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Effectiveness of Cognitive-Behavioral Play Therapy on Resilience, Emotion Regulation, and Aggression in Students with Attention-Deficit/Hyperactivity Disorder

Hanieh. Rameshgar [1], Mohamad Omid. Mohamadi [2*], Sedigheh. Ebrahimi Alavikolaei [3]

1 Master of Science in Clinical Psychology, Ayatollah Kohestani Branch, Islamic Azad University, Behshahr, Iran
2 Assistant Professor, Department of English Language Teaching, Sar.C., Islamic Azad University, Sari, Iran
3 Assistant Professor, Department of Psychology, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran
*Correspondence: Mohammadomid.mohammadi@iau.ac.ir

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ABSTRACT

This study aimed to determine the effectiveness of cognitive-behavioral play therapy on resilience, emotion regulation, and aggression among students with attention-deficit/hyperactivity disorder. The present study employed a quasi-experimental pretest-posttest design with a control group. The statistical population consisted of 79 students aged 9 to 12 years with attention-deficit/hyperactivity disorder who attended educational and rehabilitation centers in Sari, Iran, during 2025. Thirty eligible students were selected through purposive sampling and randomly assigned to an experimental group and a control group, with 15 participants in each group. The experimental group participated in eight sessions of cognitive-behavioral play therapy, while the control group received no intervention during the study period. Data were collected using the Connor-Davidson Resilience Scale, the Gross and John Emotion Regulation Questionnaire, and the Buss-Perry Aggression Questionnaire. Data were analyzed using multivariate analysis of covariance in SPSS version 22. The multivariate analysis indicated a statistically significant overall difference between the experimental and control groups across the dependent variables, Wilks' $\lambda = 0.53$, $F(3, 27) = 13.90$, $p < 0.001$. After controlling for pretest scores, significant between-group differences were observed in resilience, $F = 259.75$, $p < 0.001$, partial $\eta^2 = 0.60$; emotion regulation, $F = 310.19$, $p < 0.001$, partial $\eta^2 = 0.62$; and aggression, $F = 276.20$, $p < 0.001$, partial $\eta^2 = 0.58$. The experimental group showed significantly improved resilience and emotion regulation and significantly reduced aggression compared with the control group. Cognitive-behavioral play therapy appears to be an effective intervention for strengthening resilience and emotion regulation while reducing aggression among students with attention-deficit/hyperactivity disorder and may be useful in school-based and clinical psychological services.

Keywords: Attention-Deficit/Hyperactivity Disorder; Cognitive-Behavioral Play Therapy; Resilience; Emotion Regulation; Aggression; Students

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Introduction

Attention-deficit/hyperactivity disorder (ADHD) is one of the most prevalent neurodevelopmental disorders and is characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with academic, social, behavioral, and emotional functioning. Although ADHD is commonly identified during childhood, its consequences may persist across adolescence and into adulthood, indicating that the disorder cannot be conceptualized merely as a transient childhood behavioral problem.

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Contemporary evidence has shown that ADHD continues to be present in a substantial proportion of adults, highlighting its developmental continuity and the need for early interventions capable of altering maladaptive trajectories before difficulties become consolidated (1). Population-based evidence concerning diagnosis and treatment patterns also reflects the enduring clinical burden of ADHD and the continuing need for accessible and effective psychological interventions across developmental stages (2). ADHD has additionally been examined in specific developmental and life contexts, including pregnancy and the postpartum period, which further demonstrates the complexity, persistence, and broad functional implications of the disorder (3). At the behavioral level, children with ADHD frequently exhibit difficulties in inhibitory control, sustained attention, impulse regulation, interpersonal behavior, and adaptation to structured environments such as schools and classrooms. These impairments may manifest as academic underachievement, conflict with peers and adults, emotional instability, noncompliance, disruptive behavior, and heightened susceptibility to psychosocial stress. Research even extending ADHD-like behavioral patterns to comparative models has emphasized the relevance of impulsivity, attentional dysfunction, and excessive activity as central behavioral dimensions worthy of further mechanistic investigation (4). Accordingly, the clinical significance of ADHD lies not only in its core attentional and behavioral symptoms but also in the secondary emotional and interpersonal difficulties that substantially affect children's everyday functioning.

Among these associated difficulties, problems in emotion regulation are especially important. Emotion regulation refers to the processes through which individuals monitor, evaluate, modify, and express emotional responses in accordance with environmental demands and personal goals. Children with ADHD may experience difficulty identifying emotions, delaying reactions, tolerating frustration, cognitively reappraising challenging situations, and inhibiting impulsive emotional responses. Such deficits can intensify the behavioral manifestations of the disorder and contribute to conflict with peers, family members, and teachers. Recent evidence has demonstrated that emotional regulation problems are salient in ADHD and may overlap with, but remain distinguishable from, difficulties observed in anxiety, depression, and cognitive disengagement syndrome (5). This suggests that emotional dysregulation should not be treated merely as a peripheral characteristic of ADHD but as an important clinical dimension with implications for adjustment and intervention. Research on children with ADHD has also shown that programs targeting cognitive and executive processes may influence adaptive and maladaptive emotion-regulation strategies, thereby supporting the modifiability of these processes (6). Similarly, cognitive rehabilitation and emotion-regulation interventions have been investigated in students with ADHD, with findings indicating that direct training in cognitive and emotional processes can improve dimensions of executive functioning and emotional management (7). Because poor emotion regulation can intensify impulsive action, frustration, oppositional behavior, and social conflict, interventions that combine cognitive restructuring with behavioral practice may be especially relevant for children whose emotional reactions are rapid and poorly controlled.

A second important psychological construct in children with ADHD is resilience. Resilience generally refers to the capacity to maintain or regain adaptive functioning despite stress, adversity, psychological strain, or developmental risk. For school-age children, resilience is reflected in persistence in the face of academic difficulty, tolerance of frustration, flexible adaptation to interpersonal challenges, use of

constructive coping strategies, and the ability to recover from failure or negative emotional experiences. These capacities are particularly relevant to children with ADHD because they are frequently exposed to repeated academic criticism, disciplinary experiences, peer rejection, conflict with caregivers, and a sense of underperformance relative to expectations. Resilience may therefore function as a psychological resource that buffers the adverse effects of ADHD-related difficulties and supports better adjustment. A systematic review focusing on resilience, loneliness, and impulsivity among adolescents has emphasized the protective role of resilience in reducing vulnerability to maladaptive psychological and behavioral outcomes (8). The association between ADHD-related symptoms and broader well-being also appears to be influenced by resilience. For example, research examining ADHD symptoms and life satisfaction found that resilience may operate as an important mediating psychological mechanism between symptom burden and subjective well-being (9). Similarly, research among individuals with ADHD-related symptoms has suggested that psychological resilience may attenuate the association between attentional or impulsive difficulties and maladaptive behavioral outcomes (10). Intervention studies further indicate that resilience is responsive to behavioral and psychological change; for instance, physical exercise interventions have been associated with improvements in resilience and mental well-being among children with ADHD (11). Resilience is also relevant within the broader family context of ADHD, as caregivers themselves experience considerable psychological strain and must rely on coping resources when responding to children's behavioral and emotional difficulties (12). These findings collectively support the importance of resilience as a meaningful therapeutic target in interventions for children with ADHD.

Aggression constitutes another major behavioral concern in children with ADHD. Aggressive behavior may be physical, verbal, reactive, or accompanied by anger and hostility, and it often emerges in contexts involving frustration, perceived provocation, impaired inhibitory control, or emotional dysregulation. Children with ADHD may show elevated aggressive behavior because impulsivity reduces the time available for reflective processing, while poor emotion regulation limits their ability to modulate anger and select socially appropriate responses. Studies comparing children with ADHD with other clinical and population-based groups have shown that physical aggression toward others and self is meaningfully associated with behavioral and emotional characteristics in ADHD (13). Aggression is clinically significant because it may further compromise peer relationships, school adaptation, family functioning, and educational outcomes. Behavioral difficulties may also interact with academic stress and concerns during adolescence, thereby increasing emotional burden and maladaptive coping responses (14). Furthermore, family functioning and perceived family support are important for children's and adolescents' adaptation, suggesting that aggressive and dysregulated behavior should be understood in the context of both individual vulnerabilities and relational environments (15). From an intervention perspective, reducing aggression in children with ADHD requires more than behavioral suppression; it requires helping children recognize internal states, identify triggers, reinterpret situations, tolerate frustration, practice alternative behaviors, and experience successful interpersonal interactions.

Cognitive-behavioral approaches are particularly relevant to these difficulties because they directly address the relationship among thoughts, emotions, and behaviors. Cognitive-behavioral therapy is based on the premise that maladaptive interpretations and learned behavioral patterns can be modified through structured cognitive and behavioral techniques, including self-monitoring, cognitive restructuring, problem

solving, behavioral rehearsal, reinforcement, and skills practice. In children with ADHD, cognitive-behavioral methods may support greater awareness of emotional and behavioral triggers, improved impulse control, more adaptive appraisal of stressful situations, and better regulation of aggressive responses. The usefulness of cognitive-behavioral approaches for aggression in children with ADHD and emotion dysregulation has been sufficiently promising to justify randomized controlled investigations specifically designed to examine reductions in aggressive behavior (16). Cognitive and behavioral interventions have also been used successfully to improve emotional regulation and resilience-related outcomes in populations affected by ADHD-related family stress. For example, cognitive-behavioral therapy has demonstrated beneficial effects on emotion regulation and resilience among mothers of children with ADHD, reinforcing the broader applicability of cognitive-behavioral principles to emotional adaptation in ADHD-related contexts (17). Nevertheless, traditional verbally mediated cognitive-behavioral approaches may be difficult for younger children if they require sustained attention, abstract reasoning, or extended verbal reflection. Therefore, developmentally appropriate formats are needed to translate cognitive-behavioral principles into activities that are engaging, concrete, experiential, and compatible with children's cognitive and attentional capacities.

Play therapy provides such a developmentally appropriate therapeutic medium. Play constitutes a natural mode of expression, communication, experimentation, and learning during childhood. Through symbolic play, role-playing, storytelling, games, art-based activities, and guided interaction, children can express emotions and conflicts that may be difficult to communicate directly. Play also provides opportunities to rehearse alternative responses, receive immediate feedback, tolerate frustration, cooperate with others, and practice self-control in a relatively safe therapeutic environment. Play therapy has been specifically recommended for children with ADHD because its active and experiential nature is more compatible with children's developmental needs than prolonged verbal discussion and allows therapeutic targets to be embedded within structured but engaging activities (18). More recent research has also demonstrated that play-based interventions can affect broader regulatory capacities. For example, play therapy has been associated with improvements in sensory processing and distress tolerance among adolescents with mild intellectual disabilities, suggesting that play-based methods may promote emotional and behavioral adaptation even in populations with developmental vulnerabilities (19). Attachment-based play therapy has similarly been associated with improvements in emotion regulation and social adjustment, further indicating that play can serve as an effective vehicle for strengthening emotional and interpersonal competencies (20). These findings provide a basis for considering play therapy not solely as a method for symptom reduction but also as a structured context for developing resilience, emotion-regulation skills, social competence, and adaptive behavior.

Cognitive-behavioral play therapy integrates the developmental advantages of play with the theoretically structured techniques of cognitive-behavioral therapy. In this approach, therapeutic games, role-playing, storytelling, modeling, symbolic activities, and behavioral rehearsal are used to help children recognize the connection between situations, thoughts, emotions, and behavioral responses. Instead of relying exclusively on verbal explanation, cognitive concepts are conveyed through concrete activities that allow children to experience and practice alternative patterns of response. This may be particularly useful for children with ADHD, who often benefit from active, brief, structured, and reinforced tasks. Previous studies have reported

encouraging effects of cognitive-behavioral play therapy on behavioral problems in school-age children. In aggressive elementary-school students, cognitive-behavioral play therapy has been compared with Gestalt play therapy and shown to influence vandalistic behaviors, impulsivity, and cognitive flexibility, suggesting that play-based cognitive-behavioral interventions can modify both behavioral and executive-function-related outcomes (21). Research directly involving children with ADHD has also indicated that cognitive-behavioral game therapy may reduce attention deficits and aggression, providing particularly relevant evidence for the use of such interventions in this clinical population (22). Related studies employing play therapy grounded in other theoretical frameworks have also yielded favorable outcomes. Adlerian play therapy, for example, has been associated with reductions in aggression and improvements in emotion regulation among children with oppositional defiant disorder (23). Similarly, choice theory-based play therapy has been found to reduce aggression and improve executive functions in children experiencing depression-related difficulties within single-parent families (24). Together, these findings indicate that play-based interventions can target a range of behavioral, emotional, and cognitive difficulties and that integrating cognitive-behavioral principles into play may be especially suitable for children with self-regulation problems.

The potential mechanisms through which cognitive-behavioral play therapy may affect resilience, emotion regulation, and aggression are theoretically interconnected. Structured play provides opportunities for children to encounter manageable challenges and experience mastery, which may strengthen perceived competence and resilience. Storytelling and symbolic activities can facilitate emotional identification and expression, while cognitive discussion can help children reinterpret situations and develop more adaptive appraisals. Role-playing allows children to experiment with assertive, cooperative, and nonaggressive behaviors and observe the interpersonal consequences of different responses. Behavioral rehearsal and reinforcement may strengthen self-control and increase the likelihood that newly learned responses will generalize beyond the therapeutic setting. These processes are consistent with evidence suggesting that interventions targeting cognitive flexibility, working memory, emotion regulation, and coping can produce improvements in children with ADHD (6, 7). Moreover, resilience may improve when children develop more effective coping strategies and greater confidence in their ability to manage difficult emotions and social situations, while aggression may decline when impulsive responses are replaced by more reflective and regulated behavior. Research on children's adjustment further indicates that adaptive functioning is shaped by the interaction of individual emotional capacities, behavioral regulation, social context, and perceived support (15). Consequently, an intervention that simultaneously engages cognitive, emotional, behavioral, and interpersonal processes may offer particular advantages for children with ADHD.

Despite the growing literature on ADHD interventions, several gaps remain. Many studies focus primarily on reducing core symptoms such as inattention and hyperactivity, whereas secondary but clinically important variables such as resilience, emotional regulation, and aggression receive comparatively less integrated attention. Other studies examine these constructs separately or employ interventions that target only one domain. Research on resilience in ADHD has often focused on correlational relationships or nonpsychotherapeutic interventions, while emotion-regulation studies have frequently emphasized executive-function training rather than developmentally tailored psychotherapy (10, 11). Furthermore, although aggression is a prominent concern in children with ADHD, interventions that simultaneously

address aggression and the protective capacities that may underlie behavioral improvement remain limited. Existing studies on play therapy have demonstrated promising effects on emotion regulation, aggression, impulsivity, distress tolerance, executive functions, and social adjustment across various child populations (19, 20, 23, 24), yet evidence specifically examining cognitive-behavioral play therapy across the combined outcomes of resilience, emotion regulation, and aggression in students with ADHD remains insufficient. This gap is especially important in school-age children, for whom these three domains are closely related to academic participation, peer relationships, classroom behavior, and long-term psychological adjustment.

Accordingly, the present study aimed to determine the effectiveness of cognitive-behavioral play therapy on resilience, emotion regulation, and aggression among students with attention-deficit/hyperactivity disorder.

Methods and Materials

Study Design and Participants

The present study employed a quasi-experimental pretest-posttest design with an experimental group and a control group. The statistical population consisted of 79 students aged 9 to 12 years diagnosed with attention-deficit/hyperactivity disorder (ADHD) who attended educational and rehabilitation centers in Sari, Iran, during the second quarter of 2025. From this population, 30 students with ADHD were selected through purposive sampling based on the predetermined inclusion and exclusion criteria. After enrollment and completion of the pretest assessments, the participants were randomly assigned to either the experimental group or the control group, with 15 students in each group. The inclusion criteria were having a confirmed diagnosis of attention-deficit/hyperactivity disorder based on the clinical assessment of a specialist at the relevant educational or rehabilitation center, being between 9 and 12 years of age, having no history of severe psychiatric disorders based on clinical records and self- or parent-reported information, voluntary participation and willingness to cooperate with the researcher, provision of written informed consent by the parents, adequate cognitive and communicative ability to participate in the intervention and provide the required information, and residence in Sari. The exclusion criteria included absence from more than two intervention sessions, insufficient or inactive participation in the sessions, failure to complete the assigned therapeutic activities or homework, and unwillingness of the child or parents to continue participation in the study. Ethical principles were observed throughout the research process. Written informed consent was obtained from the parents or legal guardians before participation, and the participants and their parents were informed about the purpose of the study, intervention procedures, voluntary nature of participation, and their right to withdraw at any stage without adverse consequences. Personal and private information was treated confidentially, and the findings were explained to participants or their parents upon request. When any psychological or behavioral problem requiring further professional attention was identified, appropriate guidance for referral and follow-up was provided. Participation imposed no financial burden on the families, and all research procedures were conducted in accordance with the cultural and religious values of the participants and the local community.

Data Collection Tools

The Connor-Davidson Resilience Scale was used to assess resilience. This instrument was developed by Connor and Davidson in 2003 and consists of 25 items designed to evaluate an individual's capacity to cope with adversity, psychological pressure, and challenging life circumstances. Responses are rated on a five-point Likert scale ranging from 0, indicating "not true at all," to 4, indicating "true nearly all of the time." Accordingly, the total score ranges from 0 to 100, with higher scores indicating greater resilience. The scale assesses several dimensions of resilience, including personal competence and tenacity, trust in one's instincts, tolerance of negative affect, control, and spirituality. Personal competence and tenacity are represented by items 10, 11, 12, 16, 17, 23, 24, and 25; trust in one's instincts by items 6, 7, 14, 15, 18, 19, and 20; tolerance of negative affect by items 1, 2, 4, 5, and 8; control by items 13, 21, and 22; and spirituality by items 3 and 9. Previous psychometric studies conducted in Iran have supported the reliability of the instrument. Taghavi reported satisfactory reliability coefficients using test-retest, split-half, and Cronbach's alpha methods, with coefficients of 0.93, 0.70, and 0.90, respectively, indicating that the scale has acceptable internal consistency and temporal stability for the assessment of resilience.

Emotion regulation was assessed using the Emotion Regulation Questionnaire developed by Gross and John in 2003. The questionnaire contains 10 items and is designed to assess two major emotion-regulation strategies: cognitive reappraisal and expressive suppression. The cognitive reappraisal subscale consists of six items, whereas the expressive suppression subscale consists of four items. Participants respond to each item using a seven-point Likert scale ranging from 1, "strongly disagree," to 7, "strongly agree." Items 2, 4, 6, and 9 assess expressive suppression, whereas the remaining items assess cognitive reappraisal. Higher scores on each subscale indicate greater use of the corresponding emotion-regulation strategy. Gross and John reported internal consistency coefficients of 0.79 for cognitive reappraisal and 0.73 for expressive suppression. Subsequent psychometric evaluations have also demonstrated satisfactory reliability, with internal consistency coefficients of approximately 0.83 for reappraisal and 0.79 for suppression. Evidence from Iranian samples has similarly supported the reliability of the instrument, with a Cronbach's alpha coefficient of approximately 0.79 previously reported for cognitive reappraisal. In the present study, Cronbach's alpha coefficients were 0.83 for cognitive reappraisal and 0.79 for expressive suppression, indicating satisfactory internal consistency for both dimensions.

Aggression was assessed using the Buss-Perry Aggression Questionnaire. The questionnaire is a revised form of the earlier Hostility Inventory and is a self-report measure composed of 29 items assessing four dimensions of aggression: physical aggression, verbal aggression, anger, and hostility. Each item is rated on a five-point Likert scale ranging from 1, indicating that the statement is highly uncharacteristic of the respondent, to 5, indicating that the statement is highly characteristic of the respondent. Items 9 and 16 are reverse-scored. The physical aggression subscale contains nine items, including items 2, 5, 8, 11, 13, 16, 22, 25, and 29; the verbal aggression subscale contains five items, including items 4, 6, 14, 21, and 27; the anger subscale contains seven items, including items 1, 9, 12, 18, 19, 23, and 28; and the hostility subscale contains eight items, including items 3, 7, 10, 15, 17, 20, 24, and 26. The total aggression score is calculated by summing the scores obtained across the four subscales, with higher scores representing greater levels of aggressive tendencies. Previous psychometric evaluations have demonstrated acceptable reliability and validity for the instrument. Test-retest coefficients over a nine-week interval for the four subscales have

ranged from approximately 0.72 to 0.80, while intercorrelations among the dimensions have ranged from approximately 0.38 to 0.49. Internal consistency coefficients have also been reported as satisfactory, with Cronbach's alpha values of 0.82 for physical aggression, 0.81 for verbal aggression, 0.83 for anger, and 0.80 for hostility.

Interventions

The experimental group participated in eight sessions of cognitive-behavioral play therapy, whereas the control group did not receive the intervention during the study period. The intervention was organized to combine structured play activities with cognitive-behavioral techniques intended to facilitate emotional expression, recognition of thoughts and feelings, behavioral rehearsal, social interaction, and adaptive coping. In the first session, the children became familiar with the objectives of the program, group rules, structure of the sessions, and the activities that would be performed throughout the intervention. The second session involved expressive and sensorimotor activities such as jumping, tearing materials, and manipulating or squeezing clay, while the children were encouraged to identify and express the feelings experienced during these activities; memory-based verbal activities such as reciting alphabet poems were also incorporated. During the third session, the children created clay figures representing their feelings and subsequently developed and narrated stories about the figures they had produced, accompanied by structured reading and memorization activities. The fourth session continued the use of clay modeling and storytelling to promote recognition and verbalization of emotions, while group poetry reading was used as an additional cooperative activity. In the fifth session, the children arranged the previously created figures in relation to one another according to their own interpretations and then discussed the meaning and position of each figure; they were also asked to prepare and memorize a short dramatic text for the subsequent session. In the sixth session, each group member selected an animal and discussed the thoughts, interests, needs, motives, and typical activities associated with that animal, after which the roles of the selected animals were defined for a dramatic enactment. The seventh session focused on collaboratively developing a story, organizing its sequence, and discussing the thoughts, emotions, and behaviors of its characters with the participation of both the children and the researcher. In the eighth session, the group selected a classroom-based dramatic scenario and assigned different character roles, including submissive, fearful, dominant, and assertive roles. The children practiced and repeated the words and behaviors associated with each role, enacted the scenario, and subsequently participated in a guided discussion about the behavior, emotional reactions, interpersonal consequences, and alternative responses demonstrated by each character. Across the intervention, play, storytelling, role-playing, emotional identification, behavioral rehearsal, group interaction, and cognitive discussion were integrated to strengthen adaptive emotion regulation, resilience, behavioral self-control, and nonaggressive patterns of responding.

Data Analysis

The collected data were analyzed using SPSS version 22. Descriptive statistical indices were first used to summarize the participants' scores on resilience, emotion regulation, and aggression at the pretest and posttest stages. To determine the effectiveness of cognitive-behavioral play therapy while statistically controlling for initial differences between the experimental and control groups, multivariate analysis of

covariance was employed. In this analysis, posttest scores of the dependent variables were considered the outcome variables, group membership was entered as the independent variable, and the corresponding pretest scores were treated as covariates. Before conducting the main analysis, the relevant statistical assumptions underlying multivariate analysis of covariance, including normality of the distributions, homogeneity of variances, homogeneity of covariance matrices, linearity of relationships, and homogeneity of regression slopes, were examined. Statistical significance was evaluated at the conventional level of $p < 0.05$.

Findings and Results

The final sample consisted of 30 students with attention-deficit/hyperactivity disorder, with 15 participants (50.00%) assigned to the experimental group and 15 participants (50.00%) assigned to the control group. Regarding gender distribution, the experimental group included 8 boys and 7 girls, whereas the control group included 7 boys and 8 girls. In terms of age, 3 participants in each group were 9 years old, and 3 participants in each group were 10 years old. Among the 11-year-old participants, 7 were in the experimental group and 5 were in the control group, whereas among the 12-year-old participants, 4 were in the experimental group and 2 were in the control group. Overall, the demographic distribution of participants indicated relatively comparable gender and age compositions across the experimental and control groups.

Table 1. Descriptive Statistics for Resilience, Emotion Regulation, and Aggression Before and After the Intervention

Variable	Dimension	Group	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD
Resilience	Personal competence/tenacity	Experimental	42.29	4.80	49.12	5.75
		Control	42.89	4.92	42.22	4.92
	Trust in personal instincts	Experimental	43.22	4.23	48.12	5.44
		Control	43.29	4.20	43.19	4.20
	Tolerance of negative affect	Experimental	44.96	4.67	49.15	5.46
		Control	44.66	4.28	44.52	4.22
	Control	Experimental	45.59	4.20	50.29	5.56
		Control	45.63	4.52	45.44	4.52
	Spirituality	Experimental	44.07	4.45	47.07	3.93
		Control	44.78	4.34	44.78	4.20
Emotion regulation	Cognitive reappraisal	Experimental	11.38	6.00	14.89	6.27
		Control	11.22	5.44	11.99	5.22
	Expressive suppression	Experimental	11.89	5.80	13.87	6.57
		Control	11.87	5.98	11.46	5.93
Aggression	Physical aggression	Experimental	23.78	4.50	17.47	2.03
		Control	23.47	2.70	23.47	2.70
	Verbal aggression	Experimental	24.79	2.76	17.13	1.81
		Control	24.79	2.76	23.47	2.67
	Anger	Experimental	22.93	2.55	17.13	1.76
		Control	24.79	2.85	22.47	2.64
	Hostility	Experimental	22.93	2.55	17.07	1.67
		Control	22.20	2.85	22.47	2.64

As shown in Table 1, the experimental and control groups demonstrated relatively similar scores on most study variables at the pretest stage. Following cognitive-behavioral play therapy, however, the experimental

group showed an improvement across the resilience dimensions. For example, the mean score for personal competence/tenacity increased from 42.29 ± 4.80 at pretest to 49.12 ± 5.75 at posttest, while the corresponding score in the control group remained relatively unchanged. Similar increases were observed for trust in personal instincts, tolerance of negative affect, control, and spirituality. Emotion-regulation scores also increased in the experimental group, with cognitive reappraisal increasing from 11.38 ± 6.00 to 14.89 ± 6.27 and expressive suppression from 11.89 ± 5.80 to 13.87 ± 6.57. In contrast, only limited changes were observed in the control group. A different pattern was evident for aggression, for which lower posttest scores represented improvement. Physical aggression in the experimental group decreased from 23.78 ± 4.50 to 17.47 ± 2.03, verbal aggression decreased from 24.79 ± 2.76 to 17.13 ± 1.81, anger decreased from 22.93 ± 2.55 to 17.13 ± 1.76, and hostility decreased from 22.93 ± 2.55 to 17.07 ± 1.67. Comparatively smaller changes were observed in the control group. These descriptive findings therefore indicated improvement in resilience and emotion regulation and a reduction in aggression following the intervention.

Prior to conducting the covariance analyses, the statistical assumptions were examined. The skewness coefficients were 0.141 for resilience, 0.133 for emotion regulation, and 0.144 for aggression, while the corresponding kurtosis coefficients were −0.554, −0.488, and −0.556, respectively. These values were close to zero and fell within acceptable ranges, indicating no substantial departure from normality based on skewness and kurtosis. The Shapiro-Wilk test was nonsignificant for resilience ($W = 0.778$, $p = 0.068$) and emotion regulation ($W = 0.702$, $p = 0.066$), whereas it reached statistical significance for aggression ($W = 0.278$, $p = 0.029$). Given the relatively small sample size, the distributional shapes were additionally examined graphically in SPSS, and the distributions were judged to be sufficiently acceptable for parametric analysis. The remaining assumptions required for covariance analysis, including linear relationships between the covariates and dependent variables, homogeneity of regression slopes, and acceptable homogeneity of variance-covariance structures, were also considered before proceeding with the main analysis. The omnibus multivariate analysis demonstrated a statistically significant overall group effect across resilience, emotion regulation, and aggression, Wilks' $\lambda = 0.53$, $F(3, 27) = 13.90$, $p < 0.001$. The other multivariate criteria produced the same conclusion, including Pillai's Trace = 0.66, Hotelling's Trace = 1.38, and Roy's Largest Root = 1.38, indicating that the combined dependent variables differed significantly between the experimental and control groups after adjustment for baseline scores.

Table 2. Analysis of Covariance for the Effects of Cognitive-Behavioral Play Therapy on the Study Outcomes

Dependent Variable	Source	Sum of Squares	df	Mean Square	F	p	Partial η^2
Posttest resilience	Pretest	17.59	1	17.59	0.23	0.600	0.007
	Group	180.77	1	180.77	259.75	<0.001	0.60
Posttest emotion regulation	Pretest	22.19	1	12.59	0.75	0.600	0.006
	Group	199.77	1	99.77	310.19	<0.001	0.62
Posttest aggression	Pretest	18.45	1	9.22	0.69	0.520	0.006
	Group	160.77	1	80.55	276.20	<0.001	0.58

As presented in Table 2, after controlling for the corresponding pretest scores, a statistically significant difference was observed between the experimental and control groups in posttest resilience, $F = 259.75$, $p < 0.001$, partial $\eta^2 = 0.60$. The direction of the descriptive results indicated that students who received cognitive-behavioral play therapy had higher resilience scores at posttest than those in the control group. A

significant group effect was also found for emotion regulation, $F = 310.19$, $p < 0.001$, partial $\eta^2 = 0.62$, indicating better post-intervention emotion-regulation scores among students in the experimental group. Similarly, the group effect for aggression was statistically significant, $F = 276.20$, $p < 0.001$, partial $\eta^2 = 0.58$, with the experimental group demonstrating substantially lower aggression scores following the intervention compared with the control group. The effect sizes indicated that group membership accounted for approximately 60% of the adjusted variance in resilience, 62% of the adjusted variance in emotion regulation, and 58% of the adjusted variance in aggression. Taken together, these results indicated that cognitive-behavioral play therapy was effective in increasing resilience and improving emotion regulation while reducing aggression among students with attention-deficit/hyperactivity disorder.

Discussion and Conclusion

The present study investigated the effectiveness of cognitive-behavioral play therapy on resilience, emotion regulation, and aggression among students with attention-deficit/hyperactivity disorder. The findings showed that, after controlling for pretest scores, the experimental group demonstrated significantly higher resilience and emotion-regulation scores and significantly lower aggression scores than the control group. The effect sizes were substantial, with group membership accounting for 60% of the adjusted variance in resilience, 62% of the adjusted variance in emotion regulation, and 58% of the adjusted variance in aggression. These findings indicate that cognitive-behavioral play therapy was effective not only in reducing maladaptive behavioral responses but also in strengthening adaptive psychological capacities among children with ADHD. This pattern is theoretically meaningful because ADHD is associated with difficulties extending beyond inattention and hyperactivity, including impaired emotional control, impulsive responding, poor frustration tolerance, interpersonal conflict, and vulnerability to maladaptive coping. Therefore, an intervention that simultaneously targets cognitive appraisals, emotional expression, behavioral rehearsal, and interpersonal interaction may influence several dimensions of functioning at the same time.

The first major finding was that cognitive-behavioral play therapy significantly increased resilience among students with ADHD. This result is consistent with evidence emphasizing the protective role of resilience in children and adolescents who experience psychological, behavioral, or developmental vulnerabilities. Resilience has been described as an important resource for coping with stress, impulsivity, social difficulties, and emotional strain, and systematic evidence has suggested that stronger resilience is associated with more adaptive psychological functioning among adolescents (8). The present finding is also compatible with research showing that resilience may mediate the relationship between ADHD symptoms and broader indicators of well-being, such as life satisfaction (9). Similarly, psychological resilience has been identified as an important moderating or protective factor in individuals presenting with ADHD-related symptoms and maladaptive behavioral outcomes (10). Intervention research has further demonstrated that resilience in children with ADHD is modifiable. For instance, physical exercise interventions have been associated with improvements in resilience and reductions in psychological distress among children with ADHD (11). The present study extends these findings by showing that a structured psychological intervention delivered through play may also improve resilience in this population.

The improvement in resilience can be explained through several mechanisms embedded in cognitive-behavioral play therapy. Children with ADHD frequently encounter repeated experiences of academic failure, criticism, peer conflict, rejection, and difficulty meeting behavioral expectations. Such experiences can weaken perceived competence and contribute to avoidance, helplessness, or rapid frustration. In the present intervention, structured play activities, storytelling, clay modeling, role-playing, group participation, and behavioral rehearsal provided repeated opportunities for mastery and successful task completion. These experiences may have strengthened children's perceptions of competence and control. Cognitive-behavioral components may also have helped participants reinterpret frustrating experiences and recognize alternative ways of responding to challenges. In this sense, resilience may have increased because the children learned that difficult situations could be approached, understood, and managed rather than automatically avoided or responded to impulsively. This interpretation is compatible with evidence showing that cognitive-behavioral approaches can improve resilience-related outcomes in populations affected by ADHD-related stress (17). It is also consistent with findings showing that coping and resilience are central to adaptation in families facing the behavioral and emotional challenges associated with ADHD (12). Therefore, the increase in resilience observed in the current study may reflect improvements in perceived competence, adaptive coping, emotional tolerance, and behavioral self-efficacy.

The second principal finding was that cognitive-behavioral play therapy significantly improved emotion regulation. This finding is particularly important because emotional dysregulation is a prominent difficulty among many children with ADHD and may contribute to impulsive behavior, frustration, anger, interpersonal conflict, and poor adaptation. Previous research has shown that children with ADHD may demonstrate significant emotional regulation problems relative to typically developing peers and that such problems overlap with, but are not identical to, emotional difficulties observed in anxiety, depression, and cognitive disengagement syndrome (5). The present finding is also consistent with studies showing that cognitive training and structured intervention can modify adaptive and maladaptive cognitive emotion-regulation strategies in children with ADHD (6). Similarly, interventions targeting prospective memory, emotion regulation, and executive functions have been shown to improve self-regulatory capacities among students with ADHD (7). These findings support the assumption that emotional regulation is not a fixed deficit in ADHD but a trainable psychological capacity that can respond to structured therapeutic experiences.

The effectiveness of cognitive-behavioral play therapy in improving emotion regulation can be explained by the way in which the intervention translates abstract cognitive-behavioral concepts into concrete, developmentally appropriate activities. Younger children may have difficulty discussing emotions through prolonged verbal reflection, particularly when they also have attentional and executive-function difficulties. Play offers a more accessible medium for expressing, identifying, and modifying emotions. In the intervention used in the present study, participants created clay figures representing feelings, discussed emotional experiences, constructed stories, adopted roles, and explored the thoughts, needs, and actions of different characters. These activities may have increased emotional awareness and helped participants connect situations with thoughts, emotions, and behavioral consequences. Role-playing may also have allowed children to practice alternative responses before encountering similar situations in everyday life. These mechanisms are consistent with the rationale of play therapy for ADHD, in which active, engaging,

and structured play activities are used to facilitate self-control, emotional expression, and adaptive behavior (18). Evidence from related populations also supports the capacity of play-based interventions to improve emotional functioning. Attachment-based play therapy has been associated with improvements in emotion regulation and social adjustment (20), while Adlerian play therapy has shown effectiveness in improving emotion regulation among children with oppositional defiant disorder (23). Furthermore, play therapy has demonstrated benefits for distress tolerance, another capacity closely connected with emotion regulation and the ability to remain adaptive under emotional pressure (19).

The third major finding was that cognitive-behavioral play therapy significantly reduced aggression among students with ADHD. This result is consistent with previous research identifying aggression as a clinically relevant problem in ADHD. Physical aggression toward others and self has been associated with ADHD and related behavioral difficulties, suggesting that aggression may be particularly pronounced when impulsivity, emotional reactivity, and poor behavioral inhibition occur together (13). More directly, previous research has found that cognitive-behavioral game therapy can reduce both attention problems and aggression among children with ADHD (22). The current findings are also in line with research comparing cognitive-behavioral play therapy and Gestalt play therapy in aggressive elementary-school students, which showed favorable effects on vandalistic behavior, impulsivity, and cognitive flexibility (21). Similarly, choice theory-based play therapy has been found to reduce aggression while improving executive functioning in children presenting with depressive symptoms (24). Adlerian play therapy has likewise been associated with reductions in aggression among children with oppositional defiant disorder (23). Collectively, these findings provide convergent evidence that play-based interventions, particularly when combined with structured psychological techniques, can reduce aggressive behavior across different child populations.

The reduction in aggression can be interpreted through the interaction of cognitive, emotional, and behavioral mechanisms. Aggressive responses in children with ADHD are frequently reactive rather than premeditated and may occur because the child rapidly acts on frustration or anger before considering consequences or alternative responses. Cognitive-behavioral play therapy may interrupt this process by helping children identify triggers, label emotional states, examine the meaning they assign to social situations, and rehearse nonaggressive responses. The dramatic and role-playing components of the intervention may have been especially important because children could enact both maladaptive and adaptive interpersonal roles, observe the consequences of different behaviors, and practice assertive rather than aggressive responding. This explanation is compatible with the rationale underlying cognitive-behavioral treatment protocols specifically designed to reduce aggression in children with ADHD and emotion dysregulation (16). Moreover, because emotion regulation improved concurrently in the present study, the reduction in aggression may partly reflect greater ability to manage anger and frustration before these emotions develop into overt aggressive behavior. Improvements in cognitive flexibility may also have helped children generate alternative interpretations of provocative situations rather than responding automatically. This possibility is supported by previous findings showing that cognitive-behavioral play therapy can improve cognitive flexibility and reduce impulsive or destructive behavior (21).

The simultaneous improvement in resilience and emotion regulation and reduction in aggression suggests that the three outcomes may be functionally interconnected. Greater resilience may enable children to tolerate setbacks and interpersonal difficulties without becoming overwhelmed, while better emotion

regulation may allow them to modulate anger, frustration, and impulsive reactions. In turn, these improvements may reduce aggressive behavior. Conversely, repeated success in controlling aggressive responses may strengthen self-efficacy and resilience, creating a mutually reinforcing process of behavioral and emotional adaptation. This interpretation is consistent with evidence suggesting that resilience may protect against maladaptive outcomes associated with impulsivity and ADHD-related symptoms (8, 10). It is also compatible with findings indicating that emotional-regulation difficulties are closely connected with broader behavioral adjustment in ADHD (5). Thus, the effectiveness of cognitive-behavioral play therapy may lie partly in its capacity to address several interacting processes rather than treating each symptom separately.

Another important aspect of the findings is the developmental suitability of the intervention. Children between 9 and 12 years of age are capable of increasingly complex cognitive reflection but still benefit greatly from concrete, experiential, and play-based learning. Cognitive-behavioral play therapy provides a bridge between these developmental needs by translating therapeutic concepts into action. Instead of requiring children to understand abstract cognitive restructuring through verbal instruction alone, the intervention permits learning through stories, symbolic representation, physical activity, games, and role enactment. This may be especially valuable for children with ADHD, for whom prolonged verbal tasks may be difficult because of attentional variability and impulsivity. The usefulness of play-based interventions across emotional, behavioral, and developmental difficulties is supported by findings from multiple therapeutic models (18-20). The current findings therefore suggest that integrating cognitive-behavioral principles within play may enhance engagement while preserving the structured therapeutic mechanisms required for behavioral and emotional change.

The results also have implications for understanding ADHD beyond its core diagnostic symptoms. ADHD is increasingly recognized as a condition with broad psychosocial effects extending into adolescence and adulthood (1, 2). Emotional and behavioral difficulties associated with ADHD may persist and influence academic, relational, and later-life functioning if they are not addressed during childhood. Research in other developmental contexts has further emphasized that ADHD-related difficulties can remain relevant across major life stages (3). Although some work has examined ADHD-like behavioral patterns from broader comparative perspectives (4), the present results underscore the importance of focusing clinically on modifiable psychological capacities in children. Intervening during school age may therefore have value not only for reducing current behavioral difficulties but also for strengthening adaptive resources that can support later development.

The findings should also be considered in relation to the broader social and academic context of children with ADHD. Academic stress, interpersonal concerns, and difficulties adapting to expectations may intensify emotional strain and contribute to maladaptive responses (14). Family functioning and perceived relational support are likewise associated with adaptation during childhood and adolescence (15). Although the present intervention focused primarily on the child, improvements in self-regulation, resilience, and aggression may have broader effects on classroom relationships, peer interactions, and family functioning. A child who can tolerate frustration, reinterpret social situations, and express emotions more appropriately may experience fewer conflicts and more positive feedback from others, potentially reinforcing therapeutic gains. For this reason, cognitive-behavioral play therapy can be understood not merely as a symptom-focused intervention

but as a developmental approach that may enhance the child's capacity to interact more adaptively with multiple environments.

Despite the favorable findings, several limitations should be considered when interpreting the results. The study included only 30 participants recruited from educational and rehabilitation centers in Sari, which limits the statistical power and generalizability of the findings to other populations, age groups, and cultural contexts. The use of purposive sampling may also have introduced selection bias. In addition, the study employed a pretest-posttest design without a follow-up assessment, making it impossible to determine whether the observed improvements in resilience and emotion regulation and reductions in aggression were maintained over time. The control group did not receive an active comparison intervention, so nonspecific factors such as therapist attention, group interaction, novelty, and expectations may have contributed to the observed effects. Reliance on self-report questionnaires may also have been influenced by response bias, comprehension differences, or social desirability, particularly because the participants were relatively young. Finally, the study did not examine whether ADHD presentation, symptom severity, medication use, family functioning, or comorbid behavioral and emotional difficulties influenced treatment response.

Future studies should replicate the present research using larger and more diverse samples recruited from multiple schools, clinics, and geographical regions. Randomized controlled trials with active comparison conditions would provide stronger evidence regarding the specific efficacy of cognitive-behavioral play therapy relative to other established interventions. Follow-up assessments at several intervals, such as three, six, and twelve months after treatment, are recommended to evaluate the durability of therapeutic effects. Future research could also incorporate parent, teacher, and clinician ratings alongside child self-report measures to obtain a more comprehensive assessment of behavioral and emotional change. Examining potential mediators and moderators would also be valuable; for example, future studies could test whether improvements in emotion regulation mediate reductions in aggression or whether baseline impulsivity, ADHD severity, age, gender, family functioning, or executive-function capacity predicts treatment response. Comparative research could additionally examine different play-therapy approaches, combinations of play therapy with parent training, and the relative contribution of specific intervention components such as storytelling, role-playing, cognitive restructuring, and behavioral rehearsal.

From a practical perspective, cognitive-behavioral play therapy can be considered a promising intervention for school counselors, child psychologists, rehabilitation specialists, and mental health professionals working with students who have ADHD. The intervention can be adapted for use in schools, counseling centers, and rehabilitation settings because it relies on structured activities that are developmentally appropriate and can be delivered in small groups. Practitioners may benefit from integrating emotion-identification exercises, storytelling, role-playing, clay-based activities, behavioral rehearsal, and guided cognitive discussion into intervention programs for children who exhibit poor frustration tolerance, impulsive aggression, and weak coping skills. Coordination with parents and teachers may further strengthen treatment effects by helping children generalize newly learned skills to home and classroom environments. Training school-based professionals in structured cognitive-behavioral play techniques may therefore provide an accessible strategy for simultaneously strengthening resilience and emotion regulation while reducing aggression in children with ADHD.

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Authors' Contributions

All authors equally contributed to this study.

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.

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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