

Play-Based Intervention Plan for ADHD Children's Behavioural Problems: Creative Social Task System

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Abstract: Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders in children, often disrupting learning and social adaptation. In recent years, play-based interventions have attracted growing attention for their naturalness and high acceptance. This paper reviews their application value and proposes innovative strategies, focusing on the potential of play-based methods to address behavioural problems in children with ADHD.

Keywords: Attention deficit hyperactivity disorder; Play-based intervention; Behavioural issues; Social skills

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1. Introduction

With the growing emphasis on non-pharmacological therapies for ADHD, play-based approaches have become an increasingly important way to address behavioural problems. Their appeal lies in being natural, engaging, and well accepted by children ^[1-2].

Recent developments have expanded beyond traditional cooperative games and contextual role-play to include digital games and virtual reality technology ^[3-4]. These innovative strategies not only help children with ADHD improve their attention and behavioural control, but also enhance long-term outcomes through peer interaction and family involvement.

This study builds on Cordier et al.'s "Play-based Intervention Model", integrating modern digital tools and family collaboration to design a comprehensive intervention plan for children with ADHD aged 6–10 ^[1]. The goal is to reduce their behavioural problems, enhance their social skills, and support adaptability in both home and classroom environments.

2. Literature review

Play-based interventions aim to enhance children's social, emotional, and behavioural skills through natural play

scenarios. They are increasingly recognised as an effective supplementary method and have been given a stronger theoretical foundation in recent decades.

Piaget's theory of cognitive development underscored the central role of play in helping children make sense of the world. Through play, children can practice and consolidate their acquired skills while exploring new ones. As they mature, their play shifts from self-centred to more social forms that consider the perspective of others ^[5-6].

Building on Rogers' humanistic psychology, Axline introduced child-centred play therapy, guided by eight basic principles ^[7]. She emphasised that therapists need to follow the child's lead rather than attempting to control or guide the direction of play. This method enables children to explore their emotions and experiences in a safe environment, thereby fostering problem-solving skills.

In recent years, researchers have increasingly focused on ADHD-specific challenges in games and their potential theoretical value. Studies show that children with ADHD struggle with empathy, cooperation, impulsivity, rules-breaking, and sustaining attention ^[8-9]. These behaviours contribute to peer rejection, further aggravating social difficulties ^[10]. Such findings provide a theoretical rationale for play-based interventions, which aim to improve social skills and behavioural regulation through structured play.

In 2009, Cordier et al. proposed a play-based intervention theory model based on the integration of ADHD and play-related research ^[1]. This model suggested that the lack of intrinsic motivation and behavioural control ability in children with ADHD significantly affects their behaviours during play. It outlined four intervention principles — intrinsic motivation, internal control, reality suspension, and situational shaping — aimed at structuring the play environment to counteract the negative impact of ADHD traits.

Wikes and Barnes et al. validated the model through a pilot study, showing that children with ADHD have significantly improved social gaming abilities, and this improvement also has a positive impact on gaming partners ^[11]. Importantly, these studies also found that peers and parents can enhance intervention effectiveness and improve skill transferability.

In 2017, Wilkes et al. conducted a 12-month follow-up trial confirming that children with ADHD can maintain their social skills for a long time after interventions. Their companions also showed sustained improvement in both home and clinic environments. This highlighted the importance of parental and peer involvement in intervention design ^[12].

More recently, with advances in the understanding of the mechanism of ADHD symptoms and digital technologies, play-based interventions have expanded in scope. For example, between 2019 and 2020, several studies proposed an augmented reality (AR) gaming environment called the "AR therapist" as a cognitive-behavioural therapy for ADHD patients ^[4]. In 2024, Wilkes-Gillan et al. developed a peer-mediated play-based intervention model to address the challenge of social participation in children with ADHD. Through peer interaction in the game, the model improves ADHD children's social game skills, cooperation abilities, and social-emotional expression. Moreover, this study highlighted the key role of parents in the intervention process and emphasised the cooperative relationship between parents, therapists, and children, which is considered a core element for successful intervention ^[2].

In summary, play-based interventions represent a child-centred developmental adaptation approach, particularly suitable for improving social and behavioural abilities in children with ADHD. From Cordier et al.'s theoretical framework to the empirical verification of subsequent research, play-based intervention has shown promising application prospects in the treatment of children with ADHD. Research has shown that by stimulating children's intrinsic motivation, cultivating empathy, introducing peers, and involving parents, social skills in

children with ADHD can be effectively improved with long-term benefits ^[1, 13].

3. Intervention design

3.1. Target population and intervention domain

This intervention plan is aimed at students aged 6–10 diagnosed with ADHD, mainly with behavioural problems. The main concerns of these students include: lack of concentration (difficulty in maintaining classroom attention for more than 10 minutes, difficulty completing tasks, and being easily distracted); impulsive behaviours (difficulty waiting for turns, frequent interruptions, and rule-breaking); and social behaviour problems (lack of empathy, frequent conflicts with peers in group activities) ^[14]. This plan applies to the following situations:

Group intervention: Pair ADHD students with typically developing peers for cooperative gaming activities ^[15].

Family intervention: Include parents in intervention activities, engage in cooperative game activities, and continue the intervention effect.

Classroom integration: Children with ADHD participate in natural situational games in regular classes.

3.2. Intervention design

3.2.1. Core idea

This intervention plan extends Cordier et al.'s "Play-Based Intervention Model", incorporating new elements such as digital games and situational role-playing ^[1]. It uses game interaction as a carrier to help students with ADHD improve their behavioural control and social skills.

3.2.2. Specific solution framework

The entire intervention phase is divided into four stages, lasting for 12 weeks, as shown in **Table 1**.

Table 1. Four stages of the intervention phase

Stage	Target	Main activities and methods
Phase 1 Preparation Period (2 weeks)	ADHD Children: Basic Social Rules, Emotion Recognition Pairing partners: Understanding ADHD traits and auxiliary strategies Teachers and Parents: Observation and Recording Methods, Supporting Techniques	(1) Situational tasks: Individualised task settings, such as simple collaborative puzzles and building blocks. (2) Rule learning: Through the "Task Map", guide children to understand the alternating waiting and task objectives.
Phase 2 Pair Work Period (3-6 weeks)	Developing attention and collaboration skills Enhance the ability of emotional recognition	(1) Task-oriented games: Introduce "Construction Tasks" or "Treasure Hunt Adventures", requiring children with ADHD to cooperate with peers to solve the tasks. (2) Feedback mechanism: Teachers provide immediate feedback upon completion of the tasks.
Phase 3 Group Task Period: (7-10 weeks)	Enhance team collaboration and social interaction Enhance attention and creativity	(1) Multi-character collaborative tasks: Such as "Pirate Treasure Hunt" or "Space Exploration", where each member assumes different roles, working together to complete the task. (2) Situational role-playing: Guiding the development of empathy and social skills through gameplay.
Phase 4 Integration of Family and Classroom (11-12 weeks)	Promote skill transfer and family participation Promote social skill and problem-solving skills	(1) Family bonding tasks: Design a family game day, using "family mission cards" to help parents participate in the intervention process. (2) Classroom nature games: Children with ADHD engage in "free play" activities with their peers in the classroom, observed by the teacher who provides positive feedback.

3.2.3. Innovative features and detailed activity design

Contextual role-playing: Story-based games such as “Jungle Adventure” or “Pirate Treasure Quest” encourage cooperation, role-taking, and problem-solving ^[16]. Students alternate roles, supporting the development of emotional recognition, turn-taking, and problem-solving skills for students with ADHD. After each round, the teacher offers immediate feedback and encourages students to review their own performance.

Introduction of a digital tool app: A digital tablet-based game is used to train students with ADHD to develop endurance in completing specific tasks. The game is designed with a reward system, where completing tasks earns virtual medals or unlocks achievements.

Involvement of families and parents: Parents are invited to participate in “parent-child cooperative games”, such as “rule-based card games” or “family role-playing days”, to help children maintain behavioural adjustments in the home environment. Additionally, parents can use feedback cards to record their child’s performance in family activities and provide this feedback to the teacher on a weekly basis for continuous adjustments, thereby establishing a two-way feedback system between school and home.

Integration of Classroom Situations

Integrate children with ADHD into natural classroom settings to carry out group activities, such as collaborative “story chain” games where students with ADHD take turns with their peers to create stories. Meanwhile, the teacher monitors remotely, provides immediate behavioural cues, and records performances for weekly summaries.

3.2.3. Assessment and feedback system

This programme innovatively combines collaborative gaming, situational role-playing, and digital apps to provide an intervention approach that is applicable across multiple settings for children with ADHD ^[3]. To better understand the effectiveness of the intervention, a combination of quantitative and qualitative methods will be used. For instance, behaviour scales such as the Conners’ Parent Rating Scale will be applied to assess improvements in core ADHD behaviours ^[17]. Periodic assessments will be conducted using standardised tools such as the Test of Playfulness (TOP), the Social Skills Improvement System (SSIS), and the Parent-Child Relationship Questionnaire ^[18–20]. Lastly, weekly parent guidance classes will be scheduled to share progress, enable parents to learn strategies for cooperation, and discuss challenges in implementation.

4. Conclusion

This study proposes an innovative play-based intervention plan for children with ADHD aged 6 to 10, aiming to improve their behavioural problems and social adaptation abilities through cooperative games, contextual role-playing, and digital tools. Family participation and peer interaction also play an important role in promoting effective cooperation between families and schools through a two-way feedback system. In addition, the programme innovatively introduces digital app tools to improve children’s task execution and self-management abilities through instant feedback and reward mechanisms.

With the continuous development of technological means, future research can apply more virtual reality and artificial intelligence technologies into the intervention process to achieve more efficient intervention effects.

Disclosure statement

The author declares no conflict of interest.

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