Journal of Neurology and Neurological Disorders
Volume 11 | Issue 1

Review Article Open Access

Effects of Yoga on Social Communication, Sensorimotor Skills, Physical Health, and Symptom Severity in Children with Autism Spectrum Disorder: A Systematic Review

Varvara Papasideri[1*], Stylianos Sergios Chatziioannou [2,3,4], Emmanouil M Xydias[5] and Elias Tsakos[5]

[1]School of Humanities, Social and Education Sciences, European University of Cyprus, Nicosia, Cyprus
[2]School of Medicine, European University of Cyprus, Nicosia, Cyprus
[3]The JBI (Joanna Briggs Institute) University of West Attica Evidence-Based Healthcare Center, Athens, Greece
[4]First Department of Obstetrics and Gynecology, Maternity Hospital, Elena Venizelou, Athens, Greece
[5]EmbryoClinic IVF, Thessaloniki, Greece.

***Corresponding Author:** Varvara Papasideri, School of Humanities, Social and Education Sciences, European University of Cyprus, Nicosia, Cyprus, Email: v.papasideri@gmail.com

Citation: Varvara Papasideri (2025) Effects of Yoga on Social Communication, Sensorimotor Skills, Physical Health, and Symptom Severity in Children with Autism Spectrum Disorder: A Systematic Review. J Neurol Neurol Disord. 11(1): 105.

Received Date: December 02, 2025 **Accepted Date:** December 10, 2025 **Published Date:** December 19, 2025

Abstract

Objective: This systematic review synthesized current evidence on the effects of yoga interventions on social communication, motor abilities, physical health, and symptom severity in children and adolescents with autism spectrum disorder (ASD).

Methods: A systematic search of PubMed and CINAHL was conducted up to August 2025. Eligible studies included randomized controlled and clinical trials involving participants ≤18 years with ASD. Data were extracted on study design, intervention characteristics, and outcomes. Risk of bias was assessed using the Joanna Briggs Institute (JBI) tool. Due to heterogeneity, a narrative synthesis was performed.

Results: Of 57 records screened, 7 studies met inclusion criteria (2 RCTs, 5 clinical trials) conducted in the United States, India, and Iran, including children aged 3–16 years. Yoga interventions varied in duration and format (school-based, structured group sessions, or remote programs). Overall, yoga improved bilateral coordination, gross motor skills, balance, strength, and flexibility. Reductions were observed in autism symptom severity, irritability, social withdrawal, and behavioral dysregulation. Several studies also reported improvements in sleep, gastrointestinal function, and social communication skills, including eye contact, imitation, and turn-taking.

Conclusions: Yoga shows promise as a complementary therapy for children with ASD, enhancing motor, behavioral, and social outcomes. However, evidence remains limited by small sample sizes, variable intervention protocols, and heterogeneity

of measures. Larger, standardized randomized trials are needed to confirm efficacy and support clinical integration.

Keywords: Autism Spectrum Disorder, Yoga, Children, Social Communication, Motor Skills, Complementary Therapy

Lay Summary

This review looked at studies on yoga programs for children with autism to understand whether yoga can support their daily functioning and well-being. Overall, yoga was found to help improve social communication, motor skills, physical health, and certain behavioral challenges, including irritability and sleep or digestive difficulties. These findings suggest that yoga may be a helpful complementary activity for children with autism, although more large studies are needed to confirm these benefits.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that influences how children communicate, interact socially, and manage everyday behaviors. Although every child on the spectrum shows a different mix of strengths and challenges, certain patterns tend to appear reduced social reciprocity, unusual sensory responses, and, quite often, delays in language or motor skills. These characteristics seem to result from a combination of genetic and environmental factors, along with autoimmune and perinatal influences. At present, ASD affects about 1 in 44 children [1] The broader spectrum still includes what were once separate diagnoses, such as Asperger's syndrome, PDD-NOS, Rett syndrome, and Childhood Disintegrative Disorder [2].

Motor-related differences are frequently among the earliest signs. Children may have trouble with coordination or maintaining balance, and tasks that involve fine motor control can be more demanding than expected for their age (Bhat et al., 2011; Staples & Reid, 2010). Many also face challenges in imitation or praxis; copying a movement, judging spatial placement, or learning a new motor sequence may take more time or effort. Since these skills underpin everyday functioning and many social exchanges, such difficulties can limit both peer interaction and independence in daily life [3]. Added to this, sleep disturbances and gastrointestinal problems are common and can intensify emotional and behavioral challenges (Miano et al., 2007; Rao et al., 2008).

Because ASD spans physical, cognitive, and emotional domains, researchers have shown growing interest in yoga as a possibly helpful complementary practice. Yoga brings together movement, breathing exercises, and relaxation techniques, and has been linked to improvements in balance, attention, body awareness, and emotional regulation [4, 5]. Some early studies even report gains in imitation and social communication, perhaps because yoga provides a calm, structured context in which children can engage in shared movement and regulated breathing [6, 7].

Still, the research landscape remains uneven. Many studies involve small groups of participants or use very different tools to measure outcomes, which makes the existing evidence difficult to compare. Importantly, no recent review has tried to bring together findings across several key areas motor development, social communication, physical health, and symptom severity. For this reason, the goal of the present review is to gather and assess the available clinical evidence and to consider how yoga might fit into broader care strategies for children with ASD.

Material and Methods

Study Design

This systematic review was conducted to evaluate the effectiveness of yoga as a therapeutic intervention for children and adolescents diagnosed with Autism Spectrum Disorder (ASD). The review was structured using the PICO framework. The population included individuals under 18 years of age with an ASD diagnosis. The intervention encompassed various forms of yoga employed as therapeutic approaches. Comparisons were made against either no intervention or alternative therapeutic methods. The primary outcomes assessed were social communication skills, sensorimotor abilities, physical health, and the severity of ASD symptoms.

This systematic review adhered to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure a transparent and reproducible methodology [8] and employed the Joanna Briggs Institute's (JBI) Critical appraisal checklist for systematic reviews and research syntheses to minimize bias [9].

Transparency and Openness

This review followed the PRISMA 2020 guidelines and the Joanna Briggs Institute (JBI) framework for systematic reviews. The protocol was preregistered with PROSPERO (CRD420251152980). All data were obtained from published peer-reviewed studies; no new data were collected.

Eligibility Criteria

This review included randomized and non-randomized controlled trials published in English up to August 2025 that evaluated yoga as a therapeutic intervention for improving social communication, motor skills, physical health, and symptom severity in children with ASD. Studies that were non-interventional, non-English, reviews, case reports, or lacked complete outcome data were excluded.

Search Strategy

A comprehensive search strategy was developed in consultation with university library specialists to ensure broad coverage of biomedical and allied-health literature. Searches were conducted in PubMed and CINAHL, two databases selected for their relevance to clinical, behavioral, and rehabilitation interventions in pediatric populations. PubMed was chosen as the primary biomedical database indexing randomized and clinical trials, whereas CINAHL was included due to its extensive coverage of nursing, therapeutic, and complementary medicine interventions, including yoga. Preliminary scoping indicated substantial overlap with other databases (e.g., Scopus, PsycINFO), and therefore PubMed and CINAHL were deemed sufficient for the focused clinical question of yoga interventions for ASD.

Both controlled vocabulary (MeSH, CINAHL Headings) and free-text terms were used. Boolean operators (AND/OR) and truncation were applied to maximize sensitivity. The exact search strings used were:

PubMed search string:

(yoga) AND ("autism spectrum disorder" OR ASD) AND (child OR children OR adolescent OR youth) AND (effect OR impact OR outcome)

CINAHL search string:

(yoga) AND ("autism spectrum disorder" OR ASD) AND (child OR adolescen OR pediatric* OR youth) AND (effect* OR impact* OR outcome*)**

Search limits included: English language, human participants, and age ≤18 years. All searches were conducted up to August 2025, and the complete search record was archived as part of the study's PROSPERO registration.

In accordance with PRISMA 2020 recommendations, a manual reference search was performed on all included studies and relevant reviews to identify additional eligible trials. No additional studies were found beyond those identified in the database searches.

Grey literature (conference abstracts, dissertations, and theses) was not systematically searched because scoping indicated that pediatric yoga intervention trials are predominantly indexed within peer-reviewed biomedical databases. However, any grey literature encountered during manual searching was screened for eligibility.

Other databases such as PsycINFO, Scopus or Embase were not included due to limited indexed yoga-specific pediatric intervention studies and overlap with PubMed indexing in biomedical literature.

Study Selection

Two reviewers independently screened the titles and abstracts of all identified studies. The full texts of studies deemed potentially relevant were reviewed to determine their eligibility according to predefined inclusion criteria. Any disagreements were resolved through discussion with a third reviewer. The study selection process was documented using the PRISMA flow diagram.

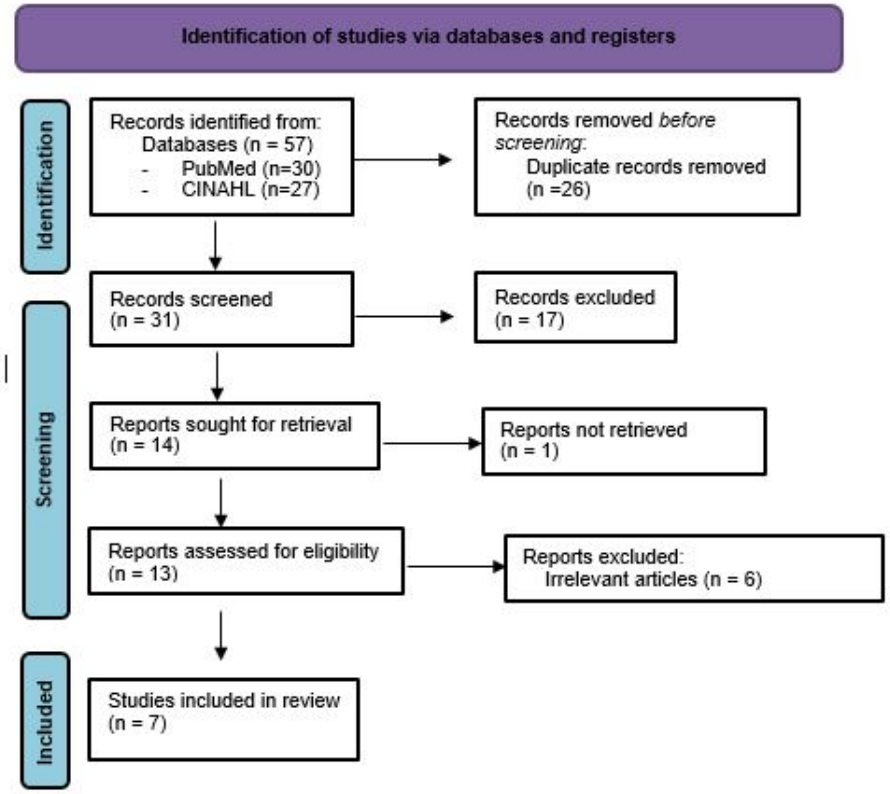

Figure 1: PRISMA flowchart

Data Extraction

A uniform data extraction tool was employed to gather detailed information on the studies' features, participant numbers, varieties of yoga practices used, assessed outcomes, and results concerning the therapeutic impact of yoga on ASD.

Data Synthesis

Due to the considerable heterogeneity among study designs, intervention protocols, and outcome measures, conducting a meta-analysis was not feasible. Therefore, a narrative synthesis was undertaken with the aim of elucidating the effects of yoga on improving social communication skills, sensorimotor abilities, physical health, and symptom severity in children with ASD.

Ethics

As this review analyzed previously published data, no primary data collection was involved. It was assumed that all included studies had obtained prior ethical approval.

Results

A total of 57 records were identified through database searches (30 from PubMed and 27 from CINAHL). After removal of 26 duplicates via Rayyan, 31 records were screened, resulting in 17 exclusions. Fourteen full-text articles were sought; 13 were retrieved, and 7 met the inclusion criteria. The final sample consisted of **2 randomized controlled trials (RCTs)** and **5 non-ran-**

domized clinical trials, conducted across the United States, India, and Iran, involving children aged 3–16 years with ASD. Figure 1 illustrates the PRISMA flow process.

Across studies, yoga interventions varied in duration (8–12 weeks), frequency (2–5 sessions weekly), delivery format (school-based, clinic-based, or remote), and components (postures, breathing exercises, relaxation, chanting, partner work). Outcomes were assessed using validated instruments, including the BOT-2, ATEC, BASC-2, ABC/ABC-2, SRS-2, and motor performance or balance assessments.

Motor Function

Four studies looked at motor-related outcomes, and although the approaches were not identical, they all reported improvements of some kind. In general, yoga seemed to help with gross motor skills, bilateral coordination, strength, flexibility, and balance, though not always to the same degree across studies. [7], for example, found clear gains on the BOT-2 for gross motor performance and bilateral coordination in children who took part in creative yoga sessions. These improvements were accompanied by better imitation of movement sequences, which often goes hand in hand with motor development in ASD. [10] reported another set of meaningful changes. After a 12-week remote program, adolescents showed increases in leg strength (12.5%) and flexibility (40.3%), and their dynamic balance improved on both sides. Not all findings lined up perfectly, though. In the same study by [7], balance did not show significant improvement. Part of the discrepancy may come down to how balance was tested: the BOT-2 includes tasks without visual cues, while the yoga intervention relied heavily on visually guided poses. In other words, the test and the training were not measuring the exact same thing.

Overall, the evidence suggests yoga can boost several aspects of motor performance in children with ASD, but the size of the improvements seems tied to how closely the yoga exercises match the motor skills being assessed.

Communication Social Responsiveness

Three studies looked at communication and social interaction, and although they didn't all measure the same things, the overall picture leans toward improvement after yoga. The most noticeable shifts came from imitation-related tasks. In [7], for instance, children made fewer imitation and praxis mistakes and were better able to follow the instructor's movements. It wasn't a dramatic transformation, but enough to suggest that some of the basic nonverbal skills things like visually tracking someone and copying what they do became a bit easier.

[11] reported gains too, this time in broader social communication. Their SRS-2 scores improved, and teachers said they were actually seeing changes in real interactions: slightly better eye contact, children waiting their turn more often, and generally being a bit more open to engaging with others.

Verbal communication results were more mixed. [12] didn't find much change on the ATEC communication scale, while [5] did. Their program happened to include chanting and breath-based vocal work, which might explain why their findings stood out compared to the others.

Overall, even with the differences between studies, yoga seems to nudge both nonverbal and sometimes verbal communication in a positive direction especially when the sessions involve imitation, partner work, or rhythmic vocal elements.

Behavioural Outcomes

Behavioural outcomes were one of the areas where studies most often reported improvement, although the specific changes varied from child to child. Irritability and social withdrawal, for example, tended to decrease in several trials. [11], noted meaningful reductions on the ABC-2 irritability ($p = .041$) and withdrawal ($p = .047$) which suggests that children became somewhat

easier to engage and less reactive in everyday situations. [13], also found improvements, particularly on the BASC-2 Atypicality scale, with school-aged participants showing the clearest gains. Their ABC subscale findings did not reach significance, but there was still a noticeable shift toward lower irritability.

A broader pattern emerged in the study by [2], where almost all of the 30 behavioural items improved after a three-month yoga program; the only item that did not change related to savant-type abilities. Taken together, these results point toward better behavioural regulation in children participating in yoga. One possible explanation is that the predictable, rhythmic nature of yoga movements and the calming influence they have on the autonomic system may help reduce hyperarousal and make it easier for children to stay regulated and engaged.

Physical Health

Three studies examined aspects of physical health mainly sleep, gastrointestinal symptoms, and overall physical well-being. [2], reported clear improvements in both sleep disturbances and gastrointestinal issues among children who participated in structured yoga sessions, whereas the control group showed no comparable change. Broader health outcomes also improved in two other trials. In both [12] and [5], scores on ATEC Subscale IV, which reflects health and physical/behavioural functioning, shifted in a positive direction. These improvements included reductions in hyperactivity, stereotyped behaviours, and various somatic complaints.

Physical fitness was another area where yoga appeared to help. [10], found that remote yoga training enhanced several fitness-related indicators in adolescents, such as strength and dynamic balance suggesting that even non-in-person programs may offer measurable physical benefits.

Taken together, the findings suggest that yoga may help address some of the co-occurring physical challenges common in ASD, which can, in turn, influence daily functioning and behavioural regulation.

Table 1: Characteristics of the Included Studies

Authors (year publication) Country	Study design	Sample	Intervention group	Control group	Outcomes - Measures	Results
[14]	Non-randomized clinical trial	24 children with ASD, aged 5 – 13 years	N=24	N=24	BOT-2, Training-specific imitation test	Following the intervention, children in the yoga group demonstrated significant improvements in gross motor performance on the BOT-2 and exhibited fewer imitation/praxis errors when replicating training-specific yoga poses. Conversely, children in the academic group showed enhancements in fine motor performance on the BOT-2 and made fewer imitation errors during the completion of training-specific building tasks.

			Yoga sessions included breathing exercises, imitative poses, partner poses, and relaxation techniques, alongside context-appropriate social activities designed to encourage greeting and farewell songs, touch/contact games, and visual engagement games. The yoga poses were organized around meaningful themes such as songs, stories, and games.	Academic activities: reading, arts and crafts, and building supplies such as Play-Doh, LEGO, and ZOOB		
			Frequency: 4 sessions/ week (2 expert sessions and 2 parent sessions)Intensity: 40 to 45 min for expert; 20 to 25 min for parent sessions		Baseline and 8th week	
			Duration: 8 weeks			
[10]	Non-randomized clinical trial	19 adolescents with ASD.	N=19	-	Feasibility, Anthropometrics (Height, Weight, and Waist Circumference), Motor Skills, Muscular Strength, Static and Dynamic Balance, Flexibility, Physical Activity and Sedentary Time	Significant improvements were observed over the 12-week period in leg strength (increased by 12.5%, p = 0.039), flexibility (increased by 40.3%, p = 0.008), and dynamic balance in both the right leg (improved by 11.1%, p = 0.001) and left leg (improved by 8.1%, p = 0.003).
			The yoga intervention was delivered to groups of adolescents with ASD (4–6 per group) in their home remotely using Zoom		Assessed before and after the intervention.	
			Thirty-minute yoga sessions were delivered 3 times per week across the 12-week intervention.			

[2]	Non-randomized clinical trial	61 children, aged 5 – 16 years, with ASD.	N=31The 75-minute yoga program took place between 9:30 a.m. and 10:45 a.m., just before school started. The yoga exercises were selected from the Integrated Application of Yoga Therapy (IAYT) programs of S-VYASA.	N=29No intervention	61-item questionnaire developed by the researchers	Significant changes were observed after the yoga intervention in three areas of concern: sleep problems, gastrointestinal problems, and behavioral problems.
					Completed by the parents before and after the intervention.	
[13]	Pilot clinical study	24 children, aged 3 – 16 years, with ASD.	N=248-week multimodal yoga, dance, and music therapy program based on the relaxation response (RR)	-	BASC-2 και ABC	Robust changes were found on the BASC-2, primarily for 5–12-year-old children.
					Completed by the parents before and after the intervention.	
[12]	RCT	29 children with ASD, aged 7 – 15 years	N=1524 sessions yoga (30-min) for 8 weeks which include Warm up, Calming poses and Strengthening poses.	N=14	ATECCompleted by the parents before and after the intervention.	There were significant differences between the two groups with regards to all ATEC sub-scores except ATEC I (speech/language/communication).
[5]	RCT	43 children with ASD, aged 5 – 15 years	N=23Daily 45-minute yoga session for 12 weeks.The intervention consisted of various loosening and dynamic practices, breathing exercises, asanas (postures), pranayama (breathing techniques), relaxation, and chanting.	N=20None intervention	ATECCompleted by the parents before and after the intervention.	There was a significant reduction in the total ATEC scores overtime in the yoga group ($p<0.001$).

[5]					SRS-2 and ABC-2	Significant changes were observed post-intervention in the mean scores of the social communication aspect in social responsiveness (p = .021), irritability (p = .041), and social withdrawal (p = .047) aspects of problem behaviors.
					Completed by the teachers before and after the intervention.	

BOT-2: Bruininks-Oseretsky Test of Motor Proficiency–2nd Edition; RCT: randomized clinical trial; ATEC: Autism Treatment Evaluation Checklist; BASC-2: Behavioral Assessment System for Children, Second Edition; ABC: Aberrant Behavioral Checklist; SRS-2: Social Responsiveness Scale-2; ABC-2: Aberrant Behavior Checklist -2

Discussion

One of the main points that stood out from our review is that yoga seems to help children with ASD improve bilateral coordination and gross motor abilities [7]. The number of ASD-focused studies is still small, but the pattern isn't new research in typically developing populations has been showing for years that yoga can strengthen coordination, flexibility, endurance, and even speed [15, 16, 17]. These changes are usually linked to a combination of physiological processes: increased angiogenesis, better alternating motor unit recruitment so muscles fatigue less quickly, gradual lengthening of muscles and connective tissues, and improvements in how sensory and motor information are integrated [4]. Yoga also tends to sharpen proprioception, which helps children position their limbs more accurately and move with better control [4].

A similar trend appears when we look specifically at ASD samples. [10] documented improvements in strength, flexibility, balance, and general motor performance in adolescents who completed a remote yoga program. The exception was balance in the study by [7] which didn't show significant gains. But the discrepancy seems to make sense if we consider the assessment tools: the BOT-2 balance tasks are visually independent and dynamic, while the yoga sessions were built around visually guided static poses such as tree pose [14]. In other words, the training and the testing weren't measuring quite the same thing.

Another consistent finding was the improvement in imitation skills. Imitation depends heavily on social tracking something many children with ASD struggle with [18, 19]. Because yoga naturally requires children to observe an instructor and then reproduce sequences of movements, it provides frequent practice in attending visually, organizing actions, and even simple turn--taking [14]. This kind of repeated exposure may explain why gains appear not only in familiar actions but also in new imitation tasks that children haven't been explicitly taught before [3].

Yoga also appeared to reduce overall ASD symptom severity in several of the studies we reviewed [12] reported improvements across most ATEC subscales, and [5] found notable gains in speech and communication. Their program included chanting and rhythmic breathing, which may have played a role, since these activities can activate oral-motor systems and encourage vocal imitation [6]. [20] also points out that yoga gives children repeated, structured moments where they can practice both verbal and nonverbal communication, which may help explain why these gains show up so consistently.

Social communication improvements were also reflected in ATEC Subscale II scores. Interventions that emphasized eye contact and active instructor–child engagement seemed to reinforce basic communication behaviors [12]. There's a broader pattern here as well physical activity in general is known to support social development [21, 22]. Yoga fits comfortably within that framework because it naturally encourages shared attention, coordinated movement, and a mutual focus between partners or

group members. The RCT by [11] showed improvements in social responsiveness, which is not surprising given yoga's reliance on imitation, gaze coordination, and expressive body cues [6, 11].

We also saw changes in cognitive and sensory awareness, reflected in ATEC Subscale III. Practices such as corpse pose invite children to tune into internal sensations, which may support self-awareness and more adaptive sensory regulation [23].

ATEC Subscale IV improvements suggest wider physical and behavioral benefits. Some programs reported reductions in gastrointestinal issues, better sleep, and decreases in hyperactivity and stereotyped behaviours [12, 2]. Yoga's structured and rhythmic qualities, and its capacity to stabilize autonomic arousal, likely play a role in these shifts; children often appear calmer and more settled afterwards [13, 5].

Behavioural gains were one of the more consistent findings. [11] observed reductions in irritability and social withdrawal, suggesting that children were regulating themselves more effectively. Rhythmic movement patterns are known to soften stress responses [24], and the group setting provides natural social exposure that helps counter withdrawal tendencies in ASD [25]. Over time, many children seem to participate with more comfort and confidence, showing less hyperarousal and more willingness to join in [11].

Finally, several methodological limitations must be acknowledged. Sample sizes were small, protocols varied widely in duration and intensity, and heterogeneous outcome measures complicate comparison across studies. The absence of standardized yoga protocols further limits reproducibility. These factors underscore the need for larger, well-designed randomized trials.

Constraints on Generality

The findings from this review should be interpreted with some care, mainly because they reflect the limitations of the studies we were able to include. Most of the participants were children aged 3–16 years, and they came from only three countries the United States, India, and Iran. This means the conclusions really speak to pediatric ASD populations, not necessarily to adolescents or adults. Children also differ from adults in terms of motor plasticity, learning capacity, and the way school-based programs are delivered, so the results cannot be assumed to generalize beyond this age range.

There was also considerable variation across the yoga programs themselves. Sessions differed in length, structure, and teaching style, and instructor training varied widely. All of this makes it harder to draw firm conclusions about what "yoga" means in a standardized sense. Moving forward, studies that include a wider range of participants particularly underrepresented or non-Western groups would help clarify how broadly these findings apply.

Reflexivity

We recognise that interpretations of yoga as a therapeutic tool may be influenced by Weste nations of mindfulness and health. Future cross-cultural research should consider indigenous and non-Western frameworks of mind–body integration to ensure equitable and context-sensitive applications.

Conclusion

Taken as a whole, the studies included in this review suggest that yoga has a generally positive effect on children with ASD. Across different interventions, researchers have reported improvements in a wide range of areas atypical behaviours, irritability, motor skills, social communication, and even common co-occurring issues such as sleep problems and gastrointestinal difficulties. Some evidence also points to reductions in the overall severity of autistic traits, alongside gains in physical fitness, including strength, balance, and flexibility. All of this supports the idea that yoga can serve as a helpful complementary interven-

tion, whether it is offered in schools or within more structured therapeutic programmes.

One reason yoga may be effective is that it works as a holistic mind–body practice, influencing both the central and autonomic nervous systems. By helping children regulate their stress responses, yoga may indirectly support a wide mix of functions cognitive skills, coordination, attention, emotional control, and sensory processing. In school settings, these effects may translate into better focus and a greater ability to absorb new information. Over time, the skills that children practice during yoga steady breathing, imitation, controlled movement, and shared attention seem to support social responsiveness and may reduce some of the more challenging behaviours often seen in ASD.

Contributor Roles (CRediT):

All authors reviewed and approved the final manuscript and agree with their respective contributions as described below.

Conceptualization: Varvara Papasideri, Stylianos Sergios ChatziioannouData curation: Varvara PapasideriFormal analysis: Varvara PapasideriFunding acquisition: Varvara PapasideriInvestigation: Varvara PapasideriMethodology: Varvara Papasideri, Stylianos Sergios ChatziioannouProject administration: Varvara PapasideriResources: Varvara PapasideriSoftware: Varvara PapasideriSupervision: Stylianos Sergios ChatziioannouValidation: Varvara PapasideriVisualization: Varvara PapasideriWriting – original draft: Varvara PapasideriWriting – review & editing: Varvara Papasideri, Stylianos Sergios Chatziioannou, Emmanouil M Xydias, Elias Tsakos

Affiliation Changes

No changes in author affiliations occurred after the completion of this study.

Disclosures and Acknowledgements

This study was preregistered with PROSPERO (Registration ID: CRD420251152980).

All data analyzed in this review were obtained from published peer-reviewed articles.

No external funding was received for this research.

The authors have no conflicts of interest to disclose.

Acknowledgement

The authors thank the European University of Cyprus library services for facilitating access to academic databases.

References

1. Maenner MJ, Warren Z, Williams AR, Amoakohene E, Bakian AV, et al. (2023). Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years - Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2020. Morbidity and Mortality Weekly Report. Surveillance Summaries (Washington, D.C. : 2002). 72.

2. Narasingharao K, Pradhan B, Navaneetham J (2017) Efficacy of Structured Yoga Intervention for Sleep, Gastrointestinal and Behaviour Problems of ASD Children: An Exploratory Study. Journal of Clinical and Diagnostic Research : JCDR. 11.

3. Mostofsky SH, Dubey P, Jerath VK, Jansiewicz EM, Goldberg MC, et al. (2006) Developmental dyspraxia is not limited to imitation in children with autism spectrum disorders. Journal of the International Neuropsychological Society : JINS. 12: 314–26.

4. Galantino MLou, Galbavy R, Quinn L (2008) Therapeutic effects of yoga for children: a systematic review of the literature. Pediatric Physical Therapy : The Official Publication of the Section on Pediatrics of the American Physical Therapy Association. 20: 66–80.

5. Shanker S, Pradhan B (2022) Effect of yoga on children with autism spectrum disorder in special schools. Industrial Psychiatry Journal. 31: 367.

6. Radhakrishna S, Nagarathna R, Nagendra HR (2010) Integrated approach to yoga therapy and autism spectrum disorders. Journal of Ayurveda and Integrative Medicine. 1: 120.

7. Kaur, M., & Bhat, A. (2019). Creative Yoga Intervention Improves Motor and Imitation Skills of Children With Autism Spectrum Disorder. Physical Therapy. 99: 1520–34.

8. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, et al. (2021) The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ (Clinical Research Ed.). 372: n71.

9. Hilton M (2024) JBI Critical appraisal checklist for systematic reviews and research syntheses. The Journal of the Canadian Health Libraries Association. 45: 180.

10. Helsel BC, Foster RNS, Sherman J, Ptomey LT, Montgomery RN, et al. (2023) A Remotely Delivered Yoga Intervention for Adolescents with Autism Spectrum Disorder: Feasibility and Effectiveness for Improving Skills Related to Physical Activity. Journal of Autism and Developmental Disorders. 53: 3958-67.

11. Shanker S, Pradhan B (2023) Effect of yoga on the social responsiveness and problem behaviors of children with ASD in special schools: A randomized controlled trial. EXPLORE. 19: 594–9.

12. Sotoodeh MS, Arabameri E, Panahibakhsh M, Kheiroddin F, Mirdoozandeh H, et al. (2017) Effectiveness of yoga training program on the severity of autism. Complementary Therapies in Clinical Practice. 28: 47–53.

13. Rosenblatt LE, Gorantla S, Torres JA, Yarmush RS, Rao S, et al. (2011) Relaxation response-based yoga improves functioning in young children with autism: a pilot study. Journal of Alternative and Complementary Medicine (New York, N.Y.). 17: 1029-35.

14. Kaur MM, Srinivasan SN, Bhat A (2018) Comparing motor performance, praxis, coordination, and interpersonal synchrony between children with and without Autism Spectrum Disorder (ASD). Research in Developmental Disabilities. 72:

79-95.

15. Birdee GS, Yeh GY, Wayne PM, Phillips RS, Davis RB, et al. (2009) Clinical applications of yoga for the pediatric population: a systematic review. Academic Pediatrics. 9.

16. D'Souza CD, Avadhany ST (2014) Effect of yoga training and detraining on respiratory muscle strength in pre-pubertal children: A randomized trial. International Journal of Yoga. 7: 41-47.

17. Tran, M. D., Holly, R. G., Lashbrook, J., & Amsterdam, E. A. (2001). Effects of Hatha Yoga Practice on the Health-Related Aspects of Physical Fitness. Preventive Cardiology. 4: 165–70.

18. Dziuk MA, Larson JCG, Apostu A, Mahone EM, Denckla MB, et al. (2007) Dyspraxia in autism: association with motor, social, and communicative deficits. Developmental Medicine and Child Neurology. 49: 734–39.

19. Dawson G, Toth K, Abbott R, Osterling J, Munson J, et al. (2004) Early social attention impairments in autism: social orienting, joint attention, and attention to distress. Developmental Psychology. 40: 271-83.

20. Porter J (2013) Yoga as an Effective Behavioral Intervention for Children Diagnosed with an Autism Spectrum Disorder. Graduate Annual. 1: 9.

21. Movahedi A, Bahrami F, Marandi SM, Abedi A (2013) Improvement in social dysfunction of children with autism spectrum disorder following long term Kata techniques training. Research in Autism Spectrum Disorders. 7: 1054-61.

22. Smith AL (2003) Peer relationships in physical activity contexts: a road less traveled in youth sport and exercise psychology research. Psychology of Sport and Exercise. 4: 25-39.

23. Khanna S, Greeson JM (2013). A Narrative Review of Yoga and Mindfulness as Complementary Therapies for Addiction. Complementary Therapies in Medicine. 21: 244.

24. Artchoudane S, Bhavanani A, Ramanathan M, Mariangela A (2019) Yoga as a therapeutic tool in autism: A detailed review. Yoga Mimamsa. 51: 3.

25. Litchke LG, Liu T, Castro S (2018) Effects of Multimodal Mandala Yoga on Social and Emotional Skills for Youth with Autism Spectrum Disorder: An Exploratory Study. International Journal of Yoga. 11: 59-65.