



Research Article

Relaxed in My Bones: Mother and Child Perspectives on a Yoga Group for Children with High Functioning Autism Spectrum Disorder: A Pilot Study

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Abstract

This qualitative, phenomenological pilot study investigated the perspectives of mothers and their children diagnosed with high functioning Autism Spectrum Disorder (ASD) before and after the children participated in a Yoga group. Four boys and two girls, ages six to fifteen, participated in a one-hour long Yoga group two times per week, for six weeks on a college campus in Virginia. The Yoga group included individual and group asanas, pranayama and savasana. Pre-Yoga group, mothers were interviewed about their knowledge of Yoga, what they hoped their children would gain from Yoga, and the impact of ASD on their child. Children were interviewed about their knowledge of Yoga, their interests, challenges and friendships at home and school. Post-Yoga group, mothers were asked about any differences as a result of their child's participation in Yoga and children were interviewed about their experiences, how Yoga made them feel, and were given a Likert scale to rate the Yoga group components. Interviews were analyzed by being coded for themes, and child ratings for the Yoga group components were totaled and averaged. All mothers reported that they had a more positive view of Yoga and its potential value, identified the need for personal self-care and noticed improvement in their children's attention and personal use of Yoga strategies during the six-week group. All children reported that they had positive experiences, developed new relationships, enjoyed leading activities and demonstrated insight into how specific elements of the Yoga group, especially savasana, made their bodies feel.

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Introduction

Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental disorder that currently affects 1 in 59 children in the United States, with boys being four times more likely to be diagnosed than girls. This prevalence continues to rise, almost doubling since 2006 [1]. ASD is costly to families and society, and it is projected that the economic burden of the direct medical, direct non-medical and productivity costs of ASD in the United States will reach 461 billion annually by 2025 [2,3].

There are numerous symptoms associated with ASD that directly impact an individual's independence and participation in meaningful activities. Those with ASD typically demonstrate deficits in social interaction and communication that decrease their social-emotional reciprocity, understanding and use of non-verbal communication, and their ability to develop friendships. Individuals with ASD also demonstrate restricted interests, hyper or hypo reactivity to sensory stimuli and stereotyped patterns of behavior that may prevent them from trying new things or adapting to changes in routines [4]. In addition to these diagnostic criteria for ASD, many individuals also demonstrate other symptoms such as motor delays and clumsiness, behavioral disturbances and social isolation [5,6]. Additionally, children with ASD have co-occurring diagnoses more frequently than others, with up to 78% being diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), up to 40% with anxiety disorders and up to 20% with depression [7-9].

Numerous therapies are being utilized to address deficits in children with ASD, however, because ASD is a lifelong "spectrum" disorder, the presence and severity of symptoms vary greatly amongst individuals and over time, so there is no effective approach to helping everyone [10,11]. The knowledge that no universal treatment for ASD exists, suggests that the 5,000 year-old philosophy of Yoga could be a potential intervention for those with ASD, specifically considering its holistic and individualized approach. Contrary to many other therapies and Complementary and Alternative Medicines (CAM), Yoga is meant to be a lifelong practice rather than one that ceases when symptoms of a condition are temporarily alleviated [12]. This purpose of Yoga as an enduring practice aligns naturally with the fact that ASD is a disorder that needs lifelong strategies for improvement or management.

Only a handful of studies have been reported that specifically investigate Yoga as a complementary treatment that may improve the quality of life and functioning for individuals with ASD, and most have small sample sizes, no control groups and limited fidelity measures [13]. However, one study has recently reported high implementation fidelity of a mindfulness-based yoga program for children with ASD and their families [14]. There is preliminary evidence that Yoga can bring qualitative improvements in balance, coordination, self-esteem, self-calming, sensory processing and language skills in children with ASD and related disorders, as well as decreases in behavioral and cognitive symptoms and maladaptive behaviors such as

irritability, lethargy, social withdrawal, hyperactivity and noncompliance [15-17]. Yoga has also been shown to improve eye-to-eye gaze, sitting tolerance, and imitation skills for children with Autism engaged in a Yoga program in combination with Applied Behavioral Analysis (ABA) over a two-year period [18]. In two pretest-post-test designs, increases were found in independence, attention, transition behavior and self-regulation of children with disabilities including ASD and preliminary evidence was found that Yoga can reduce symptoms of ASD based on scores on a child's scores on the Childhood Autism Rating Scale following Yoga [19,20]. Most recently, an increase in parasympathetic nervous system dominance and decreased heart rate variability in children with Autism was found following a three-month Yoga intervention, which suggests its potential benefit for helping with emotional regulation or anxiety challenges [21].

Despite the few studies that have been conducted on the benefits of Yoga specifically for ASD, there is a growing body of research that supports the use of Yoga to help alleviate a variety of symptoms that are commonly seen in ASD, suggesting Yoga's potential benefit with this population. A systematic review of 24 studies that investigated the therapeutic effects of Yoga for children without disabilities, support its use to improve behavior, memory, focus, socialization and emotional and physical functioning and none report adverse effects [22]. A systematic review of sixteen studies on Yoga interventions for anxiety reduction in children and adolescents shows that anxiety was reduced in almost all studies, despite some study limitations and varying outcome measures [23]. Other studies suggest that Yoga can be used to improve attention, concentration and emotional control in children with ADHD and improve confidence and communication with peers in children with emotional and behavioral difficulties [24-26].

Overall, there is strong evidence that supports the use of Yoga for numerous physical, emotional and psychological factors in children. However, there is a paucity of research on the potential use of Yoga for children with ASD, and no research that describes the experiences of children with ASD or their caregivers. Because children with ASD have difficulty with social communication and emotional expression, understanding perceptions of their experiences in a Yoga group can be crucial to understanding the potential benefits of a Yoga program for those with this disorder, as well as how to create a Yoga group that will take their specific needs into consideration. Understanding their caregivers' perceptions can help to discover why Yoga may or may not be used with this population.

Methods

This study was approved by the Institutional Review Board at Radford University. All mothers and children signed or printed their names to give parental consent or child assent. Families were recruited by flyers, word of mouth, and by contacting professionals in the community who work with children with ASD to have them share information about the study. A purposive sample was used based on the following inclusion criteria: 1) A diagnosis of high functioning ASD between the ages of five and eighteen. For the purposes of this study, "high functioning" referred to a child with the receptive and expressive language skills to ask and answer questions during interviews. 2) A child's awareness of his or her diagnosis of ASD, and its impact on his or her life, such as education, daily activities, or relationships. 3) Limitations in a child's daily occupations as a result of ASD (play, leisure, social participation, education, rest and sleep),

as assessed through parent interviews and defined in the Occupational Therapy Practice Framework [27]. Though this age range of is quite large in the first inclusion criterion, it was felt that the one-on-one ratio provided in the Yoga group would allow for individualization in a mixed-age group, and would allow older children to provide help to younger children. Living in a rural area, finding enough participants in a smaller age range was an initial concern, and this wider age range allowed for the numbers necessary for the study and the graduate student experience.

Participants

The study began with five boys: Ian (6 years), Josh (8 years), Ethan (10 years), Ryan (10 years), and Samuel (11 years), and two girls, Johanna (7 years) and Adeline (15 years). Ian and Johanna are siblings. Three weeks into the Yoga group, Josh dropped out for personal circumstances, and another 9-year old boy with a disability other than ASD (ADHD) joined the group in order to maintain a consistent adult to child ratio since graduate student assistants were working one-on-one with the children. None of the information from either child was included in this study. Six children and five mothers were included in the final analysis, since one mother had two children in the study. Ian, Ryan and Samuel were also diagnosed with ADHD, and Johanna was currently being tested for ADHD, though no other co-morbid diagnoses were reported.

Yoga group

The Yoga group took place on a college campus, for two, one-hour sessions per week, for six weeks and twelve total sessions. This research study was part of second year master of occupational therapy graduate students' pediatric practicum experience, where they learn to evaluate and treat children with disabilities. Fourteen graduate students served as one-on-one assistants for the children in the Yoga group; seven during the first Yoga session of the week, and another seven during the second session of the week. Each child was paired with the same two graduate students for the entirety of the study.

The Yoga group was developed by the female researcher, who is a two hundred hour trained Yoga teacher and pediatric occupational therapist with more than twenty years of experience working with children with ASD. The group content and structure was developed based on the researcher's knowledge of Yoga and the primary deficits of ASD, including the need for routine, decreased social communication, and motor and sensory challenges. Guidance was sought from resources that specifically address the use of Yoga for children with ASD [28,29]. Each Yoga group included introductions with a song, breathing exercises (pranayama), individual and group postures (asana) and savasana (relaxation). Most asanas remained the same each week to support routine and familiarity, and a few were added each week to build skills and add variety.

In order to facilitate social skills and interactions, the group was structured so that children engaged in partner poses and games that required eye contact and communication, and children were encouraged to take the lead and demonstrate different asanas. For example, when engaging in tree circle, the children were required to holds hands around the circle for added balance while observing each other to communicate about which leg (branch) to stand on, while the nature of being in a circle naturally required eye contact amongst members. Since children with ASD are usually visual learners, a visual schedule

board was used to outline the components of each group session so the children could follow a routine, and a board was utilized so they could enter the room and hang up their name tag as a transition into group (Table 1).

Name introduction song: (5 minutes)
Breathing exercise with Hoberman sphere (10 minutes) Have each child pass it around and inhale and exhale.
Standing asanas (10 minutes) <ul style="list-style-type: none"> Rock and roll to standing (Rock on back numerous times and come to standing from back) Mountain Pose (Tadasana) Put scarf on head and don't let it fall while lifting and lowering arms facing partner Shoulder rolls and lifts Arm swings (Shaky branches) Tree (Vrksasana) Group pose in circle holding hands with other children
Crossing the creek game (10 minutes) <ul style="list-style-type: none"> Kids cross wedges and blocks (small and large) set up a large circle around the room. Kids are an animal who is trying to cross the creek and are advised to stay on the rocks and logs so they do not disturb the crocodiles.
Sitting (10 minutes) <ul style="list-style-type: none"> Cat and cow (meow and moo) Downward facing dog to plank (Adho Mukha Svanasana to Palakasana) Squat (frog) Boat with partner (Navasana) Lion face (roar) Long-legged forward bend with partner (Paschimottanasana)
Supine (5 minutes) <ul style="list-style-type: none"> Bridge on Yoga block Supine twist (windshield wiper legs)
Savasana (5 minutes) <ul style="list-style-type: none"> Eye pillow and sandbag
Clean up and goodbye (5 minutes)

Table 1: Sample Yoga Group.

Data collection procedures

A qualitative, phenomenological approach was used for this pilot study, which emphasizes the importance of an individual's personal perspective, meaning, and interpretation of events as they occur, in this case, the meanings constructed from mothers who experienced their children being a part of a Yoga group and the meanings of the children who participated [30]. Three weeks prior to the Yoga group, interested families were called to determine their fit with the inclusion criteria, and seven of these initial thirteen families were chosen to participate. Two weeks prior to the study, mothers were interviewed regarding their knowledge of Yoga, their view of their child's functional limitations as a result of ASD, their experiences with raising a child with ASD, and what they hoped their child would gain from the group. Fathers were not intentionally excluded. Children were interviewed about their knowledge of Yoga, their interests, friends and their difficulties with school, life skills, or relationships as a result of ASD. Post Yoga group, mothers were interviewed regarding their perceptions of the group, and any differences they noticed in their children. Each child was interviewed about what he or she learned about Yoga, the relationships and experiences in the group, how it made their bodies feel, and what Yoga group components were most enjoyable (Table 2).

Mother	Child
Pre-Yoga Group	Pre-Yoga Group
Can you describe what you already know or what you think about Yoga, and any experiences you have had with it?	What is Yoga? What have you heard or seen about Yoga? What do you hope Yoga can teach you?
How does Autism impact your child (education, attention, social/sensory/self-help skills)?	What things are you really good at? What do you like to do for fun? Can you tell me about your friends?
What are the ways that you hope Yoga could benefit your child?	What things are really hard for you (school, making friends, following directions, etc.)?
Post Yoga Group	Post Yoga Group
How has your view of Yoga and the potential benefits of Yoga for your child changed or stayed the same?	What did you learn and like most about the Yoga group (poses, activities, people, etc.)?
Can you talk about any discussions you had with your child about Yoga during the group?	Can you tell me about the other kids in the group and how you got along with them?
Can you describe any differences you noticed in your child after he or she came to Yoga?	Can you describe how Yoga made you feel? (body, brain, energy, etc.)?
Describe your overall experiences being part of this group.	Describe your overall experiences being part of this group.

Table 2: Sample Interview Questions.

All interviews took place in a private location chosen by the mothers. Interview questions were semi-structured with key questions that were flexible throughout the interview. Each parent interview lasted between thirty and sixty minutes, and each child interview lasted between ten and twenty five minutes. Mothers were interviewed without their child present, and children were given the option of whether they wanted their mothers present. All interviews were tape recorded and interviewees were given pseudonyms. All pre-group interviews were conducted by the researcher and graduate student assistants working with the children, and all post-group interviews were conducted by the graduate student assistants, with interview follow-up and clarification conducted by the researcher. Though different graduate student interviewers were used, the purpose was to provide interview experience for the graduate students, and the researcher's presence at the first interview ensured thoroughness of interviewing and the ability to provide feedback to students prior to the second interviews. Post Yoga group, a five-point Likert scale with smiley face ratings and a picture of the posture or activity was used to gather information about which postures and parts of Yoga the children most enjoyed. Picture scales were used to address the strong visual skills of children with ASD, as well as the knowledge that children would have difficulty remembering the postures only by name (Table 3).

Data analysis

In phenomenology, the process of epoché is felt crucial in that the researcher must suspend judgment about the external world in order to reduce the personal biases that may impact the ability to view the phenomenon of study in terms of their inherent meaning [30]. The researcher recognized the potential for personal bias in the analysis and interpretation of the research due to her in-depth knowledge and understanding of Yoga, and the fact that Yoga is a part of her daily life experiences. Since the researcher personally believes in the benefits of Yoga, care had to be taken to suspend this personal viewpoint for the sake of investigating the meanings ascribed to Yoga from a group of children with ASD who had never practiced Yoga before, and their mothers.









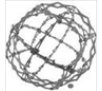
	Hate it 	Don't like it 	It's OK 	Like it 	Love it 
Asana-Poses					
Downward Dog 					
Tree Circle 					
Working With Partner 					
Pranayama- Breathing					
Breathing Ball 					

Table 3: Sample from Yoga Rating Scale.

All Yoga group interviews were transcribed by hand by the graduate student assistants who conducted them, 10 mothers and 12 child interviews total and analyzed by the researcher. Interviews of the mother who had two children in the study were conducted in a group with two graduate students and the researcher. Each interview for this mother was counted as 1 initial and 1 final interview instead of 2 initial and 2 final interviews since their mother spoke of their overall challenges and what she hoped they would gain from Yoga as a whole, instead of differentiating between them, and the researcher did not want to place double emphasis on a single viewpoint in the analysis”.

Each tape recorded interview was listened to once in isolation, and then listened to and read along with the typed transcription by the researcher two times. The researcher sought the feedback of the graduate students following the interviews including their overall perceptions and thoughts, and asking about things that shocked, excited, surprised, or confused them. Next, *In Vivo* coding was used in order to highlight major ideas of the data, including similarities and differences based on the interview key questions, as well as the frequency of words or phrases [31]. Then, the key ideas were separated into categories with similar data, and the main ideas of the mother and child interviews were categorized and reread together until themes emerged from the data. Responses that children provided on the 5-point Likert scale about favorite asanas and activities were tallied and averaged to determine which postures were the favorite of the group, in order to give insight for future group planning.

Findings and Discussion

Three major themes were discovered from the mothers’ interviews.

Hesitancy

When interviewed about their knowledge of Yoga and its potential

value for their children, all of the mothers expressed that they had heard of Yoga, though they had not personally practiced it, and they did not know about its multi-faceted nature or potential benefits. Three mothers had fears that Yoga was an activity that was “out there”, “strange”, or something done by “new age” people, and discussed their fears that Yoga might conflict with their personal religious beliefs, and thought of Yoga as “chanting or weird poses”. Because of these initial preconceived perceptions of Yoga, before this Yoga group opportunity was described to them, families had never sought any additional information about Yoga as an option for their children, and two only responded to the request for study participants because they were called or emailed directly.

Despite not knowing much about Yoga or its potential benefits, when asked what they hoped their children would gain from the Yoga group, Ryan’s mother stated, “Helping him deal with his anxiety,” and Johanna’s mother stated, “Helping her make friends and be with other people who understand her. She has a lot of trouble fitting in at school”. Other ideas were, “I don’t really know, but I hear Yoga helps a lot of people deal with stress”, and “I am willing to try anything that will help him, you know, give him tools that will help him get along better in the world”. One mother also described how her son, Samuel, had limited hobbies and did not like new things other than video games and often did not want to go to school, and stated, “I am not sure what I am hoping, but it seems like it might be something that could be really positive for him and help him find a new hobby”. So, despite some of the internal conflicts or questions about the underlying belief system of Yoga and how it might conflict with personal views, families were still willing to try to see if it could help their children with their challenges at home and in school.

Following the group, all mothers reported knowing much more about Yoga and its possible benefits. Ryan’s mom stated, “I have a more favorable impression and realized that Yoga is more comprehensive than what I thought it was. I mean, it was always equated with

the ‘ohhmmm’ you know, the chanting, not the positive benefits and relaxation”. One mother reported, “I have heard about Yoga for a long time, and after the group it seems like something that could help him in the long run. I just had no idea!” In further discussion with mothers, all other than Adeline who was homeschooled, discussed how challenging school demands and after school activities often were for their children, and felt there needed to be more opportunities for them to learn how to ease stress and interact more effectively with others. Three of the five mothers wanted to know about other opportunities in the community for their children to continue to practice Yoga, and saw it as both a potential therapy and hobby for their children.

Discovering the reasons why parents or caregivers might not seek Yoga or other complementary therapies for their children is notable, since researchers, practitioners, therapists, educators and program developers may make assumptions of a person’s knowledge or perception of a particular topic or potential treatment. Important to mention is that this Yoga group took place in rural area, which has a high level of religious participation with potentially more conservative viewpoints about CAM and geographical location may prevent families from seeking Yoga or other potentially useful treatments if they feel it is based on religious principles or other non-traditional viewpoints that may conflict with their own.

This acknowledgment of families’ belief systems is crucial as we attempt to provide numerous options and opportunities to increase the health, well-being, or functional skills of children and adolescents with ASD. Providing education to others about Yoga, its history, and its potential uses could help decrease some of the mystery and false beliefs associated with this practice, and could allow caregivers to seek it out for their children. This can also be an important message to Yoga teachers who might be interested in offering a Yoga class for children, since the complex language of Yoga becomes a Yoga teacher’s way of talking, and it is vital to remember to use understandable and neutral language to others who might not be as familiar with its background or terminology.

Loss of self and self-care

A mother’s need for personal time and self-care became evident during the interviews, most commonly when discussing how ASD impacted their child or children. It was notable that during these discussions about the impact of ASD, in 8 separate instances in the 5 initial interviews, the conversation morphed into one about how their child’s ASD impacts them and their lives as a person and parent. Though the researcher’s intent was to discover the potential use of Yoga for their children, what naturally unfolded was an expression of their own personal challenges and struggles they felt when parenting a child with ASD. One mother, after realizing she was discussing her own struggles instead of her child’s stated, “Wow, I didn’t mean to turn the conversation. I guess I never really have anyone to share all of this with. Sorry about that. Wow”. All of the mothers reported on the reality that most of their time was focused on the well-being of their children, and for those with multiple children, their children with ASD caused them significantly more worry and stress.

Ian and Johanna’s mother expressed, “Your whole life becomes about helping them get along in the world. You worry about who they will be as adults. Will they have real friends? Will they be able to work and have a successful life? What will happen when I am gone?” Following the group, three mothers described how they became

interested in the possibility of doing Yoga for themselves after their children started the group. They noticed how the group positively impacted their children, and wondered if it could help them as well. Johanna’s mom stated, “I started to realize how I don’t only need to help her improve how she handles things, but, you know, I also have to improve how I handle my own frustrations. Some days parenting a child with autism is exhausting”. Three other mothers also expressed a loss of self and previously enjoyed activities, a constant heightened state of stress, and having to put their own needs on hold so they could focus on getting their children get to speech therapy or other appointments, fight daily battles because of their child’s rigidity, or plead for them to get their homework done. The natural emergence of this theme is notable for others thinking about creating a Yoga group, and for those working with families with children with ASD overall, since parents who have a child with a disability report more stress and depression than those parenting children without disabilities [32]. ASD impacts the well-being, health and participation of family unit throughout all environments, and working with the whole family and recognizing their needs is crucial for the family unit’s success [33]. For future Yoga groups, having a group for children and parents together could be beneficial to allow the parents to connect to their children and provide the knowledge necessary to carry out a Yoga program more consistently at home. Or, it could be beneficial for Yoga teachers to specifically target parents of children with disabilities to help provide them with some of the tools they require to alleviate their own challenges.

Positive changes

All five mothers reported noticing positive differences in their children throughout the six weeks the Yoga group was occurring, including better focus on homework, decreased situational anxiety and the ability to use Yoga strategies and increased communication and interaction before and immediately following the Yoga group. Four mothers reported their children were excited to participate, and began to show her Yoga poses and breathing exercises at home. No mother reported anything adverse or negative regarding the group or its impact on their children.

Adeline’s mother described the difference in her involvement in homeschooling, which she believed to be a result of participation in the Yoga group. “We had the greatest two homeschooling weeks in a row. Every day she was on task and we got so much done and she was in a good mood, happy, and wasn’t very argumentative. Monday was a good day and then Tuesday was a good day. Whoa, two days, this is new and then by Wednesday it was like, look this is a fluke; we’ve never had good days three days in a row. And then fourth day, fifth day. I was just awe struck every day”. Ryan’s mother and reported that after getting home from the Yoga each week, he sat right down to do his homework without complaining, and others reported their children had increased focus after the Yoga group and until bed, especially after the first week once the routine had been established.

Ethan’s mother initially described her son as a child who was often worried about what was going to happen next and whether things he did would be right. When she was questioned about if anything had changed for Ethan during the Yoga group, she stated, “That’s what I was thinking, the anxiety and you know, stress of the day, this brought peace, like a peaceful setting and maybe helped him regroup to head back to homework or something that’s not so peaceful. This is a short study, but if it was given significant time I wonder how much

difference we would have seen. I don't know, it just makes me wonder". Ethan corroborated this idea when he stated, "I feel excited when I come. It is fun and I can be me and I don't feel like I am going to do anything wrong since you only have to do what you can do, and not what everyone else can do".

Ian's mother felt that the Yoga group was carrying over into his daily life. She contemplated, "I think it's been beneficial. I see Ian trying to practice his breathing, and if he gets upset he does heavy, deep breaths and calms himself down while he repeats the words in-hale and exhale". She discussed how during the last four weeks of the group, he had been more communicative at the end of the school days, especially when they were on their way to Yoga. She also commented that each week, his sister Johanna's speech therapist reported she was much more focused and on topic when she came to speech therapy after the Yoga group. She also noted that after the first week of Yoga when one of the siblings became upset, the other would tell them to "take a deep breath" or "chill out like a corpse".

All mothers reported that they felt Yoga was a success, and that their children felt positive about the group and liked coming each week, and that they would enjoy continuing if there was the opportunity to attend another class in the community or at school. All mothers reported their children asked about Yoga when it was over and five of the children asked if they could go again. These positive observations by mothers and children suggest that a long-term practice could magnify the differences seen in this short, 6-week period, and it could be a helpful intervention to continue at both home and in school. Overall, all mothers believed that the collective experience of a supportive Yoga group in a safe and non-judgmental environment over the 6-week period positively impacted their children. The perception of all five mothers was that the children were learning and internalizing Yoga and beginning to use the breathing strategies and postures throughout their day.

Three major themes were also discovered from the children's interviews.

Instant friends

Beginning on the first day, the children bounded into class with their Yoga mats, unrolled them noisily on the floor and began talking about the day to the teacher, the graduate students, and each other. By the second week, most of the children demonstrated that they knew each other's names, and noticed if someone was late or in a different spot. For example, when Adeline had to come late to class one afternoon, two of the children were concerned about starting class without her, since they didn't want her to miss anything, and asked if they could show her what she missed when she arrived.

When the children were asked to rate how they enjoyed working with a partner on the 5-point Likert scale, the average for this component was a 4.7/5. The partner poses became the most requested by the group members. Ryan stated, "I have fun with everyone and got to do Yoga with people I wouldn't normally talk to. It was easy because we were all doing something new together. The partner poses were really fun". Reports that the children enjoyed working with others was significant considering the inherent difficulties children with ASD have engaging in social situations, including sharing interests, social reciprocity, and making eye contact and this finding suggests that Yoga could be useful as a tool to utilize these challenging social skills [4].

Samuel discussed, "I don't talk to a lot of people at school because I am kind of a loner, but I talked to people here 'because we were here for the same reason". Ian even went so far as to state, "I even like my sister when I come!" and Ryan laughed and said, "It is like instant noodles, but with friends". When asked to describe this further, he said, "Like, you had to put us all in the same room and like, just add the Yoga and we all became friends".

Leader and helper

The four oldest children expressed their insights into being leaders and helpers in the group. Participants were encouraged to develop these roles by helping to plan the asanas and activities for the day, demonstrating new asanas for the group, helping each other do the asanas, and passing out and collecting materials such as blocks or sand bags. At the end of the six weeks, members rated "helping a classmate" as a 4.2/5 overall. As the oldest participant in the group, Adeline talked about how she really enjoyed the times when she got to have a helping and teaching role for the younger group members, which "made her feel good about herself and her abilities". She laughed and said, "I noticed that they don't always listen when they are supposed to do something. I liked helping them when they needed it. It also made me think about how I don't always listen to my mom during school and I should".

Ethan thoughtfully stated, "I feel like at school, the teacher asks other kids to help me, and here I got to help instead." Samuel commented that he felt "it was cool to be able to teach poses to the other kids and get help from the teachers if I needed it". Knowing the inherent difficulties with social skills of children with ASD, the group structure was purposefully planned by the researcher in order to increase the peer interaction of the group, and its structure naturally encouraged these interactions to take place. On a more global level, this feedback from children suggests the importance that those who care for and teach children with ASD need to be mindful of the impact of self-esteem needs in children with ASD and providing them with leadership and helper opportunities may help build this important skill in a safe and non-judgmental environment. It is hypothesized that the implementation of a Yoga group at school or in the community could assist children with ASD in further developing these challenging social skills and that including partner or group poses may be a crucial piece (Figure 1).



Figure 1: Partner Asana.

Relaxed in my bones

The children had many insights into performing the asanas of Yoga with comments such as, “It made my body feel buzzy and awake”, “I didn’t have to think as much about which is left and which is right”, and “I didn’t know my body could do that!” However, it was their descriptions of savasana (corpse pose) the final resting pose of Yoga, which was the most insightful. Savasana is the asana that allows the benefits of the Yoga practice to enter the body while promoting deep relaxation and was described to the group by the researcher as, “the time when you keep your body and mind still”. It was the one asana the children came in asking about each week, with an average rating of a 4.8/5. When asked to describe the purpose of savasana and how it made them feel, ten year-old Ethan stated, “When savasana is over I feel like I want to do it again”. Samuel reported, “After Yoga is over I feel relaxed, but more energized. It isn’t even hard to be still at the end”. Seven year-old Johanna simply stated, “I wiggle but I love it”, and six year-old Ian declared, “My body feels warm and cool when I do it”. Fifteen year-old Adeline shared, “My body always wishes for savasana. I felt like it was a thing that I really needed”. Samuel reported, “I just felt like real peaceful and calm and just like, not thinking on any subjects or anything except whatever is peaceful to you”. The children also expressed some salient insights into the purpose of savasana. Ethan declared that savasana was to, “make me work on getting my brain not as busy all the time” and when Ryan described the purpose of savasana, he thoughtfully stated, “It’s when you rest your body so you can get all the things that you learned down inside your body. When I do it I feel..... relaxed in my bones”.

Important is that three of the children in this study were also co-diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), one was being tested for ADHD and the others reported their children had attention-related difficulties and a decreased ability to sit still for a period of time comparable to their peers. During the interview Samuel’s mom said, “He can just never sit still for one minute, not during homework or school or dinner, really, even when he is playing video games he is moving around”. Mothers reported that attention to task was a concern throughout their school days and homework time, and wanted their children to develop strategies that would help them focus better.

The researcher had to address preconceived biases regarding savasana, as based on the interviews with the mothers, she believed that it would be difficult for the children, and they would wiggle, look around, or talk. However, from the first session, 5 of the children remained completely still on their mats for five minutes with the use of a three-pound sand bag placed across their thighs, abdomen and/or upper shoulders and five requested the use of a lavender-scented eye pillow. Johanna remained on her mat, though wiggled and fidgeted with the sand bag and eye pillow for at least half of savasana each class. The observation that savasana was possible and highly enjoyed and requested by this group, gives support that relaxation techniques and a mindfulness or meditation practice could be a useful strategy for those with ASD to handle attention or anxiety-related issues (Figure 2 & Table 4).

Study limitations

This study is limited to the perspectives of 6 children and 5mothers, and their perspectives cannot be generalized to the general population, especially considering the rural geographic location of this

study. However, as a pilot study that is investigating this new topic, it discovered many points of interest to be considered and investigated during future studies. The trustworthiness of this data may be seen as a limitation to this study, considering the researcher was the only one to code and develop thematic categories for the data, however, this was minimized as much as possible when interviews were discussed with the graduate student interviewers in order to gain their perceptions of content, which served as a method to validate findings of the researcher.



Figure 2: Savasana.

1	Cross the Creek (Group game)	5.0	25	Lizard Pose	3.8
2	Rock and Roll	5.0	26	Mountain Pose (With scarves)	3.8
3	All of Yoga	4.8	27	Camel Pose	3.7
4	Corpse Pose	4.8	28	Cow Pose	3.7
5	Sand Bags	4.8	29	Eagle Pose	3.7
6	Working with Partner	4.7	30	Lightning Pose	3.7
7	Eye Pillows	4.5	31	Shoulder Rolls	3.7
8	Puppy Pose (With partner)	4.5	32	Triangle Pose	3.7
9	Breathing Ball (Group)	4.3	33	Warrior 1	3.7
10	Down Dog	4.3	34	Boat Pose	3.5
11	Lead a Pose	4.3	35	Eye Exercises	3.5
12	Using Yoga Blocks	4.3	36	Supine Twist	3.5
13	Butterfly Pose (With partner)	4.2	37	Lion Face	3.3
14	Help a Classmate	4.2	38	Seated Side Bends	3.3
15	Cobra Pose (With partner)	4.2	39	Sphinx Pose	3.3
16	Arm Swings	4.0	40	Warrior 2	3.3
17	Dimmed Lights	4.0	41	Chair Pose	3.2
18	Plank Pose	4.0	42	Create a Pose	3.2
19	Staff Pose (With partner)	4.0	43	Freeze	3.2
20	Star Pose	4.0	44	Hand and Leg	3.2
21	Tree Circle (Group)	4.0	45	Squat	3.2
22	Tree Pose	4.0	46	Name Songs	2.8
23	Child’s Pose	3.8	47	Bow Pose	2.7
24	Cat Pose	3.8	48	Forward Bend	2.7

Table 4: Child Ratings of Group Components.

It is felt that a group longer than 6 weeks would have been useful to determine its longer term impact, especially considering Yoga is a lifelong practice that takes time and experience to develop. The fact that this study was part of a pediatric practicum course, limited its potential length, and many mothers reported they wished it could continue for a longer period of time because they were starting to see changes in their children. Additionally, four of the five mothers stated that they would have liked to occasionally watch or participate with

their children during the group in order to get a better idea of what they were doing and how to carry it over at home. A bigger space would have made this possible, and would have allowed increased interaction between mothers, children, and the group facilitators. To help with carryover of the Yoga group, and to address this limitation, each family was given a detailed, individualized Yoga home program for them and their child after the Yoga group ended.

In addition, though receptive and expressive language skills and an ability to participate in interviews was one of the inclusion criteria, the graduate student interviewers and researcher found the two youngest children difficult to interview. They had trouble staying on topic and elaborating on the questions asked, and this limited the full understanding of the experiences of these children.

Conclusion

This qualitative, phenomenological pilot study gained insight into the perspectives of mothers and their children with high functioning ASD who participated in a Yoga group. Mothers reported that they had a more positive view of Yoga and wanted it to continue, and felt that their children were learning to utilize strategies that they learned during the Yoga group. Children reported that it helped them socialize and make friends, and that they loved the whole practice of Yoga, especially the interactive games and savasana. As many children with ASD are not verbal, the insight of this particular group of children who had the ability to describe their experiences helped to gain insight into their personal views of a Yoga group, and could potentially assist with planning future Yoga groups and research for children with ASD at all functional levels.

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