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The Effects of Yoga on Balance, Strength, Flexibility, and Mindfulness in Typical Children Ages 4-9 Years

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Introduction

Yoga improves a variety of impairments in typical pediatric populations:

- cardiovascular, neuromuscular, musculoskeletal, and pulmonary conditions
- balance, strength, and flexibility

Yoga improves mindfulness in adult populations, and emerging evidence shows a similar effect among pediatric populations

Purpose

The purpose of this study was to investigate the effects of yoga practice on balance, strength, flexibility, and mindfulness in children ages 4 to 10 years.

Participants

Children were recruited from either a local yoga studio or daycare. Five typically developing children with a mean age of 6.8 years (4-9 years) participated. Participants were selected for this study using convenience sampling.

Methods

Pre and post measurements were collected on:

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

Participants practiced yoga for 8 consecutive one-hour yoga sessions weekly led by a registered yoga teacher.

Statistical Analysis

Descriptive statistics were calculated for all measures. Pre- and post measures were analyzed using the Wilcoxon signed-rank test (SPSS Statistics 23). Significance was set *a priori* at $\alpha \leq 0.05$.



Means (\pm SD) Outcome Measures

	Sit and Reach (cm)	BOT Balance	BOT Strength	CAMM
Pre-Intervention	23.6 \pm 7.33	33.2 \pm 4.32	19.8 \pm 8.40	17.2 \pm 7.46
Post-Intervention	21.4 \pm 7.56	32.8 \pm 2.94	22.6 \pm 5.41	19.4 \pm 4.66
p-value	0.066	0.581	0.273	0.416

Results

Pre and post measurement means (\pm SD) are presented in the Table. Balance, strength, flexibility, and mindfulness did not change significantly over 8 weeks of yoga practice.

Discussion

Eight hours of total yoga practice did not improve balance, strength, flexibility and mindfulness in this small sample of typically developing children.

Several of the participants in this study demonstrated higher levels of balance, strength, and flexibility at baseline. It is possible that these measures suffer from a ceiling effect, and are not sensitive to changes in such a short time period.

Further research with a larger sample size, more responsive measures, or a more intensive and longer duration yoga practice is recommended.

Limitations of the study include:

- Small sample size
- Previous yoga experience among some participants
- Unclear understanding of questions on the CAMM
- Children with difficulty following instructions secondary to age

Clinical Relevance

At this time, the effects of an 8 week yoga program on strength, flexibility, balance, and mindfulness are inconclusive, with this study having various limitations.

This project is in partial fulfillment of the degree requirements for the Doctor of Physical Therapy