

**Mindfulness-Based Outdoor Behavioral Healthcare for Individuals with Autism Spectrum
Disorder: Possibilities, Suggestions, and Challenges**

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Abstract

The prevalence of autism spectrum disorder has been rapidly increasing. Traditional treatment interventions such as applied behavior analysis (ABA) have been very successful in targeting specific behaviors to shape and reinforce, thus eliminating problem behaviors such as self-injury and aggression. However, comprehensive treatment options are being developed with more of a focus on the strengths of the individual. These treatment options seek to use the natural environment in order to form positive relationships, increase self-esteem, and lead to a greater quality of life. In this paper, I synthesize research on outdoor-based interventions, and propose mindfulness as a fundamental building block for an outdoor-based therapy for individuals with autism to foster psychological and emotional growth in addition to established social and behavioral benefits. Future research should seek to make this approach as inclusive as possible so that it can be of benefit to individuals of various ages, dispositions, and tendencies (i.e. speaking or non-speaking).

Keywords: Psychology; Autism spectrum disorder; Mindfulness; Outdoor behavioral healthcare; Wilderness therapy.

Mindfulness-Based Outdoor Behavioral Healthcare for Individuals with Autism Spectrum Disorder: Possibilities, Suggestions, and Challenges

According to the American Autism and Developmental Disabilities Monitoring Network, 1 in 54 children has ASD, and the prevalence of ASD has rapidly increased from 6.7% in 2000 to 18.5% in 2016 (Centers for Disease Control, 2020). With the prevalence increasing this rapidly, existing treatment models must be evaluated, improved and added upon so that any individual can find an intervention that best suits them. Traditional treatment interventions such as applied behavior analysis (ABA) have been very successful in targeting specific behaviors to shape and reinforce, thus eliminating problem behaviors such as self-injury and aggression. However, comprehensive treatment options are being developed with more of a focus on the strengths of the individual. These treatment options seek to use the natural environment in order to form positive relationships, increase self-esteem, and lead to a greater quality of life. In this paper, I will synthesize research on outdoor-based interventions, and propose mindfulness as a fundamental building block for an outdoor-based therapy for individuals with autism to foster psychological and emotional growth.

Autism Spectrum Disorder (ASD)

Autism spectrum disorder (ASD) is a neurological disorder that is characterized by difficulties with social behaviors and interactions. Individuals with ASD typically engage in restrictive, repetitive behaviors that can lead to challenges with forming, understanding, and maintaining relationships (American Psychiatric Association, 2013). When discussing treatment methods for individuals with autism spectrum disorder, it is important to explore multiple creative modalities. Certain methods have been cited as very effective in achieving their goals (Makrygianni et al., 2018; Dillenburger & Keenan, 2009; Vietze & Lax, 2020), but professionals

must constantly be thinking of any possible and necessary improvements. Ultimately, the goal of treatment for individuals with autism spectrum disorder is to improve the quality of life of each individual and their unique expression of ASD. Any treatment strategy must utilize an appropriate, individualized, and creative combination of strategies and involve support from both family members and trained professionals in order to maximize its benefits and respect the wishes of the participant/client and their family (Volkmar, et al., 1999).

Interventions should aim to examine an individual's daily routines, interactions, and relationships, and improve upon them. This can be done by observing naturally occurring events and elaborating upon them as teachable moments (Harris & Delmolino, 2002). There cannot be a clear-cut therapeutic technique that works for every individual; therapeutic plans must be evidence-based, scientifically tested, and tailored to each person's unique needs (Strain, et al., 2011).

In addressing each individual's unique needs, it is important not only to explore variety in treatment style but to also explore variety in treatment settings. This paper will go on to discuss traditional settings such as clinics and educational settings, and then transition to some eclectic interventions that incorporate the outdoor, natural environment. By combining a nature-based approach with established mindfulness techniques, practitioners can create a unique therapeutic program that supplements traditional methods by targeting behaviors, social skills, and mental well-being. The proposed treatment incorporates and synthesizes methods that pertain to children and adolescents on the autism spectrum, some with histories of aggressive behavior, and seeks to extend these methods to other ages and expressions of autism.

Applied Behavior Analysis (ABA)

Children with autism spectrum disorder and intellectual disabilities exhibit more “problem behaviors” than their typically-developing peers. Problem behaviors are defined by Newcomb and Hagopian (2018) as any action that “poses risks to self or others and is disruptive to functioning” (p. 96). Some examples of these behaviors are: self-injurious behavior, aggression, pica (eating inedible objects), disruptive behavior, and elopement (Newcomb & Hagopian, 2018). Many therapeutic interventions for children with autism spectrum disorder aim to target an individual’s specific problem behaviors and reduce the frequency in which they occur.

Applied behavior analysis (ABA) is a highly effective and widely studied intervention that targets problem behaviors in children with autism (Newcomb & Hagopian, 2018). ABA draws from principles of operant conditioning such that its practitioners pair reinforcement alongside desired behaviors in an orderly, systematic manner. Experts in ABA use reinforcement schedules, or well-defined rules of when to deliver reinforcement, in order to encourage a behavior to occur naturally (Staddon & Cerutti, 2003).

With the proper conditions, ABA is a very effective method of improving intellectual abilities, moderately to very effective in improving communication and language skills, and moderately effective in improving social skills (Makrygianni et al., 2018). Conditions recommended for an effective approach include early intervention (before the age of 3), a 1:1 provider to client ratio, and training sessions for parents of clients (Makrygianni et al., 2018).

ABA relies on the development and implementation of a treatment plan. A treatment plan should establish goals for intervention, identify target symptoms for intervention, and monitor the multiple domains that influence functioning (i.e., behavior, communication skills, social skills; Volkmar et al., 1999). When developing a treatment plan, professionals may engage in

functional behavior assessment, which involves observing a clients' behavioral tendencies in a natural setting, such as a classroom. By engaging in this technique, practitioners identify environmental factors that cause or intensify a maladaptive behavior; they utilize this knowledge to create each client's treatment plan (Vietze & Lax, 2020). Practitioners also come to understand the function of a problem behavior and implement it into the plan (Newcomb & Hagopian, 2018). Practitioners of ABA use a combination of techniques in order to effectively and appropriately carry out each client's individualized treatment plan.

Certain innovations in the field of ABA have been reported to be very effective, and they can be utilized in the future to strengthen various therapeutic modalities. Harris and Delmolino (2002) describe discrete trial instruction (DTI) and natural environment training (NET), two important recent contributions to the field of ABA. DTI builds upon functional behavior assessment by pairing consequences in the form of rewards to behaviors in order to reinforce desired behaviors systematically through data collection. DTI utilizes various forms of prompting (i.e., verbal prompting, visual prompting, physical prompting) to encourage an individual to engage in a certain behavior. With time, prompts are faded and the desired behavior will ideally occur naturally (Harris & Delmolino, 2002).

In natural environment training (NET), the client is in control of the circumstances in which behavior modification and shaping occurs. The client's naturally-occurring interests and motivations are at the center of the treatment; the client's intrinsic motivations are used by practitioners in order to build upon communication skills and also reduce maladaptive or disruptive behaviors (Harris & Delmolino, 2002).

Through the use of DTI and NET, behavior analysts are able to make use of any situation to reinforce, shape, and monitor behavior patterns. For example, if a client wants to play with toy

cars, but requires practice in initiating social interactions, the child may be prompted to invite a peer to play with toy cars with them. In this way, the client is in control of their natural play setting, but is also working to improve upon social skills (NET). A professional can implement DTI into this scenario by pairing a reinforcement (i.e., verbal praise) with the clients' act of inviting a peer. The interaction will be recorded and attempted multiple times, until the client independently invites peers to play. This interaction utilizes multiple aspects of ABA in order to encourage social behaviors.

The findings of Vietze and Lax (2018) supported that children benefit greatly in communication skills, motor skills, adaptive behavior, and learning milestones when entering an early intervention program. Their program involved children in a variety of different modalities of instruction including classroom instruction, individual instruction, and group activities before the age of 28 months. Their results showed significant improvement across multiple groups after an average of 28 weeks with 10 hours of sessions per week. This supports the "earlier is better" mentality as it relates to behavior-based interventions for children with autism spectrum disorder (Makrygianni, et al., 2018).

Comprehensive Treatment Options

Behavioral interventions are undoubtedly effective in shaping and influencing behavior. Dillenburger and Keenan (2009) note that many lay people as well as professionals hold perceptions that ABA should be "part of an eclectic mix of interventions" (p. 193). Creative and eclectic approaches are being explored and utilized not instead of, but in addition to behaviorally rooted interventions in order to attend to the various aspects (other than behavior) that influence individuals' lives. Within this section, I will explore and discuss the variety of non-traditional treatment methods, and how they are used in combination with traditional methods.

Comprehensive treatments are rooted in a broader approach that focuses on prosocial behaviors and socioemotional factors (Schottelkorb, et al., 2020). Child-centered play therapy (CCPT; Schottelkorb, et al., 2020) falls under the umbrella of comprehensive treatments. In play therapy sessions, a trained play therapist encourages a child to experience and better understand feelings and thoughts through play. In a CCPT setting, clients are accepted for who they are, regardless of any diagnosis or behavioral pattern. This type of therapist-client relationship is speculated to cause improvements in communication, relational engagement, and self expression, and declines in anxiety and aggression (Schottelkorb et al., 2020). Similarly to ABA, CCPT involves parents in this process in order to consult and discuss ways to maximize the effectiveness of treatment.

Comprehensive treatment programs are being explored and developed in order to facilitate social-communication skills for children on the autism spectrum. For example, summer programs have been developed which use verbal instruction in combination with modeling and role playing-based activities to reinforce communication, socialization, and daily living skills (Lopata et al., 2018). In a shift from a problem-focused approach, Ai Lim Lee et al. (2020) developed a strengths-based program that encourages individuals with autism to explore their interests in both creative and STEM-related pursuits. This program builds upon the strengths of individuals with ASD, such as detail-orientedness, memory, and creativity to foster confidence, self-esteem, and a sense of purpose.

Though specific treatment techniques such as ABA have been proven to be very effective, there is room for the increased use of other techniques with complementary goals (i.e., strength-based programs, comprehensive, and person-centered therapies). With the implementation and addition of new programs in addition to existing programs, mental health

professionals working with children with ASD can not only focus on a reduction of problem behaviors, but also on increases in self-confidence, prosocial behaviors, and overall satisfaction for the individuals involved.

Outdoor Interventions

While there is a long-standing tradition of therapeutic interventions occurring in clinical settings, there have been a number of recent developments in nontraditional settings. Researchers have been examining the benefits of exposure to nature on both cognitive processes and mental health for decades. Experiences in nature have been noted to have positive effects on mental health (i.e., positive affect, positive mood, and less feelings of sadness; Bratman, et al., 2012). Additionally, exposure to the natural environment has been discussed as a source of relief from the stress of everyday life (Kaplan, 1995; Berman et al., 2008).

Attention restoration theory (ART) explores the cognitive benefits of nature exposure as it relates to both attention and stress. Kaplan (1995) explored our daily routines as they require intentional focus, or direct attention. Direct attention requires a great deal of effort, and it results in fatigue. Eventually, we feel burnt out and require time and space to recharge, and nature is well-suited for this recharging process (Kaplan, 1995). Because nature is so captivating to us, it invokes involuntary attention, or a sense of effortless cognition. During this state, one's capacity for direct attention can replenish (Berman et al., 2008).

Berman et al. (2008) measured the effects of nature exposure on cognitive abilities. To measure cognitive ability, participants engaged in tasks that required direct attention (i.e., memory retrieval tasks). Participants spent a break in nature, and returned to continue their tasks. Post-break, the participants who spent time in nature showed greater cognitive improvements than their counterparts that spent time in an urban setting (Berman et al., 2008).

Ballew and Omoto (2018) focused on the benefits of nature exposure in terms of positive emotions. Their findings showed that individuals that spent time in nature reported greater levels of positive emotions such joy, amazement, and happiness compared to those who spent time in manmade environments. However, these positive emotions were specifically triggered by “an immersive experience with nature and not merely just by being outside” (Ballew & Omoto, 2018, p. 32). Although not as effective as physically being in nature, virtual simulations of nature have also been examined to have positive effects on well-being (McMahan & Estes, 2015). Whether it exists in a physical or virtual atmosphere, absorption in the natural environment is crucial for positive emotional outcomes.

Given the benefits of experiences in nature, it is no surprise that mental health practitioners are considering therapeutic modalities that take advantage of an immersive, natural setting to build and strengthen mental health and social skills in their clients. For example, therapeutic wilderness camping is an intervention that originated in opposition to behavior-based learning, and in favor of relationship-based learning. It was founded based on the idea that through daily routines of cooperation, leadership, and survival-based learning, people can learn about “harmonious and happy social living” and good character (Loughmiller, 2007, p. 9). Individuals in a wilderness camping environment learn about interpersonal skills, self-love, and responsibilities.

Although outdoor-based interventions are often addressed by different names (e.g., wilderness therapy, therapeutic camping, outdoor therapy), these types of interventions are similar in their basic features. Some key elements of wilderness therapy programs are time away from day-to-day stressors, physical labor challenges, hiking, sports, games, and outdoor cooking and living. These elements are incorporated into programs that take place on weekend trips,

long-term residential ventures, and even summer camps in order to reduce emotional struggles and stress for clients (Harper, 2017). In the next two sections, I describe one particular outdoor-based approach and then discuss how outdoor-based programs have occasionally been used particularly with individuals with ASD.

Outdoor Behavioral Healthcare (OBH)

In more recent years, there has been a shift from the traditional wilderness therapy to what is now known as outdoor behavioral healthcare (OBH). OBH programs incorporate professionals in mental health, medical health, and environmental pursuits to create a space where individual treatment plans can be created and carried out for individuals diagnosed with oppositional defiant disorder (ODD), substance abuse disorders, and depression (Russell, 2003). An OBH program relies on communal living and a strong therapist-client relationship in order to reduce behavioral and emotional symptoms.

In OBH, the therapist and client are often eating, sleeping, and participating in outdoor challenges together. This allows the therapist to become an approachable, relatable figure. In combination with a stable therapist-client relationship, the setting of communal living creates a unique atmosphere where participants are able to form close bonds with other participants as well (Russell, 2003).

Field instructors are the staff members that work and live the most closely with participants in an OBH setting. Their training is extensive, as it combines the fields of mental health and wilderness skills. Although they typically are not licensed mental health professionals, they are trained by licensed therapists to implement behavior management and crisis intervention techniques in their outdoor sessions. Often, this training involves role-playing as their students/clients in order to understand how they feel in the OBH setting. In a survey, field

instructors reported wanting to spend more time with program therapists in order to learn more about specific therapeutic and behavior management skills (Marchand & Russell, 2011). A strong connection between field instructors and program therapists would maximize the benefits of an OBH program for clients of all abilities.

OBH programs have been developed with the freedom to implement a focus on both mental and physical health (and the interconnectedness of the two) by infusing physical challenges with emotional/mental wellness check-ins (i.e., mindfulness practice; Combs et al., 2016). In studies measuring both adolescent self-reports and parent reports, clients in OBH programs have been shown to make significant improvements in emotional and behavioral functioning both immediately after treatment and also at 6 and 18 months post-treatment (Combs et al., 2016). Although OBH programs have been successful in reducing symptoms of a multitude of atypical behavioral, attentional, and mental disorders, not much has been explored in terms of OBH implementation with individuals with autism spectrum disorders.

Wilderness Therapy for Individuals With ASD

As already discussed, summer programs and play-based interventions have been developed and discussed to encourage individuals with ASD to explore their interests and strengths (Lopata et al., 2018; Schottelkorb, et al., 2020). In a similar fashion, other programs have been incorporating the outdoors into their experience to create a therapeutic environment for children on the autism spectrum (Morrier & Ziegler, 2018; Michalski et al., 2003; Zachor et al., 2017).

Oftentimes, especially in the school setting, outdoor activities are encouraged in an unstructured environment. Although outdoor play is beneficial, when unstructured, it typically leads to isolation for children with autism, especially from their typically developing peers. For

this reason, it is important to structure activities. The inclusion of structured activities (e.g., singing songs with peers, playing social games) has been reported to increase the likelihood for children with ASD to initiate and participate in social play activities (Morrier & Ziegler, 2018).

In their therapeutic summer camp, Michalski et al. (2003) incorporated a low camper-to-staff ratio, outdoor activities, and therapeutic support from staff to provide a healthy and constructive environment for children who may have otherwise been bullied or left out at other camps. Participants in this study had learning disabilities in addition to a variety of social, emotional, and behavioral challenges. After the camp experience, campers self-reported significant decreases in feelings of loneliness. Parents reported that their children exhibited more responsibility, cooperation, and self-control after the summer camp. By building on their strengths in an outdoor setting, participants in outdoor camps/play-based programs can increase their feelings of connectedness and inclusion.

In fact, a pioneer program has been developed that uses an outdoor adventure approach to foster self-efficacy in children with autism. In this program, Zachor et al. (2017) developed a 13 week-long program that was physically accessible for individuals of all abilities. Their weekly sessions started off with a dance warm-up, and followed with obstacle-like activities that relied on motor skills, concentration, collaboration, and communication with peers. The program had a significant impact on symptoms of ASD, especially in the area of social communication (Zachor et al., 2017).

This program also had an interesting impact on repetitive, restrictive behaviors (RRB, e.g., hand flapping). The control group that did not receive outdoor adventure activities experienced a long-term increase in these behaviors. This is typical for individuals with autism. However, the experimental group that engaged in outdoor sessions did not show this increase in

RRB (Zachor et al., 2017). This program exhibited encouraging results in shaping behavior and social communication, but could have benefited from mindfulness practices that focus more on emotional and mental well-being.

Mindfulness

Mindfulness, with its roots in Buddhist traditions, is commonly defined as the practice of keeping one's consciousness attentive and present in the moment. An individual can engage in mindfulness at any time, and when engaged in any activity (even eating). There are three underlying mechanisms of mindfulness that exist in any mindfulness-based intervention: intention, attention, and attitude (Shapiro et al., 2006). By incorporating elements of these mechanisms, therapists and mental health practitioners can infuse mechanisms of mindfulness to strengthen their treatment plans.

An *intention* of mindfulness is one's idea of why they are practicing in the first place. This is an evolving definition, and it changes with one's practice. As an example, a practitioner's intention may initially be stress management, but it may eventually become self-exploration as the practice deepens. The second mechanism is *attention*, or the act of focusing on one's moment-to-moment experiences. This component of mindfulness encourages "suspending all the ways of interpreting experience and attending to experience itself, as it presents itself in the here and now," (Shapiro et al., 2006, p. 376). The third mechanism of mindfulness is *attitude*. This can be described as the qualities one brings to their practice of mindfulness. For example, one can be observing the moment in a critical way, or in an open-minded, non-judgemental way. These three components act in concert to create each individual's practice of mindfulness (Shapiro et al., 2006).

The effects of this awareness is associated with numerous well-being indicators, including self-regulation, or a stability and predictability of an individual's internal disposition, despite the presence of external changes (Shapiro et al., 2006). By simply observing and being present in the moment, individuals who engage in mindfulness tend to exhibit a strong concordance between implicit and explicit emotional states, constructs, and processes (Brown & Ryan, 2003). For example, this concordance may involve an understanding of self-concept, gender, or self-esteem. This supports the belief that individuals who engage in mindfulness not only become more emotionally and mentally stable, but they also gain a greater understanding of their feelings and identities.

In recent years, mindfulness has become an element in many therapeutic interventions for individuals with ASD (Semple, 2019; de Bruin et al., 2014). Findings suggest that yoga and mindfulness-based interventions promote a variety of prosocial behaviors such as communication, social responsiveness, self-control, psychological relaxation, and quality of life. Additionally, these interventions tend to reduce aggressive behaviors, irritability, and social withdrawal for individuals diagnosed with ASD, some with histories of physical aggression (Semple, 2019). These results have inspired mindfulness programs that seek to improve the mental health, quality of life, and social skills of individuals on the autism spectrum and their families (de Bruin et al., 2014).

For example, *MYmind* is a mindfulness program that was originally created for children with attention deficit hyperactivity disorder (ADHD). With the addition of sessions and activities that explore stressful situations relating specifically to many people with ASD (e.g., coping with transitions and routine changes, identifying and understanding emotions), this program became a comprehensive mindfulness program for both adolescents with ASD (aged 11 to 23 years) and

their parents (de Bruin et al., 2014). The elements of this program had impressive results in terms of mental and emotional health.

Some elements of *MYmind* included predictable and structured sessions where practitioners used concrete language (as opposed to abstract), and plenty of silence where participants were offered the opportunity to reflect on their emotions and behaviors. In their spare time, participants were encouraged to keep a diary and practice meditating on their own time. While this program reported no change in the core symptoms of ASD, the adolescents reported increases in quality of life, decreases in rumination about unpleasant memories or emotions, and increases in social responsiveness (de Bruin et al., 2014). This focus on mental and emotional well-being can be combined with previously discussed interventions to create an optimal environment not only for shaping behavior, but for cultivating social skills and improving upon mental health as well.

Suggestions, Implications, and Potential Challenges for the Creation of a Mindfulness-Based OBH Program

OBH programs are effective in targeting behavioral and social skills; mindfulness, when practiced in an OBH setting, can broaden the scope of treatment outcomes for participants to produce benefits in terms of mental and emotional health (de Bruin et al., 2014; Semple, 2019; Zachor et al., 2017). The pioneer OBH program for autistic is effective in terms of behavioral and social outcomes, but is limited in emotional outcomes; by grounding their experience in mindfulness, they can extend its effectiveness into the emotional sphere (Zachor et al., 2017). Mindfulness could be the missing piece in this OBH program, and it can be a valuable component on new programs in the future.

While OBH is, by definition, a behavioral approach, its benefits do extend into social and emotional spheres as well, due to the utilization of the natural environment and techniques used within the approach (Russell, 2003; Kaplan, 1995; Bratman, 2012; Zachor et al., 2017). By implementing mindfulness into these programs, a greater emphasis can be placed on the emotional benefits of the natural environment (Shapiro et al., 2006). Combs et al. (2016) mentioned mindfulness as an element of their OBH program, but specific techniques were not defined or examined. This shows that mindfulness is a technique that can be present in this type of intervention, but further research should explore its specific benefits to the program.

I will propose some suggestions for infusing mindfulness into the OBH program for children with ASD that were previously discussed in order to create a therapeutic approach that encompasses behavioral, social, and emotional goals. This pioneer OBH program for individuals with ASD involved check-ins at the end of each session, where participants answered questions such as “how was it?” and “what activities did you enjoy doing?” (Zachor et al., p. 552). These questions facilitate social communication between participants and staff members.

This is an opportunity for a mindfulness session, and a potential opportunity to use *MYmind* mindfulness training. With mindfulness training, participants can take a break from their physically and socially challenging team-building activities to practice deep breathing, coping mechanisms, and emotion recognition and understanding. Depending on the preferences of participants, staff members can decide if these check-ins should occur once at the end of the day, or sporadically throughout the day (possibly during water breaks or after activities). By engaging in mindfulness activities, participants can gain an increase in emotion-regulation, psychological relaxation, and quality of life, alongside the established benefits of the OBH experience. (de Bruin et al., 2014; Semple, 2019; Shapiro et al., 2006). These check-ins should

be incorporated into programs with participants that vary in their expression of autism in order to gauge the effectiveness and potential for inclusivity.

The benefits of these mindfulness activities relate to attention restoration theory (Kaplan, 1995). After engaging in activities that require a great deal of direct attention and social communication, participants should be offered a chance to take a deep breath, experience the natural world around them, and restore the ability for direct attention. If sitting still and fully focusing on breathing is a challenging and effortful task for some, a nature walk could have similar beneficial effects in terms of restoring attentional energy and increasing positive emotions.

Walking meditation is the practice of being mindful and in the present moment, while simultaneously walking, “as if we were kissing the earth and the earth were kissing right back” (Kabat-Zinn, 2017, p. 249). Although this requires walking and movement, the speed of walking and the destination of the walk are unimportant. Rather, it is the individual’s awareness of the body and attention to breath that allows this technique to yield the benefits of both mindfulness and nature experience. A 2018 study has suggested that the combination of walking and meditation in succession has a significant effect in decreasing anxiety and psychological arousal in young adults (Edwards et al., 2018). Although this example of walking meditation does not involve individuals with ASD, it points to a potential for future research to be done with this population involving both meditation and the natural environment, especially if sitting still is a challenge.

The addition of mindfulness to this OBH program also connects with Ballew and Omoto’s (2018) findings that link immersion in nature and positive emotions. They suggest that individuals should be offered a break from focusing inward on their thoughts and behaviors.

Participants, especially in a physically and mentally demanding environment, should be offered time to simply focus on the environment around them (Ballew & Omoto, 2018). Since mindfulness can enhance one's feelings of immersion in the natural environment, the positive effects of immersion (e.g., joy, contentment, happiness) in nature can be enhanced through mindfulness practice.

Implications, Future Directions, and Challenges

This addition to an OBH program has the potential to reach a more diverse population of parents and guardians of children with autism. Perhaps some parents are getting involved with ABA or more traditional therapies, and they want something supplemental. Perhaps some are skeptical of a strictly behavioral approach, and they want to try something with a focus more on social relationships, mental, and emotional well-being. By using a similar mindfulness intervention to *MYmind*, parents and families could also gain a greater understanding of their children through mindfulness training (de Bruin et al., 2014).

There is currently no research on the effectiveness of a mindfulness-based OBH program for individuals with ASD. Future trials and programs should seek to utilize mindfulness practice to produce a greater sense of well-being in all participants, regardless of their unique expression of autism. Training of field instructors for this type of program must be more extensive to capture the facets of mindfulness. Also, further research and trials must be done on this type of intervention for individuals who are non-speaking, or who prefer to use methods of communication other than speaking.

Because of recent technological advancements in speech-generating devices, or alternative and augmentative communication (AAC), future research could examine how communication applications and devices can be implemented into the OBH/mindfulness process.

Studies suggest that the use of AAC within a treatment plan may facilitate communication and encourage improvements in both verbal and nonlinguistic communication skills (Almirall et al., 2016). By incorporating speech-generating devices into OBH treatment plans, staff members can ensure that participants, regardless of abilities or tendencies, have an active role in their experience in the OBH program, and they can communicate their preferences to their instructors and guides.

This type of intervention can also be adapted for individuals of a variety of ages. In the pioneer OBH program that was previously discussed, participants ranged only from age 3 to 7, but in the *MYmind* mindfulness training program, participants ranged from 11-23 years old (Zachor et al., 2017; de Bruin et al., 2014). This difference in age range could require a tweaking of the *MYmind* program so that it is relevant and effective for other ages. Though an early intervention is beneficial in maximizing an intervention's effects, this program has the potential to benefit individuals of various ages, including different stages of adulthood. Examining this type of intervention with various age groups can further validate its effectiveness.

In conclusion, a therapeutic approach that seeks to combine the outdoors and natural environment with mindfulness techniques can have great benefits for individuals with autism spectrum disorder in terms of social, behavioral, and psychological tendencies. An outdoor behavioral healthcare setting can be strengthened by incorporating breathing exercises, discussions about emotions, and meditation sessions. The goal of this program is to create a therapeutic program that is accessible and beneficial for all individuals in order to improve upon quality of life. Ultimately, future work will need to examine the practicality of this method for individuals of all ages, abilities, and tendencies.

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