

Effectiveness of Cognitive-Behavioral Play Therapy on Behavioral Adjustment and Problem-Solving Skills in Students with Dyslexia

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Abstract

Background: Dyslexia, a specific learning disorder characterized by reading difficulties, can significantly impact students' academic progress and social-emotional well-being. This study investigated the effectiveness of cognitive-behavioral play therapy (CBPT) on behavioral adjustment and problem-solving skills in students with dyslexia.

Methods: A quasi-experimental design with a pre-test, post-test, and follow-up with a control group was employed. The population consisted of all elementary school students in Tehran, Iran, who were diagnosed with dyslexia at learning disability centers in the 2022-2023 academic year. Using a convenience sampling method, 30 participants were selected from the target population and randomly assigned to either the experimental (CBPT) or control group. The Adaptive Behavior Scale (ABS) and the Problem-Solving Style Questionnaire (PSSQ) were used to assess the participants. The experimental group received eight 60-minute CBPT sessions based on cognitive-behavioral therapy techniques, while the control group received no intervention during this period. Repeated measures ANOVA, along with Bonferroni post-hoc tests, were employed to analyze the data using SPSS version 27.0.

Results: At pre-test, both groups exhibited similar levels of behavioral adjustment (CBPT group: 229.06 ± 22.37 ; control group: 229.26 ± 25.10) and problem-solving skills (CBPT group: 7.33 ± 1.87 ; control group: 7.66 ± 2.09). Post-intervention, the CBPT group demonstrated a significant improvement in behavioral adjustment (209.86 ± 20.20) compared with the control group (228.40 ± 24.12). In contrast, the control group showed no significant change in behavioral adjustment. Regarding problem-solving skills, the CBPT group exhibited a notable increase (10.20 ± 2.36) after the intervention, while the control group demonstrated a slight improvement (7.80 ± 2.30). The results revealed that CBPT significantly improved behavioral adjustment and problem-solving skills in the post-test phase ($P < 0.001$). Follow-up results indicated the sustained effectiveness of the CBPT intervention.

Conclusions: CBPT emerged as an effective intervention for enhancing behavioral adjustment and problem-solving skills in students with dyslexia. The findings highlighted the potential of CBPT to address the social-emotional and academic challenges faced by this population.

Keywords: Cognitive behavioral therapy, Dyslexia, Problem solving, Students

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1. Introduction

Reading stands as a cornerstone of acquiring information and knowledge, making it a fundamental skill for academic achievement. In most societies, literacy is considered a key to educational success (1). However, for individuals with dyslexia, this path to learning is often hindered by significant difficulties in reading fluency, accuracy, and comprehension compared with their peers of similar age and educational background (2). Dyslexia in children is associated with impairments in various cognitive functions, including language skills, coordination, integration, and memory abilities (3). Students with dyslexia represent a highly vulnerable

population, facing challenges in learning across various subjects throughout their academic careers and beyond, ultimately hindering their academic progress (4). Among learning disabilities, dyslexia arguably poses the greatest barrier to academic advancement, as reading serves as a gateway to a vast array of information. Approximately 90% of students with learning disabilities experience reading difficulties (5). Additionally, behavioral adjustment remains a significant concern among students with learning disabilities (6).

Children develop social-emotional adjustment through horizontal interactions and emotional engagement with their surroundings, particularly with their parents, due to shared characteristics (7).

Enhanced behavioral adjustment fosters self-confidence in dealing with challenges in family and educational settings. Behavioral adjustment encompasses a range of abilities that promote positive social relationships and expand friendships and closeness with peers. It facilitates satisfactory relationships at school, enabling students to adapt to circumstances and accept the demands of the social environment (8). Behavioral adjustment empowers students to navigate various situations effectively. Individuals with low behavioral adjustment exhibit unstable relationships with their social environment, negatively impacting their learning challenges (9). Behavioral adjustment poses a critical issue for the education system and forms a crucial aspect of the concept of learning disabilities. The level of adjustment serves as a foundation for academic success among students (10).

Behavioral adjustment, a cornerstone of individual well-being, involves the effective management of needs and motivations within social contexts. It hinges upon the establishment of harmonious relationships between individuals and their environments, facilitating the fulfillment of personal drives (11). Conversely, the absence of behavioral adjustment leads to maladjustment, characterized by strained environmental relationships, unmet needs, and diminished social adaptation. This predicament often culminates in behavioral problems and reduced self-esteem (12). For individuals with dyslexia, the challenges associated with reading and learning can significantly impact their behavioral adjustment. The difficulties they encounter can lead to frustration, anxiety, and social isolation, making it more difficult to navigate social interactions and meet personal needs effectively (13). This, in turn, can hinder their problem-solving abilities, as they may struggle to develop effective strategies for overcoming challenges and achieving their goals.

Problem-solving stands as one of the most critical cognitive processes, empowering individuals to effectively navigate life's challenges and significantly impacting their mental and social well-being (14). To cope adaptively with stressful situations and life conflicts, humans require the acquisition of specific skills. The aim of developing these skills lies in facilitating self-awareness, establishing effective interpersonal relationships, managing emotions, handling stressful conditions, and resolving problems (15). Problem-solving serves

as a crucial learning objective, fostering academic achievement, creativity, and innovation. It equips individuals to approach problems creatively and effectively (16). Problem-solving can be defined as a process that enhances an individual's likelihood of successful coping in a wide range of situations. In essence, problem-solving skills provide a framework for using effective cognitive abilities to address challenging interpersonal situations (17). Problem-solving strategies can serve as powerful tools for confronting and resolving a multitude of situational difficulties (18). Problem-solving involves identifying and applying skills that lead to the learner's correct response in achieving the goal. At its core, problem-solving entails the application of acquired skills in novel situations. Many individuals lack problem-solving skills and face difficulties in this domain, necessitating the cultivation of these skills (19).

While it cannot be cured, there are various effective treatment approaches that can help children with dyslexia improve their reading and writing abilities. These approaches typically focus on enhancing phonological awareness, decoding skills, and fluency (20, 21). Cognitive-behavioral play therapy (CBPT) has garnered significant attention from researchers in recent years. These forms of therapy offer both educational value and entertainment, holding immense potential for fostering cognitive/metacognitive and behavioral skills (22). Play therapy serves as a highly effective tool for addressing various childhood challenges and can significantly improve the outcomes for children with learning disabilities (23). CBPT, categorized as a direct play therapy approach, integrates traditional play therapy techniques with cognitive-behavioral techniques (24). Play therapy stands out among various rehabilitation methods due to its therapeutic, educational, and developmental value, particularly in alleviating behavioral problems and promoting social skills (25). Recent studies have explored the role of CBPT in addressing cognitive deficits and executive functioning impairments among children with neurodevelopmental disorders (26-29).

Given the challenges faced by individuals with dyslexia in academic and social settings, it is crucial to explore evidence-based interventions that can support their overall well-being. While previous research has explored various therapeutic approaches for dyslexia (20, 21), there is a need for

more studies examining the efficacy of CBPT in addressing the specific behavioral and emotional difficulties often associated with this learning disorder. The goal of this study is to contribute to the growing body of literature on dyslexia interventions by providing empirical evidence regarding the effectiveness of CBPT in improving behavioral adjustment and problem-solving skills among students with dyslexia. Therefore, the present study aimed to investigate the effectiveness of CBPT in enhancing behavioral adjustment and problem-solving skills among students with dyslexia.

2. Methods

2.1. Design and Participants

The present study employed a quasi-experimental design, specifically a pretest-posttest with follow-up design, using a control group. The target population comprised all primary school students in Tehran, Iran who received a diagnosis of dyslexia at learning disability centers during the academic year 2022-2023. Given the objectives of the present study,

a sample was selected from the target population using a convenience sampling method, adhering to the inclusion and exclusion criteria. A total of 30 participants were selected and randomly assigned to either the experimental (CBPT) or control groups, with 15 participants in each group (Figure 1). Random assignment was conducted using a simple random sampling method. A table of random numbers was generated, and participants were sequentially assigned to the experimental or control group based on their corresponding numbers in the table. This process ensured that each participant had an equal probability of being assigned to either group, minimizing potential biases and confounding factors. Power analysis conducted using G*Power indicated that a sample size of 15 participants per group was necessary, based on an alpha level of 0.05 and a power of 0.95 (29). In the CBPT group, the mean score for problem-solving skills at the pre-test was 7.33 ± 1.87 , while the post-test mean score was 10.20 ± 2.30 .

2.2. Inclusion and Exclusion Criteria

Participants were carefully selected to ensure

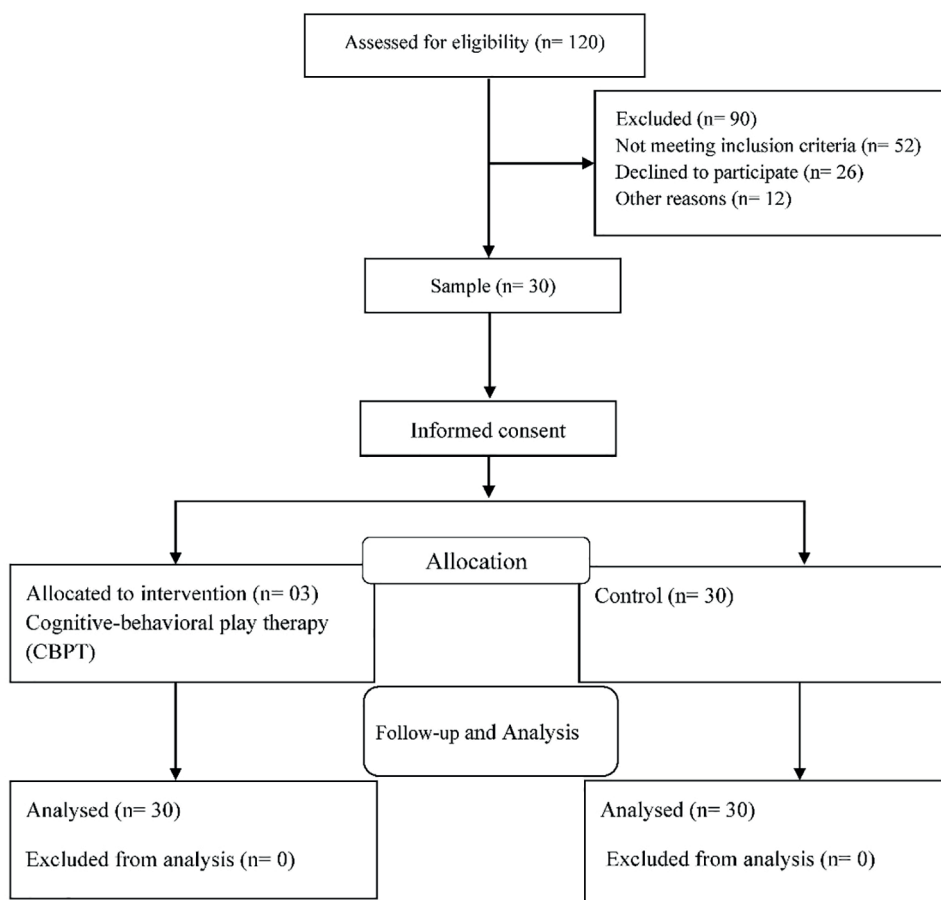


Figure 1: The figure shows the CONSORT flow diagram of the study.

the effectiveness of the study. To be included, students required a diagnosis of specific learning disability-dyslexia based on the criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Additionally, observable symptoms reported by teachers or parents for at least one academic semester were necessary. Furthermore, only students without concurrent neurodevelopmental disorders (e.g., ADHD, communication disorders, developmental coordination disorder, autism spectrum disorder) or other mental health conditions (e.g., anxiety or depression) were eligible. Finally, written informed consent was obtained from the parents of students with specific learning disabilities. To maintain the integrity of the research, participants who had received cognitive-behavioral play therapy or other interventions for reading difficulties before the study, were taking medication that could interfere with the treatment, or demonstrated non-cooperation by missing two consecutive therapy sessions were excluded.

2.3. Instruments

2.3.1. The Adaptive Behavior Scale (ABS)

The Adaptive Behavior Scale (ABS) is a widely used assessment tool designed to measure an individual's adaptive functioning across various domains. Developed by Lambert, ABS comprises 38 two-option (sometimes and frequently) items, divided into two sections. The first section focuses on developmental issues, skill assessment, and growth habits, while the second section evaluates maladaptive behaviors related to personality and behavioral disorders. The total score ranges between 38 and 76. A higher score on this scale reflects lower levels of adaptive behavior among students. (30). The content validity of ABS was rigorously assessed by Shehni Yailagh (31). The results of this analysis yielded a CVI of 0.89 and a CVR of 0.92, providing strong evidence of the scale's comprehensive coverage of the construct of adaptive behavior.

2.3.2. The Problem-Solving Style Questionnaire (PSSQ)

The Problem-Solving Style Questionnaire (PSSQ) is a 24-item self-report measure designed to assess children's problem-solving approaches (32). Each item presents three response options: "Yes" (1 point), "Somewhat" (0 point), and "No"

(0 points). Participants indicated how well each statement reflects their typical problem-solving behavior. The score range of this questionnaire is 0 to 24. Total scores are calculated by summing responses across all items, with higher scores reflecting more adaptive and effective problem-solving strategies, while lower scores suggest reliance on less effective or maladaptive approaches. Razm and colleagues (33) conducted a comprehensive content validity analysis of the PSSQ, resulting in a CVI of 0.93 and a CVR of 0.90. These findings provided robust evidence of the scale's comprehensive coverage of the construct of problem-solving styles. Moreover, Razm and colleagues (33) further supported the instrument's reliability by demonstrating a Cronbach's alpha coefficient of 0.76 for the entire questionnaire. The present study adds to this growing body of evidence, demonstrating a strong overall Cronbach's alpha coefficient of 0.81 for PSSQ, suggesting high internal consistency and reliable measurement of problem-solving styles. These findings support the PSSQ's suitability for investigating individual differences in problem-solving approaches.

2.4. Procedure

Following the acquisition of ethical approval, a group of 120 students with dyslexia, attending counseling centers in certain districts of Tehran, Iran, were identified. Informed consent was obtained from the parents of these students, and a random sample of 30 students was selected to participate in the study. Half of the participants were randomly assigned to a CBPT group. This group underwent eight 60-minute sessions weekly, guided by Drewes's (34) protocol (Table 1). The CBPT sessions were conducted by a psychotherapist who had received advanced training and attended specialized workshops. The control group received no intervention at the beginning of the study. Both groups completed pre-test, post-test, and follow-up assessments to evaluate their behavioral adjustment and problem-solving skills. Forty-five days after the follow-up, the control group also received an appropriate intervention. Throughout the research process, the study adhered to ethical principles. Informed consent was obtained from the parents or guardians of all participants. The confidentiality of participants' information was strictly maintained.

Table 1: An overview of the cognitive-behavioral play therapy sessions

Sessions	Content
1	Introduction and Relationship Building: The first session focuses on establishing a safe and supportive environment for the child and therapist to get to know each other. Through play and drawing activities, the therapist encourages and strengthens the child's relationships with others.
2	Introduction to Emotions: In this session, the child is introduced to the concept of emotions and learns to identify the four primary emotions: sadness, anger, happiness, and fear. The therapist explains the importance of expressing emotional experiences appropriately. The child is taught self-monitoring skills to recognize and label different emotions using picture cards, playdough, pantomime, and role-playing.
3	Understanding the Emotional Triangle: The child learns about the relationship between thoughts, behaviors, and emotions (the "magic circle") using drawing with crayons, storytelling, and coloring exercises. These activities help the child differentiate between thoughts and emotions.
4	Linking Thoughts, Behaviors, and Emotions: Through engaging games like "detective," "missing link," and "spider web," the child explores how thoughts, behaviors, and emotions are interconnected. Positive affirmations are also introduced to reinforce positive thinking patterns.
5	Identifying Automatic Thoughts and Cognitive Distortions: Using traffic signs and a police-themed game, the child learns about automatic thoughts and cognitive distortions. The goal is to help the child identify these unhelpful thinking patterns.
6	Cognitive Restructuring: The child practices cognitive restructuring techniques using drawing, finger puppets, and modeling to identify and replace maladaptive thoughts with positive self-talk.
7	Relaxation Techniques: The child learns relaxation skills through the "jellyfish rock" game and diaphragmatic breathing exercises involving bubbles, flowers, and candle-making activities.
8	Problem-Solving Strategies: The child develops problem-solving skills through "news reading" and "animal power" games, enhancing positive emotions and coping mechanisms.

2.5. Statistical Analyses

Descriptive statistics, including means and standard deviations, were employed to analyze the central tendency and variability of the data. The normality of the dependent variables in all groups was assessed using the Shapiro-Wilk test. Levene's test was used to evaluate the homogeneity of variances. To assess the effect of the CBPT intervention on behavioral adjustment and problem-solving skills, a repeated-measures ANOVA was conducted. Additionally, post-hoc tests with Bonferroni correction were planned to identify specific group differences at each time point. Independent t-tests were used to compare the pre- and post-intervention scores for each group. Chi-square tests were conducted to examine differences in categorical variables (e.g., gender, age group) between the experimental and control groups.

3. Results

The study sample comprised 30 students, equally divided between the experimental (CBPT) and control groups. The sample included 15 girls and 15 boys, representing grades second to fifth in elementary school. The age range of the participants was 8 to 11 years, with an average age of 10.12 ± 2.35 years. The mean age of students in the CBPT and the control groups was 10.55 ± 2.18

years, and 9.69 ± 2.51 years, respectively ($P=0.325$). The CBPT group consisted of 9 (60.0%) boys and 6 (40.0%) girls, while the control group had 7 (46.7%) girls and 8 (53.3%) boys ($P=0.472$). No statistically significant difference was found when comparing the groups based on demographic variables.

The results indicated that the CBPT intervention significantly improved behavioral adjustment and problem-solving skills in the experimental group compared with the control group. Specifically, the experimental group showed a significant decrease in behavioral adjustment scores from pre-test (229.06 ± 22.37) to post-test (209.86 ± 20.20), while the control group remained relatively stable (pre-test: 229.26 ± 25.10 ; post-test: 228.40 ± 24.12). Additionally, the experimental group demonstrated significantly higher scores on problem-solving skills at post-test (10.20 ± 2.36) and follow-up (10.46 ± 2.55) compared with the control group (post-test: 7.80 ± 2.30 ; follow-up: 7.93 ± 2.28). These findings suggested that CBPT is an effective intervention for enhancing behavioral adjustment and problem-solving skills in individuals with dyslexia (Table 2).

Repeated-measures ANOVA revealed significant main effects for both behavioral adjustment and problem-solving skills across the three measurement stages (pre-test, post-test, and follow-up) ($P < 0.001$). Additionally, the results

Table 2: Means and standard deviations of behavioral adjustment and problem-solving skills

Variables	Phases	CBPT group	Control group	P (between-group)
		Mean±SD	Mean±SD	
Behavioral adjustment	Pre-test	229.06±22.37	229.26±25.10	0.982
	Post-test	209.86±20.20	228.40±24.12	0.030
	Follow-up	208.13±20.07	229.13±25.06	0.172
P (within-group)		0.012	0.989	-
Problem-solving skills	Pre-test	7.33±1.87	7.66±2.09	0.652
	Post-test	10.20±2.30	7.80±2.30	0.009
	Follow-up	10.46±2.55	7.93±2.28	0.008
P (within-group)		0.001	0.738	-

CBPT: Cognitive-Behavioral Play Therapy; SD: Standard Deviation

Table 3: Bonferroni post-hoc comparisons for CBPT and control group

Variables	Groups	Pre-test		Post-test		Follow-up	
		MD	P	MD	P	MD	P
Behavioral adjustment	CBPT - Control	0.20	0.999	18.53	0.001	21.00	0.001
Problem-solving skills	CBPT - Control	0.33	0.650	2.40	0.009	2.53	0.008

CBPT: Cognitive-Behavioral Play Therapy; MD: Mean difference; P: P-value

demonstrated significant differences in behavioral adjustment and problem-solving skills between the CBPT and control groups ($P < 0.001$). These findings suggested that the CBPT intervention had a positive effect on both outcomes in comparison with the control group.

Table 3 presents the results of Bonferroni post-hoc comparisons conducted to examine the differences in behavioral adjustment and problem-solving skills within the CBPT group at the pre-test, post-test, and follow-up stages. The results indicated significant improvements in both behavioral adjustment and problem-solving skills within the CBPT group from pre-test to post-test ($P < 0.001$). This suggested that the CBPT intervention had a positive effect on these outcomes within the group over a short period. The significant differences persisted from the post-test to the follow-up, demonstrating the sustained effects of the intervention.

4. Discussion

This study examined the efficacy of CBPT in enhancing behavioral adjustment and problem-solving skills among students diagnosed with dyslexia. The findings of this study provided compelling evidence for the effectiveness of CBPT in improving behavioral adjustment and problem-solving skills among students with dyslexia. These findings were consistent with prior research (25, 27). Javanbakhsh and colleagues (25) observed that

CBPT positively influenced children's classroom behavior, group participation, cooperation, and attitudes towards authority figures in the primary school, ultimately leading to improved academic performance. Additionally, Rezaeerezan and colleagues (27) posited that CBPT could be beneficial in addressing expressive language disorders among bilingual children.

Play is an intrinsic human activity, particularly during childhood. It has a pivotal role in a child's development, fostering emotional, cognitive, and social growth. This study explored the therapeutic potential of play, examining its capacity to address emotional challenges and promote well-being. By its very nature, play engages a child in enjoyable activities, inducing feelings of happiness and exhilaration (34). Through various forms of play, both individual and group-based, children interact with diverse toys and materials. This engagement facilitates a deeper exploration of their own emotions and thoughts (27). Play provides a safe and supportive environment for children to confront and process their emotions and thought processes. It allows them to explore their fears, anxieties, and conflicts without fear of judgment or reprisal. Through play, children can gain valuable insights into their inner world, identify patterns, and develop coping mechanisms for challenging emotions (22). Play serves as a bridge between a child's internal world and the external environment. It empowers them to exert control over external objects, symbolizing their ability

to manage their own emotions and thoughts. Play therapy, in particular, offers a structured setting for children to express and explore their troubling emotions and internal conflicts (22). By openly expressing their emotions through play, children not only confront them but also learn to regulate and manage them effectively. This process leads to emotional well-being and self-discovery, empowering children to recognize their inner strengths and capabilities. Play therapy, in this context, not only has therapeutic values but also instills social skills and a sense of mastery (24).

Adaptation refers to a child's ability to adjust to their environment. Consequently, a child's behavioral adaptation increases. Adaptation is a series of actions and behaviors that an individual exhibits in novel situations and conditions to provide appropriate responses to existing stimuli (30). CBPT is conducted as the child progresses through various stages of therapy: the initial stage (assessment stage), the middle stage, and the final stage. Following preparation, the assessment stage for cognitive-behavioral play therapy commences. In the middle stage, the therapist develops the treatment plan, focusing on enhancing the child's self-control, sense of progress, and acquisition of more adaptive responses to cope with specific situations. Generalization and relapse prevention are employed in the middle stage to teach the child new skills in various contexts. In the final stage, the child and their family are prepared to conclude therapy. Cognitive-behavioral play therapy, emphasizing the various dimensions of a child's behavioral adaptation, can lead to improved behavioral adaptation in children with specific learning disabilities, including those with dyslexia indicators (26).

Play is indeed a symbolic language for children that allows them to learn within its framework, become aware of the consequences of their cognitions and behaviors, and facilitate and strengthen inner resources through non-verbal communication. Through the process of play therapy, children can engage in emotional catharsis and gain mastery over their surroundings, which in turn motivates them to continue playing in a way that they enjoy. This is why play is used as a therapeutic approach to address children's problems (22). Play therapy acts as a psychological catharsis for children, reducing the intensity of their frustrations and providing them with useful

problem-solving strategies during play. This way, it can alleviate feelings of hopelessness, anxiety, and behavioral problems in these children (25). CBPT allows children with learning disabilities to access their inner world, identify the source of their problems, and develop the readiness to change (23). The use of malleable materials, such as playdough, teaches children that they can overcome negative emotions. Additionally, the enjoyment derived from such play relieves children of anxiety, worries, and behavioral problems.

Problem-solving skills enable individuals to identify the best option for solving a problem and evaluate the positive and negative aspects of their choices (17). CBPT allows children to observe and learn the sub-behaviors involved in a cognitive or behavioral act from the beginning to the end, and to direct their learning process in a way that increases the efficiency of their mental processes in relation to time and place, and enables them to generalize (27). This problem-solving and generalization ability to similar situations in time and place leads to the formation and strengthening of problem-solving skills. Therefore, cognitive-behavioral play therapy improves problem-solving skills in these children.

4.1. Limitations

There are certain limitations to this study. First, the relatively small sample size of 30 participants may restrict the generalizability of the findings to a broader population of students with dyslexia. Additionally, the use of convenience sampling, while being practical, may introduce potential biases into the sample, limiting the external validity of the results. Furthermore, the study's focus on a single comparison group may limit the comprehensive understanding of the effectiveness of different interventions or other factors influencing behavioral adjustment and problem-solving skills. The relatively short follow-up period of 45 days may not capture the long-term effects of CBPT on these outcomes. Finally, the reliance solely on quantitative data may limit the depth of understanding regarding the participants' experiences and the mechanisms through which CBPT may be effective. Incorporating qualitative data could provide valuable insights into these aspects.

5. Conclusions

The findings of this study, along with the

supportive evidence from previous research, highlighted the efficacy of CBPT in addressing the behavioral and emotional challenges faced by students with dyslexia. The inherent therapeutic mechanisms of play therapy, including its ability to promote engagement, enhance self-awareness, facilitate problem-solving, and foster emotional regulation, contribute to its effectiveness in improving the overall well-being of children with dyslexia.

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Authors' Contribution

Ali Vosoughi Kalantari: Contributed to the conception and design of the study, participated in data analysis and interpretation, drafted the manuscript and critically reviewed it for important intellectual content. Fatemeh Sadat Marashian: Conducted literature reviews and contributed to the methodology development, assisted in data collection and analysis, reviewed the manuscript for significant intellectual content. Zahra Dasht Bozorgi: Involved in data collection and management, helped analyze the results and provided substantial input on the statistical analysis, contributed to review the manuscript for significant intellectual content. Fariba Hafezi: Provided clinical insight and expertise during the design of the study, contributed to the interpretation of data and the discussion section, reviewed the manuscript for significant intellectual content. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work, such as the questions related to the accuracy or integrity of any part of the work.

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Ethical Approval

This study was approved by Islamic Azad University with the code of IR.IAU.AHVAZ.

REC.1403.043. Also, written informed consent was obtained from the participants.

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