Yoga in Schools

Yoga Alliance Webinar
May 5, 2020

Sat Bir S. Khalsa, Ph.D.

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Director of Yoga Research, Yoga Alliance
Director of Research, Kundalini Research Institute
Editor in Chief, International Journal of Yoga Therapy
Research Associate, Benson Henry Institute for Mind Body Medicine
Research Affiliate, Osher Center for Integrative Medicine
U.S. Adult Yoga Demographics


From: Yoga in America Market Study, Yoga Journal, 2008
Youth Challenges
National Youth Risk Behavior Survey, 2017

Percentage of High School Students Who Were Bullied on School Property

- Total: 19.0%
- Male: 15.6%
- Female: 22.3%
- 9th: 22.7%
- 10th: 20.3%
- 11th: 18.3%
- 12th: 14.0%
- Black: 13.2%
- Hispanic: 16.3%
- White: 21.5%
National Youth Risk Behavior Survey, 2017

Percentage of High School Students Who Ever Drank Alcohol

<table>
<thead>
<tr>
<th></th>
<th>Percent</th>
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<tbody>
<tr>
<td>Total</td>
<td>60.4</td>
</tr>
<tr>
<td>Male</td>
<td>58.1</td>
</tr>
<tr>
<td>Female</td>
<td>62.6</td>
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<tr>
<td>9th</td>
<td>47.7</td>
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<td>10th</td>
<td>58.0</td>
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<tr>
<td>11th</td>
<td>66.4</td>
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<tr>
<td>12th</td>
<td>71.7</td>
</tr>
<tr>
<td>Black</td>
<td>51.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>64.7</td>
</tr>
<tr>
<td>White</td>
<td>61.7</td>
</tr>
</tbody>
</table>
National Youth Risk Behavior Survey, 2017

Percentage of High School Students Who Ate Vegetables One or More Times Per Day

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>9th</th>
<th>10th</th>
<th>11th</th>
<th>12th</th>
<th>Black</th>
<th>Hispanic</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>59.4</td>
<td>59.4</td>
<td>59.3</td>
<td>56.1</td>
<td>60.8</td>
<td>60.4</td>
<td>60.8</td>
<td>49.4</td>
<td>56.1</td>
<td>62.8</td>
</tr>
</tbody>
</table>
National Youth Risk Behavior Survey, 2017

Percentage of High School Students Who Were Physically Active at Least 60 Minutes Per Day on 5 or More Days

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>9th</th>
<th>10th</th>
<th>11th</th>
<th>12th</th>
<th>Black</th>
<th>Hispanic</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>46.5</td>
<td>56.9</td>
<td>36.8</td>
<td>54.1</td>
<td>45.0</td>
<td>45.1</td>
<td>41.4</td>
<td>42.0</td>
<td>44.9</td>
<td>48.7</td>
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</table>
National Youth Risk Behavior Survey, 2017

Percentage of High School Students Who Described Themselves As Slightly or Very Overweight

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>9th</th>
<th>10th</th>
<th>11th</th>
<th>12th</th>
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<td>31.5</td>
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<td>37.5</td>
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<td>29.7</td>
<td>33.8</td>
<td>32.3</td>
<td>28.1</td>
<td>37.1</td>
<td>29.9</td>
</tr>
</tbody>
</table>

Bar chart showing the percentage of high school students who described themselves as slightly or very overweight by gender, grade level, and ethnicity.
Stress is Taking a Physical and Emotional Health Toll on Children

...parents are underestimating how much stress their children experience and the impact their own stress has on their children.

...children as young as eight years old are reporting that they experience physical and emotional health consequences often associated with stress.
The Descriptive Epidemiology of Commonly Occurring Mental Disorders in the United States*

Ronald C. Kessler¹ and Philip S. Wang²

¹Department of Health Care Policy, Harvard Medical School, Boston, Massachusetts 02115; email: kessler@hcp.med.harvard.edu
²Division of Services and Intervention Research, National Institute of Mental Health, Bethesda, Maryland 20892-9629; email: wangphi@mail.nih.gov

Majority of seriously impairing and persistent conditions have child-adolescent onsets and high comorbidity
Need for treatment of largely untreated child-adolescent disorders
**Child-Adolescent Psychiatric Disorders**

“…10.06% of youths experience [serious emotional disturbance] with substantial impairment in one or more functional domains…”

“…large numbers of youth and families affected… underscore the need for comprehensive and effective prevention and treatment services.”


“…overall prevalence for at least one [subthreshold] disorder in the past year of…almost 16%…”

“One in four adolescents had either…disorder with impairment.”


“The most consistent factors involve indicators of stress…”

“Personal resources (e.g. mastery) enhance resilience to onset”


…the striking feature of the present data is...how high the rates of early psychiatric disorders are. Most likely, the lifetime prevalence of psychiatric problems by age 21 well exceeds 80%, suggesting that the experience of psychiatric illness is nearly universal.
National Youth Risk Behavior Survey, 2017

Percentage of High School Students Who Seriously Considered Attempting Suicide

- Total: 17.2%
- Male: 11.9%
- Female: 22.1%
- 9th: 16.3%
- 10th: 17.3%
- 11th: 17.5%
- 12th: 17.4%
- Black: 14.7%
- Hispanic: 16.4%
- White: 17.3%
Adolescent / School Challenges

- **Stress** (developmental, family, social, academic, societal)
- **Mental Health** (depression, anxiety, substance abuse, trauma)
- **Behavior** (apathy, violence, social skills, bullying, absenteeism)
- **Academics** (grades, dropouts)
- **Physical Health** (obesity, diabetes)
- **Attention** (ADD, ADHD)
Yoga Practices
Postures, Breathing, Relaxation, Meditation

Fitness
- Flexibility
- Strength
- Coordination/Balance
- Respiratory Function
- Self-Efficacy

Self-Regulation
- Stress Regulation
- Emotion Regulation
- Resilience
- Equanimity
- Self-Efficacy

Awareness
- Attention
- Mindfulness
- Concentration
- Cognition
- Meta-cognition

Spirituality
- Unitive State
- Transcendence
- Flow
- Transformation
- Life Meaning/Purpose

Global Human Functionality
- Physical & Mental Health, Physical Performance
- Stress & Emotion Regulation, Awareness/Mindfulness, Meta-cognition
- Positive Behavior, Wellbeing, Values, Life Purpose & Meaning, Spirituality
Yoga for Children/Adolescents
little flower yoga for kids
A Yoga and Mindfulness Program to Help Your Child Improve Attention and Emotional Balance
Jennifer Cohen Harper, MA, E-RCYT
Foreword by Daniel J. Siegel, MD

You Are a LION! And Other Fun Yoga Poses
Taeeun Yoo

I AM YOGA
BY SUSAN VERDE - ART BY PETER H. REYNOLDS

GO GO Yoga for Kids
A COMPLETE GUIDE TO YOGA WITH KIDS
Sara J. Weis

Yoga for Children
200+ Yoga Poses, Breathing Exercises, and Meditations for Healthier, Happier, More Resilient Children
Lisa Flynn, E-RYT, RCYT

Yoga Pretzels
50 Fun Yoga Activities for Kids & Grownups
Tara Stiles and Leah Kalmakoff

Itsy Bitsy Yoga
Poses to Help Your Baby Sleep Longer, Digest Better, and Grow Stronger
Helen Garabedian
JOIN US FOR THE 2018 NATIONAL KIDS YOGA CONFERENCE

#NKYC2018 is the leading professional environment for adults to learn the art of successfully bringing yoga, mindfulness, and social emotional learning to the youth in your community. Celebrating its 5th year, NKYC will bring you ALL of what has been great in this professional learning environment AND #elevate this year's gathering to feature:

- Town Hall Forum on Accessible Yoga, Mindfulness, and SEL for children with discussion topics ranging from Research to Trauma to Policy to Interventions
- Basic Teacher Training Certificate Track
- Advanced Teacher Training Certificate Track
- Teen Only Teacher Training Track

read more»

ANNOUNCING OUR 2018 SPEAKERS

Sally Delisle
Aruna Kathy Humphrys
Claire Matthews
Tish Jennings
Sat Bir Singh Khalsa
Craig H

enter email address
SIGN UP
YOGA AS A COMPLEMENTARY THERAPY FOR CHILDREN AND ADOLESCENTS:
A Guide for Clinicians

by LISA C. KALEY-ISLEY, PhD, RYT-500; JOHN PETERSON, MD; COLLEEN FISCHER, PhD;
and EMILY PETERSON, CYT

Dr. Kaley-Isley is from the University of Colorado School of Medicine, Division of Psychiatry, Denver, Colorado; Dr. Peterson is Director, Child and Adolescent Psychiatric Services, Denver Health Medical Center and Associate Professor, Department of Psychiatry, University of Colorado School of Medicine, Denver, Colorado; Dr. Fischer is from Denver Health Medical Center and the University of Colorado School of Medicine, Division of Psychiatry, Denver, Colorado; and Ms. Peterson is from Beloit College, Beloit, Wisconsin.

Psychiatry (Edgemont) 2010;7(8):20–32

ABSTRACT
Yoga is being used by a growing number of youth and adults as a means of improving overall health and fitness. There is also a progressive trend toward use of yoga as a mind-body complementary and alternative medicine intervention to improve specific physical and mental health conditions. To provide clinicians with therapeutically useful information about yoga, the evidence evaluating yoga as an effective intervention for children and adolescents with health problems is reviewed and summarized. A brief overview of yoga and yoga therapy is presented along with yoga resources and practical strategies for clinical practitioners to use with their...
Mind-body therapies are popular and are ranked among the top 10 complementary and integrative medicine practices reportedly used by adults and children in the 2007–2012 National Health Interview Survey. A growing body of evidence supports the effectiveness and safety of mind-body therapies in pediatrics. This clinical report outlines popular mind-body therapies for children and youth and examines the best-available evidence for a variety of mind-body therapies and practices, including biofeedback, clinical hypnosis, guided imagery, meditation, and yoga. The report is intended to help health care professionals guide their patients to nonpharmacologic approaches to improve concentration, help decrease pain, control discomfort, or ease anxiety.
CHAPTER EIGHTEEN
YOGA THERAPY FOR PEDIATRICS

S EVANS • M. GALANTINO • K LUNG • I ZEITZER

Introduction
The use of complementary and integrative medicine (CIM) is common. However, limited data are available on the use of CIM and factors associated with its use among the pediatric population in the United States (Birdcree et al., 2009). In 2007, pediatric CIM users were more likely to take prescription medications, have a parent who used CIM, and have chronic conditions such as anxiety or stress, musculoskeletal conditions, dermatologic conditions, or sinusitis (Birdcree et al., 2009). An overview of systematic reviews in 2011 evaluated the evidence for or against the effectiveness of CIM for any childhood condition and found 17 systematic reviews covering acupuncture, chiropractic, herbal medicine, homeopathy, hypnotherapy, massage, and yoga. Results were unconvincing for most conditions and many of the reviews failed to mention the incidence of adverse effects of CIM. The systematic reviews included in the overview tended to be of low quality, as were the randomized controlled trials (RCTs) within those reviews (Hunt & Ernst, 2011).

CIM data from the 2007 National Health Interview Survey were analyzed for youth 7 to 17 years old. Readily accessible CIM therapies including yoga are commonly used by youth with attention-deficit hyperactivity disorder (ADHD), depression, and anxiety, particularly those who have comorbid chronic health conditions, receive prescription medications, and have difficulty affording counseling ( Kemper, Gardiner, & Birdcree, 2013). Furthermore, a meta-analysis suggested that yoga is a useful supplementary approach with moderate effect sizes on pain and associated disability (Bussing, Osternmann, Ludtke, & Michalsen, 2012).

Two systematic reviews to date have been published regarding the benefits of yoga in the pediatric population (Birdcree et al., 2009; Galantino, Galbavy, & Quinn, 2008). In both reviews, the methodological quality of the studies was reported as low. In the first review, the effects of yoga on quality of life and outcome measures were explored. Areas for which yoga has been studied included physical fitness, cardiorespiratory effects, mental health, behavior and development, irritable bowel syndrome, eating disorders, and prenatal effects on birth outcomes. The majority of available studies suggest benefits to using yoga as a therapeutic intervention and show very few adverse effects. These results must be interpreted as preliminary because many of the studies have methodological limitations that prevent strong conclusions from being drawn. Further information about how to apply yoga most effectively and more coordinated research efforts are needed.

A growing number of RCTs have investigated the therapeutic value of yoga interventions. A recent bibliometric analysis of yoga papers published between 1975 and 2014 found a total of 366, of which 31 studies (9.9%) included children. This analysis presents the most complete up-to-date overview on published RCTs. While the available research evidence is sparse for most conditions, there was a marked increase in published RCTs in recent years (Cramer, Lauche, & Dobos, 2014). To provide clinicians with therapeutically useful information about yoga, the evidence evaluating yoga as an effective intervention for children and adolescents with health problems is reviewed and summarized through a review by Kaley-Iseley et al. (Kaley-Iseley, Peterson, Fischer, & Peterson, 2010). A brief overview of yoga and yoga therapy is presented along with yoga resources and
Yoga as an Intervention for the Reduction of Symptoms of Anxiety and Depression in Children and Adolescents: A Systematic Review

Aurora James-Palmer¹, Ellen Z. Anderson¹, Lori Zucker¹, Yana Kofman² and Jean-François Daneault*²

¹ Department of Rehabilitation and Movement Sciences, Rutgers University, Newark, NJ, United States, ² The Yoga Way Therapy Center, Morristown, NJ, United States

Purpose: The purpose of this review is to evaluate the implementation and effectiveness of yoga for the reduction of symptoms of anxiety and depression in youth. To our knowledge, there are no systematic reviews to date looking at the reduction of symptoms of both anxiety and depression.

Methods: Numerous scientific databases were searched up to November 2018 for experimental studies assessing changes in symptoms of anxiety and/or depression in youths following yoga interventions. Quality and level of evidence were assessed, and information was synthesized across studies.

Results: Twenty-seven studies involving youth with varying health statuses were reviewed. Intervention characteristics varied greatly across studies revealing multiple factors that may impact intervention efficacy, however 70% of the studies overall showed improvements. For studies assessing anxiety and depression, 58% showed reductions in both symptoms, while 25% showed reductions in anxiety only. Additionally, 70% of studies assessing anxiety alone showed improvements and 40% of studies only assessing depression showed improvements.

Conclusion: The studies reviewed, while of weak to moderate methodological quality, showed that yoga, defined by the practice of postures, generally leads to some reductions in anxiety and depression in youth regardless of health status and intervention characteristics.
Systematic Review of Randomized Controlled Trials Testing the Effects of Yoga with Youth

Shari Miller¹ · Tamar Mendelson² · Angela Lee-Winn²,³ · Natalie L. Dyer⁴ · Sat Bir S. Khalsa⁴

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Abstract
Objectives The objective of this study was to conduct a systematic review of randomized controlled trials (RCTs) of yoga with youth.
Methods Selection of studies was based on the following inclusion criteria: RCT design, publication in a peer-reviewed journal in English, participants between ages 5 and 18, and assessment of an intervention in which yoga was the primary component.
Results Our search of seven databases yielded 39 RCTs that met inclusion criteria. Studies were conducted in seven countries, with the majority in the USA. Most studies were conducted with predominantly White samples and in school settings. Studies were variable in the duration, frequency, and number of yoga program sessions. Outcomes included a range of constructs in three domains: psychological/behavioral, cognitive, and physiological/physical functioning. In all but five studies, yoga improved outcomes in at least one of these three domains. Results indicate growing evidence that yoga is a promising intervention for children and youth.
Conclusions Recommendations for future research include specification of testable theoretical models with hypothesized intervention core components and mechanisms of action, assessment of intervention mediators and moderators, routine monitoring and reporting of factors associated with program implementation, use of common validated outcome measures, and reporting of null or iatrogenic intervention effects.

Published online: 13 March 2020
Research Outcomes

- Physiological - Physical Functioning
- Psychological - Behavioral Functioning
- Cognitive Performance
Yoga in Schools
From: The Hygiene of the School Child, LM Terman, 1914.

... the health and welfare of a child will ... be regarded as one of as much importance as arithmetic and geography...
Center for Disease Control
Whole School, Whole Community, Whole Child Model

Collaborative for Academic, Social and Emotional Learning (CASEL)
Implementing yoga within the school curriculum: a scientific rationale for improving social-emotional learning and positive student outcomes

Bethany Butzer, Denise Bury, Shirley Telles and Sat Bir S. Khalsa

Abstract

Purpose – The purpose of this paper is to review and synthesise research evidence and propose a theoretical model suggesting that school-based yoga programs may be an effective way to promote social-emotional learning (SEL) and positive student outcomes.

Design/methodology/approach – This paper is a literature review focusing on the current state of research on school-based yoga interventions; a preliminary theoretical model outlining the potential mechanisms and effects of school-based yoga; similarities, differences and possibilities for integrating school-based SEL, yoga and meditation; practical implications for researching and implementing yoga in schools.

Findings – Research suggests that providing yoga within the school curriculum may be an effective way to help students develop self-regulation, mind-body awareness and physical fitness, which may, in turn, foster additional SEL competencies and positive student outcomes such as improved behaviours, mental state, health and performance.

Research limitations/implications – Given that research on school-based yoga is in its infancy, most existing studies are preliminary and are of low to moderate methodological quality. It will be important for future research to employ more rigorous study designs.

Practical implications – It is possible, pending additional high-quality research, that yoga could become a well-accepted component of school curricula. It will be particularly important for future research to examine possibilities around integrating school-based yoga and meditation with SEL programs at the individual, group and school-wide levels.

Originality/value – This paper is the first to describe a theoretical model specifically focused on school-based yoga interventions, as well as a discussion of the similarities and differences between school-based yoga, SEL and meditation.

Keywords Education, Mindfulness, School, Meditation, Yoga, Social-emotional learning

Paper type Literature review
School-based Yoga Programs in the United States: A Survey

Bethany Butzer, PhD; Marina Ebert, MA; Shirley Telles, PhD; Sat Bir S. Khalsa, PhD

**ABSTRACT**

**Context** • Substantial interest has begun to emerge around the implementation of yoga interventions in schools. Researchers have found that yoga practices may enhance skills such as self-regulation and prosocial behavior, and lead to improvements in students’ performance. These researchers, therefore, have proposed that contemplative practices have the potential to play a crucial role in enhancing the quality of US public education.

**Objective** • The purpose of the present study was to provide a summary and comparison of school-based yoga programs in the United States.

**Design** • Online, listserv, and database searches were conducted to identify programs, and information was collected regarding each program’s scope of work, curriculum characteristics, teacher-certification and training requirements, implementation models, modes of operation, and geographical regions.

**Setting** • The online, listserv, and database searches took place in Boston, MA, USA, and New Haven, CT, USA.

**Results** • Thirty-six programs were identified that offer yoga in more than 940 schools across the United States, and more than 5400 instructors have been trained by these programs to offer yoga in educational settings. Despite some variability in the exact mode of implementation, training requirements, locations served, and grades covered, the majority of the programs share a common goal of teaching 4 basic elements of yoga: (1) physical postures, (2) breathing exercises, (3) relaxation techniques, and (4) mindfulness and meditation practices. The programs also teach a variety of additional educational, social-emotional, and didactic techniques to enhance students’ mental and physical health and behavior.

**Conclusions** • The fact that the present study was able to find a relatively large number of formal, school-based yoga programs currently being implemented in the United States suggests that the programs may be acceptable and feasible to implement. The results also suggest that the popularity of school-based yoga programs may continue to grow. (Adv Mind Body Med. 2015;29(4):18-26.)
Kripalu Yoga in the Schools Teacher Training

Enrich the lives of adolescents through the transformative power of yoga.

For yoga teachers interested in bolstering their skills and enriching the lives of high school students through yoga.
The Holistic Life Foundation is a Baltimore-based 501(c) (3) nonprofit organization committed to nurturing the wellness of children and adults in underserved communities. Through a comprehensive approach which helps children develop their inner lives through yoga, mindfulness, and self-care HLF demonstrates deep commitment to learning, community, and stewardship of the environment. HLF is also committed to developing high-quality evidence based programs and curriculum to improve community well-being.
MAKING A DIFFERENCE

Our program teaches students how to choose peaceful, positive, and non-violent approaches to deal with life's challenges.

youth = yoga = success!

OUR MISSION

The Y.O.G.A. for Youth curriculum immerses students in the language of yoga, enabling them to understand and apply it in daily life.

OUR PROGRAM

Our series of classes equip students with the tools they need to develop their self-awareness and increase their capacity to deal with stress, anxiety, and other life challenges. The program includes classes for both youth and adults, focusing on physical, mental, and emotional well-being.
BEST PRACTICES FOR YOGA IN SCHOOLS

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Yoga in Schools Research
Yoga for children and young people’s mental health and well-being: research review and reflections on the mental health potentials of yoga

Ingunn Hagen* and Usha S. Nayar

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This article discusses yoga as a potential tool for children to deal with stress and regulate themselves. Yoga provides training of mind and body to bring emotional balance. We argue that children and young people need such tools to listen inward to their bodies, feelings, and ideas. Yoga may assist them in developing in sound ways, to strengthen themselves, and be contributing social beings. First, we address how children and young people in today’s world face numerous expectations and constant stimulation through the Internet and other media and communication technologies. One reason why children experience stress and mental health challenges is that globalization exposes the youth all over the world to various new demands, standards, and options. There is also increased pressure to succeed in school, partly due to increased competition but also a diverse range of options available for young people in contemporary times than in the past. Our argument also partially rests on the fact that modern society offers plenty of distractions and unwholesome attractions, especially linked to new media technologies. The dominant presence of multimedia devices and the time spent on them by children are clear indicators of the shift in lifestyles and priorities of our new generation. While these media technologies are valuable resources in children and young people’s lives for communication, learning, and entertainment, they also result in constant competition for youngster’s attention. A main concept in our article is that yoga may help children and young people cope with stress and thus, contribute positively to balance in life, well-being, and mental health. We present research literature suggesting that yoga improves children’s physical and mental well-being. Similarly, yoga in schools helps students improve resilience, mood, and self-regulation skills pertaining to emotions and stress.

Review Article

Are There Benefits from Teaching Yoga at Schools? A Systematic Review of Randomized Control Trials of Yoga-Based Interventions


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Introduction. Yoga is a holistic system of varied mind-body practices that can be used to improve mental and physical health and it has been utilized in a variety of contexts and situations. Educators and schools are looking to include yoga as a cost-effective, evidence-based component of urgently needed wellness programs for their students. Objectives. The primary goal of this study was to systematically examine the available literature for yoga interventions exclusively in school settings, exploring the evidence of yoga-based interventions on academic, cognitive, and psychosocial benefits. Methods. An extensive search was conducted for studies published between 1980 and October 31, 2014 (PubMed, PsycInfo, Embase, ISI, and the Cochrane Library). Effect size analysis, through standardized mean difference and Hedge's g, allowed for the comparison between experimental conditions. Results and Conclusions. Nine randomized control trials met criteria for inclusion in this review. Effect size was found for mood indicators, tension and anxiety in the POMS scale, self-esteem, and memory when the yoga groups were compared to control. Future research requires greater standardization and suitability of yoga interventions for children.
### Systematic Review of Yoga in Schools RCT’s

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<th>Study or subgroup</th>
<th>Favours yoga</th>
<th>Favours control</th>
<th>Weight</th>
<th>Std. mean difference IV, fixed, 95% CI</th>
<th>Std. mean difference IV, fixed, 95% CI</th>
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<td></td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
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<td>36</td>
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<td>70</td>
<td></td>
<td>-0.49 [-0.90, -0.07]</td>
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<td>5.2</td>
<td>15</td>
<td></td>
<td>-0.36 [-1.08, 0.37]</td>
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<td>Telles et al., 2013</td>
<td>14.96</td>
<td>2.41</td>
<td>49</td>
<td></td>
<td>0.01 [-0.39, 0.40]</td>
</tr>
<tr>
<td>Verma et al., 2014</td>
<td>6.01</td>
<td>1.49</td>
<td>37</td>
<td></td>
<td>0.23 [-0.23, 0.70]</td>
</tr>
<tr>
<td>Sarokte and Rao, 2014</td>
<td>14.97</td>
<td>6.58</td>
<td>30</td>
<td></td>
<td>0.54 [0.02, 1.05]</td>
</tr>
<tr>
<td>Haden et al., 2014</td>
<td>24.93</td>
<td>1.96</td>
<td>14</td>
<td></td>
<td>1.59 [0.69, 2.50]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>251</strong></td>
<td><strong>189</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>-0.01 [-0.21, 0.18]</strong></td>
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</tbody>
</table>

Heterogeneity: $\chi^2 = 28.40$, $df = 6$ ($P < 0.0001$); $I^2 = 79$

Test of overall effect: $Z = 0.11$ ($P = 0.91$)

**Figure 2:** Plot of the general effect size in the selected studies.

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From: *Are There Benefits from Teaching Yoga at Schools? A Systematic Review of Randomized Control Trials of Yoga-Based Interventions*, Ferreira-Vorkapic C Feitoza, Marchioro M, Simões J, Kozaza E, Telles S, Evidence-Based Complementary and Alternative Medicine, Article ID 345835, 2015.
Yoga in school settings: a research review

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Research on the efficacy of yoga for improving mental, emotional, physical, and behavioral health characteristics in school settings is a recent but growing field of inquiry. This systematic review of research on school-based yoga interventions published in peer-reviewed journals offers a bibliometric analysis that identified 47 publications. The studies from these publications have been conducted primarily in the United States (n = 30) and India (n = 15) since 2005, with the majority of studies (n = 41) conducted from 2010 onward. About half of the publications were of studies at elementary schools; most (85%) were conducted within the school curriculum, and most (62%) also implemented a formal school-based yoga program. There was a high degree of variability in yoga intervention characteristics, including overall duration, and the number and duration of sessions. Most of these published research trials are preliminary in nature, with numerous study design limitations, including limited sample sizes (median = 74; range = 20–660) and relatively weak research designs (57% randomized controlled trials, 19% uncontrolled trials), as would be expected in an infant research field. Nevertheless, these publications suggest that yoga in the school setting is a viable and potentially efficacious strategy for improving child and adolescent health and therefore worthy of continued research.

Keywords: yoga; meditation; schools; education; mind–body; prevention
Systematic Review of Randomized Controlled Trials Testing the Effects of Yoga with Youth

Shari Miller¹ · Tamar Mendelson² · Angela Lee-Winn²,³ · Natalie L. Dyer⁴ · Sat Bir S. Khalsa⁴

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Abstract
Objectives The objective of this study was to conduct a systematic review of randomized controlled trials (RCTs) of yoga with youth.
Methods Selection of studies was based on the following inclusion criteria: RCT design, publication in a peer-reviewed journal in English, participants between ages 5 and 18, and assessment of an intervention in which yoga was the primary component.
Results Our search of seven databases yielded 39 RCTs that met inclusion criteria. Studies were conducted in seven countries, with the majority in the USA. Most studies were conducted with predominantly White samples and in school settings. Studies were variable in the duration, frequency, and number of yoga program sessions. Outcomes included a range of constructs in three domains: psychological/behavioral, cognitive, and physiological/physical functioning. In all but five studies, yoga improved outcomes in at least one of these three domains. Results indicate growing evidence that yoga is a promising intervention for children and youth.
Conclusions Recommendations for future research include specification of testable theoretical models with hypothesized intervention core components and mechanisms of action, assessment of intervention mediators and moderators, routine monitoring and reporting of factors associated with program implementation, use of common validated outcome measures, and reporting of null or iatrogenic intervention effects.

Published online: 13 March 2020
Research Outcomes

- Physiological - Physical Functioning
- Psychological - Behavioral Functioning
- Cognitive Performance
Adolescent / School Challenges

- **Stress** (developmental, family, social, academic, societal)
- **Mental Health** (depression, anxiety, substance abuse, trauma)
- **Behavior** (apathy, violence, social skills, bullying, absenteeism)
- **Academics** (grades, dropouts)
- **Physical Health** (obesity, diabetes)
- **Attention** (ADD, ADHD)
Original Research

The effects of yoga practice on balance, strength, coordination and flexibility in healthy children aged 10–12 years

Betsy Donahoe-Fillmore, Ethan Grant

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Physical therapy
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ABSTRACT

Objective: The purpose of this study was to investigate the effects of yoga practice on balance, strength, coordination, and flexibility in healthy children aged 10–12 years.
Study design: Quasi-experimental, nonrandomized.
Background: Research on the effects of yoga in children has focused on the benefits seen in non-healthy children or on the effects on grip strength and motor performance. The studies on the effects of yoga on balance, strength, coordination, and flexibility have been limited.
Methods and Measures: A convenience sample of 26 children, aged 10–12 years was obtained. The children participated in 40 min yoga sessions, led by a registered yoga teacher, 1–3 times per week for 8 weeks. The Bruininks-Oseretsky Test of Motor Proficiency, second edition (BOT-2), the sit and reach test, and the 90/90 hamstring flexibility test were administered at baseline and at the end of the 8 weeks. Descriptive statistics were calculated for all measurements. A Shapiro-Wilk test was used to test normality. A Wilcoxon signed-rank test was used to analyze pre- and post-test measurements for all variables.
Results: There was a statistically significant within-subject difference from pre-test to post-test for balance (p = 0.026), sit and reach (p = 0.000), popliteal angle right (p = 0.005), and popliteal angle left (p = 0.018). There were no statistically significant differences in strength and bilateral coordination from pre-to post-test measurements.
Conclusions: Yoga may be a beneficial form of exercise in the school-based setting for improving balance and flexibility in healthy children.
Yoga for Social Emotional Learning

Table 1: Means (standard deviations) of the self-report study variables

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th></th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 1 (n = 9)</td>
<td>Time 2 (n = 8)</td>
<td>Time 1 (n = 14)</td>
<td>Time 2 (n = 13)</td>
</tr>
<tr>
<td>Social-emotional competence^a</td>
<td>18.89 (5.16)</td>
<td>21.88 (4.91)</td>
<td>23.32 (4.39)</td>
<td>23.23 (4.25)</td>
</tr>
<tr>
<td>Problem behaviour^b</td>
<td>31.56 (16.30)</td>
<td>27.50 (9.44)</td>
<td>26.86 (12.23)</td>
<td>26.77 (10.23)</td>
</tr>
</tbody>
</table>

Table 2: Mean student responses to social validity questionnaire (CIRP)

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean response^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Using KYIS would be a good idea for other student’s stress and difficult emotions/behaviours.</td>
<td>5.8</td>
</tr>
<tr>
<td>5. I liked using KYIS for my stress and difficult emotions/behaviours.</td>
<td>5.5</td>
</tr>
<tr>
<td>6. I think that using KYIS for stress and difficult emotions/behaviours will help me do better in school.</td>
<td>4.7</td>
</tr>
<tr>
<td>7. I think that using KYIS for stress and difficult emotions/behaviours would help other students do better in school.</td>
<td>5.3</td>
</tr>
</tbody>
</table>

^aStudent responses to CIRP items anchored as: 1 = “I do not agree” and 6 = “I agree”

## Yoga for Cognitive Performance

<table>
<thead>
<tr>
<th>Variables</th>
<th>Before/after</th>
<th>Mean±SD</th>
<th>Significance level (P)</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLCT scores</td>
<td>Before</td>
<td>20.12±6.83</td>
<td>&lt;0.001***</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>24.07±7.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DLST scores</td>
<td>Before</td>
<td>44.17±10.78</td>
<td>&lt;0.001***</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>49.89±9.62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**P<0.01, ***P<0.001, paired sample t-test used to compare before and after values. SLCT=Six letter cancellation test, DLST=Digit letter substitution test, SD=Standard deviation**


[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6521754/?report=printable](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6521754/?report=printable)
# Yoga for Cognitive Performance

**Table 1**

Mean and standard deviation of numerical Trail Making Test and alphabetical Trail Making Test for yoga and physical activity groups

<table>
<thead>
<tr>
<th>Group</th>
<th>TMTN</th>
<th>TMTA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>PA (n=391)</td>
<td>34.29±16.62</td>
<td>36.42±13.83***</td>
</tr>
<tr>
<td>Yoga (n=411)</td>
<td>35.05±18.11</td>
<td>36.76±15.51*</td>
</tr>
</tbody>
</table>

Within groups: *P≤0.05, ***P≤0.001, Between groups: †††††P≤0.001. TMTN=Numerical Trail Making Test, PA=Physical activity, SD=Standard deviation


[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6521753/?report=printable](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6521753/?report=printable)
Yoga for Academic Outcomes


Evaluation of Yoga for Preventing Adolescent Substance Use Risk Factors in a Middle School Setting: A Preliminary Group-Randomized Controlled Trial

Bethany Butzer¹ · Amanda LoRusso² · Sunny H. Shin³ · Sat Bir S. Khalsa²

Fig. 3 Yoga and control group participants’ willingness to smoke cigarettes at baseline (time 1) and end-program (time 2). ANCOVA on end-program scores (with baseline scores as a covariate) significant at $p < 0.05$

Fitness and Behavior Change

- “I like to run, a lot. And it can usually go better when I feel flexible. And I’ve been feeling better when I run [since practicing yoga]. I also ski and the balance has helped a lot. I [do] better trails, harder trails now.”

- “I was motivated and inspired to practice yoga outside of class at home. It was great to have a form of exercise I found enjoyable and that felt good. I noticed myself changing: an increase in self awareness and it felt like instant gratification.”

- “I have been eating healthier, more fruits and vegetables and not a lot of junk food; [for example] ice cream and candy...”


Serving the Yoga Community

Yoga Alliance® is committed to promoting and supporting the integrity and diversity of the teaching of yoga.
Scientific Research on Yoga

Substantial research has been done on many of the populations and parts of the body that COVID-19 preys on most. Use this section of Yoga Alliance's website to learn more about scientific research on the effects of yoga on the elderly, respiratory function, anxiety, and depression, to name a few.

Perhaps more than ever, yoga is being widely studied and evaluated for its positive effects and benefits. At Yoga Alliance, we curate the latest and most relevant research on yoga's applications in health, wellness, and disease. We have filtered it in a digestible manner for our Registered Yoga Schools and Registered Yoga Teachers as well as for the broader yoga community.

This evidence-based research not only reveals the science of yoga, it also explains its therapeutic efficacy when used in conjunction with conventional medicine. Our goal is that this impactful content will be utilized in a way that highlights even more of yoga's ancient, multi-faceted ability to improve lives.

Join us! Let us know how research on yoga is important or valuable to you on social media (@YogaAlliance) or by emailing us at research@yogaalliance.org. We honor and value your personal experiences and look forward to featuring your stories.

Our Research Conversation

Main Research Categories

- Basic Research
- Special Populations
- Disease and Disorders

Archived Videos

Browse our selection of yoga research videos to learn more about research done in specific categories of health and wellness.
Students and Education Preschools, Elementary, Middle and Secondary Schools, Post-Secondary Schools/Colleges, Postgraduate Education, Specialty/Professional Schools

Our hope is for yoga schools and yoga teachers to utilize this impactful content in their teachings to promote and highlight yoga's evident multi-faceted ability to improve lives. Let us know how research on yoga is important or valuable to you on social media (@YogaAlliance) or by emailing us at research@yogaalliance.org. We honor and value your personal experiences and look forward to featuring your stories.

These citations were curated by Yoga Alliance's Director of Yoga Research, Dr. Sat Bir Singh Khalsa.

Review Papers (What's this?)

Mind & body practices in the treatment of adolescent anxiety.
Fulweller B, John RM.
[abstract]

Psychophysiological effects of yoga on stress in college students.
Tripathi MN, Kumari S, Ganpat TS.
[full text]

Assessing Fidelity of Implementation (FOI) for School-Based Mindfulness and Yoga Interventions: A Systematic Review.
Gould LF, Dariotis JK, Greenberg MT, Mendelson T.
[full text]

Yoga in school settings: a research review.
Khalsa SB, Butter B.
[abstract]

Notable Publications (What's this?)

Yoga versus physical exercise for cardio-respiratory fitness in adolescent school children: a randomized controlled trial.
Saitish Y, Rao FM, Manjunath NK, Amritanshu R, Vivek U, Shreeganeshe HR, Deepashree S.
[abstract]

A Randomized Controlled Trial of Mindfulness Versus Yoga: Effects on Depression and/or Anxiety in College Students.
Falsafi N.
[abstract]

Yoga in the Schools: A Systematic Review of the Literature.
Serwacki ML, Cook-Cottone C.
[full text]

Feasibility and preliminary outcomes of a school-based mindfulness intervention for urban youth.