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Yoga as an Effective Behavioral Intervention for Children Diagnosed with an Autism Spectrum Disorder

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Abstract

As the prevalence of autism increases in our society, so does the need for effective therapeutic and educational interventions. Through the research of Radhakrishna (2010), Rosenblatt (2011) and others, yoga has emerged as a possible effective tool to increase a child's ability to focus, as well as quell anxiety and sensory related environmental triggers. This paper investigates research supporting this initiative and implements the practice for an eleven year old boy with autism. The objective of this action research is to answer the question: Can yoga be used as an integrated therapy for children on the autism spectrum to increase the amount of time they can focus? After the intervention is explained, I will reflect upon its achievements and disappointments in hopes of implementing yoga more successfully as a behavioral intervention in the future.

Yoga as an Effective Behavioral Intervention for Children Diagnosed with an Autism Spectrum Disorder

Introduction

As a teacher for middle school aged children with autism, I am always looking for ways to help my students cope with stresses they face throughout the school day. I teach in a middle school that is part of the School District of Philadelphia. The school is located in a neighborhood that is primarily working class and is compromised of several different races, cultures, and religions. My students reflect this observation. I teach twenty-eight students aged eleven to fourteen who have been diagnosed with an autism spectrum disorder (ASD). Along with autism, most have a co-morbid diagnosis. Some examples of these secondary diagnosis's are: specific learning disability, other health impairment, emotional disturbance, anxiety disorder, obsessive compulsive disorder and oppositional defiance disorder. These students have been identified as being in the higher functioning end of the autism spectrum. Their educational needs are serviced in a learning support placement and they receive autistic support on an itinerant level. This problem arose due to my disagreement with their educational environment.

As an educator, I believe my students would make more academic progress if they received their education in an autistic support environment. This type of environment would include a more structured routine, several sensory breaks throughout the day and content tailored to their individual needs. This is impossible in their current school environment. I introduced yoga to my students after I became a student of the practice myself. I recognized that after yoga I felt less stressed. Personally, this included less tension in my head and shoulders, less anxiety and an overall feeling of strength and calmness. Upon asking my yoga instructor and other professionals about yoga for children with autism, I found it was a fairly popular practice. This led me to search for research on the topic to answer my question.

I researched the effectiveness of yoga as a behavioral intervention for children with autism. For my action research, I choice to focus on one student and a specific behavior. The student is eleven years old and has autism and a specific learning disability. The behavior I chose was increasing the amount the student is on task and focused during class.

Literature Review

The National Autism Association defines Autism as a neurodevelopment disorder characterized by social impairments, cognitive impairments, communication difficulties, and repetitive behaviors. It can range from very mild to very severe and occur in all ethnic, socioeconomic and age groups. It is four times more likely to appear in males. Over time, and especially in recent years, the prevalence of this neurodevelopment disorder has been steadily and now rapidly increasing. The Center for Disease Control (2012) has most recently estimated the occurrence to be one in eighty-eight children. The pervasiveness of autism calls for changes in our educational system to be able to support and prepare these individuals for the highest level of independence that can be reached. Among the hundreds of different theories about which type of school, therapy and intervention works the best, there isn't one single golden ticket to helping these children. Often this diagnosis morphs into a co-morbid one pair with anxiety, depression or others. There is a large need for effective programs and support for children with autism. This literature review explores one venue to answer this problem, yoga. Information from the American Yoga Association reveals that yoga has been practiced for more than five thousand years.

This associate defines yoga as, “bringing the body and mind together into one harmonious experience... built on three main structures: exercise, breathing, and meditation... produces a clear, bright mind and a strong, capable body” (American Yoga Association). Using yoga as a therapeutic intervention for children with autism has risen in popularity, but evidence-based research is limited. This literature review will assess information available on this topic and its value in helping children with autism.

Shantha Radhakrishna, Raghuram Nagarathna and H.R. Nagendra (2010) described two years of therapy for children with Autism. There were twelve children in this study, and they were broken up into two groups of six. The first six continued to receive the Applied Behavior Analyst (ABA) therapy they were accustomed to. The second six continued with ABA therapy and practiced a special module, which was Integrated Approach to Yoga Therapy. The areas that Radhakrishna studied were: eye to eye gaze, sitting tolerance, body posture, body awareness, depth perception and balance, imitation skills, self-stimulatory behavior, receptive skills related to spatial relations and self-injurious behaviors.

This study included children aged eight to fourteen from middle class families. They received an hour of yoga therapy a day on top of fifteen hours of ABA-based training. The children receive one-on-one assistance, often by their parents. The yoga practice was broken down into different exercises under the following categories: warm-up, strengthening, release of tension and calming (Radhakrishna, Nagarathna & Nagendra, 2010, p. 121). It is interesting to note that, “after the first twelve sessions, no observable changes in eye-to-eye gaze, sitting tolerance, or imitation skills occurred” (Radhakrishna et al, 2010, p. 122). By the middle of the sessions, improvements were observed. They included eye contact, ability to sit for long period of time and improvement in body posture. After two years of integrated yoga therapy, therapist and parents noted much success,

“significant changes occurred in communication, language, play and joint attention, patterns of eye contact steadily improved...children started to trust, share, initiate and reciprocate...by the 372nd session...they greeted the therapist with a smile, vocalizing ‘Namaste’” (Radhakrishna et al, 2010, p. 123).

This article reviewed critical aspects about helping and teaching children with autism including the way they learn and the importance of their educational environment. The first was acknowledging how someone with autism responds, “ASD children sense input from muscles and joints better than eyes and ears...some suggest that the central nervous system in AS children processes information abnormally... repetitive stereotyped behavior may calm over-aroused nervous system and learned under-aroused ones” (Radhakrishna et al, 2010, p. 123). The crucial aspect of this is that, “engaging in repetitive integrated approach to yoga therapy procedures may thus make ASD children feel calmer and more awake” (Radhakrishna et al, 2010, p. 123).

A final significant find in this article was that the slow paced practice of yoga helps the children’s imitative and cognitive performance, meaning often school or home environments move too

quickly for these children and they are unable to engage, “slowing down facial and vocal events enhances imitative, verbal and cognitive skills of some ASD children” (Radhakrishna et al, 2010, p. 123). This article yielded positive results from the children engaged in two years of yoga therapy. The parents indicated positive progress at the home, and the therapist saw a much higher level of interpersonal skills during session. They ended the article with a final observation, “we hypothesize that reinforcing this experience slowly brought the children a greater sense of their felt-self, or identity, enabling them to learn to relate better to others” (Radhakrishna et al, 2010, p. 123).

Radhakrishna (2010) conducted a ten month study on the effectiveness of integrated yoga therapy to increase imitation skills. Six children participated in yoga five days a week at a yoga studio and regularly at home as well. The tasks during therapy included gross motor actions, vocalization, complex imitation, oral facial movements and imitating breathing exercises. Radhakrishna (2010) states, “The ability to understand another person’s action and, if needed, imitate that action is a core component of human social behavior.” (p. 26). She believes imitation is one of the essential skills need to interact with others, “at a social level, it represents earliest forms of reciprocal interactions between infant and the mother” (Radhakrishna, 2010, p. 26). Increasing the child’s ability to interact and engage with others was on the forefront of this study.

Radhakrishna (2010) notes that several interventions commonly used to facilitate learning for students with ASD are based on imitative relationship between teacher or therapist and the child. Discrete trial training and applied behavior analysis are among the most popular of interventions. The importance of imitation skills are integral to many programs, “imitation skills are typically among the first to be taught in many of these programs because they are often considered being pre-requisite abilities for learning other skills” (Radhakrishna, 2010, p. 27). Using yoga to aid in the acquisition of these skills is a holistic stance on educating children, “the IATY (integrated approach to yoga therapy) is based on the philosophy that the child is perfect and whole, and that the child and therapists are both unlimited in their abilities to teacher” (Radhakrishna, 2010, p. 27). This would put IATY under the umbrella of transformative pedagogy.

The study included children with a mild to moderate scale of autism. Each class followed the same sequence of warm-up asana, strengthening asana, release of tension asana, calming asana and breathing asana. The sessions were first faced with opposition from the students. Leaving the practice, not imitating the therapist and having an adult guide the children through the movements were initially needed, but not for long, “The children slowly learned that she/he is expected to imitate the model” (Radhakrishna, 2010, p. 28). If the student left his or her mat, they were not guided back. Each time they found their way back to their mat and engaged once again in the session. Data was taken in the beginning, mid point and end of ten month study. Radhakrishna (2010) noted changes found at the mid point, “there was a significant change in imitating gross motor actions, oral facial movements and performing breathing exercises (p. 29).

By the end of the study, success was found in several areas, including eye contact, increase in facial expressions, and vocalization

at peers. What these behaviors suggested would be remarkable to those who have a close relationship with these children, which was “an emerging understanding that sharing an activity could be an enjoyable experience (Radhakrishna, 2010, p. 29). At the end of this ten month study, Radhakrishan noted several improvements in the students, started with their level of gratification from the therapy, “they progressed from early resistance to passive tolerance to active participation and enjoying the therapy sessions” (2010, p.29). The parents of the children were equally happy with results, “parents reported that their children indicated basic needs using gestures, interacting with other children during play situation and increased sitting tolerance for an activity” (Radhakrishna, 2010, p. 30). It is inferred that these behaviors were also extremely helpful in success at school and other environments. This article ended with positive remarks about the children’s progress and recognizing the need for a larger study about the effectiveness of yoga as an integrated therapy for children with autism.

Cantu (2005) questioned the effectiveness of yoga as a therapy for children with special needs. She noted its popularity and attention from the media, but wanted to investigate if any research has been done on its lasting power to positively effect children with autism. Certified yoga teachers with specialized training in adapting yoga practice for children with autism state so, “these asana adaptations refine motor skills, increase body awareness, induce calming and even improve eye contact among children with autism” (Cantu, 2005, p. 57). Through internet and literature reviews, Cantu (2005) noted that across the country there are various medical centers and private studios that practice yoga for children with special needs, but research about occupational therapist using yoga therapeutically is sparse. Furthermore, at the time period this article was published, there was no mention of using yoga in the American Journal of Occupational Therapy (2005, p. 58).

Although there are positive reports of yoga, there isn’t enough scholarly research to prove its effectiveness to the academic world. Cantu (2005) didn’t discredit the encouraging information about yoga therapy, “practitioners with certification in yoga for special needs and certified yoga instructors with specialization in addressing special needs have reported positive outcomes in utilizing yoga as a therapeutic modality” (2005, p. 59). The article ends with encouraging parents and caregivers to explore yoga as beneficial activity, but research is needed to qualify yoga as a research-based therapeutic intervention.

,Koenig, Buckley-Reen and Garg (2012) examine the Get Ready to Learn program, which is a classroom based yoga program for children with autism spectrum disorders. The objective of this research is to, “examine the effectiveness of a manualized occupational therapy intervention...which uses yoga postures and breathing and relaxation exercises with elementary school students with ASD and challenging and maladaptive behavior.” The program is,

“a daily classroom-based preparatory yoga curriculum developed...that uses specific developmentally targeted breathing exercises, yoga postures, chanting and relaxation techniques to enhance the functional and academic performance of students with a variety of disabilities” (Koenig, Buckley-Reen & Garg, 2012, p. 539).

Research about this is crucial because of the need and potential for effective therapies for children with autism, “few opportunities exist in most educational curricula to train students in the skills required for maintenance of a calm but alert state” (Koenig et al, 2012, p. 539). This was a large study in New York public schools with more than seven hundred students with autism. This program trained classroom teachers to be in charge of the intervention. Each teacher was given an in-service training by the developer of the Get Ready to Learn (GRTL) yoga program, the program DVD, instructional materials and the yoga mats for the students. They were also given video equipment to tape the sessions (Koenig et al, 2012).

Although this may seem like a more informal approach to yoga therapy, this large scale format is conducive for the findings to be seen as evidence-based research. The children participated for sixteen weeks during every school day. The GRTL routine was done each morning and lasted fifteen to twenty minutes. After this time, the results were compared between the intervention group and control group. This research yielded positive outcomes, “the children in the intervention group displayed significantly less irritable behavior and changes in lethargy and social withdrawal and hyperactivity and noncompliance” (Koenig et al, 2012, p. 543).

The success of this program has a lot to do with its format. The GRTL program is administered every school day. This type of routine is closely tied to its efficacy because it, “becomes part of the classroom routine; moreover, it appears to be easy for teachers to implement” (Koenig et al, 2012, p. 543). Yoga programs not administered during the school day are often available once or twice a week, which is much less than what was available to the children in GRTL. The overall findings from this study are that, “the intervention group showed a reduction in behaviors that were identified as maladaptive by teachers” (Koenig et al, 2012, p. 544). A last thought from this article was their call for future research of implementing a program like this for students with autism in an inclusion setting.

Boyajian (2004) writes about how parents can use yoga at home for this child with special needs. She says yoga can be a recreational activity as well as a therapeutic practice by incorporating the child’s choice of music or toys. Boyajian includes blowing bubbles and other activities to encourage the students to use deep breaths. This type of yoga practice can help parents connect with their child, “If this doesn’t seem like any other yoga class, you’re right. But you’re use to things being different. Embrace your own style and the child’s needs” (Boyajian, 2004, p. 27). Although this article does not report on evidence-based research about integrating yoga for students with autism, it can help parents who are searching for a way to interact and engage their son or daughter. Anything that can help a parent with a special needs child is worth reviewing and reading, “yoga helps us cultivate and hold on to this peaceful feeling throughout the day- a much deserved gift for both adult and child” (Boyajian, 2004, p. 27).

Rosenblatt, et al., (2011) wanted to “develop and objectively assess the therapeutic effect of a novel movement-based complementary and alternative medicine approach for children with an autism-spectrum disorder” (p. 1029). This study lasted eight weeks and included twenty-four children; unlike others, this intervention included music and dance therapy as well. The children were

in groups of two to five with similar aged peers and the program lasted for eight forty-five minute sessions. The class was compartmentalized by, “breath[ing] techniques (ten minutes), yoga postures (ten minutes), music and dance (twenty minutes) and typical yoga relaxation (five minutes) (Rosenblatt et al., 2011, p. 1031).

The children involved were given two tests before and after the yoga program, the Behavioral Assessment System for Children, Second Addition BASC-2 and the Aberrant Behavioral Checklist ABC. After this intervention there were positive changes in the BASC-2, but no changes found on the ABC. There are two sections to the BASC-2 and only one produced a positive change. That is the Behavioral System Index, BSI. The constructive aspect of the results from this study was, “during this developmental period, patients with ASD may have greater receptivity to the programs’ unique emphasis on movement and sound” (Rosenblatt et al., 2011, p. 1033). This shows educators, parents and therapist that incorporating movement and sound will result in a higher level of engagement from child with autism. Again, like other reviewed articles, the authors said a larger group of children and a longer intervention period would be needed to better investigate the program’s effect.

From reviewing literature on this topic, it is evident there is not enough research to believe integrating yoga for children with autism will always be successful. There are a few legitimate studies that were reviewed above, but more is needed. Searching the internet, this topic is very popular and studios across the country offer yoga for children with autism. This is an issue that will only strengthen with time. The available information integrating this therapy suggests that yoga can help children with autism in several different areas such as eye contact, self regulating and soothing and engaging and responding to those around them. These are all positive signs that integrating yoga can help a child become more socially aware and more likely to engage with others. This type of success spills over to all areas of life for a child with autism including school and the home. Additional studies would increase this practices’ legitimacy, thereby, hopefully opening the door for more children with autism to receive a treatment that could help them better cope with and adjust to a sometimes difficult world.

Action Plan

The action plan was broken down into three steps: collecting baseline data, implementing intervention and collecting follow-up data. This intervention was conducted in my classroom. The materials necessary were a yoga mat, reduced lighting and calming music. The baseline data was taken over one week and the intervention lasted approximately four weeks. The follow up data was taken on four occasions where the student practiced yoga independently. The student came to my classroom after he got off the bus, went to his locker and ate breakfast. The practice lasted about twenty minutes. I chose the morning due to information from one of Radhakrishna’s (2010) articles, “Engaging in repetitive integrated approach to yoga therapy procedures may thus make ASD children feel calmer and more awake” (p. 123). Cantu (2005) wrote that, “These asana adaptations refine motor skills, increase body awareness, induce calming and even improve eye contact among children with autism” (p. 57). Since I chose to focus on increasing ability to focus, the following research from Koenig et

al (2012), supported the theory that yoga would aid in doing so, “the children in the intervention group displayed significantly less irritable behavior and changes in lethargy and social withdrawal and hyperactivity and noncompliance” (p. 543).

Baseline data and Description of Intervention.

The intervention included incorporating yoga into the schedule of a student with autism. The yoga occurred daily and lasted approximately twenty minutes. The practice was a combination of sun salutation and savasana. The sun salutation is a set of twelve positions that is know to have several benefits such as increase mental focus and concentration, reduce depression, anxiety and stress, increase the quantity of neurotransmitters and increase mind to body coordination. Savasana is when you lay on your back and relax your entire body from the top of your head to the tip of your toes. This position is supposed to extend the relaxation that comes from doing yoga (“Meditation, Yoga,” n.d.).

Figure 1: Sun Salutation

Figure 2: Savasana

For my baseline data, I observed the student during math for one week. This was 9:30 am to 10:15 am each morning. The student receives his math instruction in a 6th grade inclusion setting. There is an elementary education / math certified teacher and a special education teacher for the twenty-nine students in this section. The class is broken down into pre-class, review homework and then different learning stations. They come back together as a large group towards the end to receive homework and write down their homework assignment in their agenda book.

My baseline data included how often I needed to redirect the student. The student is redirected through a series of questions and question prompts. I took anecdotal records of how often this occurred. Each redirection took an average of one minute. I added the amount of times the student was redirected to see the percentage of time that was spent on redirecting the student during math class. This showed me the percentage of time the student was unfocused. Out of five class periods (45 minutes x 5) = 225 minutes, the student was not paying attention or working on assigned tasks for 98 minutes. During this week, the student was off task 44% of the class time and on task 56%.

Table 1: Baseline Daily Data

Table 2: Baseline Weekly Data

Post Intervention data and Findings

Data was taken for the four weeks the student did yoga with me. The amount of occurrences the student needed to be prompted to stay on task decreased. The amount of time the student was focused in class increased. During the baseline, my student was focused 56% of the forty-five minute math class. During the intervention, he increased the amount he was focused to 62%. After the four week of the intervention, the student did yoga

independently each morning and data was taken. After this type of practice, he was on task 73% of the time. I was happy with the interventions results in spite of the several interruptions we faced. I believe it was only a slight increase for many reasons. An area of difficulty I believe altered the potential of this intervention was the amount of days school was not held or the student was absent. Out of a thirty-three school days, due to these interruptions, yoga was only held 24 days. I think these breaks weakened my potential results due to the lack of continuity.

The student schedule was also changed two times during this intervention. The student started out with a supplemental level of learning support and an itinerant level of autistic support. Now the student receives all academics besides math in a life skills support class. He goes to an inclusion classroom for math and still continues to receive autistic support on an itinerant level. It can be inferred, by knowing the common characteristics of autism spectrum disorder that these changes combined with the many holidays and weather interruptions increased the student's anxiety producing behaviors, therefore making it hard for him to focus.

Table 3 – Data during Intervention

Table 4 – Average Percentage Focused and Unfocused during Intervention

Table 5 – Percentage Focused and Unfocused Post Intervention

Introducing a new intervention for someone with autism can be difficult. The student must adjust to the change in their schedule and are often resistant if the intervention does not include a preferred activity or topic. I found very little resistance to using yoga with this student. I found a lot of positives resulting from incorporating yoga in my student's schedule. After the first couple times, the student came to my room in the morning without needing a reminder. He took off his shoes and went to the mat independently. He often came through the door and said, "I'm here for yoga!" Although I was monitoring the amount of time he was focused, through my observations I found additional positive benefits from this intervention. The student made significant improvement in eye contact during the hour following yoga. He also cried less and was not as easily frustrated in class. He seemed happier and more relaxed following the yoga practice, and he wanted to show his peers and other teachers what he had learned.

Analysis and Reflection

Through this action research I learned a lot. I learned more about yoga, my student and myself as a teacher. I learned that yoga doesn't always have to be quiet and serious. It can be a warm, loving and fun experience. Some days it served my student to make animal noises during the different positions he thought looked liked an animal. An important aspect of yoga is that you do what feels good for your individual body and mind. I learned this carries over to yoga for a child with autism. Some days my student only needed ten to fifteen minutes and other days we practice over a half hour. I learned a lot about my student during this process. I was surprised how quickly he picked up the different positions and how easily he could practice yoga independently. I so valued the

time I spent with my student after the yoga session when he was calm and happy and present. I also learned about myself during this experience. It made me realize that you don't always need money or the best materials to create new ways to reach and help your students.

If I were to implement this again, I would make some changes. First I would pick a different location. My classroom can be hectic during the time we practiced yoga. It was during advisory and almost every single day we were interrupted. I could not deny services and support to my other students during this action research. If another student was having a problem, I had to attend to them as well. This didn't help to create a calm environment. Also my classroom is at the bottom of the stairs and even though I closed my classroom door, kids would peek in and say, "Hey what are you guys doing in here?" Again I understood the students' curiosity, but I don't think it helped my intervention. Lastly, I would like to be able to observe this intervention for a longer period of time. As I mentioned above, there were many days off and I think my student is still adjusting to including this in his routine.

I think, as a teacher, it is important to not feel complacent. Through this process I gain a lot of new knowledge about this topic, but I still have questions. There are different types of yoga, and I wonder if the different styles yield different behavioral results for children with autism. Also temperature is a factor when practicing yoga. Some varieties of yoga can be practiced in rooms heated to over a hundred degrees Fahrenheit. Would the different temperatures effect someone with autism? Lastly, I wonder if there is a change in the effectiveness of yoga if it is done one-on-one or in a small group class setting. I will continue to research and practice in hopes in answering these questions.

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