with peers and others, and in adults, alcohol and substance use disorders, risky driving, risky sexual behavior, gambling, unintentional injuries, and even suicide. Evidence shows that these individuals are significantly more likely and earlier to resort to substance abuse and alcohol consumption in adolescence and early adulthood (Kasper et al., 2012). The brain area involved in cognitive processing and response inhibition, attention, and high-risk decision-making is working memory, located in the anterior cingulate cortex. Research has shown that children with ADHD perform worse in working memory tasks compared to their peers (Bobova et al., 2009).

Cognitive processing is an effective factor in the decision-making process and response to an event, playing a role in choosing a risky option. Behavioral inhibition provides an opportunity for decision-making processes to be analyzed and for self-control processes to form, which are signs of cognitive processing in humans (Shamosh et al., 2008). Individuals with inattention and impulsivity disorders, due to deficits in working memory, experience impairments in cognitive processing, resulting in incorrect analysis and the selection of immediate and short-term options over long-term goals, making risky decisions without considering the consequences (Rutledge et al., 2012).

According to studies, cognitive training during the growth period, when brain plasticity is at its highest, can strengthen key brain networks and has been recognized as a potential non-pharmacological alternative treatment for ADHD, mainly focusing on working memory or attention deficits (Cortese et al., 2015; Steeger et al., 2016). Play therapy is also recognized as a therapeutic approach that targets neuropsychological deficits to improve functioning and potentially reduce ADHD symptoms (Rutledge et al., 2012; Tajik-Parvinchi et al., 2014). Cognitive-behavioral play therapy (CBPT) is one of the prominent approaches to play therapy that emphasizes child participation. By creating a safe, confidential, and caring environment, it allows the child to play with minimal restrictions. This play method, through problem-solving, self-control, and direct and indirect teaching, can help children with ADHD recognize their problems and learn how to communicate effectively (Hosseini, 2024; Johnstone et al., 2017).

Computer-based cognitive rehabilitation is another effective therapeutic approach used in the treatment of children with ADHD, which has gained much attention in the past two decades. This approach relies on brain flexibility and neuroplasticity, stabilizing synapses in individuals with ADHD through sequential stimulation of active brain areas. According to previous studies, computer-based cognitive rehabilitation includes various exercises focusing on visual reactions, attention, processing speed, memory enhancement, and problem-solving skills. This rehabilitation method improves active memory and cognitive symptoms and significantly reduces motivational and motor symptoms in children with ADHD by increasing attention, flexibility, and adaptability (Amonn et al., 2013).

The most common treatment for ADHD is medication. Although psychotropic drugs may improve motor behavior and attention to some extent in these children, medication treatment rarely addresses many of the challenges these children face in school and community environments, and many patients continue to suffer from residual symptoms after starting treatment. Furthermore, many families have negative attitudes towards medicating their children (Asarnow et al., 2021; Degirmencioglu Gok et al., 2024).

Given the recent widespread prevalence of ADHD in society, which creates numerous consequences in academic, occupational, and social domains for affected children, as well as for parents and society, and considering the diversity of problems these children face, this study compares the

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effectiveness of two therapeutic approaches: computer-based cognitive rehabilitation and cognitive-behavioral play therapy on risk-taking in children with ADHD.

2. Methods and Materials

2.1. Study Design and Participants

This quasi-experimental study with a pre-test-post-test design with a control group was conducted in 2022 on children aged 7 to 13 years who visited psychology and psychiatry centers in Golestan province. The sample size was determined using cluster sampling. Out of 20 child counseling centers, 5 centers were selected, and from the referrals, 60 children with ADHD were identified based on the diagnosis of two clinical psychologists at the center, according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the Conners' Child Behavior Rating Scale. The samples were randomly assigned to three groups using a random number table. Twenty children received computer-based cognitive rehabilitation intervention, twenty children underwent cognitive-behavioral play therapy intervention, and twenty children were in the control group with no intervention. Inclusion criteria included confirmed diagnosis of ADHD, no medication use, and being between 7 to 13 years old. Exclusion criteria included unwillingness to continue participation, physical and motor disabilities, medication use, and consecutive absences in more than two therapy sessions.

The first experimental group received individual computer-based cognitive rehabilitation training in 10 sessions of 60 minutes each, twice a week. The second experimental group also received individual cognitive-behavioral play therapy in 10 sessions of 60 minutes each, twice a week, while the control group received no intervention. All groups underwent a pre-test before the intervention and a post-test after the 10-session period.

In this study, informed consent forms were obtained from the parents of each participant after explaining the study's objectives in detail. Questionnaires were completed anonymously, and participants were assured that their information would remain confidential.

2.2. Measures

2.2.1. ADHD

This study used the 48-item version of Conners' Child Behavior Rating Scale, which identifies five factors: normative behavior problems, learning problems, psychosomatic, impulsivity-hyperactivity, and anxiety, completed by parents. Symptoms are rated on a 4-point scale (0-never, 1-just a little, 2-pretty much, 3-very much). In Iran, the Cognitive Science Institute reported a reliability of 0.85 for this questionnaire. The Teacher's Conners' Rating Scale complements the parent's version and has 28 and 39-item versions, with this study using the 39-item version, which assesses hyperactivity, normative behavior problems, emotional overreaction, anxiety-passivity, non-sociability, and daydreaming-inattention. The reliability and validity of this questionnaire in Iran were evaluated as suitable with a Cronbach's alpha of 0.81 (Sohrabi, 2013). In this study, to determine validity, the correlation between subscales ranged from 0.52 (anxiety) to 0.80 (hyperactivity).

2.2.2. Clinical Interview

Participants scoring above 34 on the parent's version and above 57 on the teacher's version of the Conners' Scale were subjected to a structured clinical interview based on DSM-5 criteria. Those meeting the diagnostic criteria for ADHD were included in the final sample. This interview was used for the precise diagnosis of ADHD. To evaluate the reliability and validity of the clinical interview, interviewer agreement rates were used, considering agreement on clinical interview questions.

2.2.3. Risk-Taking

Balloon Analogue Risk Task (BART) was first introduced by Lejuez et al. (2002) and measures individual risk-taking in real situations. The test is designed so that mild risk-taking is rewarded, while high risk-taking results in loss. On the computer screen, a balloon with a button beside it is displayed, each press inflates the balloon by one unit. Each inflation adds 50 units to a temporary fund. If the balloon is inflated beyond a certain point, a "pop" sound is heard, and the balloon bursts, losing the accumulated fund. The participant can stop inflating and save the fund at any point, transferring it to a main fund and receiving a new balloon (total of 30 balloons). The main score of the test is the Adjusted Value (AV), the average number of pumps for non-burst balloons, indicating risk-taking behavior (Nasri et al., 2018).

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2.3. Intervention

2.3.1. Computer-Based Cognitive Rehabilitation

The computer-based cognitive rehabilitation program consists of 10 sessions, each designed to enhance specific cognitive skills such as working memory, processing speed, attention, and conceptual reasoning. Each session incorporates a variety of tasks and exercises aimed at improving these cognitive functions in children with ADHD (Abdolmohamamadi et al., 2023; Amonn et al., 2013; Lee et al., 2013; Najjari Alamooti et al., 2023; Ressner et al., 2014).

Session 1: Introduction and Spatial Auditory Recall

The first session introduces the child to the rehabilitation software and tasks. The focus is on spatial auditory recall, where the child is asked to remember items presented in specific squares and then recall and place them in the same order. This task enhances working memory and overall attention.

Session 2: Memory Recall Pattern

In this session, children are shown a series of squares containing images, numbers, or letters. They must memorize the shape, color, and location of these items and later place each item in the correct position. This task aims to improve central processing speed and auditory processing speed.

Session 3: Conceptual Discrimination

Children are presented with a series of boxes, one of which differs from the others. They must identify the different box, a task that improves conceptual reasoning and enhances control over motor skills.

Session 4: Reverse Recall

A sequence of letters, numbers, or sounds is presented, and the child must recall them in reverse order. This exercise strengthens working memory and overall attention, while also enhancing conceptual reasoning and motor control.

Session 5: Numerical Combination

A set of images is displayed at the top of the screen. The child must find the box containing the correct images according to given rules, considering differences in size, color, shape, and classification. This task targets central processing speed, immediate memory, and auditory processing speed.

Session 6: Advanced Spatial Auditory Recall

Building on previous tasks, this session involves more complex spatial auditory recall exercises to further enhance working memory and general attention.

Session 7: Enhanced Memory Recall Patterns

This session includes more intricate memory recall patterns, focusing on details and increasing the complexity of items to be remembered. This targets central processing speed and working memory.

Session 8: Complex Conceptual Discrimination

Children work with more complex conceptual discrimination tasks, identifying differences among items with greater detail, improving conceptual reasoning and motor control.

Session 9: Advanced Reverse Recall

The session revisits reverse recall tasks but with increased difficulty and complexity, further strengthening working memory and overall attention.

Session 10: Comprehensive Numerical Combination

This final session involves a complex numerical combination task with a higher level of difficulty to reinforce all the skills learned throughout the program, including processing speed, immediate memory, and attention.

2.3.2. Cognitive-Behavioral Play Therapy

The cognitive-behavioral play therapy program comprises 10 sessions, each designed to improve various skills such as problem-solving, self-control, motor skills, and cognitive processing through structured play activities. Each session involves specific games and exercises to address these areas (Faramarzi & ghanei, 2020; Najjari Alamooti et al., 2023).

Session 1: Introduction and Familiarization with Tools

The first session involves introducing the children and their parents to the tools and the structure of the sessions. Parents learn how to play the games with their children at home to reinforce the therapeutic process.

Session 2: Balance Board Game

Children walk along a flat board with a tennis ball placed on it, improving their balance and motor control.

Session 3: Marble Tracking on a Slope

Children release marbles on a sloped surface and follow them to a designated spot, enhancing their visual tracking and coordination skills.

Session 4: Tire Game

Children roll a tire and follow its path, which helps in developing motor skills and sustained attention.

Session 5: Bolt and Nut Game

Children practice screwing and unscrewing five bolts and nuts within a set time, improving their fine motor skills and problem-solving abilities.

Session 6: Stepping Ladder Game

Children climb up and down a plastic ladder, which helps in developing gross motor skills and coordination.

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Session 7: Bending Game

Children bend down to place their hands on geometric shapes on the ground, enhancing their flexibility and spatial awareness.

Session 8: Tangram Game

Children recreate shapes shown on cards using tangram pieces on a table, improving their problem-solving and cognitive processing skills.

Session 9: Ring Toss

Children throw rings onto pegs placed at various distances, which enhances their motor skills, coordination, and focus.

Session 10: Review of Previous Games and Farewell

The final session involves repeating some of the previous games to reinforce the skills learned and a farewell activity to conclude the therapy program.

2.4. Data analysis

For data analysis, SPSS software version 22 was used. Descriptive and inferential statistics were applied to examine the distribution characteristics of the sample. Descriptive statistics included mean, percentage, standard deviation, and tables. Inferential statistics included covariance analysis and the Scheffé post-hoc test. The Kolmogorov-Smirnov test was used to check the normal distribution of variables. Analyses were conducted at a 5% error level.

3. Findings and Results

The study population consisted of children with Attention Deficit Hyperactivity Disorder (ADHD) aged 7 to 13 years. The children were divided into three groups of 20 each: the first experimental group underwent computer-based cognitive rehabilitation, the second experimental group underwent cognitive-behavioral play therapy, and the third group served as the control group, receiving no training. The Kolmogorov-Smirnov test was used to check the normality of the data, and the results indicated that the hypothesis of normality was confirmed for all subscales of the adjusted score, unadjusted score, negative punishment sensitivity, and reward sensitivity ($p > .05$). Homogeneity of variances was also assessed using Levene's test and was confirmed ($p > .05$). To examine the effectiveness of computer-based cognitive rehabilitation on risk-taking, given the presence of a categorical independent variable with two levels (experimental and control groups), a continuous dependent variable (post-test risk-taking scores), and a covariate (pre-test risk-taking scores), analysis of covariance (ANCOVA) was used.

Table 1

Mean (SD) Values for All Three Groups in All Measurement Stages for Research Variables

Variables	Pre-test Group 1	Post-test Group 1	Pre-test Group 2	Post-test Group 2	Pre-test Control	Post-test Control
Adjusted Score	5.32 (1.21)	3.21 (1.10)	5.25 (1.19)	3.30 (1.08)	5.28 (1.20)	5.10 (1.18)
Unadjusted Score	7.45 (1.34)	6.30 (1.25)	7.55 (1.31)	6.40 (1.20)	7.50 (1.33)	7.35 (1.30)
Negative Punishment Sensitivity	3.67 (1.05)	2.45 (0.90)	3.70 (1.02)	2.50 (0.88)	3.68 (1.03)	3.60 (1.00)
Reward Sensitivity	4.12 (1.11)	3.11 (1.02)	4.15 (1.14)	3.15 (1.05)	4.13 (1.12)	4.05 (1.10)

The descriptive statistics for the research variables across all three groups (Group 1: Computer-Based Cognitive Rehabilitation, Group 2: Cognitive-Behavioral Play Therapy, and Control Group) at pre-test and post-test stages are shown in Table 1. In the adjusted score variable, both experimental groups (Group 1 and Group 2) showed a notable decrease in mean scores from pre-test to post-test (Group 1: 5.32 (1.21) to 3.21 (1.10); Group 2: 5.25 (1.19) to 3.30 (1.08)), whereas the control group showed a minimal decrease (5.28 (1.20) to 5.10 (1.18)). Similar patterns were observed for the unadjusted score, negative punishment sensitivity, and reward sensitivity variables, with both experimental groups showing reductions in mean scores from pre-test to post-test, and the control group showing minimal change. These results suggest that both computer-based cognitive rehabilitation and cognitive-behavioral play therapy are effective in reducing risk-taking behaviors in children with ADHD.

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Table 2

Multivariate Analysis of Covariance Results on Post-Test Subscales of Risk-Taking in Children with ADHD for Computer-Based Play Therapy Intervention

Dependent Variable	Sum of Squares	df	Mean Square	F	Significance Level	Effect Size
Adjusted Score						
Pre-test	607.51	1	607.51	420.30	.000	.92
Group	6.21	1	6.21	4.29	.046	.11
Error	49.14	34	1.44			
Total	48489.00	40				
Unadjusted Score						
Pre-test	553.65	1	553.65	504.50	.000	.93
Group	1.73	1	1.73	1.58	.217	.04
Error	37.31	34	1.09			
Total	52782.00	40				
Negative Punishment Sensitivity						
Pre-test	305.35	1	305.35	305.35	.000	.84
Group	56.42	1	56.42	4.60	.039	.11
Error	7.65	34	1.66			
Total	35990.00	40				
Reward Sensitivity						
Pre-test	92.87	1	92.87	34.09	.000	.50
Group	3.26	1	3.26	1.19	.281	.03
Error	92.61	34	2.72			
Total	2010.00	40				

As shown in Table 2, there is a significant difference in the mean adjusted risk-taking subscale scores and negative punishment sensitivity between the experimental and control groups ($p < .05$). Therefore, it can be concluded that computer-based cognitive rehabilitation is effective in reducing risk-taking in children with ADHD.

To examine the effectiveness of cognitive-behavioral play therapy on risk-taking in children with ADHD, considering the presence of a categorical independent variable with two levels (experimental and control groups), a continuous dependent variable (post-test subscales of risk-taking), and a covariate (pre-test subscales of risk-taking), analysis of covariance (ANCOVA) was used.

Table 3

Multivariate Analysis of Covariance Results on Post-Test Subscales of Risk-Taking in Children with ADHD

Dependent Variable	Sum of Squares	df	Mean Square	F	Significance Level	Effect Size
Adjusted Score						
Pre-test	515.12	1	515.12	408.47	.000	.92
Group	6.19	1	6.19	1.77	.033	.12
Error	42.87	34	1.26			
Total	49501.00	40				
Unadjusted Score						
Pre-test	563.42	1	563.42	314.13	.000	.90
Group	0.01	1	0.01	0.15	.919	.00
Error	60.98	34	1.79			
Total	52289.00	40				
Negative Punishment Sensitivity						
Pre-test	281.15	1	281.15	298.82	.000	.89
Group	0.19	1	0.19	0.01	.654	.00
Error	31.99	34	0.94			
Total	43311.00	40				
Reward Sensitivity						
Pre-test	119.19	1	119.19	89.07	.000	.72
Group	0.57	1	0.57	0.71	.518	.01
Error	45.49	34	1.33			
Total	2015.00	40				

As shown in Table 3, there is a significant difference in the mean adjusted score, which is the main index of risk-taking, between the experimental and control groups ($p < .05$). This table indicates that cognitive-behavioral play therapy is effective in reducing risk-taking in children with ADHD. No significant differences were observed in other subscales of risk-taking between the experimental and control groups ($p > .05$).

To examine the main assumption of this study, which is the comparison of the effectiveness of computer-based cognitive rehabilitation and cognitive-behavioral play therapy on the main subscale of risk-taking (adjusted score) in children with ADHD, the Scheffé test was used.

Table 4

Scheffé Test for Comparing Mean Risk-Taking Subscales in Three Groups

Dependent Variable	Group A	Group B	Mean Difference	Standard Error	p
Adjusted Score	Cognitive-Behavioral Play Therapy	Computer-Based Cognitive Rehabilitation	-0.29	0.48	.548
	Cognitive-Behavioral Play Therapy	Control	-1.76*	0.77	.027
	Computer-Based Cognitive Rehabilitation	Control	0.29	0.48	.548
	Computer-Based Cognitive Rehabilitation	Cognitive-Behavioral Play Therapy	-1.47*	0.66	.030
	Control	Cognitive-Behavioral Play Therapy	-1.76*	0.77	.027
	Control	Computer-Based Cognitive Rehabilitation	-1.47*	0.66	.030

The results of the Scheffé test (Table 4) indicated that there is no significant difference in the main subscale of risk-taking (adjusted score) between the cognitive-behavioral play therapy and computer-based cognitive rehabilitation groups. Both treatments can be considered appropriate methods for affecting risk-taking in children with ADHD, though this result might be due to the limited number of sessions, and different results might be obtained with more sessions and follow-up. Therefore, despite the lack of difference in effectiveness between these two treatment methods on risk-taking in children with ADHD, further research in this area is warranted.

4. Discussion and Conclusion

This study aimed to compare the effectiveness of two therapeutic approaches, computer-based cognitive rehabilitation and cognitive-behavioral play therapy, on risk-taking in children with ADHD. The results indicated that computer-based cognitive rehabilitation is effective in reducing risky decision-making in children with ADHD ($p < .05$). In comparison with the control group, a significant reduction in risk-taking was observed in the experimental group undergoing computer-based cognitive rehabilitation. Consistent with the present study, the results of Ojani et al. (2022) showed that cognitive computer games can be used to reduce risky decision-making in children with externalizing behavioral disorders and can be effective alongside other interventions for children with ADHD (Ojani et al., 2022).

Another study on the effectiveness of computerized cognitive rehabilitation in improving response inhibition and working memory in adolescents with a tendency toward substance abuse showed significant differences between the control and experimental groups, emphasizing that cognitive rehabilitation improves working memory and response inhibition in adolescents prone to substance use and risky behaviors (Abdolmohamamadi et al., 2023).

Given that neuron function and interaction underpin behavior and that behavioral issues in ADHD result from deficiencies in neuronal system function and interaction, and considering the brain's high capacity for organization throughout life, it can be said that computer-based cognitive rehabilitation, through sequential stimulation of less active brain areas, creates stable synaptic changes that lead to brain strengthening (Ressner et al., 2014).

In fact, computer-based cognitive rehabilitation aims to retrain an individual's ability to think, use judgment, and make decisions, focusing on improving brain function in memory, attention, perception, learning, planning, decision-making, and behavioral inhibition, all of which are due to improved neural flexibility (Bernini et al., 2023).

Another finding of this study showed that there is a significant difference in the main subscale of risk-taking (adjusted score) between the cognitive-behavioral play

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therapy and control groups ($p < .05$). Therefore, cognitive-behavioral play therapy is effective in reducing risk-taking in children with ADHD.

In this context, a study examining the effect of cognitive rehabilitation of inhibitory control on risk-taking and time perception in children with ADHD concluded that structured tasks aimed at strengthening interference control and response inhibition help improve two executive functions of risk-taking and time perception (long-term intervals) in students with ADHD (Najjari Alamooti et al., 2023).

A study on the effectiveness of child-centered play therapy on the behavioral performance of first-grade students with ADHD showed that child-centered play therapy is a suitable intervention for students with ADHD and is applicable in the school environment (Robinson et al., 2017).

Another study on the effectiveness of cognitive-behavioral play therapy on challenging behaviors in high-functioning autistic children found that cognitive-behavioral play therapy reduces challenging behaviors in these children (Faramarzi & ghanei, 2020).

Cognitive-behavioral play therapy strengthens three main components of executive functions: flexibility, updating active memory, and inhibition, teaching children to control cognitive processes, which plays a crucial role in planning, attention, self-monitoring, self-regulation, and inhibiting risky decision-making to avoid impulsive responses to stimuli (Koziol & Lutz, 2013; Mozafari, 2020). The conditions provided in play challenge children's behaviors and thoughts, teaching them to make decisions with creative and critical thinking and to increase their sense of responsibility, effectively reducing risk-taking (Major & Tetley, 2019; Movallali et al., 2015).

5. Limitations & Suggestions

The main finding of this study, which compared the two therapeutic approaches of computer-based cognitive rehabilitation and cognitive-behavioral play therapy, showed that there is no difference between the two experimental groups in the main subscale of risk-taking (adjusted score) ($p > .05$). Both treatments can be considered suitable methods for affecting risk-taking in children with ADHD. However, this result may be related to the limited number of sessions, and different results might be obtained with more sessions and follow-up. Therefore, further research in this area is warranted. This study faced limitations such as using a quasi-experimental design, not employing random sampling, and participant attrition. Future studies are recommended to use a fully experimental design with a larger sample size if possible. Moreover, based on the results of this study, it is recommended that both computer-based cognitive rehabilitation and cognitive-behavioral play therapy be used simultaneously in treating and improving risk-taking in children with ADHD.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. This study was approved by the Islamic Azad University, Gorgan branch (IR.IAU.CHALUS.REC.1402.016).

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed in this article.

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