Objectives

KEY POINTS TO COVER

BACKGROUND  METHODS  RESULTS  DISCUSSION

My Background

PHYSICAL THERAPIST  YOGA INSTRUCTOR  RESEARCHER

I graduated from Regis University in Colorado in 2013 with a doctorate in physical therapy. I have worked in a variety of pediatric settings including the clinic, home, and school. I have used yoga in my practice since my first kids yoga training back when I was still a PT student. I have taught kids yoga classes in community settings with an emphasis on inclusiveness. Lastly, I’m a researcher in training as I pursue my PhD in the School of Kinesiology at the University of Michigan.
Why did I choose to research yoga?

It is a field that is rapidly growing in the U.S. In fact, as of 2017, about 8.4% of U.S. children reported practicing yoga. Compared to 2007 and 2012, the steep upward trend is notable.

Same data presented in a different way. Here, each dot represents 1% of U.S. children or 1 child out of 100 children. The dots in yellow represent a child who is practicing yoga. As you can see, there are still a lot of children in blue, which means there is still a lot of room for growth.

WHY RESEARCH YOGA?
Respond to every call that excites your spirit.
RUMI
A survey that was completed in 2015 on school-based yoga programs found that almost half of the programs that they surveyed offered their program to preschoolers. Early childhood is a period of rapid growth and development, so providing strategies that promote health and wellbeing creates an optimal state for learning and has the potential to improve school readiness, and set the foundation for lifelong healthy behaviors.

There have been several research studies examining the effects of yoga in a K-12 school setting, but only 9 were identified as a randomized controlled trial in this systematic review from 2015.

Another review published in 2016 only found one study done in a preschool setting that met their inclusion criteria. This study included a small sample size (only 29 children) and did not randomize the control group.
There have been a handful of other yoga research studies completed in preschool settings, but some lack statistical power due to small sample sizes, some do not include a randomized control, and others have a fairly low dosage. These are a few examples.

This analysis was part of a larger study that also examined the children’s functional balance, postural stability, and nap habits. When we have analyzed the other data, my intention is to publish all the outcomes under one article.

A total of 136 children from 9 classrooms across two preschool centers enrolled in the study. Classrooms were randomized into a yoga group and a wait list control group. We collected pre assessment data. Then the yoga classrooms were given 30 minute lessons, 2x a week for 8 weeks for a total dosage of 480 minutes. We then collected post assessment data before switching and giving the wait list control group yoga lessons. They received the same dosage of 480 minutes, but with an accelerated practice schedule. We finished with our last follow-up assessment of both groups.
We started with a warm-up song and sun salutation, then using a theme for the day, we practiced postures, breathing and mindfulness activities. Many components of yoga are done simultaneously, which I demonstrate here with overlapping circles. Breathwork with props like feathers, scarves, and cotton balls. Mindfulness activities focused on using our senses to explore an item. During relaxation the child could lie however was most comfortable and I went around and offered a foot or hand massage. Lastly, we would close with a thank you song.

There were a few primary theories that guided the development and implementation of the intervention. One was embodied cognition, which suggests that comprehension of a concept can be influenced by somatosensory and motor experiences.

Growth mindset theory which emphasizes the importance of how our mindset or beliefs can impact our learning and performance.
And lastly Lev Vygotsky’s theory on the Zone of Proximal Development. As the instructor, I provided the children with options to promote autonomy and success with each yoga activity. I like to call it the Goldilocks zone, or the “just right” zone.

Here are a few examples of differentiated instruction. I would demonstrate several ways to practice a posture and gave the children options during relaxation time.

To measure how well I integrated these theories AND stuck to the intervention protocol, I had a research assistant at each yoga session who tracked fidelity in addition to each child’s engagement.
A few components on our fidelity checklist included using differentiated instruction, providing cues for controlled breathing, and providing encouragement for children to reflect on how their body feels.

One way we targeted self-regulation skills was through mindfulness activities that had an inhibitory control or delayed gratification component. I would pass out an item to each child, such as these graham crackers or tea lights. We would use our senses slowly to explore the item. Before we could eat the graham cracker we looked at it and described its color and shape, we felt it and described its texture, we smelled it and described its scents. To target interpersonal skills, we utilized a lot of partner and group postures and activities.

The outcome measure we used is called the Child Behavior Rating Scale which is a teacher-report measure of children’s self-regulation with classroom tasks and interpersonal skills. It has been used in school districts as a way to track school readiness in kindergartners. It is a robust measure, demonstrating strong concurrent validity with other direct assessment measures of children’s self-regulation.
Classroom Self-Regulation

4. Attempts new challenging tasks.  1 2 3 4 5
5. Concentrates when working on a task; is not easily distracted by surrounding activities.  1 2 3 4 5

Interpersonal Skills

14. Cooperative with playmates when participating in a group play activity; willing to give and take in the group, to listen to or help others.  1 2 3 4 5
15. Takes turns in a game situation with toys, materials, and other things without being told to do so.  1 2 3 4 5

Examples of items targeting self-regulation and Examples of items targeting interpersonal skills.

To decrease risk of bias, we observed children up to three days in the classroom during each data collection period and collaboratively completed the measure for each child with all classroom teachers present.

Results

ANCOVA OF CHANGE SCORES BETWEEN GROUPS

For self-regulation, the yoga group remained stable ($M_{T1} = 34.25, M_{T2} = 34.25$) and the control group declined ($M_{T1} = 36.59, M_{T2} = 34.60$).

And for interpersonal skills, the yoga group demonstrated an increase over time ($M_{T1} = 22.52, M_{T2} = 23.69$) while the control group decreased ($M_{T1} = 24.80, M_{T2} = 23.97$).

Follow up Results. What’s interesting is that our yoga group continued to improve their skills even after two months had passed from their last yoga session. These graphs also show how the wait-list control group improved in self-regulation and interpersonal skills after they received the yoga intervention.
We measured adherence to fidelity outcomes at 97%. On average, children were present for 82% of the yoga sessions. During the session, they were engaged, or on task 2/3 of the time. Lastly, qualitative data from anonymous, open-ended teacher feedback surveys further confirmed that the behavior changes were meaningful. Out of 18 comments specific to children’s behavior, the majority were positive, a handful were neutral, and there were no negative comments made.

Strengths: sample size of 136 children, inclusion of a randomized control group, completion of a follow up assessment, and tracking of fidelity and child engagement. Limitations: randomized by classroom level versus individual level, preschools were university-sponsored centers so children were mostly from families of middle to high SES, only used one measure to assess self-regulation and interpersonal skills, and our control group was not an active control (e.g. stretching class)
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**CHILDREN’S CENTERS**

Children
Teachers
Staff

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**Thank you for your presence!**

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