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## **Autism Treatments: Beyond Applied Behavioral Analysis Therapy**

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### Mindfulness and Autism

My name is Sarah Samosiuk. I am a current senior at Grand Valley State University and as a part of my senior project through the Honors College, I have decided to create a resource explaining the benefits of using mindfulness for individuals with autism. I chose this treatment because mindfulness (meditation and yoga specifically) is something that I have been using for many years dealing with my own anxiety and trauma. Autism is something I have been exposed to all my life as two of my close friends had siblings with autism and so I had frequent interactions. I became interested in treatments for autism because my sophomore year of college I started working as a behavior technician doing ABA therapy with children with autism. I originally got the job as just a “job” but once I started working, I was immediately interested in pursuing it. It was incredible to see the growth of the kids I was working with in short spurts, as well as how my consistent clients have improved over the years. Although I am extremely impressed with what ABA therapy has to offer, I couldn’t help but wonder: What else is out there?

ABA is an expensive treatment option that is thankfully being covered by more and more insurance companies but still, I wanted to see if there were other therapies or supplementary treatments that could help. I know that diet is something important to everyone's physical and mental health and have heard theories about it improving certain symptoms of autism. I have heard of vagus nerve therapy, art/ music therapy, neurofeedback, etc. So many treatments exist

because the range of symptoms varies so much, that no one treatment is going to work with every individual with autism. There is such a wide array available, and I wanted to know more about them so that in the future I can hopefully present a more holistic view of treatment options. My initial plan was to pursue all these therapies but once I started researching, I found that each resource has such depth individually. Over time, I hope to explore these options but for now I felt extremely motivated by my passion for mindfulness that it took over as the main topic of this paper. The purpose of this paper is to inform myself as well as others about how incredibly powerful meditation and mindfulness can be for the treatment of people with autism.

Autism spectrum disorder (ASD) is a developmental disability that can impair social, cognitive, and motor functions (*What is autism spectrum disorder?* 2020). There is no known cure or cause, which makes treatment extremely important. The neurological understanding of a person with autism tells us some, but not all of why their brain differs from a person who is neurotypical. Some differences are that individuals with ASD have extra gray and white matter as infants, leading to longer neuronal connections which could possibly amplify sensory stimuli. As they age certain areas thin, typically areas responsible for cognitive functioning and forming emotional memories. More specifically, the mirror neuron system (inferior frontal gyrus) is thinned and the degree of thinning correlates with the severity of ASD symptoms. The amygdala, however, has an excess of neuronal signals being passed through it. This intensifies the individuals fight-or-flight response causing intense fear response and emotions. This is a contributing factor to symptoms like increased social withdrawal, seemingly unprompted tantrums, or fear of novel items/places (Sequeira & Ahmed 2012). Other differences include dysregulation of the vagus nerve which impacts a multitude of things including the HPA axis, the heart and the immune system (Semple 2018). A huge issue among people with autism is anxiety

and depression. A study found that “Individuals with ASD are four times more likely to experience depression in their lifetime than individuals without ASD” and 70% of people with autism have a comorbid psychiatric disorder (Menezes et al. 2020).

Current common treatments include things like ABA, dietary treatments, and medications. There are many more treatments available, but some are unproven and seem to only work for certain individuals. This makes sense when you recognize that the symptoms and severity differ so much with this condition that treatments are hard to generalize. In my experiences working in ABA, I can see the direct benefits of teaching the child in a patient, individualized manner. In this way it allows a single treatment protocol to help with a variety of individuals. However, after reading this research I have found myself thinking more about why they exhibit these symptoms. What anxieties do they have, why are certain things so scary to them, and how can I help them not feel so scared? One thing that I think must be emphasized when looking at treatment is the following: “autism is a stress-related disorder” (David Lynch Foundation 2013). A person with autism has a world perception that is so different from a neurotypical person’s and so it is hard to understand why certain situations frighten them. Regardless, they are still scared and have the same feelings of anxiety we do just much more often. Their world is generally a stressful place. Making it less stressful will significantly improve their quality of life.

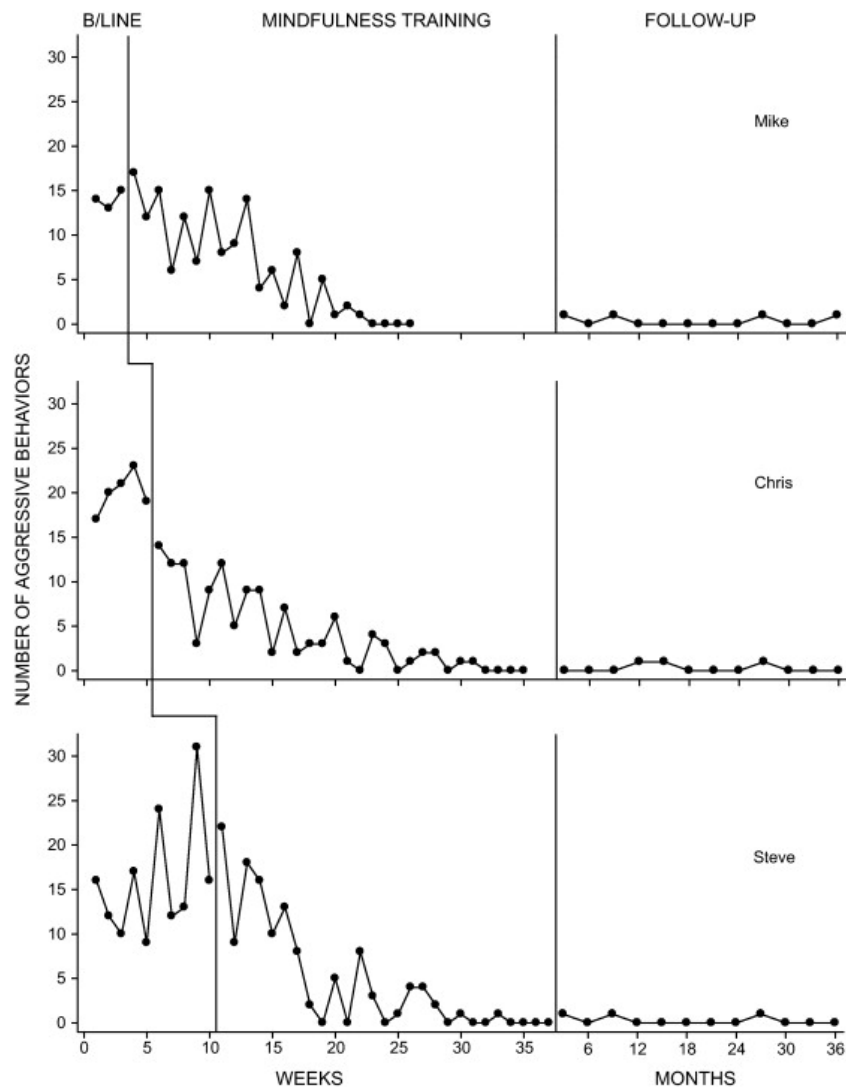
It is my dream that I can help people feel less scared in this world through the use of meditation and mindfulness. Mindfulness is “maintaining a moment-by-moment awareness of our thoughts, feelings, bodily sensations, and surrounding environment, through a gentle, nurturing lens” (*Mindfulness Definition: What Is Mindfulness*). This is a practice that can be used by almost anyone, anywhere, after learning the techniques. Furthermore, it is free, and has no

negative side effects. Scientific studies have demonstrated that mindfulness training can greatly improve mood, coping skills, and immune function in neurotypical individuals (Sequeira & Ahmed 2012). Additionally, individuals have reported decreased pain following mindfulness training (Sequeira & Ahmed 2012). Mindfulness allows for recognition of emotions at low intensities and helps slows down mental processes to allow increased thought before emotional reactions. Furthermore, mindfulness has been shown to decrease avoidance of experiences, and provide overall stress reduction (Tami 2018). There are so many avenues to use this practice since stress is an underlying cause of many other health issues, combating stress directly would be a logical solution. Yet, meditation is just starting to be respected in the medical field and still has a long way to go. Since there is even less research into its effectiveness in treating ASD, I hope that I can be a part of the movement to change that.

The preliminary research has found convincing evidence to support its use. Mindfulness techniques can be used for children as young as 3, utilizing mantras (Sequeira & Ahmed 2012). In fact, a music, dance, and yoga study which utilized mindfulness through these activities, found that children aged 5-12 benefitted the most out of any age group from these practices (Semple 2018). This indicates that certain mindfulness techniques may be beneficial to some groups more than others and that mindfulness can be utilized by young children during a critical developmental period.

The most profound study I read was using a technique known as *Meditation on the Soles of the Feet* or SoF (Singh et al. 2011). This treatment is meant for individuals with aggressive behaviors. The participants in the study had an average 15-30 aggressions per week. Baseline behavior was recorded and then the subjects went through a training course for SoF until their aggressive behaviors were at zero for four weeks. When the training stopped, Singh et al. (2011)

did a 3-year follow-up to find that all three subjects had less than 3-4 aggressive outbursts in the entire time since their training. This has been repeated with populations with Asperger's and found the same results in a 4-year follow-up (Singh et al. 2011).



Singh et al. (2011)

Another common issue among people with ASD is a lack of social skills. Dr Stixrud stated in a webinar, that because ASD individuals are stressed or don't feel safe it is very hard for them to engage socially (David Lynch Foundation 2013). Multiple studies have found that mindfulness-based practices are helpful in increasing social behaviors (de Bruin et al. 2015,

Koenig et al. 2012, Radhakrishna 2010, Radhakrishna et al. 2010). This improves the quality of life for the one with autism so that they can more easily develop friendships and form social bonds.

People with autism tend to have more intense reactivity to stimuli because of the extra gray and white matter in the brain (Sequeira & Ahmed 2012). Mindfulness reduces reactivity and can reduce the internal reaction and therefore the external outcomes. This could result in reduced aggressive behaviors, tantrums, or escape behavior. Another common ASD symptom is rumination, where the person gets fixated on one particular thing or phrase. A group mindfulness therapy program and a randomized control trial found that mindfulness decreased rumination (Semple 2018, Spek et al. 2013). Decreasing rumination has been found to attribute to the decrease in anxious and depressive symptoms (Spek et al. 2013).

Mindfulness based treatments have been compared to cognitive-behavioral therapy (CBT). Both tend to have lasting effects in follow up (Sizoo and Kuiper 2017) but there are still many differences. The two differ in various ways but one of the most prominent qualities of this type of treatment is its simplicity. Many individuals with autism have lower cognitive functioning and so treatments like CBT can be more difficult to comprehend and implement (Spek et al. 2013). Some of the emotions being brought up and examined during CBT are hard to confront and since individuals with ASD tend to have higher emotional reactivity, mindfulness is gentler, allowing them to notice and accept their emotions without judgement (Sizoo & Kuiper 2017). Another benefit to mindfulness is that it can be used in any situation since it is more focused on gaining skills that can be generalized whereas CBT is more structured and much of the work is done in the session. One paper compared the effectiveness of a variety of treatments including CBT, mindfulness-based therapy, cognitive remediation therapy, behavioral therapy,

combined psychosocial intervention, and social/academic/vocational skills training. In this study, out of all the psychosocial treatments, MBT was the only one that was rated as being consistently effective and having an overall moderate effect compared to the low effects rated for the other therapies (Menezes et al. 2020). Another study found that CBT and mindfulness-based stress reduction (MSBR) are equally effective in treating anxiety and depression. However, I feel it is important to mention that when looking at the data, even though there wasn't a significant difference between CBT and MBSR, the MSBR group had slightly better improvements in all domains (Sizoo & Kuiper 2017).

All of these findings showcase a multitude of benefits to the individuals with autism; however, it goes even further. Families that have an autistic child tend to lead stressful lives as the cost of treatment and the everyday behavioral problems of their child can be a lot to handle. Many of the studies cited earlier had the parents (typically mothers) do the meditations with their child. It did much more than just keep their child accountable, it helped create a stronger bond between them and reduced the anxiety of the mothers (David Lynch Foundation 2013). Even in the SoF treatment, the mothers found themselves using the technique so that they could ground themselves and put their attention towards a neutral part of the body in order to calm themselves (Singh et al. 2011). What medication or therapy can help both the child and parent in this way?

The benefits of mindfulness are so far reaching to so many different aspects to life, which is great, however, this makes it a difficult thing to study and quantify. This is an issue with holistic medicine in general, there are a multitude of effects but sometimes the effects are slight and not paid attention to. I personally think that although this practice may be useful on its own, I think that other treatment options like diet and ABA in certain cases would still be relevant in helping someone with autism improve their quality of life. Other limitations to this field of study

are that currently most of the studies that have been conducted have small sample sizes and tend not to have control groups. This just means there is much more room for research to be done. Not only replicating what has been done, but widening the pool of subjects, specifically individuals with ASD that are non-verbal. Almost all the studies I read were about verbal and higher functioning ASD adults. Some were with children but those tended to be movement and music based which is fine if that is what works best for that population. However, even after searching specifically for this kind of study, I did not find anything. Non-verbal people with ASD seem like they would be some of the most stressed within the autism community since they have extreme anxieties and can't even verbalize them. This has lots of potential but there needs to be a new way of altering mindfulness in order to work with more specific populations. In one study, they altered it so that the instructional period and breathing exercise was longer so that they could accommodate the learning capabilities of those individuals (Spek et al. 2013). I think that is an important aspect to using these practices, that patience and understanding that sometimes certain people just take more time and care in order to help them properly.

This project has helped me realize how I can use my passions and interests to help the world in some small way. Since things are all very new in this area of study, I know I will need to forage my own path which is something I am prepared to do. I want to be part of the reason why someone's life is better and if this is the way I am going to do that, that makes me happy.

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