

## Comparison of the Effectiveness of Mediation-Based Intervention and Behavioral Intervention on Teaching Organizational Skills in Students With Attention-Deficit/Hyperactivity Disorder

Zahra. Hajinezhad<sup>1</sup>, Sayed Amir. Amin Yazdi<sup>2\*</sup>, Hossein. Kareshki<sup>3</sup>, Ali. Mashhadi<sup>4</sup>

<sup>1</sup> PhD Student, Department of Counseling and Educational Psychology. Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran

<sup>2</sup> Professor, Department of Counseling and Educational Psychology. Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran

<sup>3</sup> Assistant Professor, Department of Counseling and Educational Psychology. Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran

<sup>4</sup> Professor, Department of Psychology, Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran

\* Corresponding author email address: yazdi@um.ac.ir

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### ABSTRACT

**Purpose:** The objective of this study was to compare the effectiveness of behavioral organizational skills training (OST) and mediated learning-based intervention in improving organizational skills among elementary school students with Attention-Deficit/Hyperactivity Disorder (ADHD).

**Methods and Materials:** This study employed a quasi-experimental pretest-posttest design with a control group. The study population consisted of elementary school students aged 9 to 11 years diagnosed with ADHD during the 2023–2024 academic year in Mashhad. A total of 55 students and their mothers were initially recruited through voluntary sampling and randomly assigned to three groups: behavioral organizational skills training (OST), mediated learning-based organizational skills intervention, and a control group. Due to attrition and group size balancing, data from 45 participants (15 per group) were analyzed. The OST program was delivered in 16 group sessions, while the mediated learning intervention was conducted in 13 group sessions, both involving active parental participation. Data were collected using the SNAP-IV Parent Form to confirm ADHD symptoms and the Parent Version of the Children's Organization, Planning, and Sequencing Scale (P-COSS) to assess organizational skills, including task tracking, materials management, time management, and task planning. Data were analyzed using multivariate and univariate analyses of covariance, controlling for pretest scores.

**Findings:** Multivariate analysis of covariance revealed a significant overall difference between the combined posttest organizational skills scores of the experimental groups and the control group ( $p < .001$ ). Univariate analyses indicated significant group differences in task tracking, materials management, time management, and task planning (all  $p < .001$ ), with large effect sizes. Bonferroni post

hoc comparisons showed that both intervention groups performed significantly better than the control group across all organizational skill components, while no significant differences were observed between the two intervention groups.

**Conclusion:** Both behavioral organizational skills training and mediated learning-based intervention were equally effective in improving organizational skills in students with ADHD, suggesting that either approach can be selected based on contextual, familial, and educational considerations.

**Keywords:** *behavioral training, mediated learning experience, organizational skills, attention-deficit/hyperactivity disorder*

## 1. Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most prevalent neurodevelopmental disorders of childhood and is characterized by developmentally inappropriate levels of inattention, hyperactivity, and impulsivity that significantly interfere with academic, social, and family functioning. Beyond the core diagnostic symptoms, a substantial body of research has demonstrated that children with ADHD experience pervasive deficits in higher-order self-regulatory processes, particularly in organizational skills, planning, time management, and task monitoring, which persist across developmental stages and educational contexts (DuPaul et al., 2021; Kofler et al., 2018). These organizational impairments are not merely secondary features of ADHD but are increasingly recognized as central mechanisms underlying long-term academic underachievement, functional impairment, and reduced quality of life.

Organizational skills are multidimensional constructs encompassing the ability to plan tasks, manage materials, monitor progress, sequence activities, and allocate time efficiently to meet environmental demands. Empirical evidence indicates that children with ADHD consistently demonstrate marked weaknesses in these domains compared with typically developing peers, even when controlling for intellectual ability and symptom severity (Abikoff & Gallagher, 2008; Gallagher et al., 2018). Such deficits contribute to chronic difficulties in homework completion, classroom engagement, and independent learning, and they frequently persist into adolescence and adulthood, predicting poor academic trajectories and occupational outcomes (Cole et al., 2024; DuPaul et al., 2021). Consequently, organizational skills have emerged as a critical intervention target in contemporary ADHD research and practice.

Neuropsychological models suggest that organizational skill deficits in ADHD are closely linked to impairments in executive functions, particularly working memory, cognitive flexibility, and inhibitory control. Studies have

demonstrated robust associations between working memory limitations and difficulties in planning, task tracking, and time management in children with ADHD (Cole et al., 2024; Kofler et al., 2018). These executive dysfunctions undermine children's capacity to maintain goal-relevant information, sequence actions effectively, and adapt behavior to changing task demands, thereby exacerbating organizational challenges across academic settings. Importantly, such deficits often remain even when pharmacological treatments effectively reduce core ADHD symptoms, underscoring the need for targeted psychosocial interventions (Gallagher et al., 2018).

Behaviorally oriented interventions have historically constituted the foundation of non-pharmacological treatment for ADHD. Rooted in principles of behavior modification, these approaches emphasize the systematic manipulation of antecedents and consequences to increase adaptive behaviors and reduce maladaptive ones (Miltenberger, 2016). Behavioral organizational skills training (OST) programs apply these principles by teaching children explicit strategies for organizing materials, tracking assignments, planning tasks, and managing time, often supplemented by reinforcement systems, parental involvement, and school-based supports (Abikoff & Gallagher, 2008; Gallagher et al., 2018). Meta-analytic evidence indicates that such interventions produce moderate to large improvements in organizational skills and related academic outcomes, particularly when implemented with fidelity and integrated across home and school environments (Bikic et al., 2017).

Recent randomized controlled trials further support the efficacy of OST in diverse cultural and educational contexts. For example, controlled studies have demonstrated significant reductions in organizational deficits and academic impairment following structured OST programs, with effects maintained over follow-up periods (Huang et al., 2025). These findings underscore the cross-cultural applicability of behaviorally based organizational interventions and highlight their potential as scalable, evidence-based treatments. However, despite these

demonstrated benefits, behavioral approaches may be limited by children's intrinsic motivational deficits, difficulties in generalizing learned skills, and reliance on external reinforcement systems, which can reduce long-term sustainability (De Meyer et al., 2021).

In parallel with behavioral models, cognitive-developmental and socio-cultural theories have emphasized the role of mediated learning processes in cognitive and behavioral change. Feuerstein's theory of Mediated Learning Experience posits that cognitive modifiability is facilitated through intentional, structured interactions between the learner and a mediator who guides attention, assigns meaning, and promotes transcendence beyond immediate task demands (Feuerstein & Jensen, 1980). Within this framework, learning is not solely the result of direct stimulus-response contingencies but is shaped by higher-order mediation processes that foster self-regulation, metacognition, and flexible problem solving. These theoretical assumptions are particularly relevant for children with ADHD, whose difficulties often reflect deficits in internalized self-regulatory mechanisms.

Empirical research has increasingly examined mediated learning and related interaction-based interventions in children with ADHD. Studies indicate that mediated approaches can positively influence cognitive processing, emotional regulation, and learning engagement by enhancing children's awareness of strategies, goals, and task structures (Gatica et al., 2013). In technology-enhanced contexts, mediation principles have also been applied to interactive learning environments and serious games, demonstrating improvements in attention regulation and learning outcomes when mediation criteria are systematically embedded (Coma-Roselló et al., 2020). These findings suggest that mediation-based interventions may offer a theoretically robust alternative or complement to traditional behavioral approaches for addressing organizational deficits.

One potential advantage of mediated learning interventions lies in their emphasis on internalization and transfer of skills. By explicitly fostering metacognitive awareness and reflective thinking, mediation-based approaches may promote more durable changes in organizational behavior that generalize across contexts and persist beyond the intervention period (Feuerstein & Jensen, 1980; Gatica et al., 2013). This stands in contrast to purely behaviorist models, which may produce context-specific gains that are contingent on ongoing external reinforcement. Nonetheless, empirical comparisons between mediation-

based and behaviorally based organizational interventions in children with ADHD remain limited, creating a significant gap in the literature.

Parental involvement represents another critical dimension in the effectiveness of organizational skills interventions. Research indicates that parent training and parental cognitions significantly influence children's engagement with interventions and the maintenance of treatment gains (Fleming et al., 2025; Sanders & Mazzucchelli, 2017). Behavioral parent training programs have been shown to enhance consistency, structure, and reinforcement in the home environment, thereby supporting children's organizational skill development (Hawkey et al., 2024). Similarly, mediation-based approaches often rely on parents as key mediators who scaffold children's learning and self-regulation in daily activities, suggesting overlapping mechanisms of change across intervention models.

Adherence and implementation fidelity further moderate intervention outcomes. Recent evidence suggests that children's organizational skills and emotion regulation capacities are associated with parental adherence to behavioral training protocols, highlighting bidirectional influences between child characteristics and intervention processes (Hawkey et al., 2024). This underscores the importance of selecting intervention approaches that align with family resources, parental beliefs, and educational contexts. Comparative research examining different intervention paradigms can therefore inform more personalized and context-sensitive treatment planning for children with ADHD.

Despite substantial evidence supporting both behavioral and mediated learning approaches, few studies have directly compared their relative effectiveness in improving organizational skills in children with ADHD. Existing meta-analyses primarily aggregate heterogeneous intervention types, limiting conclusions about the comparative advantages of distinct theoretical models (Bikic et al., 2017). Moreover, many studies focus on symptom reduction rather than functional skill acquisition, leaving organizational outcomes underexamined. Addressing this gap is essential for advancing evidence-based practice and optimizing intervention selection based on empirical data rather than theoretical preference alone.

From an educational and clinical perspective, understanding whether mediation-based interventions yield outcomes comparable to established behavioral programs has important implications. If mediation-based approaches

demonstrate equivalent effectiveness, they may provide flexible alternatives in settings where traditional behavioral reinforcement systems are difficult to implement or sustain. Conversely, demonstrating parity between approaches would support the integration of mediation principles into existing behavioral frameworks, potentially enhancing intervention depth and generalization (Gallagher et al., 2018; Miltenberger, 2016).

Given the central role of organizational skills in academic success and long-term functioning, and in light of theoretical and empirical developments in both behaviorist and mediated learning paradigms, systematic comparative research is warranted. Such research can contribute to a more nuanced understanding of mechanisms of change, inform multimodal intervention design, and support evidence-based decision-making in educational and clinical practice for children with ADHD (Cole et al., 2024; Huang et al., 2025).

Therefore, the aim of the present study was to compare the effectiveness of behavioral organizational skills training and mediated learning-based intervention in improving organizational skills among elementary school students with Attention-Deficit/Hyperactivity Disorder.

## 2. Methods and Materials

### 2.1. Study Design and Participants

The present study was conducted using a quasi-experimental pretest–posttest design with a control group. The statistical population consisted of all elementary school students diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) during the 2023–2024 academic year in schools in the city of Mashhad. A sample of 55 students, along with their mothers, was voluntarily selected and randomly assigned to three groups: a control group ( $n = 17$ ), a behavioral therapy group ( $n = 19$ ), and a mediated learning training group ( $n = 19$ ). Inclusion criteria were as follows: a diagnosis of ADHD by a psychiatrist, age between 9 and 11 years, the presence of deficits in organizational skills, absence of comorbid psychiatric disorders, no medication use during the intervention period, no parental participation in concurrent intervention programs, and absence of acute or chronic physical or psychological illnesses in the child or parents. Exclusion criteria included absence from more than two intervention sessions and voluntary withdrawal from continued participation.

During the research process, 7 participants (12.7%) were excluded due to excessive absenteeism and withdrawal from the study. Of the remaining 48 participants, 17 were in the

behavioral therapy group, 15 in the mediated learning training group, and 16 in the control group. To achieve statistical balance and prevent bias resulting from unequal group sizes, 2 participants from the behavioral therapy group and 1 participant from the control group were randomly removed. Ultimately, data from 45 participants (15 in each group) were included in the analysis.

Informed consent was obtained from all participants, and all ethical principles, including respect for privacy and confidentiality, were observed.

### 2.2. Measures

**Attention-Deficit/Hyperactivity Disorder Assessment Scale:** In this study, the Parent Form of the SNAP-IV Questionnaire, Fifth Version, was used to assess Attention-Deficit/Hyperactivity Disorder. This scale is scored on a 4-point Likert scale ranging from 0 to 3. In the present sample, the reliability of the questionnaire, as assessed by Cronbach's alpha coefficient, was 0.89 for the inattention subscale, 0.84 for the hyperactivity–impulsivity subscale, and 0.93 for the total scale, indicating satisfactory reliability. These values are consistent with the findings reported by Hall et al. (2020), who reported overall reliability coefficients of 0.97 and 0.98, respectively. In terms of validity, the study by Sadralasadat et al. (2007) confirmed a criterion validity coefficient of 0.48 and acceptable content validity for this scale.

**Children's Organizational Skills Scale:** The Parent Version of the Children's Organization, Planning, and Sequencing Scale (P-COSS), developed by Abikoff and Gallagher (2009), was used to assess organizational skills in elementary school students. This questionnaire consists of four subscales: task tracking, materials management, time management, and planning, and is scored using a Likert scale. In the present sample, Cronbach's alpha coefficients for the subscales were 0.87 for task tracking, 0.85 for materials management, 0.86 for time management, and 0.88 for planning. The overall reliability of the scale was 0.92, indicating good internal consistency in the study population. These findings are consistent with the results reported by Abikoff and Gallagher (2009), who reported an overall reliability of 0.91 and subscale reliabilities of 0.89, 0.87, 0.88, and 0.90 for task tracking, materials management, time management, and planning, respectively. Additionally, Shamsi and Ghamarani (2020) reported an overall reliability coefficient of 0.89 and confirmed acceptable content validity for this scale.

### 2.3. Interventions

The Behavioral Organizational Skills Training (OST) program is a behaviorally based intervention designed to improve organizational skills in children with ADHD aged 8 to 13 years. The program consists of 16 sessions, each approximately 45 minutes in duration, and is implemented with small groups of three to four students along with their parents. The session structure is standardized and includes four core components: (a) review of homework and between-session application of previously learned organizational skills, (b) direct instruction and modeling of new organizational skills by the therapist, (c) guided in-session practice of these skills with feedback, and (d) preparation for between-session practice at home and school. Parents are actively trained in behavioral management strategies, including monitoring, prompting, reinforcement, and reward systems, to support skill acquisition and generalization. Children are reinforced for active participation and consistent practice through structured reward systems, and skills are sequentially taught across domains of task tracking, materials management, time management, and task planning, culminating in consolidation and review of all learned strategies in the final sessions.

The mediated learning-based organizational skills training program is grounded in cognitive-emotional mediation principles and aims to enhance children's organizational skills through structured parent-child mediated interactions. This program comprises 13 sessions and emphasizes the active role of parents as mediators who scaffold children's awareness, regulation, and

internalization of organizational strategies. Initial sessions focus on group orientation, clarification of program goals and rules, psychoeducation about ADHD, and strengthening the parent-child relationship through emotional mediation. Parents are trained in cognitive mediation processes, including intentionality, meaning, and transcendence, and practice these skills to support children's readiness for organization and planning. Subsequent sessions target children's self-awareness of attention difficulties, followed by systematic mediation-based training in time management, task tracking, task planning, and materials management. Techniques such as guided dialogue, use of reminders, "think-aloud" strategies, mental imagery, daily task mapping, checklists, and environmental organization are employed, with parents modeling and mediating each process. The final session is devoted to review, reflection on parent-child experiences with the techniques, and consolidation of learned skills to promote transfer and sustained use across academic and daily contexts.

### 2.4. Data Analysis

Data were analyzed using analysis of variance with repeated measurement and post-hoc tests via SPSS software, version 26.

## 3. Findings and Results

The means and standard deviations of the research variables, including difficulties in task tracking, materials management, time management, and task planning, are presented in Table 1.

**Table 1**

*Descriptive Statistics of the Research Variables by Group Across Study Phases*

Variable	Statistics	Mediated Learning Group		Behavioral Training Group		Control Group	
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Task Tracking	Mean	10.13	8.13	10.63	6.27	12.00	12.53
	Standard Deviation	2.67	3.81	2.07	1.83	1.85	1.88
Materials Management	Mean	18.33	12.53	18.93	10.60	19.60	19.53
	Standard Deviation	4.45	4.87	4.23	2.69	3.46	3.42
Time Management	Mean	14.07	8.67	14.87	7.27	13.53	13.87
	Standard Deviation	2.05	3.73	2.85	2.15	1.85	1.55
Task Planning	Mean	12.93	8.27	12.03	6.73	13.00	13.27
	Standard Deviation	2.22	3.51	2.82	2.15	2.27	1.58



Based on the results presented in Table 1, the mean scores of the research variables—including difficulties in task tracking, materials management, time management, and task planning—decreased from the pretest to the posttest in both experimental groups compared with the control group. To analyze the research data, multivariate analysis of covariance (MANCOVA) was employed. Accordingly, assumptions including normality of score distributions and homogeneity of variances were examined. The Shapiro–Wilk test was used to assess the normality assumption. The results indicated that the null hypothesis of normal distribution of the research variables was confirmed for all

three groups at both measurement points ( $p > .05$ ). Levene’s test was used to examine the assumption of homogeneity of variances, and the results showed that this assumption was satisfied for all research variables at the posttest stage. In addition, the results of Box’s M test indicated that the assumption of homogeneity of variance–covariance matrices was met at the posttest stage (Box’s  $M = 28.803$ ,  $F = 1.239$ ,  $p = .211$ ). To address the main research question, multivariate analysis of covariance (MANCOVA) and univariate analysis of covariance (ANCOVA) were conducted. The results of these analyses are reported in Table 2.

**Table 2**

*Results of Multivariate Analysis of Covariance (MANCOVA) at the Posttest Stage*

Wilks’ Lambda	Hypothesis df	Error df	F	Sig.	Partial $\eta^2$
0.427	8	72	4.634	.000	0.346

As shown in Table 2, after adjusting for pretest scores, a significant difference was found in the combined posttest means of the organizational skills variables among participants in the two experimental groups and the control group ( $F = 4.634$ ,  $p < .001$ ). These results indicate that the two experimental groups that received behavioral organizational skills training (OST) and mediated learning training showed significantly greater improvement in the combined components of organizational skills compared

with the control group, which did not receive any intervention. Moreover, the mean levels of organizational difficulties in these variables were significantly lower in the experimental groups than in the control group. Following the significant multivariate effect observed at the posttest stage, each research variable was examined separately. For this purpose, univariate analysis of covariance (ANCOVA) was conducted, and the results are presented in Table 5.

**Table 3**

*Results of Univariate Analysis of Covariance (ANCOVA) at the Posttest Stage*

Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial $\eta^2$
Task tracking	161.762	2	80.881	13.546	.000	0.416
Materials management	468.923	2	234.462	16.520	.000	0.465
Time management	243.951	2	121.976	20.618	.000	0.520
Task planning	262.253	2	131.126	20.645	.000	0.521

The results presented in Table 3 indicate that, at the posttest stage, the variables of task tracking ( $\eta^2 = 0.416$ ,  $F = 13.546$ ,  $p < .001$ ), materials management ( $\eta^2 = 0.465$ ,  $F = 16.520$ ,  $p < .001$ ), time management ( $\eta^2 = 0.520$ ,  $F = 20.618$ ,  $p < .001$ ), and task planning ( $\eta^2 = 0.521$ ,  $F = 20.645$ ,  $p < .001$ ) showed significant differences among groups after controlling for pretest effects. Given that the obtained partial eta squared ( $\eta^2$ ) values for all variables were greater than 0.40, it can be concluded that the interventions exerted a

large effect on improving all components of organizational skills. Therefore, both the behavioral organizational skills training (OST) program and the mediated learning–based organizational skills training program produced significant improvements in each of the four variables in the experimental groups compared with the control group. To further examine the significance of group differences, Bonferroni post hoc comparisons were conducted, and the results are presented in Table 6.

**Table 4**
*Bonferroni Pairwise Comparisons of Groups at the Posttest Stage*

Stage	Variable	Group i	Group j	Mean Difference	Std. Error	Sig.
Posttest	Task tracking	Mediated learning	Behavioral training	1.867	0.892	.129
		Mediated learning	Control	-3.305	0.995	.006
		Behavioral training	Control	-5.172	0.995	.000
	Materials management	Mediated learning	Behavioral training	1.932	1.376	.504
		Mediated learning	Control	-6.675	1.534	.000
		Behavioral training	Control	-8.608	1.534	.000
	Time management	Mediated learning	Behavioral training	1.400	0.888	.370
		Mediated learning	Control	-4.810	0.990	.000
		Behavioral training	Control	-6.210	0.990	.000
	Task planning	Mediated learning	Behavioral training	1.533	0.920	.312
		Mediated learning	Control	-4.925	1.026	.000
		Behavioral training	Control	-6.459	1.026	.000

Based on the results shown in Table 4, for all variables at the posttest stage, significant differences were observed between the group receiving the mediated organizational skills learning (OSML) intervention and the control group, as well as between the group receiving behavioral organizational skills training (OST) and the control group ( $p < .001$ ). However, no significant differences were found between the mediated learning intervention group and the behavioral training group across any of the variables ( $p > .05$ ).

#### 4. Discussion and Conclusion

The present study examined the comparative effectiveness of behavioral organizational skills training (OST) and mediated learning-based intervention in improving organizational skills among elementary school students with Attention-Deficit/Hyperactivity Disorder (ADHD). The findings demonstrated that both intervention approaches led to significant improvements in core components of organizational functioning, including task tracking, materials management, time management, and task planning, compared with the control group. These results are consistent with the growing body of evidence emphasizing organizational skills deficits as a central and modifiable aspect of ADHD-related functional impairment (Abikoff & Gallagher, 2008; Gallagher et al., 2018). Importantly, the absence of a statistically significant difference between the two experimental groups suggests that both behavioral and mediation-based approaches are similarly effective in enhancing organizational skills when implemented in a structured and systematic manner.

The observed effectiveness of behavioral organizational skills training aligns closely with prior empirical findings and theoretical models grounded in behavior modification principles. OST programs explicitly teach organizational strategies while reinforcing their use through structured feedback, environmental supports, and contingent reinforcement (Miltenberger, 2016). Previous randomized controlled trials have reported significant reductions in organizational deficits and related academic difficulties following OST interventions, with moderate to large effect sizes (Huang et al., 2025). The present findings corroborate these outcomes and extend them by demonstrating that OST produces broad improvements across multiple domains of organizational functioning, reinforcing its status as an empirically supported treatment for children with ADHD (Bikic et al., 2017; Gallagher et al., 2018).

From a neuropsychological perspective, improvements in organizational skills following behavioral intervention may reflect compensatory gains in executive functioning processes, particularly working memory and self-monitoring. Research has consistently shown that deficits in working memory and planning are strongly associated with organizational problems in ADHD (Cole et al., 2024; Kofler et al., 2018). By providing external structure and repeated practice, behavioral interventions may reduce cognitive load and support the development of more efficient task management routines. These findings are consistent with evidence indicating that targeted organizational interventions can improve academic functioning even when core ADHD symptoms persist (DuPaul et al., 2021).

Equally noteworthy is the finding that mediated learning-based intervention was as effective as behavioral training in improving organizational skills. This result lends empirical

support to Feuerstein's theory of Mediated Learning Experience, which emphasizes cognitive modifiability through intentional, guided interactions that foster metacognitive awareness and self-regulation (Feuerstein & Jensen, 1980). Prior studies have shown that mediated learning approaches can enhance cognitive and emotional functioning in children and adolescents with ADHD by promoting reflective thinking, strategy awareness, and goal-directed behavior (Gatica et al., 2013). The present findings suggest that such mediation processes are also effective in addressing practical organizational difficulties that directly impact academic performance.

The equivalence in effectiveness between the two intervention models may be explained by overlapping mechanisms of change. Although behavioral and mediation-based approaches differ in their theoretical foundations, both emphasize structured guidance, active engagement, and repeated practice of adaptive strategies. Behavioral interventions rely primarily on external reinforcement and environmental modification, whereas mediated learning focuses on internalization and self-regulation through guided interaction (Feuerstein & Jensen, 1980; Miltenberger, 2016). In practice, both approaches may converge in their ability to scaffold organizational behavior and facilitate skill acquisition, leading to comparable functional outcomes. This convergence is consistent with findings from meta-analytic research indicating that diverse organizational skills interventions can yield similar effect sizes despite theoretical heterogeneity (Bikic et al., 2017).

Parental involvement likely played a significant role in the effectiveness of both interventions. Organizational skills training programs frequently incorporate parents as active agents in monitoring, reinforcing, and generalizing learned skills to daily routines (Gallagher et al., 2018). Similarly, mediated learning approaches often position parents as mediators who guide children's cognitive and behavioral processes in everyday contexts. Prior research has demonstrated that parental cognitions, adherence, and engagement significantly influence the outcomes of behavioral parent training and related interventions (Fleming et al., 2025; Sanders & Mazzucchelli, 2017). The improvements observed in the present study may therefore reflect synergistic effects between child-focused intervention components and parent-mediated support.

The findings also resonate with recent evidence highlighting the relationship between organizational skills, emotion regulation, and treatment adherence. Hawkey et al. (2024) reported that children's organizational abilities are

associated with parental adherence to behavioral training protocols, suggesting that improvements in organizational skills may enhance engagement with intervention demands (Hawkey et al., 2024). Similarly, mediated learning approaches that emphasize emotional and cognitive regulation may indirectly support sustained skill use by reducing frustration and increasing self-efficacy (Gatica et al., 2013). These complementary pathways may help explain why both interventions produced robust improvements without significant differences between them.

Another important implication of the present findings concerns the cultural and contextual adaptability of organizational skills interventions. Prior studies have demonstrated the effectiveness of OST across diverse educational systems, including non-Western contexts (Huang et al., 2025). Mediation-based approaches, with their emphasis on relational processes and individualized scaffolding, may be particularly well suited to educational settings where rigid reinforcement systems are less feasible or culturally congruent. The comparable effectiveness observed in this study suggests that educators and clinicians may select intervention models based on contextual fit, resource availability, and practitioner expertise rather than concerns about differential efficacy.

Despite the positive outcomes, it is important to interpret the findings within the broader literature on ADHD interventions. Organizational skills deficits are multifaceted and influenced by cognitive, motivational, and environmental factors (Cole et al., 2024; Kofler et al., 2018). While both interventions produced significant improvements, neither approach should be viewed as a standalone solution. Rather, these interventions may be most effective when integrated into comprehensive, multimodal treatment plans that address symptom management, academic support, and family functioning (DuPaul et al., 2021; Gallagher et al., 2018). The present findings contribute to this integrative perspective by demonstrating that different theoretical approaches can achieve comparable functional gains.

Several limitations should be considered when interpreting the results of this study. The sample size was relatively modest, which may limit the generalizability of the findings to broader populations of children with ADHD. In addition, the reliance on parent-reported measures may introduce response bias, despite the strong psychometric properties of the instruments used. The absence of long-term follow-up data also precludes conclusions about the durability of intervention effects over time. Finally, potential



moderating variables such as ADHD subtype, comorbid learning difficulties, and parental characteristics were not examined and may have influenced intervention outcomes.

Future studies should employ larger and more diverse samples to enhance generalizability and statistical power. Longitudinal designs with follow-up assessments are needed to determine the sustainability of organizational skill improvements and their impact on long-term academic and psychosocial outcomes. Further research should also explore potential moderators and mediators of treatment response, including executive functioning profiles, parental involvement, and school-level supports. Comparative studies integrating qualitative methods may provide deeper insight into the mechanisms underlying behavioral and mediated learning interventions.

From a practical perspective, the findings suggest that both behavioral organizational skills training and mediated learning-based interventions can be effectively implemented in educational and clinical settings to support children with ADHD. Practitioners should consider contextual factors such as family resources, school infrastructure, and practitioner training when selecting intervention approaches. Combining elements from both models may further enhance effectiveness by addressing both external structure and internal self-regulation. Ultimately, flexible, individualized intervention planning is recommended to optimize organizational skill development and academic functioning in children with ADHD.

### Authors' Contributions

All authors significantly contributed to this study.

### 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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### Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

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