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Exploring Hydrotherapy with Autism

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Exploring Hydrotherapy with Autism

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The University of Akron Williams Honors College

Spring 2018

Exploring Hydrotherapy with Autism

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College of Health Professions

Honors Research Project

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I. Abstract

The Centers for Disease Control and Prevention (CDC, 2010), have recently reported an increase in the number of children diagnosed with an Autism Spectrum Disorder (ASD).

Occupational therapists who work with children diagnosed with an ASD focus on building skills in all areas of life such as daily living skills, education, play, and social communication, and in various environments such as school, home, and community (American Occupational Therapy Association [AOTA], 2009). Currently, occupational therapists working with children who have been diagnosed with an ASD are expanding the use of aquatic therapy (Vonder Hulls, Walker, & Powell, 2006) as a treatment approach within the Occupational Therapy Practice Framework (AOTA, 2008).

The purpose of this study was to explore hydrotherapy, and other similar forms of aquatic therapy with autism. Qualitative data observations were collected at a Northeast Ohio recreational and aquatic therapy center for individuals with special needs. Observational field notes and hands-on experience provided robust data collection on the beneficial aspects of aquatic and adapted therapy sessions. Therapy observations included: facilitating language development and self-esteem as well as adaptive behavior, balance, agility, lower and upper extremity strength, and cardiovascular fitness. Observations were analyzed for major trends among observations. The results yielded noticeable benefits such as a reduction in the stereotypic autistic movements such as spinning and rocking, an increase in eye contact and social interaction, and the ability to verbalize what one wanted.

II. Definition

Autism currently ranks as the second most common developmental disability diagnosed in the United States and incidence rates continue to grow at a profound rate (Conatser, 2007). Autism Spectrum Disorder, or ASD, is a neurodevelopmental disorder that is diagnosed on the basis of early-emerging social and communication impairments and unusual, restricted, and repetitive patterns of behavior and interests. The expression of these is varied based on age and ability (Frith 2005). In addition to Autism, the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (DSM-IV-TR) has listed four other autistic-like conditions that are under the pervasive developmental disorders (PDD) umbrella which include Asperger's disorder, Rett's disorder, childhood disintegrative disorder, and pervasive developmental disorder, not otherwise specified (PDD-NOS). When clinicians refer to ASD they are typically including autism, Asperger's and PDD-NOS. (Steiner, 2007). The discovery of Autism Spectrum Disorder as well as Asperger's has a historical significance. In the 1940s, Leo Kanner and Hans Asperger both published their findings on a disorder involving social and communication deficits. Even though they worked independently of one another, both described this disorder as "autism," meaning "alone" (Slaughter, 2016).

Within the diagnosis of autism, there are vast differences with each individual and their level of functioning. Some children remain non-verbal while others develop language abilities but may continue to struggle with social communication (Steiner, 2007). Language development is frequently delayed and between twenty-five and thirty percent never acquire spoken language. Those that do are often monotone, repetitive, and focus mainly on their own concerns (Slaughter, 2013).

Because there is a wide variability within this condition, researchers have coined the term “high functioning autism” which separates children that have a high level of cognitive functioning. These children have a different expression of symptoms which is often less severe. HFA closely resembles children with Asperger’s in many ways and the distinction becomes even less apparent as they get older (Steiner, 2007).

There are many signs and symptoms that are displayed by those with autism. Social interactions are abnormal ranging from self-imposed social isolation to somewhat engaged but inappropriate social behavior. Individuals usually avoid eye contact, exhibit little facial expression and body language, and lack empathy. In adults with autism it is uncommon that they have close friendships or romantic relationships (Slaughter, 2013). Additional associated features are commonly seen in autism including sensory issues, sleep and eating disturbances, learning deficits, phobias, temper tantrums, and aggression (Steiner, 2007).

According to the US Centers for Disease Control, one in sixty-eight children has autism spectrum disorder with boys being four times more likely than girls to have these conditions (Slaughter, 2013). Although most people believe autism has become increasingly prevalent, some researchers argue that this rise is simply due to more awareness of the disorder and an increase in the accuracy of the diagnostic criteria (Slaughter, 2013).

Diagnosis

The *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition is the newest and most up to date version of the handbook that is used by health care professionals in the United States and much of the world as the authoritative guide to diagnosing mental disorders. In the DSM-5 the diagnostic criteria for Autism Spectrum Disorder states

“A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive, see text):

1. Deficits in social-emotional reciprocity ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
2. Deficits in nonverbal communicative behaviors used for social interaction ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.
3. Deficits in developing, maintaining, and understanding relationships, ranging for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).
2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day).

3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest).
 4. Hyper- or hyporeactivity to sensory input or unusual interests in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).
- C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).
- D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.
- E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level” (DSM-5). The following is a table from the DSM-5.

Table 1: Severity Levels for Autism Spectrum Disorder

Severity Level	Social Communication	Restricted, repetitive behaviors
<p>Level 3 "Requiring very substantial support"</p>	<p>Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches</p>	<p>Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.</p>
<p>Level 2 "Requiring substantial support"</p>	<p>Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and has markedly odd nonverbal communication.</p>	<p>Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.</p>
<p>Level 1 "Requiring support"</p>	<p>Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful response to social overtures of others.</p>	<p>Inflexibility of behavior causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.</p>

	<p>May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.</p>	
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Medical professionals are often the first people to rely on when identifying and referring children with ASD for proper evaluations and follow-up. The first step in identifying autism is systematic developmental surveillance beginning in early childhood and usually done by the primary care physician (Steiner, 2007).

Autism is almost always diagnosed in early childhood with the exception of some mild presentations that may not be diagnosed until middle childhood. One defining characteristic included in the diagnostic criteria for autism is a lack of imaginative or pretend play in childhood. The play of children with autism tends to be solitary and to involve the repetitive manipulation of objects (Slaughter, 2013).

Causes

As of the early 21st century, there is no known cause of Autism Spectrum Disorder. Some risk factors include genetic relatedness, difficult birth, and comorbid disorders such as attention deficit hyperactivity disorder and obsessive compulsive disorder (Slaughter, 2013). Genetics and environmental contributions seem to be the popular opinion among researchers. A biological basis has been recognized in early brain development. It is believed by some that a “three strikes” model will eventually lead to an explanation of the causes of ASD. This model

hypothesizes that a genetic context at a vulnerable point in development and the co-occurrence of these three strikes leads to a faltering in the developmental process (Steiner, 2007).

As well as genetics there is also the environmental factors. Recently, several environmental factors have been suggested as possibly contributing to the increase in prevalence of ASD. There are multiple environmental factors; some of these include infectious etiologies, exposure to toxins such as during vaccination, and excess ultrasounds during pregnancy. However, there is no scientific data that has been published to support these hypotheses (Steiner, 2007).

Oxytocin is a peptide that primarily acts as a neurotransmitter in the brain and has been implicated in autism. This is due to the role it has in social affiliative behaviors, social recognition, anxiety, and maternal behaviors. Low oxytocin levels and polymorphisms in its receptors as well as clinical benefits after oxytocin administration have all been reported in individuals with autism supporting the role that these peptides play in the pathophysiology of autism and open the door to development of disease-specific treatments (Steiner, 2007).

In one study, Hollander conducted a double-blind, placebo controlled, cross-over study in which synthetic oxytocin (Pitocin) was administered to 15 adults with ASD via intravenous infusion in a randomized, counter-balanced design in which subjects served as their own controls. Participants underwent two identical challenge days in which they were administered a continuous infusion of oxytocin or placebo intravenously over a 4-hour period and were evaluated for severity and frequency of repetitive behaviors using a four-point ordinal scale ranging from 0 (never) to 3 (constantly). The ratings were completed at baseline (0 minutes) and at 60, 120, 180, and 240 minutes. The results of a repeated-measures analysis of variance indicated that the severity and frequency of repetitive behaviors, as well as the total number of

different repetitive behaviors, decreased over time after oxytocin administration, compared with placebo (Green, 2011). These results suggest that OXT may play a role in severity and frequency of common compulsive and repetitive behaviors seen in ASD and offer further support for the theory that OXT dysfunction plays a role in the etiology of autism (Green, 2011).

Treatment

There is no cure for autism and there is not one single treatment that is relied on, rather multiple approaches have proven to be beneficial. Some of these include behavior modification, social skills training, speech and language therapy, occupational therapy, music therapy, and medication (Steiner, 2007). A combination of these types of treatments is often used to address the therapeutic needs of autistic individuals.

To adequately address the multiple areas of life affected when one has autism, interventions must be multidisciplinary, intensive, and occur across settings such as at home, at school, and in the community (Steiner, 2007). One of the most successful treatments for autism has been the intensive behavior modification therapy. O. Ivar Lovaas (1987) describes a program of intensive one-on one- behavior modification theory that can be highly effective but also very controversial. This is because it involves both rewards for appropriate behaviors and punishments for inappropriate behaviors. Those in opposition assert it that the positive reinforcement of rewarding appropriate behavior is effective enough that punishment is not necessary (Slaughter, 2013). There are variations in philosophy as well as technique but the overall goal of behavior modification is to increase social responsiveness and decrease inappropriate behaviors (Slaughter, 2013).

Occupational therapy focuses on teaching skills that allow individuals with autism to participate in daily life such as crossing the street, preparing simple meals, making purchases, and answering the telephone (Slaughter, 2013). Working on activities such as these can help individuals with autism develop the skills that they can later use to get a job. Some repetitive occupations such as entering computer data may fit well (Slaughter, 2013). Music therapy is also used and it is used to draw emotional responses (Slaughter, 2013). Dietary interventions have also shown positive results in alleviating some of the symptoms in certain cases (Slaughter, 2013).

There is no specific drug that is prescribed for autism but there are various medications that are used to treat the symptoms. Stimulant drugs may be used to treat the inattentiveness of those who are isolated and unresponsive. Tranquilizing drugs, on the other hand, are used to help obsessive compulsive behaviors that tend to disrupt normal functioning. Antidepressants are also used for those with particularly heightened emotional responsiveness or to stabilize mood.

Parents, siblings, and friends of individuals with autism can also benefit from therapies such as counseling and support groups. Living with an autistic person can be depressing, frustrating and exhausting but it can also be rewarding. Feelings of rejection are common because the autistic tendency is to avoid close social contact (Slaughter, 2013).

III. Aquatic Therapy and Adapted Aquatics

Drowning is the number one cause of accidental death in children with Autism Spectrum Disorder (Alaniz, 2017). Some individuals with autism react fearfully to new situations, while others have very little fear, which may lead them into dangerous situations. In an aquatics environment this means that some children with autism may need significantly more time to

adjust to being around water, while others need constant supervision because they may be unable to fully appreciate the dangers associated with water (ARC, 2009).

Aquatic therapy refers to treatments and exercises that are performed in the water for the purpose of relaxation, fitness, physical rehabilitation, and other therapeutic benefit. The water provides light resistance and increases the range of motion and sometimes the independence of the patient. Adapted aquatics is similar to aquatic therapy but it is typically prescribed for those who are more advanced. Adapted aquatics uses techniques that emphasize swimming skills modified to accommodate individual abilities (Conatser, 2007). Currently, occupational therapists working with children who have been diagnosed with ASD are expanding the use of aquatic therapy as a treatment approach within the Occupational Therapy Practice Framework (AOTA, 2008).

Water properties of buoyancy, hydrostatic pressure, and thermodynamics have been credited with aiding the effectiveness of therapies in the aquatic environment (Becker, 2009; Broach & Dattilo, 1996; Dale, MacDonald, & Messer, 2005). Each of these properties provides a unique advantage in providing therapy. Buoyancy helps reduce the load of body weight and can be used to assist, support, or to provide resistance. (Becker, 2009; Broach & Dattilo, 1996). Hydrostatic pressure exerts an equal and consistent amount of pressure on all submerged parts of the body, and provides resistance to help increase muscle strength and aerobic capacity without overstressing soft tissue (Fragala-Pinkham, Haley, & O'Neil, 2008; Getz, Hutzler, & Vermeer, 2006). Thermodynamics refers to the temperature of the water, which is most often recognized to have therapeutic benefits of relaxation, decreased pain and reduction in muscle tone (Becker, 2009).

When compared to individuals without ASD, children with ASD are more likely to have difficulty with balance, core stability, posture, and overall flexibility and fitness levels (Jansiewics et al., 2006). These deficits may be more pronounced because of the reduced opportunity to engage in physical activity. An example of this is shown in a study performed by Pan and Frey (2006). They compared 21 levels of physical activity during school by elementary students with ASD and those without disabilities. In that study, accelerometer measurements indicated that children with ASD were considerably less active than the comparison group. Previous research also suggests that health problems related to a sedentary lifestyle such as cardiovascular disease, diabetes, and obesity are more common among individuals with intellectual and developmental disabilities such as ASD (Chanas, Reid & Hoover, 1998). In contrast, when exercise is increased for children with disabilities, positive improvements in physical health, intellectual functioning, perception, behavior, affect, and personality have been reported (Folkins, 1981).

The therapeutic use of water activities in children with ASD has many benefits such as facilitating language development and self esteem as well as improving adaptive behavior, balance, agility, lower and upper extremity muscle strength and cardiovascular fitness. Aquatic therapy has also shown reduction in the stereotypic autistic movements such as spinning and rocking (Pan, 2010). The use of aquatic therapy for interventions in treatment for diagnosis on the autism spectrum is relatively new but the benefits from studies are undeniable. Based on the results of a survey administered to eighteen occupational therapists in the United States who provided aquatic therapy to children with ASD, findings reported increases in swim skills, muscle strength, balance, attention, touch tolerance, and initiation and maintenance of eye contact (Dubois, 2011). A research study posted on a recreational therapy website stated that

hydrostatic pressure “actually soothes and calms the children, providing the necessary sensory input they crave” (Jake, 2003, para. 10).

Although there are many physical, social, and emotional benefits to aquatic therapy for individuals with autism, there are also some obstacles that must be overcome. In the field of physical medicine, research lags behind anecdotal evidence and there are few gold standard clinical trials which support aquatic therapy for the treatment of autism (Case-Smith, 2014). This causes some therapists to deny the use of aquatic therapy for autism spectrum disorder. It would be beneficial to see the pool as another tool much like a therapeutic ball, a bolster, or a mat or swing; it is not the solution, it is simply another intervention to assist in therapeutic activities (Case-Smith, 2014).

Another obstacle is the cost of aquatic therapy. The Americans with Disabilities Act required private businesses to make reasonable accommodations for individuals with disabilities. This civil rights legislation mandates aquatic programs and facilities that are open to the public to provide accommodations for individuals with disabilities and equal opportunities to participate in the programs and services they offer (Gobin, 1998; Osinski, 1993). The spirit of the law does not allow community aquatic programs to offer a segregated class for individuals with disabilities as a substitute for making modifications to integrated programs (Dummer, 2003; Osinski, 1998). Segregated programs (e.g., a separate adapted aquatic program) may be offered as one of the services available, but placement in that program must be based on individual assessment of the swimmer, the demands of the regular program, and the desires of the individual with a disability or his or her caregiver (Lepore et al., 1998). Furthermore, if the individual with a disability is placed in a separate aquatic program (e.g., one-on-one), the cost to

the individual cannot be more than what is charged for a group program. This regulation means that no additional cost can be applied because a person has a disability

Insurance can aid in the cost of therapy. Insurance is widely varied and is dependent on the individual and their health status. Both Medicare and Medicaid can grant a specific number of therapy visits in a calendar year for a certain amount of years. Aquatic therapy with therapeutic exercise may be considered medically necessary if at least one of the following conditions is present and documented: the patient has rheumatoid arthritis; the patient has had a cast removed and requires mobilization of limbs; the patient has paraparesis or hemiparesis; the patient has had a recent amputation; the patient is recovering from a paralytic condition; the patient requires limb mobilization after a head trauma; or the patient is unable to tolerate exercise for rehabilitation under gravity based weight bearing. Aquatic therapy is not usually covered by insurance for people with Autism, it is self pay. Aquatic therapy can also be considered an out of network provider. The services are then billed as out-patient Physical Therapy or Occupational therapy (Jannenga, 2018).

IV. Personal Observations

Over the course of the semester I was able to observe first-hand both aquatic and adaptive therapy for children with Autism. Sessions are self-pay and include pool time that is also during open swim, swimming lessons, and sometimes aqua aerobic classes. Overall, observations from my time in the aquatic center included many therapeutic benefits along with witnessing the positive distraction water provides children during the sessions. Splashing water and screaming kids comprise the majority of distractions aiding the ambience of fun energy for kids during therapy sessions. Detailed field notes of my observations provide tangible qualitative data

outlining beneficial aspects of aquatic therapy. The names below are fictitious as to keep the confidentiality of the client.

Case 1: Seth – 24-year-old male

Seth, along with one other boy, were the very first clients in 2002 at the clinic where observations were conducted. He has received aquatic therapy for sixteen years now and has seen many of its benefits. When he first arrived, he was unable to walk on land or swim independently. He can now walk on his own both in the water and on land and he can swim freestyle and backstroke independently. I was able to observe Seth during my bi-weekly observations and he also receives therapy on another day, totaling three days per week. He is treated by two therapists on alternating sessions. Each instructor performs mainly the same routine however their teaching style is very different. One therapist is very easy going and allows Seth to do what he wants more easily than the other. This is because she has experienced his aggressive behaviors. Seth can become easily upset and become very aggressive. He pinches and grabs hair and arms and reaches for items to rip during his aggressive outbursts.

Something that really helps Seth to keep calm is singing. When his dad walks him into his therapy session, he is always singing and when he hands him off to the therapist, the therapists immediately start singing to continue the sensory stimuli that Seth enjoys. Singing usually helps keep him calm and prevents him from lashing out or getting overwhelmed. Seth is nonverbal but clearly understands what is being said when he is spoken to. He does not make eye contact and when he feels nervous or uncomfortable he fidgets with the strings on his swimming suit.

Seth is usually brought to his lesson by his dad or his aide. If his dad brings him he leaves during his lesson to get a “break.” He has watched Seth grow and progress through aquatic therapy over the years and because Seth is not able to make much more progress staying and watching is not important to him. His dad seems to enjoy his short break during therapy sessions and explains that he enjoys going outside for fresh air or even resting his eyes with a quick nap. If Seth is brought by his aide, the aide usually sits on the side of the pool physically present but not engaged and usually on his phone watching sports.

Seth has been receiving aquatic therapy for sixteen years and is not seeing any more progress, however they do have a “soft spot” for him as one of the instructors stated because he has been there since the beginning. This particular instructor is seeing some signs of burnout in herself teaching him because she has been doing the same thing over and over again but also because Seth has been aggressive with her. She now sees herself being hyper sensitive around him and she is not happy that she has grown apprehensive with her relationship. She explains that Seth can sense this with her which makes him sad and sometimes uncomfortable. This instructor does not see a need for him to continue therapy, however she thinks that he can go to open swim on his own time and get the same benefits; this would just be more work for the parents and they would not receive the break in their day.

Even though he does not see any progress, Seth still enjoys swimming because it is part of his routine that he is now very used to and does not want to change. He feels more independent when he is in the water. This is one of the only forms of exercise that Seth enjoys so it is important to him and his family that he continue. As discussed previously, Seth sees the benefits that any other individual who performs exercise also experiences such as positive change in mood, better sleep, and increased overall health.

Case 2: Zack – 17-year-old male

Zack is part of the adapted aquatics program at the clinic. His lesson is thirty minutes and the instructor coaches from the side of the pool and directly in the water. Zack always begins with a cardio activity that usually focuses on his lower body. He then chooses a stroke from the four strokes on his schedule and performs fifty yards of a drill and then fifty yards swim of that stroke. Alternating every other week, the stroke drill is upper body, and then lower body.

Zack usually has longer hair and he would fidget with it all the time but the first night I was able to observe him he had gotten a haircut and could no longer do this. His instructor pointed this out to me but at the end of the session said he did not notice it having any significant effect on Zack during his lesson. Sometimes Zack swims to the other side of the pool and forgets what he is supposed to be doing but once verbally prompted, he begins to swim again. Zack has trouble using both sides of his body at the same time therefore he cannot bilaterally breathe and breaststroke and butterfly are his weaker strokes.

When Zack concentrates on the water exercises he is very intensely focused and loves to succeed. He loves to compete and that is what motivates him. He wants to be able to “run” his own session. Sometimes he grabs his fat to show that he wants it gone. His mother says at home he is always looking for things to do to work out because he wants muscles. He is very self-conscious of his body. He started out with the clinic receiving aquatic therapy but progressed quickly and smoothly and is now in adapted aquatics. He is non-verbal but his mother states that since beginning here, he shows a lot more emotion through facial expression. He is always smiling and splashing during his lesson. He is usually dropped off and comes in to his session independently.

Case 3: Nick – 14-year-old male

Nick receives aquatic therapy at the clinic. He does not enjoy if there is more than one person near him so I was never part of his lesson, just a distant observer. Nick was particularly affected by the swimmers and children around him. He enters the clinic covering his ears because he does not like the audio stimulation of screaming children nor the simple noise of the pool area which is always amplified because of pool acoustics. Nick has a very hard time focusing when there are families in the water near him. Nick is somewhat verbal, usually talking when he is excited but cannot form full sentences. One day, Nick was telling us about sandwiches in the car, he seemed to be very excited about this, however, when asked anything else, he simply repeated “sandwiches in the car.” We later learned from his father that they had gone to Chicago on vacation and ate sandwiches in the car. Nick squeals a lot when he is either happy or very upset and is good at making eye contact, which is abnormal for an individual with autism.

Most of the time Nick comes with his father. While Nick is in his lesson his dad swims laps in the open swim lanes. He uses this time to get exercise himself and “de-stress.” He has made friends with the other individuals that swim at this time and enjoys socializing as well. Sometimes Nick’s mother also comes to the lesson and gets in the water, however she does not swim laps so she is on the same side as Nick. If this becomes a distraction she exits the pool and does not work out that day but if Nick is not distracted she goes about her workout, avoiding contact with Nick.

Case 4: Shane – 19-year-old male

Shane is part of aquatic therapy and I have also observed him during open swim on his own. His mother brings him to open swim and sits on the side of the pool on her phone while Shane enjoys jumping into the deep end. He does not perform any activities nor does he swim laps, he just enjoys being in the water either by jumping or standing in the shallow end of the pool. When coming to his lesson he is always on a mission. He walks in with his aide tagging along, usually running to catch up. He has many aides and they usually stay pool side and watch or do something on their phone.

Shane always walks directly to the water and gets in, even if instructed not to do so. This is most likely because he loves being in the water and does not understand the safety rules about getting in without the instructor. Shane is very good at making eye contact. He is always looking to his aide to see if they are paying attention. The instructor thinks this is due to the fact that he is proud of what he is accomplishing in the water. Shane also looks to the instructor for confirmation that he is doing it correctly when performing his activities. If he does something correctly and receives positive feedback his face lights up and he smiles.

Shane seems to be very balanced. He does not necessarily have good or bad days when he is in therapy. He requires constant verbal and physical prompting but he listens well and follows directions. He is non-verbal but communicates well through body language and facial expressions.

V. Discussion

Drowning is the number one cause of accidental death in children with Autism Spectrum Disorder. Studies have shown that as little as eight hours can be beneficial in improving the

water safety skills of children with Autism Spectrum Disorder (ASD), which is an important factor for drowning prevention (Alaniz, 2017). With education of aquatic professionals, there is a demand for an increase in accessibility and programming for families. It would be advantageous for therapists working with children with ASD to address swim skills as part of their usual care. By targeting skills that are particularly relevant for drowning prevention, there is an opportunity to meaningfully reduce the risk of drowning for children with ASD.

A study published in the *American Journal of Public Health* suggested that swimming classes for children with autism should be of top priority. Dr. Guohau LI, founding director of the Center for Injury Epidemiology and Prevention at Columbia, discussed the study with MedicalNewsToday.com saying *"Pediatricians and parents should immediately help enroll the child in swimming classes, before any behavioral therapy, speech therapy, or occupational therapy."* He continues: *"Swimming ability for kids with autism is an imperative survival skill."* Citing frustration with communication and social skills, Dr. Li says individuals with autism often seek refuge near bodies of water given the serene nature of the scene. This, in tandem with impaired motor skills, has led to a disproportionately large number of accidents for people with autism (Capers, 2017). One suggestion to caregivers and parents is to let neighbors and family friends know about the tendency of the autistic individual to wander and their attraction to water so the neighbor or friend can be on high alert. The Autism Elopement Alert Form is a form to share with people such as neighbors and first responders about the individual with autism so they are aware of specific information (Capers, 2017).

Children with ASD are 160 times more likely to drown than their neurotypical peers (Slaughter, 2016) making water safety especially critical for children and adults with autism. Many individuals on the spectrum are drawn to water, some of whom are unable to understand

the dangers associated with it. More information and research needs to be disseminated for parents and caregivers as well as physicians about the importance of including aquatic therapy with autism. Brochures advertising aquatic therapy can be placed in settings such as support groups and physical, occupational, music, and speech therapy clinics so the population of those with autism are exposed to the idea and can inquire about it to their physician. These brochures should also be placed in the facility in which aquatic therapy is provided. Another form of advertisement that would target most everyone is billboards and radio ads. Simply educating the public is what needs to be done to make advancements and increase the number of children with ASD receiving some form of water safety instruction.

As I was completing my project there was an article published in the Akron Beacon Journal on April 19th about a class at the YMCA that taught water safety to children with autism. The Autism Society of Greater Akron partnered with the YMCA to develop a ten-week water safety program titled “Swimming with Autism.” This program is based on a curriculum and program whose main goal is for participants to learn safety first and swimming second. It is programs like this that are not only helping to spread awareness but also provide the tools necessary for an autistic individual to understand the dangers of water and how to overcome them (Klafczynski, 2018).

Personally observing the caregivers, parents, therapists, and children was enlightening regarding the positive feedback that was given to me by them. The parents encourage their friends that also have children to be a part of some form of aquatic therapy. Every patient at the clinic I observed was referred by another client. They started with two and have grown to now serve over one hundred clients. This is a testament to the positive results aquatic therapy provides. One particular therapist that has been working at the clinic for seven years has clients

that have been with her for a minimum of two years, all the way up to five. This proves that the overwhelming benefits are worth the cost and time and that the children truly enjoy being in the water and do not want to eliminate it from their routine. The benefits of observations such as my own is another way to spread education and awareness however, much more support by the prescribing physician is necessary in adopting the use of aquatics with autism.

VI. Conclusion

Overall, the major themes that surfaced in my field notes throughout the one hundred hours I spent at the clinic were an observable increase in social interaction, eye contact, and trust. Clients not only leave their parents to be with the instructor without issue but also interact with other children already in the water. The instructors informed me that it is not always this way and if the client is new, it is a long process to get them to this point. The majority of the clients I observed have been with the clinic for multiple years. Eye contact was another major theme that reoccurred from patient to patient. An increase in eye contact was visible to the instructors as well as a decrease in stereotypic autistic movements. There are however good and bad days where these benefits fluctuate but overall, individuals with autism who participate in aquatic therapy are able to participate more normally in daily activities.

I was able to work alongside multiple different instructors with multiple different backgrounds and experience. Many of them have a Bachelor's degree in Recreation with a concentration in therapeutic recreation but not all of them possess this qualification. To work at the clinic, you first undergo two months of training with an instructor trainer. Because they have been with the children much longer than myself observing, they were able to provide much more insight into the benefits they have seen throughout the years. They articulated that each

individual is very different and schedules change and adapt to the client every week or until what works best for the client is discovered. Over the course of years, they have seen increases in social interaction both with the instructor as well as other children in the water. They have observed an increase in eye contact and verbalization as well as a more trusting relationship.

Volunteering at the clinic requires an understanding of both the needs of the child and the end goal that we are working towards, but also the understanding of what may overwhelm the child. Each child with autism has different needs, just like with any client that I might work with. In all cases, helping them to understand what we are going to do and how it will help work to calm their fears and show them that they are still in control. This experience has taught me a lot about the teaching processes and learning process with autistic children and enhanced my skills both on and off land. Teaching clients about their care will occur daily. Critical and creative thinking will be utilized in creating the best possible plan for helping clients to meet their goals. Overall, this focus will me to become the best possible therapist I can be, and ultimately help my clients to get the best care.

VII. Personal Statement

Upon completion of this project, I have successfully compiled sufficient research in attempt to gain further insight into the physical and social benefits of aquatic therapy for children with Autism Spectrum Disorder. I was worried at first that some the of tasks would be tough and provide many points of frustration, but the children were just happy to be in the water and learning more than anything. These experiences have shown me that I have a true passion for working with patients with disabilities and special needs. I enjoy the challenge and find that I appreciate the opportunity to work with them as much as they appreciate the opportunity to learn

from me. I am thankful for the opportunity to work with the instructors at the clinic and their willingness to help me learn.

As a student in the honors college I have been privileged with many opportunities that I am very thankful for. The Williams Honors college has allowed me to explore different areas of study through the honors distribution and the honors colloquia. The honors colloquia allowed me to meet and befriend students that also had a passion for learning and were self-motivated. I would like to thank my sponsor for assisting me in brainstorming ideas to begin the project as well as being there for me along the way, guiding me in the right direction. Thank you to my readers for taking the time to assist me, provide feedback, and help me grow as a writer. It has been a highly beneficial experience to work with faculty in my area of study and I thoroughly enjoyed it. Completing the independent honors project allowed me to grow as both a student and a professional. It provided me with greater knowledge in research as well as my field of study.

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