

Behavioral Effects of Yoga Based Interventions in Children and Adolescents: A Systematic Review

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Article Info	Abstract
Article type: Review Article Article history: Received 05 February 2026 Received in revised form 13 April 2026 Accepted 01 May 2026 Available online 29 June 2026 Keywords: Yoga, Child, Adolescent, Self-Control, Attention.	Introduction: Behavioral regulation during childhood and adolescence plays an important role in academic achievement, social functioning, and long-term mental health. Yoga based interventions have increasingly been explored as strategies to enhance behavioral and emotional regulation in youth. However, evidence focusing specifically on behavioral outcomes in children and adolescents remains limited. Objective: The present systematic review was conducted to consolidate the available evidence regarding the influence of yoga-based interventions on behavioral outcomes among children and adolescents. Method: A PRISMA-guided search of PubMed, Scopus, and Web of Science identified 16 eligible intervention studies published since 2015 involving participants aged 7-18 years and examining yoga-based interventions with behavioral outcomes. Results: Included studies comprised controlled trials and pre-post designs conducted in school and clinical settings. Yoga-based interventions were generally associated with improved attention, self-regulation, behavioral control, and social functioning, with reported reductions in impulsivity and behavioral problems across different populations. Conclusions: Yoga based interventions may positively influence behavioral functioning in children and adolescents, particularly attention, self-regulation, and social competence. However, heterogeneity in intervention protocols and outcome measures highlights the need for further well designed RCTs. Cite this Article: Ulusoy, A. (2026). Behavioral Effects of Yoga Based Interventions in Children and Adolescents: A Systematic Review. <i>Physical Activity in Children</i>, 3(1), 82-90. https://doi.org/10.22034/pach.2026.586476.1090

1. Introduction

1.1. Importance of Behavioral Development in Youth

Behavioral development during childhood and adolescence plays a critical role in shaping long-term psychological, social, and academic outcomes (1). Core behavioral competencies such as attention, self-regulation, impulse control, and social interaction form the foundation for adaptive functioning across multiple life domains (2). These behavioral skills are closely linked to children's ability to manage emotions, maintain focus in academic settings, interact positively with peers, and respond appropriately to environmental demands.

Among these competencies, behavioral regulation is considered particularly important for healthy development (3). Behavioral regulation refers to the capacity to control impulses, sustain attention, and adjust behavior in response to situational demands (4). Children with stronger regulatory abilities tend to demonstrate better academic engagement, improved classroom behavior, and more positive peer relationships (5). Conversely, difficulties in behavioral regulation are associated with disruptive behavior, conduct problems, and reduced academic performance (6).

Social behavior also represents a central component of youth development (7). Prosocial behaviors such as cooperation, empathy, and effective communication facilitate positive peer interactions and support healthy social integration (8). In contrast, maladaptive behavioral patterns, including aggression, impulsivity, and conduct problems, can negatively affect social relationships and increase the risk of behavioral disorders (9).

For the purposes of the present review, behavioral outcomes are defined as observable or functionally expressed patterns of self-regulation, attention, impulse control, social interaction, and conduct that influence children's and adolescents' functioning in educational, family, and community settings. Although constructs such as resilience, coping, stress management, and psychosocial well-being are often considered psychological outcomes, they were included only when assessed as indicators of behavioral functioning or closely linked to behavioral adaptation in everyday contexts. This conceptual framework was adopted to capture the multidimensional nature of behavioral functioning while maintaining a clear distinction from studies focusing exclusively on emotional or mental health outcomes.



Behavioral competencies are particularly important within school environments, where children must maintain attention, follow instructions, regulate emotions, and interact constructively with classmates and teachers. Consequently, interventions that support behavioral development during childhood and adolescence have become an important focus for educators, clinicians, and researchers. Identifying effective strategies that can improve behavioral regulation and social functioning in youth therefore remains a priority in developmental and educational research.

1.2. Physical Activity and Behavioral Outcomes

Growing evidence suggests that physical activity (PA) may play an important role in promoting positive behavioral outcomes among children and adolescents (10). Regular engagement in PA has been associated with improvements in attention, executive functioning, and behavioral regulation (11). These benefits are thought to arise, at least in part, from neurobiological mechanisms, including enhanced cerebral blood flow, improved neurotransmitter regulation, and stimulation of brain regions involved in cognitive control and self-regulation (10,12).

In addition to physiological mechanisms, structured PA programs can also provide opportunities for behavioral learning. Participation in organized physical activities often requires children to follow rules, cooperate with others, manage frustration, and regulate their actions within group settings (13,14). These experiences may contribute to improvements in self-discipline, impulse control, and social behavior.

Various forms of PA interventions have been investigated for their potential behavioral benefits in youth populations. School-based exercise programs, sports participation, and movement-based activities have been linked to improvements in attention, classroom behavior, and emotional regulation (15-17). However, the magnitude and consistency of these effects may vary depending on the type of activity and the specific components of the intervention.

Importantly, yoga should be considered within this broader landscape of behavioral interventions. Similar to PA programs, mindfulness-based interventions and social-emotional learning (SEL) programs, yoga seeks to improve self-regulation, attention, and social functioning. However, yoga differs in that it integrates physical movement with breathing exercises, mindfulness practices, and relaxation techniques within a single intervention. Whether any behavioral benefits are specific to yoga or reflect broader effects of participation in structured, supportive group activities remains an important question that current evidence has not fully resolved.

Among the diverse forms of PA, mind-body practices have received increasing attention due to their potential to simultaneously influence both physical and psychological processes related to behavioral regulation.

1.3. Yoga as a Mind-Body Intervention

Yoga is a holistic mind-body practice that typically combines physical postures, controlled breathing techniques, and elements of mindfulness or meditation (18). Although traditionally rooted in ancient contemplative traditions, yoga has

increasingly been adapted for educational and therapeutic settings involving children and adolescents.

Yoga-based interventions have been proposed to influence behavioral functioning through several complementary mechanisms. First, mindfulness practices integrated within yoga encourage present-moment awareness and attentional control. Training attention through mindful movement and focused breathing may help children develop greater capacity to sustain attention and regulate distractions (19).

Second, breathing techniques commonly used in yoga may support autonomic regulation by influencing the autonomic nervous system. Slow and controlled breathing patterns have been associated with reduced physiological arousal and improved emotional regulation, which may facilitate behavioral self-control, although direct evidence in pediatric populations remains limited (20).

Third, yoga practices emphasize body awareness, self-reflection, and non-reactivity, which may contribute to self-regulation and impulse control. By encouraging children to observe thoughts and emotions before responding, yoga may facilitate behavioral inhibition and self-management skills (21).

Finally, yoga sessions conducted in group settings may foster positive social interactions and cooperative behaviors. Structured group activities can encourage respect, empathy, and supportive peer engagement, potentially contributing to improvements in social and prosocial behavior (22). However, it remains uncertain whether these benefits arise from yoga-specific components or from participation in structured, instructor-led group activities more generally.

Overall, these proposed mechanisms remain biologically and behaviorally plausible but should be interpreted cautiously, as relatively few pediatric studies have directly measured the underlying physiological or neurobehavioral pathways responsible for observed behavioral changes.

1.4. Current Evidence and Research Gap

Over the past decade, research examining yoga interventions in youth populations has grown substantially. Several studies have explored the potential benefits of yoga for improving mental health, reducing stress and anxiety, and enhancing overall well-being in children and adolescents (23,24). In addition, some investigations have examined physiological outcomes such as cardiovascular fitness, physical function, and autonomic regulation (24,25). Despite this expanding literature, the behavioral effects of yoga interventions have received comparatively limited comprehensive synthesis. Existing reviews have primarily focused on specific clinical populations or have emphasized psychological outcomes. While these outcomes are important, they are conceptually distinct from behavioral functioning and therefore do not fully characterize how yoga may influence observable behavior in everyday settings.

Furthermore, behavioral constructs have been evaluated inconsistently across studies. Outcomes including attention, behavioral regulation, impulsivity, conduct, social competence, resilience, coping, and psychosocial functioning are often

reported using different conceptual frameworks and measurement tools. This variability has made it difficult to determine which aspects of behavioral functioning are most consistently influenced by yoga interventions.

Moreover, behavioral outcomes such as attention regulation, impulsivity, conduct problems, and prosocial behaviors are frequently reported across yoga intervention studies but are rarely synthesized collectively across diverse pediatric populations. A systematic review using an explicit behavioral framework may therefore provide greater conceptual clarity, identify consistencies and sources of heterogeneity across studies, and highlight important gaps in the existing evidence.

In addition, children and adolescents undergo substantial developmental changes in cognitive, emotional, and social functioning. Whether the behavioral effects of yoga differ across developmental stages remains insufficiently understood and represents another important gap in the literature.

1.5. Aim of the Study

This systematic review sought to integrate the available evidence regarding the effects of yoga-based interventions on behavioral outcomes in children and adolescents. Specifically, this review examined the impact of yoga interventions on behavioral domains including attention and behavioral regulation, self-regulation and impulsivity, behavioral problems and conduct, and social or prosocial behavior in youth populations. In doing so, the review sought to evaluate the consistency of the available evidence, consider methodological quality and risk of bias across studies, and identify priorities for future research regarding the role of yoga in promoting behavioral functioning during childhood and adolescence.

2. Methods

2.1. Study Design

This systematic review was conducted in accordance with the PRISMA guidelines.

2.2. Search Strategy

A systematic search was conducted in PubMed/MEDLINE, Scopus, and Web of Science for studies published between January 2015 and December 2026. The search strategy targeted yoga-based interventions in children and adolescents and their effects on behavioral outcomes. Keywords related to yoga, youth populations, and behavioral domains (e.g., attention, self-regulation, impulsivity, and social behavior) were combined using Boolean operators (AND/OR). The search terms were adapted for each database, with the PubMed strategy combining yoga-related terms, youth-related terms, and behavioral outcome terms.

2.3. Eligibility Criteria

Study selection was guided by the PICOS framework. Eligible studies included children and adolescents (≤ 18 years) from clinical or non-clinical populations and evaluated yoga-based interventions involving postures, breathing exercises, mindfulness, or combined approaches. Studies were required to

include a comparison condition (e.g., usual care, active control, wait-list control) or a pre-post intervention design and report behavioral outcomes related to attention, self-regulation, behavioral control, impulsivity, conduct, or social functioning. Studies assessing only psychological outcomes without behavioral measures were excluded. Eligible designs included RCTs, non-RCTs, and prospective intervention studies. Only English-language, peer-reviewed articles published between January 2015 and December 2026 were considered. Reviews, conference abstracts, protocols, dissertations, editorials, case reports, and studies lacking relevant behavioral outcomes were excluded.

2.4. Study Selection

All retrieved records were imported into a reference management software, and duplicates were removed before screening. Two reviewers independently conducted title/abstract screening followed by full-text assessment based on the eligibility criteria. Any disagreements were resolved through discussion or consultation with a third reviewer. Reasons for full-text exclusions were recorded, and the study selection process was reported using a PRISMA flow diagram.

2.5. Data Extraction

Data extraction was performed using a predefined standardized form by two independent reviewers. Extracted information included study characteristics (author, year, country, design, and sample details), participant demographics, yoga intervention features, behavioral outcome measures, main findings, and risk-of-bias assessments. Any inconsistencies between reviewers were resolved through consensus, and the extracted data were used to synthesize the characteristics and findings of the included studies.

2.6. Quality Assessment

Methodological quality was evaluated using design-specific validated tools. RCTs were assessed with the Cochrane RoB 2 tool, while non-randomized studies were evaluated using the appropriate NIH Quality Assessment Tool. Two reviewers independently conducted the assessments, and disagreements were resolved through consensus or third-reviewer consultation when required. Domains related to selection, intervention deviations, missing data, outcome assessment, reporting bias, and other methodological limitations were considered. Quality ratings were summarized according to the recommendations of each tool and were incorporated into the interpretation of the review findings.

3. Results

3.1. Study Selection

The database search yielded 68 records, with 49 unique studies remaining after duplicate removal. Title and abstract screening excluded 27 articles due to ineligible designs, populations, interventions, or outcomes. Full-text assessment of the remaining 22 studies resulted in the exclusion of 6 additional articles that did not meet the eligibility criteria. Consequently, 16 studies were included in the qualitative synthesis. The selection process is presented in the PRISMA flow diagram (Figure 1).

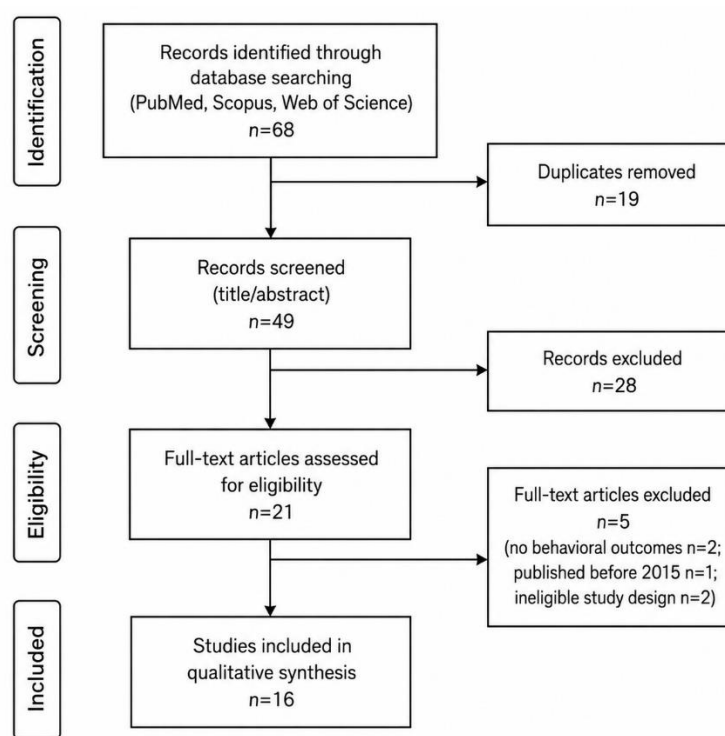


Figure 1. PRISMA Flow Diagram of Study Selection.

3.2. Characteristics of Included Studies

A total of 16 intervention studies evaluating the behavioral effects of yoga-based interventions in children and adolescents were included in this review. The included studies represented a broad range of pediatric populations, including typically developing schoolchildren as well as children and adolescents with ADHD, autism spectrum disorder, cerebral palsy, visual impairment, psychiatric disorders, behavioral difficulties, and pediatric oncology patients. Study designs included RCTs, non-RCTs, pilot RCTs, controlled intervention studies, and prospective pre-post intervention studies. RCTs represented the largest proportion of included studies, although several investigations were small pilot studies with limited sample sizes. Sample sizes varied considerably, ranging from fewer than 20 participants in pilot investigations to several hundred participants in large school-based

trials. Intervention duration ranged from 4 weeks to approximately 12 months, although most programs lasted 8–12 weeks. Yoga interventions generally incorporated combinations of physical postures (asana), breathing exercises (pranayama), relaxation techniques, mindfulness practices, and meditation, with most interventions delivered in school settings under instructor supervision. Behavioral outcomes were categorized into four domains: 1) attention and behavioral regulation, 2) self-regulation and impulsivity, 3) behavioral problems and conduct, and 4) social and prosocial behavior. Considerable heterogeneity was observed across studies with respect to participant characteristics, intervention content, intervention duration, outcome measures, and behavioral assessment tools, precluding quantitative meta-analysis. Detailed study characteristics are presented in Table 1, whereas Table 2 summarizes the evidence across behavioral domains.

Table 1. Summary of Included Studies by Behavioral Outcome Domain.

Study (Author, Year)	Population	Study Design	Attention & Behavioral Regulation	Self-Regulation & Impulsivity	Behavioral Problems & Conduct	Social & Prosocial Behavior
Mak 2018	Children with Cerebral Palsy	RCT	✓ (Attention)	✓ (Behavioral Regulation)	—	—
Frank 2017	School Children	Controlled Trial	✓ (Attention)	✓	—	✓ (Classroom Behavior)
Chou 2017	Children with ADHD	RCT	✓ (Sustained Attention)	✓ (Impulsivity)	✓ (Adhd Symptoms)	—
Butzer 2017	Adolescents	RCT	—	✓ (Self-Regulation)	✓ (Risk Behaviors)	—
Yang 2025	Schoolchildren	RCT	✓ (Attentional Performance)	—	—	—
Tanksale 2021	Children with Autism	Pilot RCT	✓ (Attention)	✓	✓	✓
Bazzano 2023	Children With Behavioral Difficulties	Non-Randomized Controlled	✓	✓	✓ (Externalizing Behavior)	✓
Sivashankar 2022	Schoolchildren	Non-Randomized Controlled	✓	✓	—	—
Canatan 2024	School Children	Intervention Study	✓	✓	—	✓
Kanchibhotla 2022	Children with Visual Impairment	Intervention	✓	✓	—	✓

Güneş 2026	Pediatric Oncology Patients	Intervention	—	✓ (Behavioral Coping)	—	—
Felver 2020	School Children	Pilot Trial	✓	✓	—	✓
Petrofes 2021	Adolescents with Psychiatric Condition	Preliminary Study	✓	✓	✓	✓
Sarkissian 2018	School Children	Intervention	—	✓	✓	✓
Choukse 2019	Residential Yoga Camp Participants	Intervention	✓	✓	✓	✓
Velásquez 2015	School children	Controlled Program	✓	✓	✓	✓

Table 2. Summary of Evidence Across Behavioral Outcome Domains.

Domain	Number of included studies (n)	Strength of Evidence
Attention & Behavioral Regulation	12	Strong
Self-Regulation & Impulsivity	14	Very strong
Behavioral Problems & Conduct	8	Moderate
Social & Prosocial Behavior	9	Moderate

3.3. Methodological Quality and Risk of Bias

Methodological quality varied across the included studies. RCTs were generally judged as having low risk of bias or some concerns according to the RoB 2 tool, whereas non-randomized and pre-post intervention studies were more frequently rated as fair quality because of potential selection bias, lack of allocation concealment, absence of participant blinding, and incomplete outcome reporting. The most common methodological limitations included relatively small sample sizes, insufficient reporting of randomization procedures, limited blinding of participants and outcome assessors, and short intervention durations. Several studies were described as pilot or feasibility investigations and therefore were not powered to detect small intervention effects. Overall, although the evidence suggests potentially beneficial behavioral effects of yoga interventions, the methodological heterogeneity and variable study quality should be considered when interpreting the findings.

3.4. Behavioral Outcomes

The behavioral outcomes were categorized into four primary domains: 1) attention and behavioral regulation, 2) self-regulation and impulsivity, 3) behavioral problems and conduct, and 4) social and prosocial behavior.

3.4.1. Attention and Behavioral Regulation

Attention and behavioral regulation were evaluated in 12 of the 16 included studies, making this one of the most frequently investigated behavioral domains. Several RCTs reported improvements in attentional performance following yoga interventions. Chou and Huang (26) demonstrated significant improvements in sustained attention among children with ADHD following an 8-week yoga intervention, while Yang et al. (27) reported enhanced attentional performance following a 12-week school-based yoga program in schoolchildren. Beneficial findings were also observed in clinical populations. Mak et al. (28) reported improvements in attention and behavioral functioning among children with cerebral palsy participating in the MiYoga randomized controlled trial. Similarly, Tanksale et al. (29) found improvements in attentional regulation among children with autism spectrum disorder receiving a yoga-based intervention integrated with cognitive-behavioral therapy components. Several school-based interventions likewise reported improvements in classroom attention and behavioral regulation (30–35). However, the magnitude of improvement varied across studies, reflecting differences in intervention duration,

behavioral assessment methods, participant characteristics, and methodological quality. Overall, the available evidence suggests that yoga-based interventions may improve attention and behavioral regulation in children and adolescents, although the consistency of these effects is limited by study heterogeneity and the relatively small number of high-quality randomized trials.

3.4.2. Self-Regulation and Impulsivity

Self-regulation and impulsivity represented the most commonly evaluated behavioral domain, being assessed in 14 of the 16 included studies. Several investigations reported improvements in emotional regulation, behavioral control, and impulsivity following yoga participation. Tanksale et al. (29) observed improved self-regulation among children with autism spectrum disorder, whereas Petrofes et al. (36) reported reductions in impulsivity among adolescents receiving yoga therapy within psychiatric care. School-based interventions also demonstrated improvements in behavioral regulation and emotional control (30,31). Additional studies reported improvements in resilience, coping, and stress management (32,33,35,37), which were included in the present review only when these constructs were explicitly linked to behavioral regulation or adaptive behavioral functioning. Although the majority of studies reported favorable findings, the behavioral constructs and outcome measures varied substantially, making direct comparison between studies difficult. Overall, the evidence indicates that yoga-based interventions may contribute to improvements in self-regulation and reductions in impulsive behavior, although larger randomized trials using standardized behavioral measures remain necessary.

3.4.3. Behavioral Problems and Conduct

Behavioral problems and conduct-related outcomes were evaluated in eight included studies. School-based interventions generally reported reductions in disruptive behaviors and improvements in classroom conduct following yoga participation. Sivashankar et al. (38) reported reductions in behavioral problems among early adolescents following a school-based yoga intervention, while Velásquez et al. (40) observed reductions in aggressive behavior and improvements in socio-emotional adjustment. Among clinical populations, Tanksale et al. (29) and Petrofes et al. (36) also reported improvements in behavioral functioning following yoga interventions. However, relatively few studies evaluated conduct-related outcomes as primary endpoints, and outcome measures differed

substantially between investigations. Overall, the evidence suggests that yoga interventions may reduce behavioral problems in some pediatric populations, although the available evidence remains moderate because of the limited number of studies and methodological variability.

3.4.4. Social and Prosocial Behavior

Social and prosocial behavior was examined in nine included studies. Several investigations reported improvements in social competence, interpersonal functioning, cooperation, and socio-emotional development following yoga interventions. Bazzano et al. (34) demonstrated improvements in social-emotional development among preschool children, whereas Velásquez et al. (40) and Kanchibhotla et al. (41) reported improvements in social functioning among school-aged children. Additional studies found improvements in psychosocial functioning and adaptive social behavior among adolescents participating in school-based or residential yoga programs (32,33,35). Nevertheless, considerable variability existed in the behavioral constructs evaluated, with some studies emphasizing observable social behaviors whereas others focused on broader psychosocial functioning, resilience, or coping. Overall, the available evidence suggests that yoga-based interventions may support aspects of social and prosocial functioning, although the current evidence base remains heterogeneous and should be interpreted cautiously.

4. Discussion

4.1. Summary of Main Findings

This systematic review synthesized evidence from 16 intervention studies examining the effects of yoga-based interventions on behavioral functioning in children and adolescents. Across the included studies, yoga was associated with improvements in several behavioral domains, most consistently attention and behavioral regulation, self-regulation and impulsivity, and, to a lesser extent, behavioral problems and social functioning. However, the strength of evidence varied considerably across domains because of differences in study design, participant characteristics, intervention protocols, and behavioral outcome measures.

The findings should therefore be interpreted as indicating promising rather than definitive evidence. Although RCTs generally reported favorable effects, many included studies were pilot investigations or involved relatively small samples, limiting statistical power and increasing the possibility of imprecise effect estimates. Nevertheless, the consistency of positive findings across both school-based and clinical populations suggests that yoga may represent a potentially useful adjunctive approach for promoting behavioral development in youth.

An important conceptual consideration is that some included studies assessed broader psychosocial constructs such as resilience, coping, emotional adjustment, or social-emotional competence, that are closely related to, but not identical with, directly observable behavioral outcomes. These outcomes were included because they influence behavioral regulation and adaptive functioning within educational and clinical settings. However, this conceptual overlap

should be recognized when interpreting the scope of the present review.

4.2. Mechanisms of Yoga on Behavioral Regulation

Several mechanisms may explain the observed effects of yoga on behavioral outcomes in children and adolescents.

Autonomic Regulation: Yoga practices, particularly breathing techniques (pranayama) and relaxation exercises, may enhance parasympathetic activation and reduce sympathetic arousal. Improved autonomic regulation can contribute to better emotional stability and behavioral control (20,26,33). By reducing physiological hyperarousal, children may become better able to manage impulses and respond adaptively in challenging situations.

Mindfulness and Attentional Control: Many included interventions incorporated mindfulness components that encourage present-moment awareness and focused attention. Repeated practice of sustained attention during yoga postures and breathing exercises may strengthen executive functioning and cognitive control processes. Improvements in attention reported in several randomized trials (e.g., 26,27) are consistent with this proposed mechanism, although direct neurophysiological evidence in pediatric populations remains limited.

Improved Self-Control and Executive Function: Yoga requires intentional movement, posture maintenance, and breath coordination, all of which demand inhibitory control and cognitive flexibility. Over time, these practices may enhance executive functioning capacities, including self-monitoring and behavioral inhibition, thereby reducing impulsivity and disruptive behavior.

Stress Reduction: Stress reduction appears to be another key pathway. Several studies reported improvements in resilience and coping (e.g., 32,33,37). Lower stress levels may indirectly improve behavioral regulation by reducing emotional reactivity and enhancing adaptive coping strategies. In school settings, stress reduction may translate into improved classroom behavior and social interactions.

Although these mechanisms are biologically plausible and supported by adult literature, relatively few pediatric studies directly evaluated mechanistic outcomes. Consequently, the proposed pathways should be considered theoretical explanations that require further experimental confirmation.

4.3. Positioning Yoga Within the Broader Intervention Landscape

The behavioral benefits observed following yoga should also be interpreted within the broader context of pediatric behavioral interventions. School-based PA programs, mindfulness training, SEL curricula, and behavioral self-regulation programs have all demonstrated beneficial effects on attention, executive functioning, emotional regulation, and classroom behavior. Yoga shares important characteristics with several of these approaches. Similar to PA interventions, yoga involves structured movement that may improve neurocognitive functioning. Like mindfulness programs, yoga emphasizes attentional focus, emotional awareness, and non-reactivity.

Furthermore, many school-based yoga sessions are delivered in supportive group environments that naturally promote cooperation, social interaction, and behavioral learning. Consequently, it remains uncertain whether the observed improvements are unique to yoga itself or reflect broader benefits associated with structured, supportive group activities incorporating movement, adult supervision, and regular practice. Because relatively few included studies directly compared yoga with alternative active interventions, current evidence does not permit conclusions regarding the superiority of yoga over other behavioral or PA programs. Future comparative-effectiveness trials are therefore warranted.

4.4. Developmental Considerations

Behavioral development changes substantially across childhood and adolescence, suggesting that intervention effects may differ according to developmental stage. Younger children may derive greater benefit through improvements in basic self-regulatory skills and classroom behavior, whereas adolescents may experience greater effects on emotional regulation, coping strategies, resilience, and stress management. However, the studies included in this review enrolled participants across a broad age range and rarely stratified outcomes according to developmental stage or pubertal status. Consequently, the current evidence is insufficient to determine whether age moderates responsiveness to yoga interventions. Future research should investigate developmental differences more systematically to identify the ages at which yoga-based interventions may be most effective.

4.5. Comparison with Previous Reviews

Previous systematic reviews of pediatric yoga interventions have primarily focused on anxiety, depression, stress reduction, mental health, or overall well-being (23,24). By contrast, the present review specifically synthesized behavioral outcomes, including attention, behavioral regulation, impulsivity, behavioral problems, and social functioning. This behavioral focus provides a complementary perspective to existing reviews while also highlighting an important conceptual challenge. Many behavioral constructs overlap with psychosocial functioning, making clear operational definitions essential for future research. Establishing greater consistency in behavioral outcome measurement would facilitate comparisons across studies and strengthen future evidence syntheses. Although our findings generally align with previous reviews reporting favorable effects of yoga, the present review also emphasizes the considerable heterogeneity of intervention protocols and outcome measures. Accordingly, conclusions regarding effectiveness should remain appropriately cautious.

4.6. Implications for Schools and Clinical Practice

The available evidence suggests that yoga-based interventions may represent a feasible complementary strategy for supporting behavioral functioning in educational and clinical settings. In schools, structured yoga sessions may improve attentional control, behavioral self-regulation, and classroom functioning while requiring relatively minimal equipment and resources. Similarly, children with neurodevelopmental or chronic health conditions may

benefit from yoga as an adjunct to, rather than a replacement for, established behavioral and psychological interventions. Given the current evidence base, yoga should be viewed as one component within a broader framework of behavioral health promotion rather than as a stand-alone therapeutic solution. Decisions regarding implementation should consider program quality, instructor training, developmental appropriateness, and integration with existing educational or clinical services.

4.7. Strengths and Limitations

This review has several strengths. It followed PRISMA guidelines, employed a comprehensive search across multiple electronic databases, and systematically evaluated methodological quality using established risk-of-bias assessment tools appropriate for different study designs. Furthermore, by focusing specifically on behavioral outcomes, this review provides a more detailed synthesis of an area that has received comparatively limited attention. Several limitations should also be acknowledged. First, substantial heterogeneity existed across studies regarding participant populations, intervention characteristics, intervention duration, outcome measures, and study quality, precluding quantitative meta-analysis and limiting direct comparisons. Second, many included studies involved relatively small sample sizes, pilot designs, or non-randomized methodologies, increasing the risk of bias and reducing confidence in estimated intervention effects. Third, behavioral outcomes were assessed using diverse instruments, many relying on parent- or teacher-reported questionnaires, which may introduce measurement variability. Fourth, only English-language peer-reviewed studies were included, raising the possibility of language bias. Finally, publication bias and selective outcome reporting cannot be excluded, particularly because positive findings were more commonly reported than null results. These limitations suggest that the current evidence should be interpreted as encouraging but still evolving.

4.8. Future Research

Future research should prioritize large, adequately powered RCTs employing standardized and clearly defined behavioral outcome measures. Studies should also directly compare yoga with other active interventions, including aerobic exercise, mindfulness programs, and SEL curricula, to determine whether observed benefits are specific to yoga or reflect broader intervention effects. Future investigations would also benefit from examining moderators such as age, developmental stage, baseline behavioral functioning, intervention dose, and clinical diagnosis. Incorporating objective behavioral assessments alongside teacher- and parent-reported measures, as well as mechanistic outcomes (e.g., executive function, autonomic regulation, neurophysiological markers), would further strengthen understanding of how yoga influences behavioral development.

4.9. Conclusion

This systematic review indicates that yoga-based interventions show promising potential to improve several aspects of behavioral functioning in children and adolescents, particularly attention, behavioral regulation, self-regulation, and selected aspects of

social functioning. However, the available evidence remains heterogeneous in terms of study quality, participant characteristics, intervention protocols, and behavioral outcome measures. Accordingly, the present findings should be interpreted as preliminary rather than conclusive. Although the overall pattern of evidence is encouraging, it is not yet sufficient to establish the effectiveness of yoga across all behavioral domains or populations. Larger, methodologically rigorous RCTs using standardized behavioral constructs and active comparison interventions are needed before firm recommendations can be made regarding the role of yoga in pediatric behavioral health. Nevertheless, the current evidence suggests that yoga represents a feasible and potentially valuable complementary intervention that may contribute to promoting healthy behavioral development when appropriately integrated into educational and clinical settings.

Authors' Contribution: The author was responsible for the conceptualization of the review, development of the review methodology, literature search, study selection, synthesis and interpretation of the evidence, and preparation of the manuscript.

Funding Support: This review received no external financial support.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process: During the preparation of this manuscript, the author used ChatGPT solely to support proofreading, grammatical correction, linguistic refinement, and improvement of the clarity and readability of the written text. The ChatGPT was not used to conduct the literature search, select or exclude studies, extract or analyze data, interpret the evidence, or formulate the review's scientific conclusions. The author reviewed all AI-assisted revisions and assumes full responsibility for the accuracy, originality, and integrity of the final publication.

Ethical Considerations: As this study is a systematic review based exclusively on previously published research, no direct involvement of human participants occurred and no new participant data were collected. Accordingly, institutional ethical approval and informed consent were not required. The review was conducted in accordance with accepted principles of responsible research and transparent evidence synthesis.

Data Availability: The information synthesized in this review is derived from publicly available published studies. The materials underlying the review findings are available from the corresponding author upon reasonable request.

Acknowledgments: The author acknowledges the researchers whose published work contributed to the evidence base examined in this review. Appreciation is also extended to the anonymous reviewers for their constructive comments and valuable suggestions, which helped improve the quality and clarity of the manuscript.

Conflicts of Interest: The author declares no financial, personal, or professional conflicts of interest related to this review.

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