Effects of Classroom Based Yoga on Gross Motor Skills and Self-Regulation in Preschool Aged Children with Developmental Delays

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Purpose
The purpose of this research is a quality assurance initiative to examine the effects of a currently existing classroom based pediatric yoga program on gross motor skills, strength, and self-regulation ability of preschool aged children with developmental delays.

Background
In the United States, the Center for Disease Control (CDC) estimates that 1 in 6 children aged 3 to 17 years old are diagnosed with one or more developmental disabilities.1 These disabilities often require a variety of therapies, such as Physical Therapy, to address a wide range of limitations and restrictions. Many individuals and their families seek adjunct interventions to compliment typical treatment approaches, however, many of these interventions are considered alternative due to the lack of research surrounding them. Yoga is the 10th most commonly practiced complementary medicine with proposed benefits to mental, emotional, physical, and behavioral health.2,3 These benefits have been studied in both pediatric and adult populations; however, limited research has been conducted regarding motor impairments in the pediatric population with developmental disabilities. It is challenging to make comparisons among research using yoga as an intervention due to the wide variety of yoga styles and the limited ability to standardize one yoga intervention; however, all styles of yoga typically involve postures (asana), breathing (pranayama), and meditation.4 Regardless of the style of yoga practiced, positive results regarding physical and emotional health benefits for both adult and pediatric populations have been demonstrated, but these results cannot be generalized to pediatric populations with disabilities. After reviewing current research, we expect that the use of yoga, as a complementary medical treatment to traditional therapies, will increase motor performance and self-regulatory behaviors in children with developmental disabilities.

Materials and Methods

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<td>1. Raghunath P, Telles S</td>
<td>Published: 2003</td>
<td>To compare the effects of a 1-month yoga program and a 1-month physical activity program on motor perception in children</td>
<td>32 Participants girls aged 10-11 years</td>
<td>Analyzed depth perception with an electronic apparatus</td>
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<td>2. Sotodeh MS, Arabameri E, Panahibakhsh M et al.</td>
<td>Published: 2017</td>
<td>To evaluate the effects of yoga training on the severity of autism in children</td>
<td>29 participants aged 7-15 years</td>
<td>Parents/caregivers completed the Autism Treatment Evaluation Checklist (ATEC) to assess severity of ASD</td>
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<td>3. Galantino ML et al.</td>
<td>Published: 2008</td>
<td>To investigate the effects that different varieties of yoga have on musculoskeletal, neuromuscular, and cardiopulmonary systems in typically developing children.</td>
<td>Systematic review of 24 studies</td>
<td>Articles needed outcome measure on quality of life</td>
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<td>4. Birdie GS et al.</td>
<td>Published: 2009</td>
<td>To determine the efficacy of yoga in children (0-21 years old) on physiological heart, behavioral disorders and on Incontinent Bowel Syndrome (IBS).</td>
<td>Systematic review of 34 studies</td>
<td>Articles included with yoga or yoga based interventions were used</td>
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Results
The results of this study suggest that yoga may be an effective intervention strategy for improving aspects of motor control in children with typical development. This article examined whether yoga training results in significant improvements in aspects of physical fitness, neuromuscular and cardiopulmonary systems, and overall mental health. These results indicate that yoga may be an efficacious physical therapy treatment for children; however, due to the numerous varieties of yoga, there is a need to standardize what is classified as yoga training. None of the studies shared parameters for their treatment. Due to the scarcity of studies in this area, future research should be conducted to further evaluate the efficacy of this intervention for improving motor skills in children with developmental delays.

Conclusions
Through analysis of the research, the efficacy of yoga training on motor skills in preschool age children with developmental disabilities cannot be determined. The effects on depth perception, cardiovascular and pulmonary health, and overall physical fitness shown in the research consistently demonstrate that yoga results in improvements in each of these areas. However, how these body systems can correlate to motor performance, measures of strength, coordination, and motor planning are needed to see the true effect of yoga in this domain. Additionally, because the sample population in the current research rarely involve children with disabilities, the effects demonstrated in these studies are not generalizable to this population. For children with ASD, the current research indicates that the efficacy of yoga therapies on improving eye contact/eye gaze, sitting tolerance, body posture, body awareness, imitation skills, self-regulatory behavior and a decline in stereotyped behaviors, overall development are notably absent from the current body of research. These populations could benefit from the already shown efficacy of yoga as a conjunct treatment for typically developing adults and children. Therefore, for children with motor related impairments, like those with a development disability, yoga may be efficacious to restore function and give this community an alternative to traditional therapies. However, further research is warranted to investigate the effects of yoga on children with varying developmental disabilities.

References