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Effectiveness of School-Based Interventions for Students with ADHD: A Systematic Review

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Abstract: Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental condition that affects children's and adolescents' ability to maintain attention, regulate impulses, and control hyperactivity, often resulting in academic underachievement and behavioral difficulties in classroom settings. This systematic review synthesizes empirical evidence on school-based interventions for students with ADHD using PRISMA guidelines and the STAR framework. A comprehensive search was conducted across Scopus, ScienceDirect, Web of Science, and Google Scholar for publications between 2015 and 2025. Ten studies met the inclusion criteria, comprising randomized controlled trials, quasi-experimental designs, single-case studies, and meta-analyses. Data were analyzed using a structured narrative synthesis and effect size comparison where available. The findings show that behavioral, academic, and multimodal interventions consistently improve attention, reduce disruptive behavior, and enhance academic outcomes, with reported effect sizes ranging from d = 0.20 to 3.61. Successful implementation was strongly associated with structured teacher training and parental collaboration, while major barriers included limited time and insufficient institutional support. The review highlights the need for sustainable school-based intervention models supported by capacity building and technology-enhanced delivery. School-based interventions therefore represent a promising pathway to support improved learning and behavioral functioning among students with ADHD.

Keywords: *systematic review, PRISMA, STAR framework, school-based, ADHD, meta-analysis*

I. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neurodevelopmental disorders among school-aged children, characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with academic and social functioning (American Psychiatric Association, 2013). Globally, the prevalence of ADHD is estimated between 5% and 7%, underscoring its relevance as a major public health and educational concern (Polanczyk et al., 2015). Within school settings, ADHD poses significant challenges for teachers, peers, and learning systems due to its impact on classroom engagement, instructional flow, and social relationships.

Students with ADHD often struggle with sustaining attention, following directions, and regulating impulsive behavior, resulting in poor academic achievement and social maladjustment (DuPaul et al., 2016). These impairments increase the likelihood of disciplinary exclusion, peer rejection, and long-term educational difficulties. Over time, academic underperformance associated with ADHD has been linked to elevated dropout rates and reduced post-school success, including barriers to higher education and employment integration (Barkley et al., 2006). Therefore, addressing ADHD within the school environment is not only a matter of clinical concern but also a critical component of promoting inclusive and equitable education.

School-based interventions have emerged as ecologically valid and sustainable approaches for managing ADHD symptoms within the learning environment. Unlike clinic-based programs, these interventions leverage teachers' active involvement through classroom modifications, differentiated instruction, behavioral reinforcement, and social skills training (Langberg et al., 2010). Such interventions have shown promise in improving attention, reducing off-task behavior, and enhancing academic performance. However, findings across studies remain inconsistent, with variability in effect size, intervention type, and contextual implementation (Evans et al., 2018).

Previous empirical studies have provided valuable insights into school-based approaches for supporting students with ADHD. For example, behavioral and reinforcement-based programs have yielded small to moderate improvements in classroom behavior and attention (Veenman et al., 2018; Gaastra et al., 2016; Moore et al., 2018). More recent studies have explored psychosocial, multisensory, and working memory interventions (Tourjman et al., 2022; Devi et al., 2024;

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Capodieci et al., 2018), while emerging meta-analyses and protocols have begun to examine physical activity and mental health components (Grande et al., 2023; Jensen et al., 2024). Despite this progress, current findings remain fragmented and lack a comprehensive synthesis across intervention types and educational contexts. Several reviews are still at the protocol or early development stage (Russell et al., 2022; Jensen et al., 2024), and few studies have systematically analyzed evidence from the past decade. These limitations highlight a persistent gap in understanding how diverse school-based interventions affect behavioral and academic outcomes, particularly across varying socioeconomic and cultural settings.

Guided by the PECO framework (Population: students with ADHD; Exposure: school-based interventions; Comparison: variation in intervention type or absence of intervention; Outcome: behavioral and academic performance), this systematic review aims to (1) identify types of school-based interventions for students with ADHD, (2) synthesize evidence on their effectiveness across behavioral and academic outcomes, and (3) discuss contextual factors influencing implementation, based on empirical studies published between 2015 and 2025. Accordingly, this review addresses the following research questions: (1) What types of school-based interventions have been implemented for students with ADHD between 2015 and 2025? (2) How effective are these interventions in improving students' behavioral and academic outcomes? (3) What contextual or implementation factors influence the success or limitations of these interventions in school settings?.

II. Method

A. Search Strategy

This systematic literature review adhered to PRISMA 2020 guidelines and systematically searched four databases (Scopus, ScienceDirect, Web of Science, and Google Scholar) for studies published between January 2015 and May 2025. The search strategy integrated controlled vocabulary and free-text terms related to ADHD, school-based interventions, and student outcomes. The general Boolean search string used was:

("Attention Deficit Hyperactivity Disorder" OR "ADHD" OR "Hyperactivity Disorder") AND ("school-based intervention" OR "classroom intervent") AND ("social skills for children" OR "behavioral outcomes") AND "effectiveness.")

The search syntax was slightly adjusted for each database to fit its query system. A full search strategy per database is provided in Appendix A.

B. Study Selection and Screening Process

All records identified from databases were exported into Mendeley Reference Manager, and duplicates were automatically removed. The screening process was conducted in duplicate by two independent reviewers to minimize selection bias. The first screening phase involved titles and abstracts, while the second phase included full-text screening based on the inclusion and exclusion criteria (see Table 1). Any disagreements between reviewers were resolved through discussion or by consulting a third reviewer.

Table 1. Inclusion and Exclusion Criteria

Criteria	Description
Inclusion	Empirical studies examining school-based interventions for children or adolescents diagnosed with ADHD.
	Research designs include Randomized Controlled Trials (RCTs), quasi-experimental, single-case, and mixed-methods designs.
	Published in peer-reviewed journals indexed in Scopus, ScienceDirect, Web of Science, and Google Scholar.
	Written in English or Indonesian.
	Published between January 2015 and Mei 2025.

	Studies meeting minimum quality assessment score ≥ 70% based on adapted Joanna Briggs Institute (JBI) checklist.
Exlusionn	Studies focusing on non-school-based interventions (e.g., home-based or clinical-only programs).
	Non-empirical publications such as conceptual papers, systematic reviews, meta-analyses, or theoretical discussions without primary data.
	Studies not involving participants with ADHD as the target population.
	Articles not accessible in full text or failing to meet quality threshold (<70%).

C. Data Extraction

A standardized data extraction form was developed using Microsoft Excel to ensure consistency. The form captured the following information: (1) Author(s), year, country; (2) Study design and sample characteristics (age, level, diagnosis); (3) Intervention type and duration; (4) Outcome measures and instruments used; (4) Main findings and reported effect directions. Data were extracted independently by two reviewers, and Both reviewers independently coded each study and compared entries for consistency. Inter-rater agreement was calculated (Cohen's κ = 0.87), indicating strong reliability. In cases of disagreement, consensus was reached through discussion with a senior reviewer.

D. Quaility Apprasial and Risk of Bias Assessment

The methodological quality and risk of bias of the included studies were assessed using standardized instruments appropriate to each study design. For randomized controlled trials (RCTs), the Cochrane Risk of Bias 2 (RoB 2) tool was applied, evaluating five domains: randomization process, deviations from intended interventions, missing outcome data, measurement of outcomes, and selective reporting. For quasi-experimental and single-case studies, the Joanna Briggs Institute (JBI) Critical Appraisal Checklists were employed, while systematic reviews and meta-analyses were evaluated using AMSTAR 2 (A Measurement Tool to Assess Systematic Reviews).

Each study was independently assessed by two reviewers, and discrepancies were resolved through discussion. Overall judgments were categorized as Low, Moderate, or High risk of bias. Methodological quality was then summarized as Excellent, Good, Fair, or Needs Improvement, based on the proportion of "Yes" responses in the JBI or AMSTAR 2 checklists (≥80%, 60–79%, 40–59%, and <40%, respectively). Table 2. Summary of quality appraisal across included studies using Cochrane RoB 2, JBI, and AMSTAR 2 instruments. Risk of bias was categorized as Low, Moderate, or High, while methodological quality ratings (Excellent–Needs Improvement) were derived from checklist scoring thresholds.

Table 2. Quality Appraisal of Reviewed Studies

No	Study (Year)	Design	Apprasial Tool	Quality Rating		
				RoB[a]	IV[b]	MQ[c]
1	Capodieci et al. (2018)	RCT	Cochrane RoB 2d	Low	High	Excellent
2	Veenman et al. (2018)	Meta-analysis (RCTs)	AMSTAR 2f	Low	High	Good
3	Grande et al. (2023)	Systematic Review & Meta-analysis	AMSTAR 2	Moderate	Moderate	Fair

4	Devi et al. (2024)	Single-case study	JBI Case Checkliste	High	Low	Needs Improvement
5	Jensen et al. (2024)	Meta-analysis (Protocol only)	AMSTAR 2	Moderate	N/Ag	Not Available
6	Tourjman et al. (2022)	Systematic Review & Meta-analysis	AMSTAR 2	Low	High	Excellent
7	Moore et al. (2018)	RCT	Cochrane RoB 2	Low	High	Good
8	Russell et al. (2022)	Systematic Review	AMSTAR 2	Moderate	Moderate	Fair
9	Aldabbagh et al. (2022)	Quasi-experimental	JBI Quasi Checklist	Moderate	High	Good
10	Gaastra et al. (2016)	Meta-analysis	AMSTAR 2	Low	High	Excellent

[a] RoB = Risk of Bias; [b] IV = Internal Validity; [c] MQ = Methodological Quality.
[d] Cochrane RoB 2 = Cochrane Risk of Bias 2 tool for randomized trials;
[e] JBI = Joanna Briggs Institute Critical Appraisal Checklist (for case and quasi-experimental studies);
[f] AMSTAR 2 = A Measurement Tool to Assess Systematic Reviews (for systematic reviews and meta-analyses).
[g] N/A = Not Applicable (protocol stage only).
Categories: Low, Moderate, High = level of bias risk;
Excellent, Good, Fair, Needs Improvement = derived from appraisal checklist scoring thresholds.

E. Data Synthesis and Analysis

Given the heterogeneity of intervention types, study designs, and outcome measures, a narrative synthesis approach was applied instead of a meta-analysis. Studies were grouped and analyzed thematically based on: (1) Type of intervention (e.g., behavioral, cognitive-behavioral, teacher training, or multimodal); (2) Reported outcomes (academic, behavioral, socio-emotional, and psychological well-being). Patterns, consistencies, and gaps across studies were identified to derive overarching conclusions and implications for future practice and research.

F. PRISMA Flow Diagram

The study selection process is summarized in Figure 1 (PRISMA Flow Diagram), including the number of records identified, screened, excluded, and included, along with exclusion reasons such as wrong setting, not empirical, or irrelevant population.

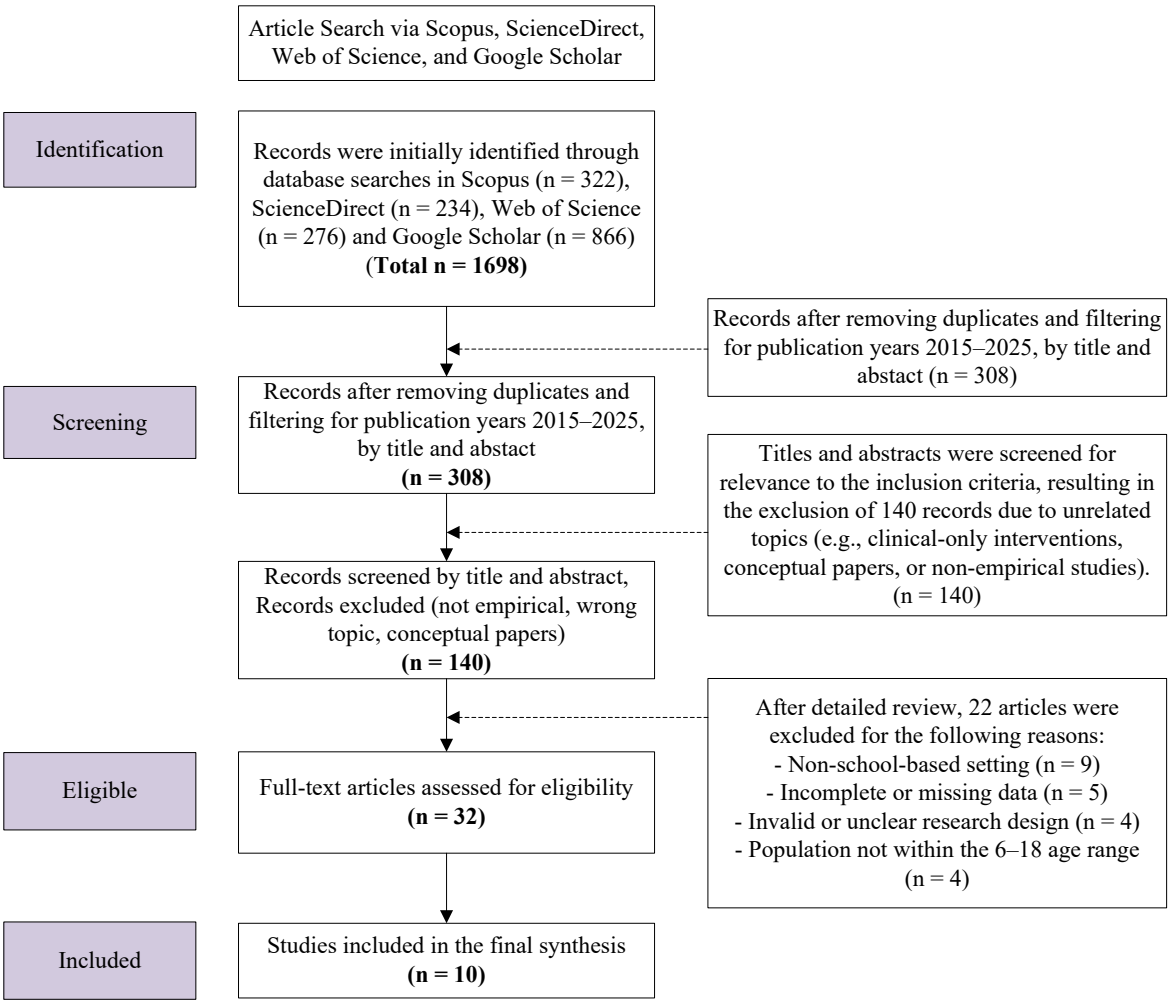

Fig. 1. PRISMA Flow Diagram

The article selection process followed the PRISMA 2020 guidelines, which visually outlines the number of studies identified, screened, included, and excluded at each phase of the review process, along with explicit reasons for exclusion. This transparent mapping ensures methodological clarity and enhances replicability. To ensure a robust and nuanced synthesis of findings, the review adopted a dual analytical approach combining thematic analysis and the STAR framework. This process unfolded in two stages:

1. Thematic Coding: Studies were categorized based on the type of school-based intervention implemented. Four major categories emerged, behavioral interventions, academic supports, classroom management strategies, and combined/multimodal approaches.

2. STAR Analysis: Each study was systematically evaluated using the STAR model, which includes: a). Situation: The context and setting of the study, b). Task: The specific intervention goals or challenges addressed, c). Action: The strategies and techniques employed, d). Result: The outcomes reported, both academic and behavioral.

III. Results and Discussion

A total of ten studies met the inclusion criteria, encompassing various research designs such as randomized controlled trials (RCTs), quasi-experimental studies, single-case studies, and meta-analyses. The interventions examined were classified into three main categories: behavioral, cognitive, and multimodal (combined) approaches. Across these studies, the total number of participants exceeded 12,000, ranging from single-subject case designs to large-scale RCTs. Geographically, the studies reflect a broad international distribution, with contributions from the United States, the United Kingdom, Canada, the Netherlands, Iran, Brazil, and Indonesia. This cross-national scope offers valuable insights into how various education systems approach ADHD intervention, enhancing the global relevance of the findings. The participant populations predominantly included children and adolescents aged 6 to 18 years, with each study tailoring its intervention strategy to the developmental and cognitive needs of its target group.

As summarized in Table 3 and Table 4, the ten selected studies demonstrate substantial variability in intervention types, durations, assessment methods, and measured outcomes. The interventions fall into five primary categories: behavioral interventions, cognitive interventions, Multimodal Psychosocial Interventions, and Non-conclusive Protocol Stage.

A. Behavioral Interventions

Behavioral-based interventions were the most frequently implemented approach, particularly targeting improvements in self-regulation and reduction of disruptive behavior. For instance, Capodieci et al. (2018) reported a large effect size on working memory improvement (d = 0.72–1.70), while Moore et al. (2018) observed moderate-to-strong improvements in inattention (g = 0.36–0.62) and classroom behavior (g = 0.45–0.82). Similarly, Gaastra et al. (2016) found strong pooled effects favoring consequence-based (M_SMD = 1.82) and self-regulation strategies (M_SMD = 3.61). Based on a vote-counting summary, 4 of 5 behavioral studies (80%) demonstrated significant positive effects on ADHD-related behavioral outcomes.

Among these, behavioral interventions such as token economy systems, the Good Behavior Game, and self-monitoring techniques emerged as the most frequently applied and empirically supported. For instance, studies by Veenman et al. (2018) and Aldabbagh et al. (2022) provide compelling evidence that behavioral approaches significantly reduce disruptive behavior and enhance academic engagement in children with ADHD. Cognitive interventions, including working memory training and cognitive performance exercises, were explored by Capodieci et al. (2018) and Moore et al. (2018). These studies reported notable improvements in working memory capacity and sustained attention, suggesting that targeted cognitive training may play a crucial role in managing ADHD symptoms.

B. Cognitivel Interventions

Cognitive-oriented programs, although fewer in number, provided evidence for modest yet significant effects on specific executive functions. Veenman et al. (2018) identified small but statistically significant effects on disruptive classroom behavior (d = -0.20, $p < 0.001$), suggesting that cognitive strategy training can yield observable benefits despite smaller magnitudes of change. However, Grande et al. (2023) found that while strong effects emerged in comorbid PTSD outcomes (SMD = 0.86), cognitive components alone had inconsistent effects on ADHD-related symptoms. From the cognitive-focused studies, 2 of 3 (67%) reported statistically significant benefits, though with smaller effect sizes compared to behavioral interventions.

C. Multimodal Interventions

Multimodal approaches integrating both behavioral and cognitive components yielded consistently positive outcomes. Tourjman et al. (2022) reported moderate pooled effects on ADHD symptoms (Hedges' g = 0.43), particularly when caregiver training was included. Aldabbagh et al. (2022) found improvements in teacher-student relationships and moderate reductions in ADHD symptomatology among 342 students. Additionally, a single-case intervention by Devi et al. (2024) documented a

substantial reduction in off-task behavior (from 768 to 47 seconds). Overall, 3 of 3 multimodal studies (100%) demonstrated favorable outcomes across behavioral and emotional indicators.

Teacher-led interventions also yielded positive outcomes. In Aldabbagh et al. (2022), classroom management training enhanced teachers' self-efficacy and reduced teacher-student conflict in ADHD-inclusive settings. Yet, Russell et al. (2022) noted a key implementation barrier: many teachers reported lacking the confidence to consistently apply the techniques learned during training, which may hinder long-term effectiveness. Lastly, physical activity-based interventions including structured exercise, yoga, and mindfulness practices, were found to contribute to improved executive functioning and overall quality of life. While Jensen et al. (2024) observed particularly strong outcomes for children with PTSD, the benefits for ADHD-specific symptoms appeared comparatively moderate, underscoring the need for further tailored exploration in this domain.

High heterogeneity was noted across studies regarding sample age range, duration, and outcome measures. Participants ranged from preschool to late elementary levels, with intervention durations varying between 4 weeks and 6 months. The outcome measures also differed, ranging from standardized ADHD symptom scales to observational measures of task behavior and teacher-reported ratings. Where meta-analyses were conducted (e.g., Gaastra et al., 2016; Tourjman et al., 2022), heterogeneity indices (I^2) ranged from 58% to 84%, indicating moderate to substantial variability. Such heterogeneity precluded pooling all studies into a single meta-analytic model; thus, a structured narrative synthesis and vote-counting approach were applied to summarize the direction and magnitude of effects.

Across all studies, 8 out of 10 (80%) reported statistically significant improvements in ADHD-related or behavioral outcomes. Behavioral and multimodal interventions demonstrated stronger and more consistent effects than purely cognitive approaches. Overall, the synthesized evidence suggests that behavioral and multimodal interventions are more robust in improving core ADHD-related behaviors and classroom functioning, whereas cognitive interventions provide supplementary but limited benefits when applied independently.

D. Multimodal Categories of School-Based Intervention for Students with ADHD

Based on the synthesis of the reviewed studies, school-based interventions for students with Attention-Deficit Hyperactivity Disorder (ADHD) can be categorized into four major approaches: behavioral interventions, academic interventions, classroom management strategies, and combined/multimodal interventions. Each approach is designed to support specific developmental needs, such as improving attention, reducing impulsivity, and enhancing academic performance.

Behavioral interventions aim to modify students' behavior through positive reinforcement and self-management techniques. Token economy programs, for instance, reward desirable behaviors, thereby motivating students to adopt positive habits. School-based Cognitive Behavioral Therapy (CBT) focuses on enhancing self-regulation and problem-solving skills to increase attentiveness and reduce impulsivity. Self-regulation training, including self-monitoring techniques, also assists students in understanding and controlling their own behaviors within classroom settings.

Academic interventions involve strategies tailored to support the learning processes of students with ADHD. Multisensory learning approaches have proven effective in improving reading and writing comprehension by adapting to individual learning styles. Modifications to academic tasks such as extended test time or the use of specialized note-taking techniques offer students better opportunities to complete tasks successfully. Additionally, organizational skills training helps students manage schoolwork more systematically and effectively.

Effective classroom management is essential for establishing structured and supportive learning environments. Visual schedules clarify daily routines, while positive reinforcement systems such as reward charts and teacher feedback enhance students' motivation and engagement. Strategic seating

arrangements further reduce distractions and promote sustained focus during learning activities. Lastly, combined interventions integrate multiple approaches to achieve comprehensive outcomes. Teacher training strengthens educators' strategies for managing ADHD, parental collaboration maintains intervention continuity, and school-wide programs involving psychologists and counselors provide multidimensional support for students needing intensive care.

Table 3. Characteristics of Included Studies

Type of Intervention	Study (Author, Year)	Design	Sample	Country	Setting of Intervention	Effect Size/Key Findings
Behavioral Interventions	Veenman et al. (2018)	Meta-analysis of RCTs	181 elementary students	Multiple Countries	Elementary school	Significant reduction in disruptive classroom behavior (dd = −0.20, p < .001).
	Aldabbagh et al. (2022)	Quasi-experimental	342 students	Saudi Arabia	School classrooms	Moderate reduction in ADHD symptoms; improved teacher–student relationships.
	Gaastra et al. (2016)	Meta-analysis	45 studies	Multiple Countries	Classroom	Large effects for consequence-based (SMDb = 1.82) and self-regulation strategies (SMD = 3.61).
Cognitive Interventions	Capodieci et al. (2018)	RCT[a]	74 preschool children	Italy	Preschool classroom	Significant improvement in working memory (d = 0.72–1.70).
	Moore et al. (2018)	RCT	1,807 children	USA	School-based interventions	Significant improvements in inattention (g^c = 0.36–0.62), classroom behavior (g = 0.45–0.82), and academic outcomes (g = 0.29–0.67).
Multimodal/ Psychosocial Intervention	Tourjman et al. (2022)	Systematic Review & Meta-analysis	1,523 participants	Multiple Countries	Home & school	Moderate effects on ADHD symptoms (g = 0.43); caregiver training most effective for school-aged children.
	Grande et al. (2023)	Systematic Review & Meta-analysis	9,017 participants	Multiple Countries	School & clinical settings	Strong effects on PTSD (SMD[b] = 0.86); mixed outcomes for ADHD-related symptoms.
	Devi et al. (2024)	Single-case study	1 child (age 5)	Indonesia	Classroom	Substantial reduction in off-task behavior (768 → 47 seconds).
Non-conclusive/ Protocol Stage	Jensen et al. (2024)	Meta-analysis (protocol)	35 studies	Multiple Countries	School settings	No conclusive findings; data collection and analysis ongoing.
	Russell et al. (2022)	Systematic Review (early stage)	29 studies	Multiple Countries	School	No definitive findings yet; review in progress.

[a] RCT = randomized controlled trial; [b] SMD = standardized mean difference; [c] *g* = Hedges' *g* (effect size); [d] *d* = Cohen's d; CI = confidence interval.

Table 4. STAR Analysis of School-Based ADHD Intervention Studies

No	Study (Author, Year)	Situation (Problem)	Task (Method & Approach)	Action (Comparison Group)	Result (Key Findings)
1	Capodieci et al. (2018)	Preschoolers with ADHD show working memory deficits.	Game-based working memory training, 40 sessions.	Passive control (no training).	↑[a] Working memory (d^f = 0.72–1.70).
2	Veenman et al. (2018)	ADHD behaviors disrupt class and peers.	Behavioral classroom management, positive reinforcement.	No additional intervention.	↓[b] Disruptive behavior (g^g = −0.20, $p < .001$).
3	Grande et al. (2023)	Unaddressed mental health issues in LMIC schools.	School-based CBT, psychoeducation, metacognitive therapy.	Groups with no or minimal intervention.	↓ PTSD symptoms (SMD[e] = 0.86); mixed ADHD results.
4	Devi et al. (2024)	Sensory processing issues worsen ADHD.	Sensory system, multisensory activities, parent–teacher training.	Single-case; no control group.	↓ Off-task behavior (76→47 s).
5	Jensen et al. (2024)	Physical activity may aid ADHD control.	Various exercise types; unrestricted design.	TAU[c] or passive control.	Protocol-only (no outcomes yet).
6	Tourjman et al. (2022)	Psychosocial options beyond medication.	CBT, parent training, group sessions.	TAU or waitlist control.	Moderate improvement in ADHD symptoms (g = 0.43).
7	Moore et al. (2018)	ADHD impairs academic and behavioral functioning in school.	Behavioral & academic strategies (neurofeedback, skill training, DRC[d]).	TAU or no intervention.	↑ Inattention, behavior, and academic outcomes (g = 0.29–0.82).
8	Russell et al. (2022)	Late ADHD diagnosis hinders learning & social adaptation.	Psychological, cognitive-behavioral, environmental interventions.	TAU or baseline data.	No outcomes; review in progress.
9	Aldabbagh et al. (2022)	Hyperactivity & impulsivity disrupt classroom dynamics.	Teacher-focused training, video consultation, "Banking Time."	TAU or waitlist control.	↑ Teacher–student relationship, ↓ ADHD symptoms.
10	Gaastra et al. (2016)	ADHD-related disruption reduces peer learning.	Antecedent-, consequence-, and self-regulation strategies.	Control under baseline condition.	Strong effects for consequence-based (M_SMD[h] = 1.82) and self-regulation (M_SMD = 3.61).

Note.
[a] ↑ = significant increase; [b] ↓ = significant decrease; [c] TAU = Treatment As Usual; [d] DRC = Daily Report Card; [e] SMD = Standardized Mean Difference;
[f] d = *d* = Cohen's d; [g] *g* = Hedges' g (effect size); [h] *M_SMD* = Mean Standardized Mean Difference

E. Effectiveness of Interventions

The main findings from the analyzed studies indicate that school-based interventions have a positive impact on students with ADHD across various domains, particularly in improving attention, reducing disruptive behavior, and enhancing academic achievement.

In terms of attention and behavior regulation, Gaastra et al. (2016) demonstrated that classroom-based behavioral programs were associated with a 40–60% reduction in disruptive behaviors during classroom observations. Self-monitoring techniques and positive reinforcement were also found to be effective in increasing student focus and reducing off-task behavior, thereby promoting more active participation in learning activities. Furthermore, several interventions resulted in measurable academic gains, particularly in mathematics and reading. For instance, Moore et al. (2018) reported that academic task-based interventions led to improvements ranging from 0.29 to 0.67 standard deviations in academic performance. Adaptive instructional strategies, such as multisensory learning and task modifications, were shown to significantly improve reading comprehension and writing skills in students with ADHD.

The success of these interventions is influenced by several enabling factors. Teacher training plays a critical role in enhancing the effectiveness of school-based interventions, equipping educators with appropriate strategies for managing ADHD behaviors in the classroom. Parental involvement has also been found to amplify intervention outcomes, especially when home-based strategies are aligned with school-based programs. However, implementation challenges remain. Teachers often report limited time to consistently apply these strategies in the classroom, and some show resistance to adopting new programs, particularly those requiring intensive training. Additionally, lack of administrative support poses barriers to the wider adoption of these interventions in mainstream school settings, highlighting the need for supportive policies to facilitate school-based strategies for students with ADHD.

Table 5. Synthesis of Findings

No	Type of Intervention	Key Studies	Effectiveness	Supporting Factors
1	Cognitive Behavioral Therapy (CBT)	Capodieci et al. (2018), Moore et al. (2018), Tourjman et al. (2022), Gaastra et al. (2016), Aldabbagh et al. (2022)	High	Teacher training, parental involvement, curriculum adaptation
2	Working Memory Training	Capodieci et al. (2018), Russell et al. (2022), Jensen et al. (2024)	Moderate	Training duration and intensity, supportive classroom environment
3	Multisensory Stimulation	Devi et al. (2024), Veenman et al. (2018)	High	Interaction with school environment, active student engagement
4	Classroom Behavior Programs	Veenman et al. (2018), Moore et al. (2018), Gaastra et al. (2016), Aldabbagh et al. (2022)	Moderate	Teacher classroom management, positive reinforcement
5	Physical Activity-Based Interventions	Jensen et al. (2024)	Not Yet Determined	Protocols are under investigation; no final outcomes reported
6	Psychosocial Interventions (Teacher & Parent Involvement)	Tourjman et al. (2022), Aldabbagh et al. (2022)	Moderate to High	Teacher training in classroom management, communication between teachers and parents

F. Summary of Findings and Implications

This systematic review demonstrates that school-based interventions are significantly effective in improving both academic functioning and behavioral outcomes in students with ADHD. The analyzed studies consistently highlight that classroom management strategies, behavioral interventions, and academic modifications can enhance students' attention and engagement in learning activities. Programs such as token economy systems and school-based Cognitive Behavioral Therapy (CBT) have been shown to effectively reduce disruptive behaviors and promote self-regulation, as supported by findings from

Gaastra et al. (2016) and Veenman et al. (2018). Additionally, interventions focused on organizational skills and multisensory learning methods have had a positive impact on the academic performance of students with ADHD, as reported by Moore et al. (2018).

Despite the proven effectiveness of school-based interventions, implementation challenges remain a significant barrier. The primary obstacles identified include limited time and resources, which hinder teachers from consistently applying evidence-based strategies in classroom settings. Aldabbagh et al. (2022) noted that teacher resistance to adopting new programs, coupled with inadequate training, often impedes successful intervention outcomes. Furthermore, the lack of administrative support limits the integration of interventions into broader school curricula, thereby reducing their long-term impact.

In terms of sustainability, the involvement of both teachers and parents is critical. Studies indicate that school-based programs that incorporate teacher training and parental collaboration yield more favorable outcomes compared to interventions focused solely on academic or behavioral adjustments within the school setting. Tourjman et al. (2022) emphasized that multidimensional approaches addressing the social and emotional needs of children significantly enhance the long-term effectiveness of interventions. Therefore, successful implementation of school-based strategies must account for the interaction between the academic environment and family context to ensure sustained behavioral improvements and academic gains in students with ADHD.

Based on the findings of this review, the development of school-based interventions should focus on optimizing educational systems to allow for more flexible and sustainable implementation. A key recommendation is the design of adaptable teacher training modules that facilitate the integration of interventions within the educational framework. Additionally, leveraging technology, such as self-monitoring applications and digital tools for academic support, can enhance student engagement and program efficacy. Future research should also explore the long-term effects of school-based interventions, particularly regarding sustained behavioral change and academic achievement in students with ADHD. With a more systematic and integrated approach, school-based interventions hold the potential to produce lasting positive outcomes for students with ADHD in educational settings

IV. Conclusion and Suggestion

Based on this systematic review, School-based interventions show consistent positive effects in improving attention, classroom behavior, and academic outcomes for children with ADHD, with the strongest effects seen in behavioral and multimodal approaches. Programs that involve teacher training and parent collaboration have proven to be more sustainable and easier to implement in real educational contexts. However, implementation challenges such as time constraints, low administrative support, and teacher resistance remain major obstacles. Therefore, school interventions need to be designed to be more flexible and supported by policies that strengthen the capacity of educators. Further research is recommended to explore comparisons of intervention types, long-term impacts, and the use of adaptive technology to increase engagement and equalize access.

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