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The Effectiveness of Cognitive-Behavioral Therapy on Emotional Processing and Selective Attention in Children with Learning Disabilities

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ABSTRACT

This study aimed to examine the effectiveness of cognitive-behavioral therapy (CBT) on improving emotional processing and selective attention in children with learning disabilities. A randomized controlled trial was conducted with 30 children (aged 9–12) diagnosed with learning disabilities in Tehran, Iran. Participants were randomly assigned to an experimental group (CBT; n = 15) and a control group (n = 15). The CBT program consisted of ten 90-minute sessions implemented over five weeks. Standardized tools—the Emotional Processing Scale for Children (EPS-C) and the Stroop Color-Word Test (SCWT-C)—were used to assess the dependent variables at three time points: pre-test, post-test, and five-month follow-up. Data were analyzed using repeated measures ANOVA and Bonferroni post-hoc tests via SPSS version 27. The results revealed significant time × group interaction effects for both emotional processing ($F(2, 56) = 18.59$, $p < .001$, $\eta^2 = .40$) and selective attention ($F(2, 56) = 15.78$, $p < .001$, $\eta^2 = .36$). Post-hoc analysis indicated that the CBT group showed significant improvements in emotional processing from pre-test to post-test (MD = 10.16, $p < .001$) and to follow-up (MD = 11.22, $p < .001$), with similar significant gains in selective attention (pre-test to post-test: MD = -7.83, $p < .001$; to follow-up: MD = -7.24, $p < .001$). No significant changes were observed in the control group. The findings demonstrate that cognitive-behavioral therapy is an effective intervention for enhancing emotional regulation and selective attention in children with learning disabilities, with sustained effects observed over a five-month period. The study supports the integration of CBT-based programs into psychoeducational services for this population.

Keywords: Cognitive-Behavioral Therapy; Emotional Processing; Selective Attention; Learning Disabilities; Children; Executive Function.

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Introduction

Children with learning disabilities (LDs) often face not only academic challenges but also emotional and cognitive regulation difficulties that can severely affect their adaptive functioning and psychosocial well-

being. Learning disabilities such as dyslexia, dysgraphia, and dyscalculia are neurodevelopmental disorders characterized by impairments in reading, writing, or mathematical reasoning despite adequate intelligence and educational opportunities. Beyond the academic struggles, numerous studies have highlighted that children with LDs exhibit deficits in executive functions, attention regulation, and emotional processing (1, 2). These impairments hinder their ability to manage social interactions, cope with frustration, and succeed in daily problem-solving, making them more vulnerable to emotional dysregulation and attentional lapses.

Emotional processing refers to the ability to perceive, interpret, and regulate emotional experiences. When compromised, it can manifest as emotional reactivity, avoidance, or maladaptive coping strategies (3). Westen (4) emphasized that implicit and emotional processes are central to behavioral dysfunctions and must be addressed to facilitate cognitive and behavioral changes. Children with LDs often struggle to decode emotional cues and appropriately express or manage their feelings, which in turn contributes to internalizing and externalizing problems (5). The inability to process emotions adaptively has been associated with a heightened risk of social withdrawal, anxiety, aggression, and reduced academic motivation (6).

Selective attention, another crucial cognitive function, is defined as the capacity to focus on task-relevant stimuli while filtering out distractions. It plays a foundational role in academic learning and behavioral regulation. Deficits in selective attention among children with LDs are well-documented, often leading to disorganized behavior, task abandonment, and inefficient learning strategies (2, 7). Executive functions such as inhibitory control, cognitive flexibility, and working memory are closely intertwined with attention control mechanisms, all of which are frequently impaired in LD populations (8, 9). These deficits exacerbate academic underperformance and contribute to negative emotional experiences, further perpetuating the learning-emotion dysfunction cycle.

Cognitive-Behavioral Therapy (CBT) has emerged as an empirically supported intervention for a wide range of psychological and developmental disorders in children and adolescents. As a structured, goal-oriented approach, CBT targets dysfunctional thought patterns and behaviors, teaching children how to manage distress, develop adaptive coping mechanisms, and improve emotional and cognitive regulation (1). CBT has been shown to be particularly effective in addressing emotional dysregulation by modifying maladaptive beliefs, increasing emotional awareness, and enhancing problem-solving skills (10). Alpert and colleagues (3) emphasized that emotional processing theory, when integrated into trauma-focused CBT, significantly strengthens the therapeutic process by targeting core emotional deficits. This is particularly relevant for children with LDs, who may not always possess the metacognitive skills to articulate their emotional challenges without structured intervention.

Multiple studies support the application of CBT in improving emotional processing among children with anxiety, mood, and developmental disorders. For example, Daryay-e Laleh and Akbari (5) found that CBT significantly improved emotional processing in students with social anxiety disorder, a population similarly marked by attentional and emotional regulation difficulties. Similarly, Shamsnajafi et al. (11) demonstrated that CBT-based interventions reduced impulsivity and emotional processing deficits in adolescent soldiers, suggesting its broad applicability across emotionally vulnerable groups. Within the context of learning disorders, CBT techniques such as cognitive restructuring, emotion regulation training, and behavioral rehearsal are especially relevant, given the cognitive limitations and behavioral manifestations observed in these children (12, 13).

CBT has also been adapted to address attention-related deficits through techniques like attention training, cognitive modeling, and reinforcement systems. For example, in their randomized trial, Mariappan and Mukhtar (14) found that Internet-based CBT significantly enhanced executive function and attention control in medical students. In younger populations, play-based adaptations of CBT have shown promise in enhancing attention and executive functions while maintaining child engagement (9, 15). In a study on children with specific reading disorders, Dado and Emadian (15) reported significant improvements in attention and executive function following cognitive-behavioral play therapy, reinforcing the suitability of this approach for LD populations. Norouzi Homayoun et al. (8) likewise reported that CBT improved working memory, response inhibition, and emotional self-regulation in male students with social anxiety, conditions often comorbid with learning disabilities.

Moreover, emotional processing and attention are not isolated constructs but mutually reinforcing domains. Theoretical and empirical models have demonstrated that improved emotional regulation can enhance attention span and task persistence, while better attentional control can facilitate the use of adaptive emotional coping strategies (7, 16). Rahmani et al. (16) found that CBT targeting executive functions in children with sluggish cognitive tempo also reduced academic procrastination, highlighting the dual impact of CBT on cognitive and emotional domains. Similarly, Babaei et al. (17) identified the mediating role of theory of mind between executive functions and interpersonal difficulties, suggesting that improving cognitive capacities can indirectly bolster emotional and social functioning.

In Iran, the cultural adaptation of CBT-based interventions has gained momentum in recent years, with numerous studies confirming their effectiveness in both clinical and educational settings (17, 18). Hosseini Dastjerdi et al. (18) compared cognitive-behavioral play therapy with resilience-based play therapy and found both effective in reducing anxiety and enhancing emotional expression in children undergoing dental treatment, showing the versatility of CBT across emotionally charged situations. Similarly, Fazeli et al. (19) used a CBT-based cognitive rehabilitation program to reduce cognitive deficits in patients with schizophrenia, further validating the cognitive enhancement capabilities of CBT approaches across age groups and clinical profiles.

Emerging research also suggests that the effectiveness of CBT can be augmented through integration with neurodevelopmental tools such as martial arts and physical training. Pujari (20) argued that martial arts may enhance executive function and attention control by promoting discipline, emotional regulation, and sensorimotor integration—concepts that align closely with CBT's behavioral modification goals. These findings open promising avenues for multimodal interventions targeting cognitive and emotional deficits in children with LDs.

Despite the compelling evidence, there is still limited research on the combined impact of CBT on both emotional processing and selective attention in Iranian children with learning disabilities. Most existing studies focus either on emotional or cognitive outcomes separately, without considering their dynamic interplay. Moreover, studies incorporating longer-term follow-ups and structured play-based adaptations of CBT in LD populations remain scarce (12, 15). Therefore, this study seeks to fill this critical gap by examining the effectiveness of a cognitive-behavioral intervention on emotional processing and selective attention in children with learning disabilities

Methods and Materials

Study Design and Participants

This study employed a randomized controlled trial (RCT) design with a control group to examine the effectiveness of cognitive-behavioral therapy (CBT) on emotional processing and selective attention in children with learning disabilities. A total of 30 participants (15 in the experimental group and 15 in the control group) were selected through purposive sampling from educational and clinical centers in Tehran, Iran. All participants were boys and girls aged 9 to 12 years, diagnosed with specific learning disabilities by a licensed psychologist based on DSM-5 criteria. Participants were randomly assigned to the intervention and control groups using block randomization. Inclusion criteria included: (1) diagnosis of learning disabilities, (2) normal IQ (above 85), and (3) no history of neurological or psychiatric disorders. Exclusion criteria included absence from more than two sessions or receiving other simultaneous psychological interventions. The CBT intervention lasted five weeks, and follow-up data were collected five months after the intervention concluded.

Data Collection

The Emotional Processing Scale for Children (EPS-C), originally developed by Baker et al. (2004) and adapted for children by several researchers including Iranian studies, is a standardized instrument used to assess how children identify, process, and express emotions. The EPS-C includes 25 items divided into five subscales: suppression, unprocessed emotion, avoidance, signs of unregulated emotion, and impoverished emotional experience. Responses are rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (very much), with higher scores indicating greater difficulty in emotional processing. The total score is calculated by summing the subscale scores, providing both subscale and overall emotional processing indices. Studies conducted in Iran have confirmed the reliability and validity of this instrument in the context of children with emotional and learning difficulties, reporting a Cronbach's alpha above 0.80 for the total scale and acceptable construct validity.

The Stroop Color and Word Test – Children's Version (SCWT-C), originally developed by Golden (1978), is a widely used neuropsychological tool to evaluate selective attention and cognitive flexibility in children aged 5 to 14 years. This test consists of three parts: (1) reading color names printed in black ink (word condition), (2) naming the color of color patches (color condition), and (3) naming the ink color of color words that are incongruent (interference condition). The key indicator of selective attention is the interference score, calculated based on the time difference and error rate between the color and interference conditions. The SCWT-C has been adapted and validated in Iran in various child clinical populations, including those with learning disabilities, with studies confirming its acceptable psychometric properties, including test-retest reliability ($r > 0.80$) and convergent validity with other attention-related assessments.

Intervention

The intervention was designed as a structured Cognitive-Behavioral Therapy (CBT) program tailored for children with learning disabilities, focusing on enhancing emotional processing and selective attention. The program consisted of ten sessions, each lasting 90 minutes, conducted twice a week over five weeks. The

content was adapted to be developmentally appropriate and included visual aids, storytelling, play-based techniques, and guided practice. The sessions targeted emotional recognition, regulation strategies, and attentional control using CBT techniques such as cognitive restructuring, behavioral rehearsal, and attention training.

Session 1: Introduction and Therapeutic Alliance Building

The first session focused on establishing rapport with the children, introducing the structure and goals of the program, and creating a safe, supportive group atmosphere. Through games, storytelling, and drawing activities, children were encouraged to share their feelings and thoughts about their learning difficulties and emotional experiences. Ground rules for group participation were also collaboratively set to ensure a respectful and secure environment.

Session 2: Recognizing Emotions

This session introduced basic emotional literacy. Children were taught to identify primary emotions (e.g., happiness, sadness, anger, fear) through visual cards, body mapping, and real-life scenarios. Activities included matching facial expressions with emotion names and sharing times when they felt specific emotions. The goal was to enhance emotional awareness, a critical foundation for emotional processing.

Session 3: Emotional Triggers and Body Signals

Children learned how emotions manifest physically and what triggers specific emotional reactions. The therapist guided participants to recognize bodily signals associated with emotions (e.g., clenched fists for anger, tears for sadness) through games and role-play. Personal examples were elicited to help link emotional responses to situational triggers.

Session 4: Introduction to Thoughts, Feelings, and Behaviors Triangle

The cognitive triangle (thoughts–feelings–behaviors) was introduced using simplified language and illustrations. Children practiced identifying how their thoughts about learning challenges influenced their emotions and behaviors. Exercises included drawing the triangle for personal examples and discussing how changing a thought might change a feeling or behavior.

Session 5: Cognitive Restructuring and Positive Self-Talk

This session focused on recognizing negative automatic thoughts and replacing them with helpful, adaptive ones. Using cartoon strips and thought bubbles, children practiced reframing unhelpful beliefs about their academic abilities (e.g., “I’m dumb” → “I can ask for help and improve”). Repetition and praise were used to reinforce the use of positive self-talk.

Session 6: Emotion Regulation Strategies

Children were introduced to concrete emotion regulation strategies such as deep breathing, counting to ten, and using calming imagery. Practice included guided relaxation exercises and identifying situations where each strategy could be applied. Children made "calm cards" as personalized visual reminders of the techniques learned.

Session 7: Selective Attention Skills – Part I

The first of two attention-focused sessions began with psychoeducation about attention and distraction. Interactive games like “Simon Says” and card sorting tasks were used to practice focusing attention and inhibiting impulsive responses. Children also learned to identify distractors in their environment and brainstormed ways to reduce them.

Session 8: Selective Attention Skills – Part II

This session built on the previous one with more advanced attention exercises, such as Stroop-like color-word games, listening tasks, and time-on-task training. Children practiced shifting attention between stimuli and learned how to use internal cues (e.g., self-reminders) to maintain focus during academic tasks.

Session 9: Problem-Solving and Emotional Conflict Resolution

This session introduced structured problem-solving steps: identifying the problem, generating solutions, evaluating outcomes, and selecting the best response. Emotion regulation was integrated into problem-solving, teaching children how to stay calm and think clearly in emotionally charged situations. Role-plays with peer interaction were central to this session.

Session 10: Review, Consolidation, and Closure

In the final session, all skills taught throughout the program were reviewed through games and storytelling. Each child was encouraged to reflect on what they learned, create a "toolbox" of strategies, and share progress. The session concluded with a group celebration, certificate distribution, and feedback from participants to promote a sense of closure and achievement.

Data analysis

Data were analyzed using SPSS version 27. Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to describe the demographic variables. To evaluate the effectiveness of the intervention, repeated measures analysis of variance (ANOVA) was used with group (intervention vs. control) as the between-subjects factor and time (pre-test, post-test, follow-up) as the within-subjects factor. When significant interaction effects were detected, the Bonferroni post-hoc test was applied to compare pairwise differences across time points. The significance level was set at $p < .05$ for all statistical tests. Prior to conducting the main analyses, the assumptions of normality, homogeneity of variance, and sphericity were tested and confirmed.

Findings and Results

Of the 30 participants enrolled in the study, 17 (56.7%) were boys and 13 (43.3%) were girls. Regarding the educational grade, 10 children (33.3%) were in grade 3, 12 children (40%) were in grade 4, and 8 children (26.7%) were in grade 5. Additionally, 18 participants (60%) were firstborn children, 9 (30%) were second-born, and 3 (10%) were third-born or later. The majority of mothers (70%) had at least a high school diploma, while 9 mothers (30%) held a university degree. All participants resided in urban areas of Tehran.

Table 1. Descriptive Statistics for Emotional Processing and Selective Attention by Group and Time

Variable	Group	Pre-test (M ± SD)	Post-test (M ± SD)	Follow-up (M ± SD)
Emotional Processing	CBT	71.43 ± 6.25	61.27 ± 5.48	60.21 ± 5.67
	Control	70.89 ± 5.98	69.37 ± 6.14	70.01 ± 5.83
Selective Attention	CBT	22.64 ± 3.79	30.47 ± 3.26	29.88 ± 3.45
	Control	23.11 ± 3.65	24.02 ± 3.44	23.57 ± 3.59

As shown in Table 1, the CBT group demonstrated a notable decrease in emotional processing scores from pre-test (M = 71.43, SD = 6.25) to post-test (M = 61.27, SD = 5.48), with maintenance at follow-up (M = 60.21, SD = 5.67). In contrast, the control group showed minimal change. For selective attention, the CBT

group improved significantly from pre-test (M = 22.64, SD = 3.79) to post-test (M = 30.47, SD = 3.26), with a slight reduction at follow-up (M = 29.88, SD = 3.45), while the control group showed negligible change.

Prior to conducting repeated measures ANOVA, all statistical assumptions were examined. The assumption of normality was assessed using the Shapiro–Wilk test, which indicated that emotional processing scores were normally distributed across time points (pre-test: W = 0.962, p = .378; post-test: W = 0.944, p = .191; follow-up: W = 0.957, p = .301). Levene's test confirmed the homogeneity of variances across groups for all dependent variables (p > .05). Mauchly's test of sphericity was also non-significant for repeated measures of both emotional processing ($\chi^2(2) = 3.41$, p = .182) and selective attention ($\chi^2(2) = 2.77$, p = .251), indicating that the sphericity assumption was met. Therefore, the data met all conditions required for conducting repeated measures ANOVA.

Table 2. Repeated Measures ANOVA for Emotional Processing and Selective Attention

Variable	Source	SS	df	MS	F	p	η^2
Emotional Processing	Time	1284.53	2	642.26	21.45	<.001	.43
	Group	2589.17	1	2589.17	34.76	<.001	.56
	Time × Group	1109.64	2	554.82	18.59	<.001	.40
	Error	1794.61	56	32.05			
Selective Attention	Time	874.29	2	437.15	19.62	<.001	.41
	Group	1497.22	1	1497.22	29.14	<.001	.52
	Time × Group	703.36	2	351.68	15.78	<.001	.36
	Error	1247.83	56	22.28			

Table 2 reveals statistically significant main effects of time and group, as well as significant interaction effects for both emotional processing and selective attention. For emotional processing, the interaction of time × group was significant ($F(2, 56) = 18.59$, p < .001, $\eta^2 = .40$), indicating that the CBT group experienced significantly greater improvement over time compared to the control group. Similarly, a significant time × group interaction was found for selective attention ($F(2, 56) = 15.78$, p < .001, $\eta^2 = .36$), confirming the differential benefit of CBT across time points.

Table 3. Bonferroni Post-Hoc Comparisons for Emotional Processing and Selective Attention

Variable	Time Comparison	Mean Difference (CBT)	p	Mean Difference (Control)	p
Emotional Processing	Pre-test vs Post-test	10.16	<.001	1.52	.164
	Post-test vs Follow-up	1.06	.487	-0.64	.691
	Pre-test vs Follow-up	11.22	<.001	0.88	.522
Selective Attention	Pre-test vs Post-test	-7.83	<.001	-0.91	.232
	Post-test vs Follow-up	0.59	.618	0.45	.743
	Pre-test vs Follow-up	-7.24	<.001	-0.46	.716

The Bonferroni post-hoc tests in Table 3 indicate that the CBT group exhibited statistically significant improvements in emotional processing from pre-test to post-test (MD = 10.16, p < .001) and pre-test to follow-up (MD = 11.22, p < .001), with changes between post-test and follow-up being non-significant. Similarly, selective attention improved significantly from pre-test to post-test (MD = -7.83, p < .001) and from pre-test to follow-up (MD = -7.24, p < .001). The control group did not demonstrate any significant change across time points for either variable.

Discussion and Conclusion

The findings of the present study revealed that the implementation of cognitive-behavioral therapy (CBT) significantly improved emotional processing and selective attention in children with learning disabilities, compared to the control group. The experimental group demonstrated statistically significant progress at both post-test and five-month follow-up stages, indicating not only immediate but also lasting therapeutic effects. These results provide empirical support for the efficacy of CBT in addressing the dual challenges—emotional and cognitive—faced by this population.

In terms of emotional processing, children in the CBT group showed marked improvement in their ability to identify, express, and regulate emotions. This outcome aligns with previous studies that emphasized the role of CBT in fostering adaptive emotional responses by restructuring maladaptive thoughts and increasing emotional awareness (5, 6). Alpert et al. (3) noted that CBT interventions grounded in emotional processing theory effectively help children reprocess distressing emotions and correct irrational beliefs, leading to reductions in emotional avoidance and reactivity. The improvement in emotional processing observed in this study can be attributed to the structured CBT components such as emotion labeling, relaxation techniques, and problem-solving skills, which were explicitly taught and reinforced across sessions.

The present results are also consistent with the findings of Shamsnajafi et al. (11), who reported reductions in emotional processing deficits among adolescent soldiers following a CBT-based intervention. Likewise, Rajaeinia (10) found that CBT decreased perfectionistic tendencies and improved emotional states in female religious students, further confirming that CBT facilitates emotional regulation across diverse populations and settings. Furthermore, Westen (4) emphasized the importance of targeting implicit emotional processes during CBT, arguing that deeper emotional learning is necessary for sustainable behavior change—an assertion validated by our five-month follow-up results.

With respect to selective attention, the intervention group outperformed the control group significantly on attention measures, reflecting better focus, reduced distractibility, and enhanced cognitive control. These findings support the theoretical underpinnings of CBT, which assert that maladaptive behaviors are often reinforced by attentional biases and cognitive distortions that can be modified through focused interventions (1). Structured CBT techniques such as attention training, inhibitory control exercises, and metacognitive strategies likely played a pivotal role in this outcome. Studies by Aminian and Asli Azad (9) and Dado and Emadian (15) have similarly shown that CBT-based play therapy improved executive functions and attentional performance in children with ADHD and specific reading disorders.

The integration of emotion regulation with cognitive training, as employed in our protocol, seems to offer a synergistic benefit. Evidence from Rahmani et al. (16) indicated that CBT targeting executive functions also reduced academic procrastination in children with sluggish cognitive tempo, suggesting that emotional and cognitive dimensions are interdependent. Similarly, Barron and Storch (7) emphasized the overlap between cognitive-behavioral processes and executive function mechanisms, advocating for integrated therapeutic models. The parallel improvement in both emotional and attentional domains in the current study supports this integrative perspective and adds to the growing body of literature promoting multidimensional CBT protocols.

Moreover, our findings gain further support from studies conducted in Iran that confirm the cultural adaptability and effectiveness of CBT in educational and clinical contexts. Hosseini Dastjerdi et al. (18)

demonstrated that CBT-based play therapy enhanced emotional expression and executive functioning in young children undergoing dental treatment. Likewise, Babaei et al. (17) highlighted the predictive role of executive functions on interpersonal dynamics, underscoring the importance of cognitive control in emotional and social adaptation. These culturally grounded findings reinforce the present study's results and suggest that CBT is well-suited for addressing the unique needs of Iranian children with learning disabilities.

In addition, the durability of therapeutic gains observed at the five-month follow-up indicates that the CBT intervention had a sustained effect. Longitudinal improvements may be attributed to the structured and repetitive nature of the sessions, which allowed for the internalization of skills over time. This finding is consistent with the literature emphasizing that CBT fosters durable changes in both cognition and emotion through skill acquisition and behavioral reinforcement (12, 19). Furthermore, the inclusion of attention training within the emotional processing framework echoes the recommendations of Mariappan and Mukhtar (14), who proposed combining CBT with cognitive training for optimal outcomes.

It is also noteworthy that CBT may enhance emotional and cognitive capacities indirectly by boosting self-efficacy and reducing avoidance behaviors, two key mediators discussed in the literature. As shown in Ziaei Sanich and Sadegh Pour (13), cognitive-behavioral hypnotherapy improved self-esteem and reduced emotion-seeking behavior among women with depression. Though our sample focused on children, the underlying mechanism—changing maladaptive thought-emotion-action patterns—remains relevant and may explain the broad improvements witnessed.

Lastly, the findings support the notion that CBT is effective in neurodiverse populations. Norouzi Homayoun et al. (8) reported improvements in emotional regulation and working memory in children with social anxiety using CBT play therapy. Similarly, Pujari (20) emphasized the cognitive benefits of integrating physical and cognitive-behavioral interventions, which may further enhance attention and executive functioning. The current study adds to this conversation by showing how standard CBT, when developmentally tailored, can yield measurable gains across both emotional and attentional domains in children with learning disabilities.

Despite the promising results, this study is not without limitations. First, the sample size was relatively small (N = 30), which limits the generalizability of findings to broader populations. Second, the study included only children from Tehran, which may reduce the ecological validity of results in rural or socioeconomically diverse contexts. Third, while the use of standardized tools enhances internal validity, the reliance on self-report and performance-based tasks may be subject to response bias and situational variables such as fatigue or motivation. Moreover, teacher or parent ratings were not incorporated, which could have provided a more comprehensive view of the children's behavior in natural settings. Lastly, while the five-month follow-up offers valuable insights into durability, longer-term effects beyond this window remain unknown.

Future research should aim to replicate these findings in larger and more diverse populations across various regions in Iran and internationally. Expanding the scope to include children with different types of learning disabilities (e.g., dyscalculia or dysgraphia) could help assess differential effects. Additionally, the inclusion of parent- or teacher-report questionnaires and observational methods would strengthen the ecological validity of the findings. Comparing CBT with other modalities such as mindfulness-based

interventions, resilience training, or even technology-assisted CBT could also help refine treatment strategies. Finally, exploring the role of mediating variables such as self-efficacy, emotion regulation strategies, or neural correlates of attention and emotional processing would offer deeper insights into underlying mechanisms.

Based on the findings, educational and clinical practitioners are encouraged to integrate cognitive-behavioral techniques into intervention programs for children with learning disabilities. Teachers and school psychologists should consider implementing group-based CBT modules focusing on emotional awareness, attentional control, and problem-solving strategies in inclusive settings. Clinicians working with this population may benefit from developmentally appropriate adaptations of CBT, including the use of play, visual aids, and behavioral rehearsal. Regular follow-up sessions and parental involvement can further enhance the maintenance of treatment gains. Overall, CBT presents a viable, culturally adaptable, and empirically supported approach to improving both emotional and cognitive functioning in children with learning disabilities.

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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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