

University of Dayton

eCommons

---

University of Dayton Doctor of Physical Therapy  
Annual Research Symposium

Department of Physical Therapy

---

5-2018

## **The Effects of an 8 vs. 16 Week Yoga Practice on Balance, Strength, Flexibility, and Mindfulness in Children Ages 4-10 Years: A Pilot Study**

Betsy Donahoe-Fillmore

Samantha Brown

Katherine Chu

Kelly Clancy

Jordan McMillan

*See next page for additional authors*

Follow this and additional works at: [https://ecommons.udayton.edu/dpt\\_symposium](https://ecommons.udayton.edu/dpt_symposium)



Part of the [Pediatrics Commons](#), and the [Physical Therapy Commons](#)

---

---

**Authors**

Betsy Donahoe-Fillmore, Samantha Brown, Katherine Chu, Kelly Clancy, Jordan McMillan, Lesley Park, Kari Shank, and Safiyeh Shalash



# The Effects of an 8 vs. 16 Week Yoga Practice on Balance, Strength, Flexibility, and Mindfulness in Children Ages 4-10 Years: A Pilot Study

Betsy Donahoe-Fillmore, PT, PhD, PCS; Samantha Brown, SPT; Katherine Chu, SPT; Kelly Clancy, SPT; Jordan McMillan, SPT; Lesley Park, SPT; Kari Shank, SPT; Safiyeh Shalash, SPT  
Department of Physical Therapy, University of Dayton, Ohio

## Introduction

Yoga has been shown to have positive benefits in:

- Improving cardiovascular, neuromuscular, musculoskeletal, and pulmonary function in ages 0-21 years
- Improving mindfulness to manage pain and anxiety in adults

There is limited evidence regarding the use of yoga to improve balance, strength, flexibility, and mindfulness in children ages 4-10 years.

## Purpose

The purpose of this study was to evaluate the effects of 8 versus 16 weeks of yoga practice on balance, strength, flexibility, and mindfulness in children ages of 4-10 years.

## Participants

A convenience sample of five typically developing children with a mean age of 6.8 years (4-10 years), were recruited from a local yoga studio or daycare.

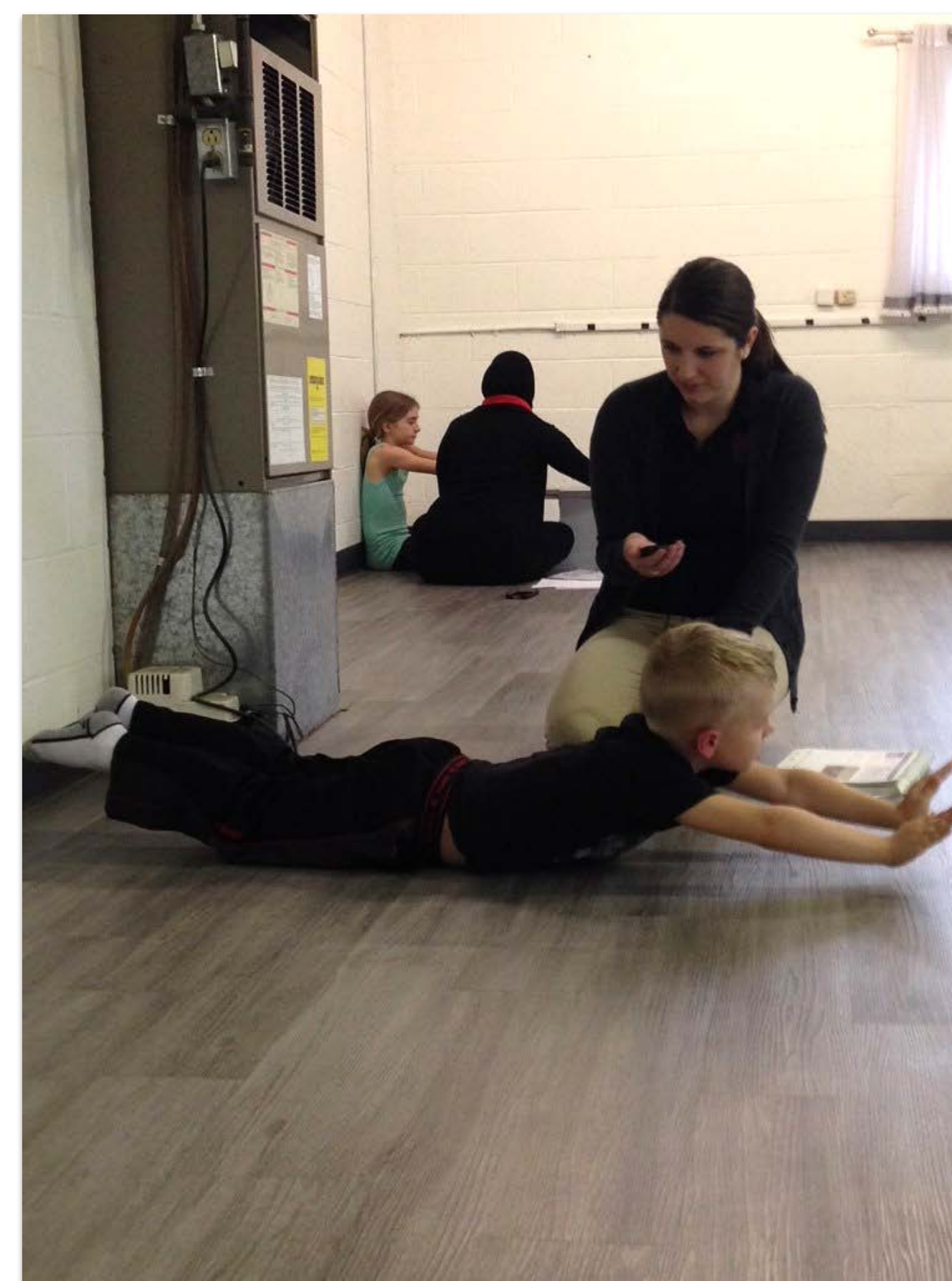
## Methods

Measurements were collected at baseline, 8 weeks, and 16 weeks on:

- Balance and strength using the second edition of Bruininks-Oseretsky Test of Motor Proficiency (BOT-2)
- Flexibility using the sit and reach test
- Mindfulness using the Children and Adolescent Mindfulness Measure (CAMM)

Participants practiced yoga for one hour per week for 16 weeks. Sessions were led by a registered yoga teacher. Who had experience teaching children.

Data was analyzed using Related-Samples Friedman's 2-way Analysis of Variance by Ranks. Significance level was adjusted to  $\alpha = 0.10$  to accommodate for small sample size.



## Results

Means and standard deviations of pre and post measures can be found in Table 1. Balance, strength, flexibility, and mindfulness did not change significantly over 8 or 16 weeks of yoga practice.

### Means ( $\pm$ SD) Outcome Measures

	Baseline	8 Weeks	16 Weeks	p-value
BOT Balance	33.2 $\pm$ 4.32	32.8 $\pm$ 2.94	31.0 $\pm$ 1.00	0.247
BOT Strength	19.8 $\pm$ 8.40	22.6 $\pm$ 5.41	22.2 $\pm$ 6.30	0.678
Sit & Reach (cm)	21.9 $\pm$ 8.20	20.3 $\pm$ 7.30	19.0 $\pm$ 6.62	0.165
CAMM	17.2 $\pm$ 7.46	19.4 $\pm$ 4.66	23.40 $\pm$ 5.89	0.854

Table 1. Means and standard deviations of data obtained at baseline, 8 weeks, and 16 weeks.

## Discussion

This study demonstrated no significant difference between baseline, 8 weeks, and 16 weeks of yoga practice in measures of balance, strength, flexibility, and mindfulness. At baseline of this study, several participants had higher levels of balance, strength, and flexibility. This data could indicate that there was a ceiling effect of measures utilized.

Future research is recommended with a larger sample size, participants with no previous yoga experience, and more responsive outcome measures.

Limitations of this study include:

- Small sample size
- Previous yoga experience of participants
- Ceiling effect of BOT-2

## Clinical Relevance

The findings of a 16 week yoga program for children ages 4-10 years were inconclusive when analyzing balance, strength, flexibility, and mindfulness.