

# Feasibility and implementation of a video-based yoga program in a special education setting using a collaborative model

## Abstract

**Background:** Yoga has been used as an intervention in children with evidence for reducing stress and for improving self- and social- confidence in children with typical and atypical development. Improvement in physical function has also been noted in the literature. Children with moderate to severe developmental delay often need support in the educational environment. While they may benefit from a school-based yoga program, the need for support to participate in a group yoga activity may create a barrier for implementation of such a program in many classrooms. A collaborative model with related service providers may help to remove this barrier.

**Aim:** The purpose of this short communication is to describe the implementation of a yoga program in a self-contained education environment using a collaborative approach between classroom teachers and related service providers. This collaboration may improve participation in children with moderate-to-severe levels of intellectual or physical impairment.

**Outcomes:** The yoga program was successfully implemented in two special education classrooms. The six participants in group 1 with a diagnosis of autism had reported anecdotal improvement in ability to focus following individual sessions. These students required cues primarily to remain engaged in group activity. In group 2, seven of eight participants were diagnosed with autism. One participant had a dual diagnosis of cerebral palsy and autism, and the eighth participant was diagnosed with muscular dystrophy. These children required modifications and assistance to participate, with similar results as group 1. The child diagnosed with cerebral palsy demonstrated increased lower extremity flexibility and the child with muscular dystrophy had a more relaxed breathing pattern following yoga postures.

**Keywords:** yoga, autism, education, pediatrics, emotional balance, flexibility, physical postures, psychological effects

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## Introduction

### Yoga practice in schools

Yoga is a centuries old practice that means union of the body and mind. In the western world, yoga practice most commonly consists of physical postures (asanas) and breathing (pranayama) exercises conducted individually or in a group format. Research has shown that a consistent practice of yoga has both physiological and psychological effects that result in improvements inflexibility, balance, strength, stress, and concentration.<sup>1</sup> While these findings have primarily involved adult populations, similar findings are emerging in yoga research involving children. A systematic review by Galantino et al. examined 24 studies on the effect of yoga for children and found supporting evidence of positive benefits from yoga in the areas of neuromuscular, musculoskeletal and cardio respiratory physical therapy practice patterns.<sup>2</sup> Serwacki et al. conducted a systematic review of research regarding the effectiveness of yoga based interventions delivered in schools for atypical and typical developing children. They concluded that yoga provided positive results for atypical developing children in the areas of reducing stress, improved self and social confidence, attention and concentration. Positive effects of yoga were also found for typically developing children that included decreased anxiety, negative behavior, impulsivity and increased emotional balance.<sup>3</sup>

More recently, research has found additional support for yoga in school for children in elementary to seventh grade. Koenig et al.<sup>4</sup> found significant decreases in maladaptive behavior in children 9 years of age with autism spectrum disorders after receiving 16 weeks of daily school-based yoga.<sup>4</sup> Eggleston<sup>5</sup> found that seventh grade students who participated in yoga for at least 30 minutes per week over the course of one academic school year demonstrated a significant increase in self-esteem and a decrease in perceived stress. Folleto et al.<sup>6</sup> examined the effects of a 12-week school based yoga program on the motor and social abilities of children 6-8 years of age, finding improvements in balance, strength and flexibility.<sup>6</sup>

### Education considerations

Children with special needs have unique challenges in the educational environment. These can include impaired mobility, sensory processing, and cognitive functioning-all of which can lead to anxiety, frustration and behavioral concerns that further impair learning.<sup>7</sup> Maskey et al.<sup>8</sup> examined the prevalence of aggression, sensory issues, fears and phobias in children diagnosed with autism. They found that of those children diagnosed with autism and low language development, 68% also experienced sensory impairment, and 40% experienced anxiety, fears and phobias.<sup>8</sup>

Children diagnosed with neuromuscular disorders may experience impairments that limit mobility in a school environment. According to Majnemer et al.,<sup>9</sup> a majority of children with cerebral palsy receive educational and rehabilitation resources in school. Majnemer et al.<sup>9</sup> This study also determined services to address accompanying social-emotional issues may be lacking.

Children may require support services to enable successful participation in the least restrictive environment. Adaptations and support are mandated under federal law and can include physical therapy, occupational therapy, speech therapy and other related services to enhance a child's ability to successfully participate in their school experience.<sup>10</sup> According to school-based physical therapists surveyed by Kaminker et al.,<sup>11</sup> a team approach with treatment occurring in a natural environment is advocated in order to ensure carry over and consistency when educating children with special needs, so long as the environment allows adequate time for practice.<sup>11</sup> The educational community in general advocates collaboration;<sup>12</sup> however, with day-to-day demands within the educational system, finding time to have meaningful collaboration can be a challenge.

## Purpose

It is with these factors in mind that educators may decide to implement yoga practice into daily classroom routine. The level of impairment and need for support services for children with special needs is a challenge to implementation of such a program. The purpose of this short communication is to describe the implementation of a yoga program in a self-contained education environment using a collaborative approach between classroom teachers and related service providers. This collaboration may improve participation in children with moderate-to-severe levels of intellectual or physical impairment.

## Procedures

### Yoga program development

Yoga was introduced in suburban special education classrooms by individuals on the special education team with personal yoga experience. In this setting, children often require individualized attention to participate in movement activities, either due to shortened attention span, physical impairments leading to participation restrictions, or frustration manifested in challenging classroom behaviors. Through the collaboration of members of the education team, it was determined that successful implementation of a program in this population would require low student-to-teacher ratio, proper utilization of staff to meet individualized needs of the child, consistency of programming, and child-centered media. To garner support of building administrators and parents, the need for activities supportive of curriculum and individual educational goals of each participant was identified.

Educational team members included the classroom teacher, who was considered to be the program leader. As movement specialists in the educational setting, occupational and physical therapists attended the yoga sessions on a monthly basis with students who were assigned to their client case load. Similarly, speech therapists, who provide instruction in the area of appropriate social communication in school, were engaged appropriately to facilitate peer interaction. These strategic assignments during the yoga program ensured that the individual who was assisting each child was aware of their unique needs in order to best facilitate active participation. This support was

helpful in meeting the goal of not only keeping the ratio between students and adult support staff low, but helped to individualize the program to the specific needs of the child.

It was identified by the educational team that the safety of yoga programming would be achieved through the individualized attention achieved by maintaining a low student-to-teacher ratio. Any concerns about the ability of each child to maintain or transition among yoga postures were alleviated through the ongoing collaboration between classroom staff and movement specialists, in this case physical and occupational therapists. The role of the physical therapist in this environment was to determine the need for physical modification to postures and movements without compromising the effect of the intervention (yoga). Additionally, training the classroom staff in proper guarding techniques that would enable active participation on the part of the child was a key component to ensuring the most safe and effective level of participation.

Yoga video selection was determined separately in each class, with an emphasis on a selection that was most in line with the goals and ages of the children. Each video utilized within the school had the following commonalities. First, animal poses (asanas) were used in each of the videos considered. This allowed the reinforcement of early science programming to be included in a fun manner. Second, children performing the yoga program under the instruction of a kid-friendly yoga expert were featured in each video. Third, the format of each video included a warm up period emphasizing relaxation and breathing (pranayama), an activity phase that encouraged peer interaction, and a cool down component.

Specific benefits of the selected programs included elongation of shortened muscles, as well as positioning that emphasized balance, coordination and core strengthening activities.<sup>2</sup> Interactive locomotor skills reinforced socialization, which is a goal for many children with autism and other impairments. The cool-down component was necessary for transition back to usual learning activities, a task that is particularly difficult for children with special education needs. The programs selected also met specific goals for each of the domains represented by the staff who was participating: academic education, speech and language, socialization, and motor skill acquisition.

The videos utilized in each classroom were commercially available and projected on a large screen via SMART Board technology. Each student in the class was positioned to enable unobstructed view of the screen, with an adult to facilitate participation. Students were strategically matched with their assigned physical, occupational or speech therapist, based on educational goals that related to the domain of each service provider. Postures were modified as needed to accommodate the specific physical needs of each child. Children with less gross motor impairment were matched with classroom staff instead of therapists. Sessions were a total of 30 minutes, and the same video was used for each session to reduce anxiety and allow practice of familiar activities.

Yoga programming was initiated on a monthly basis with the entire team present. Interim yoga sessions led by classroom staff only (without participation of related service provider) were conducted at various intervals, depending on the structure and needs of each class. The safety and consistency of individualized activity modifications was ensured by consultation between the classroom teacher and related service providers in attendance during the monthly collaborative yoga session.

## Participants

There were 2 classes in which the collaborative yoga program were initially offered. The first class of students, group 1, was comprised of 6 students (ages 5-6 years) who were diagnosed with autism and were a mix of 4 male(s) and 2 female(s). Their level of impairment was considered to be severe, with developmental delays in the areas of speech and language, as well as motor. All were ambulatory, but exhibited coordination and balance deficits, in addition to sensory processing difficulties. At least 2 children in group 1 required individual attention to prevent elopement. This group required consistent one-on-one pairing with an adult in order to maintain focus on the program, but relatively few motor cues. The physical therapist provided methods of guarding without preventing the child from actively participating in the yoga program. In the motor learning theory, this is essential to promote control of postural mechanisms involved in the yoga postures and movements.<sup>13</sup> The occupational therapist provided sensory cues and props that matched the yoga video in order to increase student engagement. The speech therapist promoted interaction among the students in the class by increasing awareness and turn taking as appropriate. The benefit of the program was anecdotally reported to be improved focus on task following participation, which was in line with the study by Serwacki et al.<sup>3</sup>

The second class (group 2) in which a yoga program was implemented had 8 children (ages 7-8 years), 6 male(s) and 2 female(s). This group dynamic was different than group 1 because 6 of the students in this class were primarily diagnosed with autism. A 7<sup>th</sup> student in group 2 had a primary diagnosis of cerebral palsy (CP) and a secondary diagnosis of autism. He was classified as having spastic diplegia, which is characterized by increased muscle tone, primarily in the lower extremities. This physiologic finding contributes to a scissor-type gait in which his lower extremities cross over one another while stepping.<sup>14</sup> He also experienced characteristic impaired muscle length in his hamstring, hip adductor and internal rotator and ankle plantar flexor muscle groups. An 8<sup>th</sup> student in group 2 was diagnosed with muscular dystrophy (MD) and had significant muscle weakness in her proximal trunk and breathing muscles. She required motorized wheeled mobility in all settings. As is typical of this medical condition, she experienced weak respiration<sup>15</sup> and associated anxiety that caused her breathing to be even more rapid and shallow at times.

## Discussion

Children of all socioeconomic home/community settings are affected by modern stress compared with previous generations. The learning challenges this generation of young people face are more prevalent in today's society, particularly in children who live in stressful home environments, as well as in children with developmental disorders.<sup>3</sup> Eggleston et al have outlined the benefits of yoga for children, and their findings include reduced perceived stress and anxiety, improved self-esteem, and better focus on tasks in school.<sup>5</sup> Evidence of decreased levels of salivary cortisol, a biomarker associated with stress, was found in elementary children in a study by Butzer et al. (Butzer et al., 2014). These findings are supportive of the efficacy of developing yoga programs in educational environments.

The school in the current short communication educates children with physical and intellectual impairments in a self-contained setting. The children who participated in classroom yoga programs were largely diagnosed with autism, which is a population that has been shown in the literature to benefit from yoga programming. Rosenblatt

et al reported changes on the Aberrant Behavior Checklist following 8 weeks of yoga in 5-12 year-old children with autism Rosenblatt et al.<sup>16</sup> Another study that reviewed the effects of yoga on this population found decreases in maladaptive behavior in children 9 years of age with autism spectrum disorders after receiving 16 weeks of daily school-based yoga Koenig et al.<sup>4</sup> Improved attention and focus reported by anecdotal response following yoga intervention in the present report was in line with findings of these studies.

Two students who participated in this program were diagnosed with other health impairments, including CP and MD. No studies examining the effects of yoga on these populations have been published. However, the effect of stretching, which is a commonly used therapeutic treatment in children with CP,<sup>17</sup> has been documented in other populations to be positively affected by yoga. The study by Folleto et al used the sit and reach test to determine hamstring length in children who participated in yoga as a part of a physical education program in school Folleto et al.<sup>6</sup> Improved scores on this test suggest that yoga may be helpful in improving flexibility in children. Further research is needed to examine the specific effects on children with CP, as the mechanism for tight muscles may be different than what would be found in the general population.

The child diagnosed with muscular dystrophy represented in this paper experienced low respiratory capacity that is an effect of MD.<sup>15</sup> The mechanism of reduced respiration rate and associated anxiety that was anecdotally noted in this child may be similar to findings in the study by Jensen et al that examined respiration rate in students with disruptive behavior. They found some of the participants exhibited fast and chaotic breathing patterns indicative of upper respiratory muscle use in the pre-yoga phase. Following the yoga program, diaphragmatic breathing patterns were more evident.<sup>18</sup> While this population differs significantly from MD, a primary goal when working with children diagnosed with MD is to maintain respiratory function for as long as possible.<sup>15</sup>

The task of implementing a yoga program in a special education environment is a large undertaking. Children in this school environment often require federally mandated services for successful participation in their education activities.<sup>10</sup> Scheduling time when all the students are in the classroom, as well as when service providers are available to provide appropriate, discipline-based support, can be a barrier to success. Another challenge is when a child occasionally responds to the yoga programming with increased agitation due to the nature of handling techniques required. Further analysis of the cues provided and other environmental factors may mitigate this in some children. Finally, perceptions by some of parents and school personnel about what yoga is may be a barrier to success of a school-based yoga program. Further research, with rigorous methodology, would be helpful in convincing some members of the educational community that yoga is a worthwhile pursuit in this setting.

## Conclusion

Successful implementation of a school-based yoga program using a collaborative model in special education classrooms was achieved. A team approach helped individualize the video-based yoga program to meet the needs of students involved.

Anecdotal feedback and observations as it relates to the student participant's function was generally positive. While most of the participants in the classrooms engaged in yoga programs were

diagnosed with autism, children with other diagnoses such as Down syndrome, CP and MD also participated in the school-based yoga program. One child diagnosed with CP was observed to have improved lower extremity mobility and a short term reduction in the influence of muscle tone while walking. This was manifest in improved ability to isolate movement of one leg at time while walking. The child with MD who had apparent anxiety related to respiration challenges experienced more relaxed breathing immediately following yoga sessions. The children diagnosed with autism reportedly experienced short-term improvement in their ability to focus on academic activities following yoga instruction. Since a lengthy bus ride can be an antecedent to challenging behaviors in children with special needs, one classroom teacher in the autism program reported reduced negative behaviors following the yoga program, and integrated the program into a daily routine as the children got off the bus. Observations of negative outcomes rarely occurred, but included one student participant who became more agitated when tactile input was provided. It is not uncommon for children who have autism and sensory processing disorder to resist manual handling techniques. Further exploration of strategies to enable effective participation was ongoing.

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## Conflict of interest

The author declares no conflict of interest

## References

1. Bussing A, Michalsen A, Khalsa B, et al. Effects of yoga on mental and physical health: a short summary of reviews. *Evidence-Based Complementary and Alternative Medicine*. 2012;2012(2012):1–7.
2. Galantino M, Galbavy R, Quinn L. Therapeutic effects of yoga for children: a systematic review of the literature. *Pediatric Physical Therapy*. 2008;20(1):66–80.
3. Serwacki M, Cook Cottone C. Yoga in the schools: a systematic review of the literature. *International Journal of Yoga Therapy*. 2012;22(1):101–109.
4. Koenig K P, Buckley Reen A, Garg S. Efficacy of the get ready to learn yoga program among children with autism spectrum disorders: a pretest-posttest control group design. *American Journal of Occupational Therapy*. 2012;66(5):538–546.
5. Eggleston B. The benefits of yoga for children in schools. *The International Journal of Health, Wellness, and Society*. 2015;5(3):1–7.
6. Folleto J, Pereira K, Valentini N. The effects of yoga practice in school physical education on children's motor abilities and social behavior. *International Journal of Yoga*. 2016;9(2):156–162.
7. *The Mental and Emotional Well-Being of Children: A Portrait of States and the Nation 2007*. Rockville, Maryland, USA: US Department of Health and Human Services; 2010. p. 8–14.
8. Maskey M, Warnell F, Parr JR, et al. Emotional and behavioural problems in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*. 2013;43(4):851–859.
9. Majnemer A, Shikako Thomas K, Lach L, et al. et al. Rehabilitation service utilization in children and youth with cerebral palsy. *Child: Care, Health and Development*. 2012;40(2):275–282.
10. Wright PWD. *Individuals with disabilities Education Improvement Act of 2004*. Special Education Law; 2016. 56 p.
11. Kaminker MK, Chiarello LA, O'Neil ME, et al. Decision making for physical therapy service delivery in schools: a nationwide survey of pediatric physical therapists. *Physical Therapy*. 2004;84(10):919–933.
12. Blask F. Collaboration between general education teachers and related services providers; 2011.
13. Nielsen J, Willerslev Olsen M, Christiansen L, et al. Science-based neurorehabilitation: recommendations for neurorehabilitation from basic science. *Journal of Motor Behavior*. 2015;47(1):7–17.
14. Fish D. Characteristic gait patterns in neuromuscular pathologies. *Journal of Prosthetics and Orthotics*. 1997;9(4):163–167.
15. Stuberger W. *Muscular Dystrophy and Spinal Muscular Atrophy*. In *Physical Therapy for Children*. 4th ed. St Louis MO, USA: Elsevier Saunders; 2012. p. 353–369.
16. Rosenblatt LE, Sasikanth G, Torres JA, et al. Relaxation response-based yoga improves functioning in young children with autism: a pilot study. *The Journal of Alternative and Complementary Medicine*. 2011;17(11):1029–1035.
17. Wright M, Wallman L. *Cerebral Palsy*. In *Physical Therapy for Children*. 4th ed. St Louis MO, USA: Elsevier Saunders; 2012. p. 583–586.
18. Jensen P, Stevens P, Kenny D. Respiratory patterns in students enrolled in schools for disruptive behaviour before, during, and after yoga nidra relaxation. *Journal of Child and Family Studies*. 2012;21(4):667–681.