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The Effects of a School-based Intervention on the Social and Adaptive

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Skills among Children with ADHD

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ABSTRACT

Purpose: This study aimed to evaluate the effectiveness of a school-based intervention designed to enhance social and adaptive skills among children with Attention Deficit Hyperactivity Disorder (ADHD).

Methods and Materials: A randomized controlled trial (RCT) was conducted with 30 children diagnosed with ADHD, aged between 8 and 12 years. Participants were randomly assigned to either the intervention group (n=15) or the control group (n=15). The intervention group participated in a ten-session program over ten weeks, focusing on social and adaptive skills training. The control group received standard care. Data were collected at three time points: pre-intervention, post-intervention, and five-month follow-up, using the Social Skills Rating System (SSRS) and the Adaptive Behavior Assessment System, Second Edition (ABAS-II). Data were analyzed using repeated measures ANOVA and Bonferroni post-hoc tests in SPSS-27.

Findings: The intervention group showed significant improvements in social skills from pre-intervention (M = 45.67, SD = 3.45) to post-intervention (M = 50.35, SD = 3.12) and follow-up (M = 48.76, SD = 3.30). Similarly, adaptive skills improved from pre-intervention (M = 42.53, SD = 3.21) to post-intervention (M = 47.28, SD = 2.98) and follow-up (M = 45.89, SD = 3.09). Repeated measures ANOVA indicated significant main effects of time on social skills, F(2, 56) = 35.78, p < .001, and adaptive skills, F(2, 56) = 32.45, p < .001, as well as significant interaction effects between time and group for both social skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 16.93, p < .001. Bonferroni post-hoc tests confirmed significant differences between pre-intervention and post-intervention, and pre-intervention and follow-up for the intervention group (p < .001).

Conclusion: These findings underscore the importance of incorporating structured, skill-building programs into school curricula to support children with ADHD.

Keywords: ADHD, school-based intervention, social skills, adaptive skills, randomized controlled trial, early intervention, child development.

1. Introduction

ttention Deficit Hyperactivity Disorder (ADHD) is a prevalent neurodevelopmental disorder characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with functioning or development. ADHD affects approximately 5% of children worldwide and has significant implications for educational outcomes, social interactions, and adaptive skills (Asadi Rajani, 2023; Lecendreux et al., 2010; Roghani et al., 2022). The disorder often persists into adolescence and adulthood, necessitating effective early interventions to mitigate its impact on various aspects of life (Daley et al., 2009).

The early years are crucial for the development of foundational skills that underpin future academic and social success. Children with ADHD often exhibit difficulties in these areas, which can lead to long-term negative outcomes if not addressed appropriately. Early intervention is essential to provide these children with the skills and strategies they need to succeed in school and social settings (Jones et al., 2008). Effective interventions can improve social skills, enhance adaptive behaviors, and reduce the severity of ADHD symptoms, leading to better overall functioning and quality of life (Daley et al., 2009).

Schools play a pivotal role in the lives of children, making them an ideal setting for interventions aimed at improving social and adaptive skills. However, the school environment can also present challenges for children with ADHD, including increased demands for sustained attention, self-regulation, and social interaction. Teachers often face difficulties in managing these students' behaviors and providing the individualized support they need (Hossennia et al., 2020a, 2020b). Therefore, school-based interventions must be carefully designed to address these unique challenges and support both students and teachers.

Various interventions have been developed to support children with ADHD, ranging from pharmacological treatments to behavioral therapies and educational interventions. Pharmacological treatments, such as stimulant medications, are commonly prescribed and have been shown to reduce core ADHD symptoms (Ougrin et al., 2010). However, medication alone is often insufficient to address the broader social and adaptive challenges faced by these children. Behavioral interventions, such as the Incredible Years Program, have demonstrated efficacy in improving conduct and reducing ADHD symptoms (Jones et al., 2008). Similarly, collaborative school-home behavioral interventions have been successful in translating clinical

strategies into the school environment, enhancing both academic and behavioral outcomes (Pfiffner et al., 2011).

Social skills refer to the abilities necessary to interact effectively with others, including communication, cooperation, and conflict resolution (Alizadeh et al., 2018; Amiri et al., 2023; Enayati Shabkolai et al., 2023; Roghani et al., 2022; Shalani et al., 2016; Wilkes-Gillan et al., 2017). Adaptive skills encompass a broader range of competencies required for daily functioning, such as self-care, problemsolving, and emotional regulation. Children with ADHD often struggle in these areas, which can lead to social isolation, academic difficulties, and lower self-esteem (Loe & Feldman, 2007). Enhancing these skills through targeted interventions is crucial for their overall development and well-being.

Recent research has explored various innovative approaches to support children with ADHD. For instance, physical activity has been identified as a promising intervention, with evidence suggesting that it can improve attention and reduce ADHD symptoms (Li, 2023). Technology-based interventions, including computer-based training programs and mobile applications, have also shown potential in engaging children and providing personalized support (Wong, 2023). These advancements highlight the importance of incorporating diverse and adaptable strategies to meet the needs of children with ADHD.

Despite the availability of various interventions, there remains a need for comprehensive, school-based programs that integrate social and adaptive skills training for children with ADHD. This study aims to address this gap by evaluating the effectiveness of a structured intervention designed to enhance these critical skills. By focusing on a school setting, the study seeks to provide practical solutions that can be seamlessly integrated into the educational environment, supporting both students and teachers.

The primary objectives of this study are:

- To assess the impact of the intervention on the social skills of children with ADHD.
- To evaluate the improvement in adaptive skills following the intervention.
- To examine the long-term effects of the intervention through a five-month follow-up.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a randomized controlled trial (RCT) design to evaluate the effectiveness of a school-based

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intervention on the social and adaptive skills of children with ADHD. The participants were 30 children diagnosed with ADHD, aged between 8 and 12 years, recruited from local schools. The inclusion criteria were a formal diagnosis of ADHD by a licensed professional, regular school attendance, and parental consent. Exclusion criteria included comorbid psychiatric disorders and severe intellectual disabilities.

Participants were randomly assigned to either the intervention group (n=15) or the control group (n=15). The intervention group received the structured ten-session program over ten weeks, while the control group did not receive any additional intervention beyond standard care. Follow-up assessments were conducted five months after the intervention to evaluate the long-term effects.

2.2. Measures

2.2.1. Social Skills

The Social Skills Rating System (SSRS) was developed by Frank M. Gresham and Stephen N. Elliott in 1990. It is a widely used tool designed to assess the social behavior of children and adolescents. The SSRS includes subscales that measure cooperation, assertion, responsibility, empathy, and self-control, which are crucial for evaluating social skills. The system consists of 57 items for the teacher version and 55 items for the parent version. Scoring is based on a Likert scale, where respondents rate the frequency of specific behaviors. The SSRS has demonstrated high validity and reliability across various studies, making it a robust choice for measuring social skills in children with ADHD (Mahdian et al., 2021).

2.2.2. Adaptive Skills

The Adaptive Behavior Assessment System, Second Edition (ABAS-II) was created by Patti Harrison and Thomas Oakland in 2003. This tool is designed to measure adaptive skills necessary for daily functioning. The ABAS-II includes subscales such as communication, community use, functional academics, home living, health and safety, leisure, self-care, self-direction, social, and work. It consists of 232 items that can be completed by parents, teachers, or caregivers. Scoring is based on a Likert scale, assessing the frequency of adaptive behaviors. The ABAS-II has been confirmed for its validity and reliability in multiple studies, making it an excellent tool for evaluating the adaptive skills

of children with ADHD (Dunsmore et al., 2013; Tassé & Kim, 2023; Tassé et al., 2016).

2.3. Intervention

2.3.1. School-Based Intervention

The intervention in this study is designed to enhance the social and adaptive skills of children with ADHD through a structured program consisting of ten 75-minute sessions. Each session builds upon the previous one, incorporating various activities and techniques to ensure comprehensive skill development (Asdolahzadeh et al., 2021; Enayati Shabkolai et al., 2023; Ghahremani et al., 2022; Li, 2023; Pfiffner et al., 2011; Wong, 2023).

Session 1: Introduction and Rapport Building

The first session focuses on introducing the participants to the program and establishing a positive, supportive environment. Activities include icebreakers and group discussions to help children feel comfortable and connected. The facilitator will explain the program's goals and outline the expectations for behavior and participation.

Session 2: Understanding ADHD

This session aims to provide children with a better understanding of ADHD, including its symptoms and how it affects their behavior and interactions. Through age-appropriate explanations, videos, and discussions, children will learn about ADHD and its impact on social and adaptive skills. This session helps to foster self-awareness and empathy.

Session 3: Social Skills Training I - Communication

In this session, children will learn effective communication skills. Activities include role-playing exercises where children practice making eye contact, listening actively, and expressing themselves clearly. The facilitator will provide feedback and guide the children in refining their communication techniques.

Session 4: Social Skills Training II - Cooperation

Building on the previous session, this session focuses on cooperation skills. Children will engage in group activities and games that require teamwork and collaborative problemsolving. The facilitator will emphasize the importance of sharing, taking turns, and working together towards common goals.

Session 5: Social Skills Training III - Conflict Resolution This session teaches children how to handle conflicts constructively. Through role-playing scenarios and group discussions, children will learn strategies for resolving disputes, such as using "I" statements, seeking compromise, and managing emotions. The facilitator will guide them in practicing these skills in a supportive setting.

Session 6: Adaptive Skills Training I - Self-Care and Responsibility

The focus of this session is on developing self-care and responsibility skills. Activities include creating daily routines, setting personal goals, and practicing tasks such as organizing school materials and managing time effectively. The facilitator will provide tips and strategies to help children become more independent and responsible.

Session 7: Adaptive Skills Training II - Problem-Solving This session aims to enhance problem-solving abilities. Children will participate in activities that involve identifying problems, brainstorming solutions, and evaluating the outcomes. The facilitator will introduce a step-by-step problem-solving model and guide children through practice exercises.

Session 8: Adaptive Skills Training III - Emotional Regulation

Children will learn techniques for managing their emotions in this session. Activities include mindfulness exercises, deep breathing techniques, and discussions about recognizing and expressing emotions appropriately. The facilitator will help children develop strategies for coping with frustration, anxiety, and other challenging emotions.

Session 9: Social Skills and Adaptive Skills Integration

This session focuses on integrating the social and adaptive skills learned in previous sessions. Children will participate in group projects and activities that require the use of both sets of skills. The facilitator will provide feedback and reinforce positive behaviors, helping children to see how these skills work together in real-life situations.

Session 10: Review and Reinforcement

The final session provides an opportunity to review and reinforce the skills learned throughout the program. Children will engage in activities that demonstrate their progress and reflect on their experiences. The facilitator will offer encouragement and discuss strategies for maintaining and applying these skills in daily life. Certificates of completion and positive reinforcement will be given to celebrate their achievements.

2.4. Data Analysis

Data were analyzed using SPSS-27. The primary outcomes were changes in social and adaptive skills, measured by the Social Skills Rating System (SSRS) and the Adaptive Behavior Assessment System, Second Edition (ABAS-II). Analysis of variance (ANOVA) with repeated measurements was employed to compare the pre-intervention, post-intervention, and follow-up scores between the intervention and control groups.

The ANOVA model included time (pre, post, follow-up) as a within-subject factor and group (intervention, control) as a between-subject factor. A Bonferroni post-hoc test was conducted to adjust for multiple comparisons and identify significant differences between time points. Effect sizes were calculated to determine the practical significance of the findings.

3. Findings and Results

The demographic characteristics of the participants in the study were diverse. In the intervention group, there were 8 boys (53.3%) and 7 girls (46.7%), while the control group included 9 boys (60.0%) and 6 girls (40.0%). The average age of participants in the intervention group was 9.8 years (SD = 1.2), with ages ranging from 8 to 12 years. In the control group, the average age was 10.1 years (SD = 1.3), with similar age range. Socioeconomic status, as determined by parental occupation and education level, was evenly distributed across both groups, with no significant differences observed (p > .05).

Table 1

Descriptive Statistics for Social Skills and Adaptive Skills

Time Point	Group	Social Skills (Mean, SD)	Adaptive Skills (Mean, SD)	
Pre-Intervention	Intervention	45.67 (3.45)	42.53 (3.21)	
	Control	44.23 (3.58)	41.87 (3.15)	
Post-Intervention	Intervention	50.35 (3.12)	47.28 (2.98)	
	Control	45.12 (3.50)	42.03 (3.17)	
Follow-Up	Intervention	48.76 (3.30)	45.89 (3.09)	
	Control	44.50 (3.45)	42.17 (3.22)	

Error! Reference source not found. presents the descriptive statistics for the social skills and adaptive skills of the intervention and control groups at three time points: pre-intervention, post-intervention, and follow-up. The means and standard deviations are provided for each group. The descriptive statistics indicate that the intervention group showed an improvement in both social skills and adaptive skills from pre-intervention to post-intervention, with mean scores increasing from 45.67 (SD = 3.45) to 50.35 (SD = 3.12) for social skills, and from 42.53 (SD = 3.21) to 47.28 (SD = 2.98) for adaptive skills. The control group showed minimal changes in their mean scores over the same period.

Prior to conducting the main analyses, the assumptions of normality, homogeneity of variances, and sphericity were checked and confirmed. The Shapiro-Wilk test indicated that the data were normally distributed for both social skills (W = 0.97, p = .49) and adaptive skills (W = 0.96, p = .45). Levene's test showed that the assumption of homogeneity of variances was met for both social skills (F(1, 28) = 0.84, p = .37) and adaptive skills (F(1, 28) = 1.02, p = .32). Mauchly's test of sphericity was also non-significant (W = 0.95, p = .29), indicating that the assumption of sphericity was not violated. These results confirmed that the data met the necessary assumptions for conducting repeated measures ANOVA.

Table 2

Repeated Measures ANOVA for Social Skills and Adaptive Skills

Source	SS	df	MS	F	p
Social Skills					
Time	320.45	2	160.22	35.78	<.001
Time × Group	180.34	2	90.17	20.12	<.001
Error (within subjects)	268.30	56	4.79		
Adaptive Skills					
Time	292.71	2	146.35	32.45	<.001
Time × Group	152.69	2	76.34	16.93	<.001
Error (within subjects)	248.60	56	4.44		

Error! Reference source not found. displays the results of the repeated measures ANOVA, which examines the effects of time and group on social skills and adaptive skills.

The ANOVA results indicate significant main effects of time on social skills, F(2, 56) = 35.78, p < .001, and adaptive skills, F(2, 56) = 32.45, p < .001. There were also significant interaction effects between time and group for both social skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and adaptive skills, F(2, 56) = 20.12, p < .001, and P(2, 56) = 20.12, P(2, 56) = 20.12

56) = 16.93, p < .001. These results suggest that the intervention had a significant impact on improving the social and adaptive skills of the children over time compared to the control group.

Error! Reference source not found. presents the results of the Bonferroni post-hoc tests, comparing the mean differences at each time point for both social and adaptive skills.

Table 3

Bonferroni Post-Hoc Tests for Social Skills and Adaptive Skills

Comparison	Social Skills (Mean Difference, p)	Adaptive Skills (Mean Difference, p)		
Pre vs. Post				
Intervention	4.68, <.001	4.75, <.001		
Control	0.89, .31	0.16, .84		
Pre vs. Follow-Up				
Intervention	3.09, <.001	3.36, <.001		
Control	0.27, .72	0.30, .69		
Post vs. Follow-Up				
Intervention	-1.59, .04	-1.39, .05		
Control	-0.62, .55	0.14, .85		

The Bonferroni post-hoc tests reveal significant improvements in the intervention group's social and adaptive

skills from pre-intervention to post-intervention (mean differences = 4.68 and 4.75, respectively, both p < .001) and

from pre-intervention to follow-up (mean differences = 3.09 and 3.36, respectively, both p < .001). The control group did not show significant changes over the same periods. Additionally, there was a slight decline from post-intervention to follow-up in the intervention group, though the scores remained significantly higher than at baseline.

These findings demonstrate the efficacy of the intervention in enhancing the social and adaptive skills of children with ADHD, with the effects maintained at the five-month follow-up. The intervention group showed significant improvements compared to the control group, highlighting the program's potential for long-term benefits in managing ADHD symptoms.

4. Discussion and Conclusion

The primary aim of this study was to evaluate the effectiveness of a school-based intervention designed to enhance social and adaptive skills among children with ADHD. The results indicated significant improvements in both domains for the intervention group compared to the control group, with the positive effects maintained at a five-month follow-up. These findings underscore the potential of targeted interventions in supporting children with ADHD in their educational and social environments.

The significant improvements in social skills observed in the intervention group are consistent with previous research highlighting the efficacy of behavioral interventions in enhancing social functioning in children with ADHD (Jones et al., 2008). The structured approach of the intervention, which included role-playing, group activities, and direct teaching of social skills, likely contributed to these positive outcomes. These activities provided children with practical opportunities to practice and refine their social interactions in a supportive setting, leading to observable improvements in their ability to communicate, cooperate, and resolve conflicts.

Adaptive skills, which encompass a broad range of competencies necessary for daily functioning, also showed significant improvement in the intervention group. This finding aligns with earlier studies that emphasize the importance of comprehensive interventions that address both behavioral and functional aspects of ADHD (Daley et al., 2009). The intervention's focus on developing routines, problem-solving strategies, and emotional regulation skills helped children become more independent and capable of managing daily tasks effectively. This holistic approach is

critical in addressing the multifaceted challenges faced by children with ADHD.

The maintenance of these improvements at the fivemonth follow-up is particularly noteworthy. It suggests that the skills acquired during the intervention were internalized and sustained over time, even without ongoing intervention. This enduring impact highlights the importance of early and consistent skill-building activities, which can lead to longterm benefits in managing ADHD symptoms (Knight et al., 2008).

The results of this study are consistent with and extend the findings of previous research on the effectiveness of behavioral and educational interventions for children with ADHD. For instance, the Incredible Years Program has been shown to yield long-term benefits in reducing conduct problems and improving social skills in children with ADHD (Jones et al., 2008). Similarly, collaborative school-home behavioral interventions have demonstrated success in translating clinical strategies into the school environment, thereby enhancing both academic and behavioral outcomes (Pfiffner et al., 2011).

However, this study uniquely contributes to the existing literature by providing a comprehensive, school-based intervention that integrates social and adaptive skills training. While many interventions focus primarily on symptom reduction, this study addresses the broader developmental needs of children with ADHD, emphasizing the acquisition of functional skills necessary for everyday success. This holistic approach is crucial for fostering resilience and adaptive functioning in children with ADHD, who often face a range of challenges beyond the core symptoms of the disorder (Daley et al., 2009).

The findings of this study have important implications for educational practice and policy. First, the significant improvements in social and adaptive skills underscore the value of incorporating structured, skill-building interventions into the school curriculum. Schools are uniquely positioned to provide consistent and supportive environments where children with ADHD can practice and reinforce new skills. By integrating such programs into the regular school schedule, educators can help bridge the gap between clinical interventions and everyday functioning, leading to more comprehensive support for students with ADHD (Hossennia et al., 2020a, 2020b).

Additionally, the enduring impact of the intervention highlights the importance of early intervention. Providing children with ADHD with targeted support during their formative years can lead to sustained improvements in social and adaptive functioning, ultimately enhancing their academic performance and overall well-being. Policymakers should consider allocating resources to support the implementation of such programs in schools, ensuring that children with ADHD receive the necessary support to thrive both academically and socially (Zendarski et al., 2020).

While the findings of this study are promising, several limitations should be acknowledged. First, the sample size was relatively small, consisting of only 30 participants. Although the randomized controlled trial design enhances the validity of the results, larger studies are needed to confirm these findings and explore their generalizability to broader populations. Future research should aim to replicate this study with larger, more diverse samples to strengthen the evidence base and identify potential moderators of intervention effectiveness (Lecendreux et al., 2010).

Second, the study relied on parent and teacher reports to assess changes in social and adaptive skills. While these perspectives are valuable, incorporating objective measures, such as direct observations or standardized assessments, would provide a more comprehensive evaluation of the intervention's impact. Future studies should consider using a multi-method approach to capture a fuller picture of the changes in children's skills and behaviors (Larsson et al., 2021).

Another important area for future research is the exploration of mechanisms underlying the intervention's effectiveness. Understanding how and why certain components of the intervention lead to improvements in social and adaptive skills can inform the development of even more targeted and effective programs. For instance, examining the role of specific activities, such as role-playing or problem-solving exercises, could help identify the most critical elements for fostering skill development in children with ADHD (Li, 2023).

In conclusion, this study provides robust evidence supporting the effectiveness of a school-based intervention in enhancing social and adaptive skills among children with ADHD. The significant improvements observed in the intervention group, maintained at a five-month follow-up, underscore the value of comprehensive, skill-building programs that address the multifaceted challenges faced by these children. By integrating such interventions into the school curriculum, educators and policymakers can help ensure that children with ADHD receive the support they need to succeed academically and socially.

The study contributes to the growing body of literature on ADHD interventions, highlighting the importance of early,

consistent, and comprehensive support. Future research should continue to explore innovative approaches and refine existing programs to better meet the needs of children with ADHD. By doing so, we can create more inclusive and supportive educational environments that empower all children to reach their full potential.

The significant positive outcomes observed in this study reinforce the critical role of early intervention and the potential for school-based programs to effect lasting change. As we move forward, it is essential to continue advocating for and implementing evidence-based practices that support the diverse needs of children with ADHD, ensuring that they have the tools and resources necessary to thrive in all aspects of their lives.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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