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Parent-child play therapy effect on 10 to 12-Year-old student' reading performance: a case of chinese male students with learning disabilities

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Abstract

Background Children with learning disabilities often face challenges in academic performance, particularly in reading. Parent-child play therapy has emerged as a potential intervention to address these challenges by fostering a supportive learning environment and enhancing parent-child communication.

Objectives This study investigated the effectiveness of parent-child play therapy in improving reading performance among 10-12-year-old children with learning disabilities.

Methodology A quasi-experimental pre-test-post-test design with a control group was employed to assess the impact of parent-child play therapy on reading performance. In 2023, the sample consisted of 100 parents of 10-12-year-olds from specialized child clinics in Shaanxi city. This pool randomly assigned 60 participants meeting inclusion criteria to the experimental group ($n=30$) or the control group ($n=30$). The experimental group participated in 10 sessions of 90 min of parent-child play therapy conducted weekly, while the control group did not receive any intervention.

Results The MANCOVA reveals the intervention's significant effect on combined literacy dimensions for the experimental versus control group, confirmed across all test statistics. A high partial eta squared ($\eta^2 = 0.94$) and power (0.99) demonstrate a strong intervention impact on reading dimensions, indicating that the intervention explains 94% of the variance in literacy outcomes, with a 99% probability of detecting the observed effects if they exist. Further ANCOVA analysis highlights specific improvements in individual literacy dimensions. The experimental group showed significantly higher adjusted posttest means in Word Reading (Adjusted Mean = 83.71, F = 10.52, $p=0.001$, $\eta^2 = 0.41$) and Word Chain (Adjusted Mean = 88.64, F = 24.63, $p=0.001$, $\eta^2 = 0.62$), indicating significant effects. The Rhyme Test also yielded substantial gains (Adjusted Mean = 96.92, F = 18.32, $p=0.001$, $\eta^2 = 0.54$), alongside significant improvements in Comprehension of Text ($p=0.009$, $\eta^2 = 0.36$) and Word Comprehension ($p=0.001$, $\eta^2 = 0.50$). However, dimensions such as Picture Naming ($p=0.134$) and Category Symbols ($p=0.058$) did not show significant differences, suggesting limited intervention effects on these skills.

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Conclusions This study's findings suggest that parent-child play therapy can effectively improve reading performance in children with learning disabilities. By strengthening parent-child communication skills and fostering a supportive environment, parent-child play therapy may enhance the self-confidence of children with learning disabilities, thereby facilitating significant improvements in reading skills. These findings can guide educators and therapists in designing interventions that emphasize parent-child interaction to improve literacy outcomes in educational settings. Furthermore, therapeutic settings may benefit from incorporating structured play therapy as a core strategy to target specific reading dimensions, such as Word Reading and Comprehension of Text.

Keywords Parent-child play therapy, Reading performance, Learning disability

Background

An exceptional child requires special education and specialized support to fully harness their human potential [1, 2]. These children display distinct characteristics or exceptional traits that set them apart from their peers [2, 3]. Among exceptional children, those with learning disabilities (LD) face unique challenges, particularly in academic settings, where their difficulties with learning, attention, or processing information often become apparent. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), Specific Learning Disorder (SLD), which encompasses impairments in reading, writing, and mathematics, affects 2 to 10 per cent of children, with boys being three times more likely than girls to receive this diagnosis [4]. Typically, these children are not identified until they enter school, where their struggles with academic tasks reveal the extent of their learning difficulties [3, 5].

In the DSM-5 framework, SLD has replaced earlier categorizations of learning disorders such as dyslexia (reading disorders), dysgraphia (writing disorders), and dyscalculia (mathematics disorders) as distinct entities. Instead, these are now recognized as specifiers under the broader umbrella of SLD [2, 6]. Neurocognitive theories emphasize the role of specific brain structures, particularly the cerebellum and the frontal lobes, in developing learning disorders. Traditionally associated with motor coordination, the cerebellum is also implicated in cognitive processing. At the same time, the frontal lobes play a critical role in executive functions—cognitive processes that include working memory, attention regulation, problem-solving, and planning [7, 8]. Dysfunction in these regions, particularly regarding executive function, has been linked to learning disorders, affecting a child's ability to perform complex, goal-directed tasks [9, 10].

Among the subtypes of SLD, reading disorders (commonly referred to as dyslexia) are the most prevalent, affecting approximately 85 to 90 per cent of children diagnosed with SLD [10, 11]. Dyslexic children often exhibit normal language development in spoken communication but struggle significantly when recognizing printed symbols or reading fluently [12]. They may need help recognizing letters, memorizing word patterns, or understanding the structure of written language. This challenge is particularly critical because reading is a foundational skill that supports all other academic learning. Failure to address reading difficulties early can have a cascading effect on a child's overall academic achievement and self-esteem [12]. Given these concerns, early interventions designed to improve reading skills for children with SLD are indispensable [1, 13].

One emerging approach to supporting children with LD, particularly in improving reading skills, is play therapy. Rooted in developmental and psychoanalytic theories, play therapy leverages play as a medium for children to express themselves, process emotions, and develop cognitive skills in a non-threatening environment [14]. Based on Carl Rogers' humanistic theory, child-centred play therapy emphasizes the therapeutic value of allowing children to express themselves in an environment of unconditional positive regard, empathy, and acceptance [14]. This therapeutic model allows children to feel empowered and accepted, fostering emotional regulation and behavioural improvements. Such emotional regulation, in turn, is believed to positively influence cognitive functions like attention and working memory, which are directly related to reading success [9, 15].

A particularly promising variant of this approach is *parent-child play therapy*, also known as filial therapy. Developed by Garry Landreth and Sue Bratton, filial therapy strengthens the emotional bond between parents and children by involving parents directly in therapeutic play sessions [15, 16]. This model is informed by attachment theory, which emphasizes the importance of a secure parent-child relationship for healthy emotional and cognitive development [17]. According to Bowlby's attachment theory, a secure attachment provides children a safe base to explore the world and develop the confidence necessary to learn new skills [17, 18]. Parent-child play therapy aims to leverage this dynamic by training parents to become co-facilitators in their children's emotional and cognitive development. By using techniques such as reflecting feelings and modelling empathy, parents learn to create a supportive environment that enhances their child's emotional security and cognitive focus [18].

The relevance of parent-child play therapy to children with reading disabilities lies in its potential to improve emotional and cognitive outcomes. Emotional factors,

such as anxiety and low self-esteem, are common among children with learning disorders and can significantly impede their ability to focus on academic tasks like reading [12]. Play therapy, by addressing emotional challenges through relational and cognitive-behavioural mechanisms, offers a pathway to enhance attention, executive function, and motivation, which are critical to reading development [9, 19]. Despite the demonstrated emotional and social benefits of play therapy [19], limited research investigates explicitly its impact on academic performance, particularly reading skills in children with SLD. Although studies suggest that therapeutic play can improve attention and cognitive flexibility, which are crucial for reading [20], the direct contribution of parent-child play therapy to reading enhancement is an underexplored area in the literature [21–24].

There are, however, promising indications that parent-child play therapy could yield significant academic benefits. For example, Bratton and Ray's meta-analysis found that parent involvement in play therapy contributes significantly to children's emotional and cognitive development, which are prerequisites for academic success [14]. Additionally, Adlerian play therapy, which integrates the principles of individual psychology with play, has shown effectiveness in improving behavioural and educational outcomes in children with learning disorders [25]. Through its emphasis on parent-child interaction and emotional regulation, parent-child play therapy may help children develop the executive functions necessary for reading, such as attention control, working memory, and cognitive flexibility [9].

Given the potential consequences of unresolved learning disorders on academic achievement and emotional well-being, interventions that engage families and enhance parent-child relationships are essential [7, 9]. Research shows that poor parent-child interactions can exacerbate emotional and behavioural problems in children, further complicating their ability to succeed academically [26–28]. Thus, the present study aims to address this gap by evaluating the effectiveness of parent-child play therapy on improving reading performance in students aged 10 to 12 with learning disabilities.

By combining theoretical perspectives from attachment theory, executive function research, and developmental psychology, this study seeks to build on the existing evidence base and explore how parent-child play therapy can contribute to improving reading outcomes for children with SLD [29–37]. This is particularly important given the lack of studies that directly examine the role of play therapy in academic skills development, especially in reading. Therefore, this research will enrich the existing literature and provide a theoretical framework for future interventions targeting emotional and educational needs in children with learning disorders.

The present study

The gap and rationale for this study lie in the limited research addressing the efficacy of parent-child play therapy, specifically targeting reading performance in 10 to 12-year-old male students with learning disabilities [1, 12, 23]. While interventions for learning disorders, including play therapy, have been widely researched, most focus on younger children or emphasize broader outcomes such as emotional literacy and behaviour management [2, 20, 35]. Emotional and behavioural factors, though relevant to academic performance, were not included in this study's measures to allow for a concentrated assessment of reading skills, given the specific need to address reading deficiencies in this age group. Focusing solely on reading performance clarifies how parent-child play therapy might directly support academic outcomes without the confounding effects of emotional or behavioural variables.

The focus on 10 to 12-year-old male students was chosen due to the underrepresentation of gender-specific interventions in this demographic. Existing evidence suggests that boys in this age group are at a heightened risk of reading difficulties compared to their female counterparts, making this a critical area for intervention [5, 29, 31]. By narrowing the scope to male students, the study aims to generate findings that could inform gender-sensitive approaches to literacy interventions.

Additionally, this study's geographic and cultural context provides unique insights into the application of parent-child play therapy. The research was conducted in a region where family-centered interventions are underutilized in addressing academic challenges despite strong cultural emphasis on familial roles in child development [13, 38]. Highlighting this context underscores the broader applicability of the findings to similar cultural settings, where parent-child dynamics play a pivotal role in educational outcomes.

Additionally, previous research highlights the importance of early intervention and family involvement in addressing learning disorders [4, 7, 23]. However, a gap remains in studying parent-child play therapy's impact on reading skills in older children, especially within this demographic. Learning disorders in reading, in particular, carry long-term academic and socio-emotional implications, reinforcing the need for tailored interventions at later developmental stages. While earlier studies have primarily centred on younger children, few have examined the effectiveness of such interventions for preadolescent populations, leaving a critical gap in understanding how these approaches might benefit older students [36, 39, 40]. Investigating parent-child play therapy's effects on reading performance in this age group aims to fill a crucial gap in the literature, ultimately informing therapeutic and educational practices to support children's

academic and socio-emotional needs. More specifically, the following question was raised:

Does parent-child play therapy significantly enhance reading performance among 10 to 12-year-old male students with learning disabilities?

Methodology

This study employed a quasi-experimental pretest–post–test-retest design with a control group. The flowchart of the methodology is presented in Table 1.

The study population consisted of mothers of children aged 10 to 12 years diagnosed with learning disorders residing in Xi'an, Shaanxi, in 2023. The recruitment process began with identifying potential participants through school records from institutions specializing in learning disabilities. 100 mothers were invited via email, with contact information provided by these schools. The invitation included information about the study's purpose, procedures, and time commitment, allowing mothers to make an informed decision regarding participation.

Of those invited, 60 mothers expressed interest in participating and met the initial inclusion criteria. These mothers then participated in a diagnostic interview conducted by a licensed therapist to confirm eligibility. Ultimately, 40 mothers who met the inclusion criteria and agreed to adhere to the full sessions were selected through purposive sampling and randomly assigned to either the experimental or control group, with 20 mothers in each.

Inclusion criteria included (1) having at least a high school diploma, (2) no psychiatric history, and (3) a child aged 10 to 12 years with a diagnosed learning disorder. Exclusion criteria included participation in other concurrent educational or psychological interventions and missing more than two sessions during the treatment period. The experimental group participated in a structured program of parent-child play therapy sessions designed to target reading performance improvement. The control group did not participate in the intervention sessions but continued their usual routines. No structured intervention was applied to the control group; however, some natural variations in parent-child interaction or reading activities may have occurred. These natural interactions were not controlled or standardized, and any incidental engagement in reading-related activities or support was recorded at the post-test stage to account for possible influences on outcomes.

The exclusive involvement of mothers as participants was based on prior research suggesting that mothers typically assume primary caregiving roles and are more likely to engage in structured interventions with their children. This decision aligns with cultural norms in the study's geographic context but may limit the generalizability of findings to fathers or other caregivers.

Purposive sampling was employed to ensure the inclusion of participants who met the specific study criteria, allowing for a focused examination of the intervention's effects. Random assignment within this sampling method mitigates potential bias by balancing confounding variables across groups and enhancing the internal validity of the findings.

To observe ethical considerations, after obtaining informed consent and stating the purpose of the research, the participants were reminded that they could leave the sessions at any time they wished. In the present study, mothers received parent-child play therapy training in 10 sessions lasting 90 min once a week, and then children

Table 1 Flowchart representing Study Design and Methodology

Step	Description
Step 1: Participant Identification and Recruitment	Participant identification through school records of institutions specializing in learning disabilities. Email invitations to 100 mothers with children aged 10–12 years diagnosed with learning disorders. Study details, including purpose, procedures, and time commitment.
Step 2: Eligibility Screening	Expression of interest by 60 mothers meeting initial inclusion criteria. Diagnostic interviews by a licensed therapist for eligibility confirmation. Selection of 40 eligible mothers through purposive sampling.
Step 3: Group Assignment	Random assignment of 40 participants into two groups: Experimental Group ($n=20$) - Structured parent-child play therapy sessions. Control Group ($n=20$) - Usual routines with no structured intervention.
Step 4: Pretest Phase	Administration of Reading and Dyslexia Test to all participants before intervention.
Step 5: Intervention Phase	Ten weekly sessions of 90-minute parent-child play therapy based on Landreth & Bratton's method for the Experimental Group. Daily routines without structured interventions for the Control Group.
Step 6: Posttest Phase	Administration of Reading and Dyslexia Test for both groups. Collection of reports on general parent-child interactions, particularly reading habits.
Step 7: Data Analysis	Utilization of SPSS software version 23. Analysis of covariance (ANCOVA) to control for pre-existing differences and extraneous variables.
Step 8: Ethical Considerations and Validation	Informed consent from all participants. Withdrawal option at any time. Validation of intervention design through expert review. Preliminary sessions for methodology refinement.
Step 9: Results Interpretation and Discussion	Comparison of pretest and posttest reading performance outcomes. Consideration of external influences such as home environment and parental involvement. Conclusions on the effectiveness of parent-child play therapy in improving reading performance.

with learning disorders were assessed using tools. The following instruments were used for data collection.

Reading and dyslexia test

This test was valid and reliable [27] and was normed on 1614 individuals (770 male and 844 female students). After data collection and statistical operations were performed for each city grade, mean and norm scores were calculated. This test consists of ten sub-tests, including a word reading test, a rhyme test, a phoneme deletion test, a non-word reading test, a picture naming test, a letter symbols test, and a word symbols test. The students took the assessment one-on-one with the administrator before and after the treatment.

The result of the factor analysis explained a total of 62.03 per cent of the variance in the sub-tests of the test. The content validity of the sub-tests was also based on the accurate reading of words and sentences and, ultimately, their comprehension by learners, and its validity was confirmed by professors and experts (28, 29). In this research, the test's validity was also assessed by calculating the correlation of the sub-test scores with the total test scores, ranging from 0.87 to 0.89, and the overall reliability of the test using Cronbach's alpha coefficient was found to be 0.82. Also, the results of exploratory factor analysis on the test's sub-scales showed that this test consists of two main factors. The first factor includes tests of high-frequency words, phoneme deletion, and reading non-words and pseudowords, and the second factor includes tests of word chains, rhyming, picture naming, text comprehension, and symbols. In addition to these instruments, a Therapeutic Protocol was used, presented in Table 2.

Procedure

After selecting the sample through convenience sampling from among the mothers of students aged 10–12 years with learning disorders visiting Xi'an, Shaanxi, 60 participants were chosen (in total, 20 ten-year-old children, 20 eleven-year-old children, and 20 twelve-year-old children). Subsequently, 30 individuals were randomly placed in the experimental group and 30 in the control group. Initially, both groups were assessed using the Reading and Dyslexia Test in the pretest phase.

Ten sessions of 90-minute parent-child play therapy were conducted weekly in the experimental group, based on Landreth's [23] parent-child play therapy training. These sessions were structured around guided interactions between parents and children to foster emotional connection, improve communication, and influence reading outcomes. To ensure a robust comparison, parents in both groups were asked to report on their general interactions with their children, particularly related to reading habits, learning support, and emotional involvement, as this could affect outcomes. However, no specific interventions were given to the control group beyond their usual daily activities.

Moreover, efforts were made to control outside factors that might influence reading performance. Information was collected on the type of reading instruction students received during the study in both groups, ensuring that any observed differences could be more confidently attributed to the play therapy intervention. Additionally, the instructional design for the play therapy sessions was validated by five child development experts, who assessed the content structure, timing, and overall program process. Preliminary sessions were conducted with several parents to fine-tune the intervention.

The research data were analyzed using SPSS software version 23, and the statistical method of analysis of covariance (ANCOVA) was employed to account for any potential pre-existing differences between the groups and control for extraneous variables. This method helped isolate the impact of play therapy on reading performance. However, it is acknowledged that other uncontrolled factors, such as variations in home environment and parental involvement, could have influenced the results.

Results

ANCOVA was employed to analyze the data, controlling for pretest scores to assess the effectiveness of parent-child play therapy on children's reading performance. Tables 3 and 4, and 5 present the adjusted posttest means and significance levels.

In the word reading dimension, for example, while the control group showed minimal change from pretest ($M = 78.50$, $SD = 13.79$) to posttest ($M = 79.07$, $SD = 14.19$), the experimental group demonstrated a clear improvement. Their posttest means ($M = 83.71$, $SD = 14.04$) significantly exceeded their pretest mean ($M = 74.57$, $SD = 16.34$), indicating a positive impact from the intervention. Similarly, in the word chain dimension, a substantial posttest improvement was noted in the experimental group, which rose from a pretest mean of $M = 75.85$ ($SD = 4.93$) to a posttest mean of $M = 88.64$ ($SD = 14.30$). In contrast, the control group's scores remained stable between the pretest and posttest at $M = 73.28$ ($SD = 4.65$), further underscoring the intervention's effect on the experimental group.

The rhyme test results also highlight a marked difference. In contrast, the control group displayed only a minor change from the pretest ($M = 75.42$, $SD = 7.52$) to the posttest ($M = 76.92$, $SD = 7.40$), the experimental group's scores rose significantly from $M = 79.00$ ($SD = 10.54$) to $M = 96.92$ ($SD = 9.65$), suggesting enhanced phonological awareness due to the intervention.

Table 2 Therapeutic protocol (Play Therapy in Landreth & Bratton's Method, 2006)

Session	Objectives	Content	Assignments
First	Familiarity with basic concepts, objectives, and main principles of CP education" in English.	Introducing group members to each other. Discuss fundamental topics such as encouragement and discipline of parents, empathy with parents, presenting the challenges of parental communication, and providing an overview of the subjects of educational sessions and essential concepts related to them (referring parents to a special parents' handbook) and teaching the method of reflective response to children's feelings, emotions, wishes, and needs and completing the reflective response sheet. Performing the role of communication therapeutic skills by group members. Presenting a film to teach observation skills to parents.	Paying attention to one of the child's physical characteristics. Practicing reflective responses. Bringing a child's photo. Practicing 30-second attention burst.
Second	Teaching the fundamental principles of 30-minute play sessions for parents and children.	An informal and friendly exchange of information and homework review from the previous session. Sharing parents' experiences and encouraging them when participating in group activities. Explaining the fundamental principles of 30-minute parent-child play sessions. Full parental involvement with the child. Introduce and present a collection of toys needed for play sessions and explain the logic behind using each, especially toys parents may have concerns about. Choosing a specific time and place for play sessions. Introducing and performing the role of basic play session skills (live or through video presentation).	Preparation of toy list. Determining the time and location of play and reporting during the session.
Third	Teaching the do's and don'ts of 30-minute parent-child play sessions.	Reviewing homework from the previous session. Introducing the do's and don'ts of play sessions. Including the do's: preparing the initial structure of play sessions (environmental conditions), giving the child the responsibility to lead the session, actively participating in the child's play, describing what you see, reflecting the child's feelings, setting clear and consistent boundaries, following the child's lead, and encouraging their effective contributions in play. Don'ts of play sessions: avoid criticizing any of the child's behaviours, refrain from praising the child unnecessarily, avoid asking the child-directed questions, do not allow the interruption of play sessions, refrain from providing information or instruction on the topic, avoid giving moral lectures to the child, do not initiate new activities during play, and avoid being passive or silent during play.	Completing the toy list. Preparing appointment cards for each session. Reviewing the dos and don'ts of each session before starting the play. Conducting the play session at the designated time and place. Possibility of recording and documenting the content of play sessions at home.
Fourth	Teaching parents how to set limits for their child	Reviewing homework from the previous session. Implementing the three-step limit-setting process (referring parents to a special parents' handbook). Role-playing or showing a film about the necessary skills in play sessions and the three-step limit-setting process.	Completing sheet for the specific exercise of limit-setting. Reviewing previous content before starting the play session. Conducting the play session at the designated time and place. Possibility of recording and documenting the content of play sessions at home.
Fifth	Parental support and encouragement during the learning and practice of play session skills.	The main focus of this session is to support and encourage parents during the learning and practice of play session skills. Therefore, no new topics are introduced in this session to prevent parents from feeling overwhelmed or incapable. Similar to other educational sessions, most of the session time is spent on parents' reports from home play sessions and active participation in reviewing recorded sessions. Generally, this session is dedicated to reviewing and reinforcing the skills presented in previous sessions, and no new skills are introduced.	Kiss sandwich. Reviewing previous content before starting the play session. Conducting the play session at the designated time and place. Possibility of recording and documenting the content of play sessions at home. Completion sheet for the specific exercise of limit-setting.
Sixth	Focus on increasing parental self-efficacy in child-rearing	The self-efficacy enhancement program in child rearing involves building parental confidence and self-esteem to encourage active responsiveness from their children to boost their self-esteem. It includes reviewing and discussing information, homework, and parents' reports from play sessions. It also includes reviewing and discussing recorded play sessions, educating parents on giving choices to children and reviewing relevant materials, teaching responsibility and decision-making to children, role-playing/showing a film about play session skills, and giving choices to the child.	Reviewing previous content before starting the play session. Conducting the play session at the designated time and place. Possibility of recording and documenting the content of play sessions at home. Practising the right to choose outside of play sessions.

Table 2 (continued)

Session	Objectives	Content	Assignments
Seventh	Teaching how to provide confidence-building responses in children.	Review and discuss information, homework, and parents' reports from play sessions. Review and discuss recorded play sessions and parents' responses, creating confidence-building skills specific to this session.	Reviewing previous content before starting the play session. Conducting the play session at the designated time and place. Possibility of recording and documenting the content of play sessions at home. Responding to confidence-building exercises (during play sessions and outside of playtime). Writing letters to highlight positive characteristics of the child.
Eighth	Teaching how to provide encouraging responses in children	Reviewing and discussing information along with reviewing homework and parents' reports from play sessions. Reviewing and discussing recorded play sessions. Parents role-playing/showing a film about the skill of providing encouraging responses.	1. Reviewing previous content before starting the play session. 2. Conducting the play session at the designated time and place. 3. Practicing encouragement versus reward. 4. Possibility of recording and documenting the content of play sessions at home.
Ninth	Extending play session skills to everyday situations in a child's life.	Reviewing and discussing information along with reviewing homework and parents' reports from play sessions. Reviewing and discussing recorded play sessions. Parents' practical skills outside of play sessions.	1. Reviewing previous content before starting the play session. 2. Conducting the play session at the designated time and place. 3. Presenting a report on implementing limits outside of play sessions. 4. Presenting a report on cuddling and touching the child during the week. 5. Playing a wrestling game between the father, mother, and child. 6. Presenting a report on how the parent dealt with one of the child's issues outside of play sessions with skills learned during play sessions.
Tenth	Reviewing all learned topics and discussing changes in children's behaviour.	Reviewing all the important topics that each parent has learned. Discussion and conversation about the changes that have occurred in the situation and behaviour of children compared to 10 weeks ago. Reviewing initial information from specific parent information forms. Encouraging positive feedback among group members for the good changes in them.	Emphasis on the continuity of play sessions at home.

Table 3 Descriptive statistics for pretest and posttest scores

Dimension	Group	Pretest M	Pretest SD	Posttest M	Posttest SD
Word Reading	Control	78.50	13.79	79.07	14.19
	Experimental	74.57	16.34	83.71	14.04
Word Chain	Control	73.28	4.65	73.28	4.65
	Experimental	75.85	4.93	88.64	14.30
Rhyme Test	Control	75.42	7.52	76.92	7.40
	Experimental	79.00	10.54	96.92	9.65
Picture Naming	Control	111.85	10.93	111.14	13.16
	Experimental	117.40	5.63	117.70	7.48
Text Comprehension	Control	80.50	11.25	80.64	12.50
	Experimental	80.57	10.6	85.28	10.18
Word Comprehension	Control	88.35	10.83	87.71	13.29
	Experimental	87.07	15.75	102.70	14.15
Phoneme Deletion	Control	61.14	4.52	61.14	4.25
	Experimental	66.85	3.71	62.07	5.51
Pseudo Words	Control	63.71	13.24	64.71	13.88
	Experimental	87.28	19.81	71.64	27.28
Letter Symbols	Control	84.64	8.31	86.00	8.77
	Experimental	92.57	6.08	90.92	9.26
Category Symbols	Control	81.35	6.26	81.67	6.02
	Experimental	93.41	4.73	90.84	0.28

Table 4 MANCOVA results for all dimensions by group (Control vs. Experimental)

Test Statistic	Value	F	Hypothesis df	Error df	*p*	Partial η^2	Power
Pillai's Trace	0.94	11.14	10	7	0.002	0.94	0.99
Wilks' Lambda	0.059	11.14	10	7	0.002	0.94	0.99
Hotelling's Trace	15.92	11.14	10	7	0.002	0.94	0.99
Roy's Largest Root	15.92	11.14	10	7	0.002	0.94	0.99

Table 5 Univariate analysis of covariance (ANCOVA) results for each dimension

Dimension	Group	Adjusted Posttest Mean	Adjusted Posttest SD	F	*p*	Partial η^2
Word Reading	Control	79.07	14.19	10.52	0.001	0.41
	Experimental	83.71	14.04			
Word Chain	Control	73.28	4.65	24.63	0.001	0.62
	Experimental	88.64	14.30			
Rhyme Test	Control	76.92	7.40	18.32	0.001	0.54
	Experimental	96.92	9.65			
Picture Naming	Control	111.14	13.16	2.45	0.134	0.15
	Experimental	117.70	7.48			
Comprehension of Text	Control	78.92	12.50	8.51	0.009	0.36
	Experimental	84.28	4.95			
Word Comprehension	Control	87.71	13.29	15.27	0.001	0.50
	Experimental	102.70	14.15			
Phoneme Deletion	Control	61.14	4.25	5.35	0.035	0.26
	Experimental	66.85	3.71			
Pseudo Words	Control	64.71	13.88	4.88	0.043	0.23
	Experimental	71.64	27.28			
Letter Symbols	Control	84.64	8.31	6.70	0.021	0.31
	Experimental	92.57	6.08			
Category Symbols	Control	81.67	6.02	3.94	0.058	0.20
	Experimental	87.23	4.73			

When looking at picture naming, both groups demonstrated performance stability. The control group's scores remained almost unchanged, shifting slightly from M = 111.85 (SD = 10.93) to M = 111.14 (SD = 13.16), while the experimental group showed a minimal increase from M = 117.40 (SD = 5.63) to M = 117.70 (SD = 7.48). This stability indicates that the intervention had a limited impact in this specific dimension.

In text comprehension, while the control group showed minimal change from the pretest (M = 80.50, SD = 11.25) to the posttest (M = 80.64, SD = 12.50), the experimental group demonstrated a clear improvement. Their posttest means (M = 85.28, SD = 10.18) significantly exceeded their pretest mean (M = 80.57, SD = 10.60), indicating a positive impact from the intervention.

Both groups displayed divergence in word comprehension results. While the control group's scores showed only minor fluctuations between the pretest (M = 88.35, SD = 10.83) and posttest (M = 87.71, SD = 13.29), the experimental group demonstrated a marked improvement, increasing from M = 87.07 (SD = 15.75) to M = 102.70 (SD = 14.15), which supports the intervention's effectiveness.

Findings in the phoneme deletion dimension were mixed. The control group's scores remained unchanged between pretest and posttest (M = 61.14, SD = 4.52, and SD = 4.25, respectively). Conversely, the experimental group improved, moving from M = 66.85 (SD = 3.71) at the pretest to M = 62.07 (SD = 5.51) at the posttest, albeit a smaller one than in other dimensions.

Moreover, in pseudowords, the experimental group showed improvement from the pretest (M = 63.71, SD = 13.24) to the posttest (M = 71.64, SD = 27.28), while the control group scores changed minimally (pretest M = 63.71, SD = 13.24; posttest M = 64.71, SD = 13.88).

Lastly, for letter and category symbols, the experimental group showed moderate gains in both, particularly from pretest (M = 92.57, SD = 6.08) to posttest (M = 90.92, SD = 9.26). In contrast, the control group's scores remained steady across both tests.

To check whether the differences among the groups' scores were statistically significant, Multivariate Analysis of Covariance (MANCOVA) was used. It is worth noting that all assumptions of this test were checked, and results showed that the scores on pretests and posttests were normally distributed and variances of the groups' scores on all dimensions were equal. Results are shown in Table 4.

The MANCOVA results show a significant multivariate effect for the group variable (Control vs. Experimental) across all four test statistics (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root). The low *p*-value (0.002) indicates a statistically significant difference in the combined literacy dimensions between the control and experimental groups. The partial eta squared value of 0.94 suggests a large effect size, meaning the intervention explains a substantial portion of the variance in literacy outcomes. Also, the power of 0.99 indicates a high probability that the test correctly detected the effect, giving confidence in the significance of the findings. Furthermore, a Univariate Analysis of Covariance (ANCOVA) was performed to examine the intervention's effects on individual literacy dimensions, as shown in Table 5.

Across all dimensions, the experimental group achieved significantly higher adjusted posttest means than the control group, demonstrating the intervention's effectiveness in enhancing specific literacy skills. Specifically, in the dimension of Word Reading, the experimental group outperformed the control group (Adjusted Posttest Mean = 83.71 vs. 79.07) with a significant F-value of 10.52 and a large effect size (Partial η^2 = 0.41, $p = 0.001$). Similarly, for Word Chain, the intervention had a very strong effect, with the experimental group's adjusted mean (88.64) substantially exceeding that of the control group (73.28), reflected by a high Partial η^2 of 0.62 ($p = 0.001$).

Additionally, substantial gains were observed in the Rhyme Test dimension, where the experimental group's mean (96.92) was notably higher than the control group's (76.92), with an F-value of 18.32 ($p = 0.001$) and a large effect size (Partial η^2 = 0.54). Comprehension of Text and Word Comprehension also showed significant improvements, with *p*-values of 0.009 and 0.001, respectively, and high Partial η^2 values (0.36 and 0.50), suggesting that the intervention positively impacted these areas.

However, not all dimensions showed statistically significant differences. For example, in Picture Naming, although the experimental group achieved a higher mean (117.70) compared to the control group (111.14), this difference was not statistically significant ($p = 0.134$, Partial η^2 = 0.15). This suggests that the intervention may have had limited or negligible effects on this particular skill. Similarly, while gains were noted in Category Symbols (Adjusted Posttest Mean = 87.23 for the experimental group vs. 81.67 for the control), the effect did not reach statistical significance ($p = 0.058$, Partial η^2 = 0.20). These findings underscore that while the intervention effectively enhanced most literacy skills, its impact on these specific dimensions was either less pronounced or influenced by other unexamined factors.

Discussion and conclusions

The study aimed to evaluate the efficacy of parent-child play therapy in improving reading performance among 10 to 12-year-old children with learning disabilities. Findings indicated that play therapy has the potential to enhance reading skills in children in this age group who struggle with such disabilities. This result aligns with

research [2, 8, 20] demonstrating the possible effectiveness of filial play therapy on the emotional literacy of children with specific learning disorders [3, 20, 23, 27, 33], as well as studies highlighting the potential role of play therapy in improving academic performance and reducing learning difficulties in students [1, 6, 8, 10].

Moreover, the study found that the experimental group's dyslexia scores decreased significantly compared to the control group, suggesting that parent-child play therapy may offer an engaging approach to increase self-awareness about reading disorders and reduce stress in affected children. This process could foster skill development by creating a positive emotional and interpersonal environment [2, 12, 19]. The therapy's emphasis on structured parent-child interactions is pivotal, as parents become facilitators, guiding children toward more adaptive behaviours. Play sessions provide children with safe spaces to express concerns and release frustrations, which may foster self-regulation and enhance their capacity to focus and control behaviour. Such structured play allows children to externalize emotions while helping parents reflect on and respond to their child's emotional needs, thus reinforcing communication and reducing tension.

Landreth and Bratton (2006) support this approach, noting that focusing on mother-child interactions can substantially benefit the child's emotional regulation and adaptability to learning challenges. The intervention's combination of cognitive control and parent support may ultimately promote academic success, aligning with the positive impacts of similar studies on social and emotional adaptability [3, 13, 21].

However, the findings also revealed that certain subtests, such as Picture Naming and Category Symbols, were not significantly impacted by the intervention. One potential hypothesis for these results is that these dimensions may rely more heavily on specific cognitive processes, such as visual recognition or categorical organization, which may not be directly targeted by the emotional and relational components of play therapy. Another possibility is that the relatively short duration of the intervention limited the extent of measurable changes in these areas. Future studies could explore whether incorporating additional activities focused on visual-cognitive integration might yield improvements in these specific sub-skills.

Through controlled thought processes, the intervention facilitates adaptive social behaviours and cultivates positive attitudes, allowing children to navigate emotional and academic challenges better. As Landreth et al. (2006) further emphasize, filial therapy activates parental involvement in the therapeutic process, fostering verbal and emotional exchanges between parent and child and enhancing communication and understanding. This engagement promotes empathy, emotional expression, and management skills in children, which are crucial for overcoming the hurdles of learning disabilities. Additionally, positive mother-child interactions encourage the appropriate use of emotions, thereby improving children's comprehension of both their and their mothers' emotions during play and aiding them in managing learning difficulties more effectively [4, 9, 16, 24, 38–41].

This study underscores the transformative potential of parent-child play therapy as a dual-purpose intervention targeting academic and emotional challenges faced by children with learning disabilities. The findings reveal meaningful improvements in reading performance, emotional regulation, and attention management, demonstrating the value of integrating therapeutic approaches that simultaneously address cognitive and emotional development. By emphasizing the active role of parents in fostering their children's growth, the study offers a compelling framework for enhancing both academic outcomes and familial relationships.

The contributions of this research extend to both academic and practical domains. Academically, the study provides robust evidence supporting the efficacy of parent-child play therapy, contributing to a growing body of literature advocating for holistic interventions in special education and child psychology. Practically, it offers actionable insights for educators, therapists, and policymakers, emphasizing the importance of embedding structured play-based interventions within educational and therapeutic contexts. For example, schools and community centres could incorporate parent training sessions alongside student-focused interventions to amplify their collective impact.

Implications

The findings of this study have several important implications for educational practice, therapeutic interventions, and parental involvement in supporting children with learning disabilities. First, the positive impact of parent-child play therapy on reading performance highlights its potential as an alternative or complementary approach to traditional remediation programs in educational settings. Schools and learning centres might consider integrating structured play therapy into their support services, particularly for children struggling with reading and other learning challenges, to provide a holistic approach that addresses academic and emotional needs. For instance, incorporating brief parent-child play therapy sessions into existing reading intervention programs could give the children a well-rounded framework that develops literacy skills and emotional resilience. *For example, a study by Johnson* [42] *demonstrated that integrating parent-child play activities into reading programs improved*

literacy outcomes and emotional well-being among elementary school students.

Second, these results emphasize the significance of parental involvement in therapeutic interventions. Children benefit from improved reading skills and more substantial emotional support and communication with their caregivers by actively engaging parents in therapy. Workshops or training programs could equip parents with specific strategies and tools, such as guided play techniques and emotional coaching, to maximize their contributions to their child's development. This approach helps foster a supportive environment for children at school and home, reinforcing their learning and adaptation to academic demands. *Studies like that of Marti et al.* [43], *have shown that parental engagement in guided play leads to significant improvements in children's academic performance and social skills, providing a model for scalable interventions*.

Furthermore, the study suggests that parent-child play therapy can be valuable for enhancing emotional regulation and reducing attention deficits in children with learning disabilities. By offering children a safe, structured environment to express and process emotions, play therapy enables them to develop self-regulation skills crucial for academic success. Practical applications include embedding emotion-focused play therapy activities into classroom routines or after-school programs, allowing children to benefit from consistent opportunities to practice self-regulation in supportive settings. This insight highlights the need for therapeutic approaches that address cognitive, emotional, and behavioural factors in children with learning difficulties. A notable example is the work of Da Silva [44], which demonstrated that emotion-focused play interventions improved self-regulation and attention span among children with ADHD.

Finally, the study underscores the value of strengthening the parent-child relationship through targeted interventions like filial therapy. Building emotional bonds and empathy through structured interactions can empower children with learning disabilities to face challenges with greater resilience and confidence. To promote accessibility, schools and community centres could offer low-cost or subsidized family therapy programs, focusing on fostering parent-child interactions through guided play. Policymakers and practitioners might consider supporting programs emphasizing relational skills and family-based interventions, as these have long-term benefits on children's academic and social development. *For instance*, Ceballos [45] *highlighted how subsidized family play therapy programs in underserved communities improved both relational and academic outcomes for children facing socio-economic challenges.*

Limitations and suggestions for further studies

While this study provides valuable insights into the effects of parent-child play therapy on children with learning disabilities, several limitations must be acknowledged. First, the quasi-experimental design, which lacks random assignment, introduces potential biases that may influence the outcomes. The absence of randomization increases the risk of pre-existing differences between the experimental and control groups, affecting the results and limiting the study's internal validity. Although efforts were made to control for confounding variables, the findings should be interpreted cautiously, as they may not fully reflect causal relationships.

Second, the relatively homogenous sample in terms of demographic and socio-economic characteristics may limit the generalizability of the results. Specifically, the study's focus on a specific age group and geographic region further narrows the scope of applicability. This raises questions about how well the intervention might perform in diverse cultural, educational, or socio-economic contexts.

The findings' applicability to broader populations also warrants careful consideration. Variations in developmental stages may influence how children respond to play-based interventions. The intervention's potential effectiveness for other age groups, such as adolescents or younger children, remains uncertain, necessitating further investigation.

Additionally, cultural or linguistic differences could impact the generalizability of the findings. Play therapy techniques and parent-child dynamics need adaptation to align with cultural norms, particularly in communities where play-based approaches are less.

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Additionally, cultural or linguistic differences could impact the generalizability of the findings. Play therapy techniques and parent-child dynamics need adaptation to align with cultural norms, particularly in communities where play-based approaches are less familiar or emphasized. This highlights the need for expanding future studies to include diverse samples and cross-cultural comparisons, offering a more comprehensive understanding of the intervention's relevance.

Moreover, the intervention's scalability in resource-limited settings requires further exploration. Schools or communities with fewer resources may encounter challenges implementing structured play therapy, emphasizing the necessity for adaptable and cost-effective strategies that retain core benefits.

Future research should also consider the role of fathers or other caregivers in the intervention process to enhance inclusivity. By involving a wider range of caregivers, studies could provide insights into how different familial roles impact the effectiveness of play therapy. This approach would promote a more holistic understanding of familial dynamics and their influence on therapeutic outcomes.

Future research should address the study's limitations, such as the quasi-experimental design and lack of randomization, to strengthen the evidence base. Expanding the sample to include diverse populations and cultural contexts will improve the generalizability of the findings. Moreover, longitudinal studies are needed to examine the long-term effects of parent-child play therapy on academic achievement and emotional resilience. Investigating its scalability and adaptability in resource-limited settings could further enhance its practical relevance.

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Author contributions
TX designed the study. TX collected the data. TX analyzed and interpreted the data. TX drafted the manuscript. TX proofread the paper. TX agreed to be accountable and verified the submitted version.

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Data availability
Data is provided within the manuscript or supplementary information files.

Declarations

Ethics approval and consent to participate
All subjects gave their informed consent to participate in the study before they participated. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Institutional Review Board Shaanxi Normal University. Informed consent was obtained from parents/guardians for participants under 18.

Consent for publication
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Competing interests
The authors declare no competing interests.

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