## MIDWESTERN UNIVERSITY



# The Effects of Scuba Diving on Occupational Performance in Individuals with Autism Spectrum Disorders



Shane Allen, OTS-II, Kelly Hayn, OTS-II, Megan Rowland, OTS-II

#### Introduction

The purpose of the study was to determine how scuba diving affects individuals with Autism Spectrum Disorders (ASD), specifically their occupational performance and social participation. The perceived benefits of scuba diving from the perspectives of the individuals with ASD, their parents, and dive leaders were also included.

ASD is a neurobiological developmental disorder that impacts social interaction, sensory processing, language, and communication (Dubois, 2011). The limited research available on scuba diving and disabilities is mostly on individuals with physical disabilities, but none related to ASD. The researchers partnered with Diveheart Foundation, whose goal is to create opportunities for individuals of varying ages and disabilities to experience scuba diving as a therapeutic occupation. This study sought to examine individuals with ASD who participate in scuba diving through the Diveheart Foundation.

#### Methods

Ten participants with ASD, aged 11-28 years, their parents, and six dive leaders were recruited via electronic flyers, phone calls and email communication. Data were collected after approval by the Midwestern University Institutional Review Board. A qualitative interview approach was used to capture each participant's experiences of scuba diving and to glean parents' perspectives about their child's participation in scuba diving. Each parent also completed the *Short Child Occupational Profile (SCOPE) Parent Report Form* to provide descriptive data about their child's occupational performance. A focus group was held with the dive leaders about their experiences and perceptions of working with individuals with ASD scuba diving.

All interviews were transcribed verbatim to ensure accuracy. Each researcher reviewed each transcript independently to identify common words, phrases and themes, then they collectively ascertained salient themes. The themes were then compared within each group (participants, caregivers, and leaders), and across groups to identify overarching constructs.

#### Results from the SCOPE

Activity	Challenge	Strength	N/A
Showing enjoyment or happiness when playing or doing something he/she likes	1	7	2
Knowing what he/she likes; choosing a favorite toy, person, or activity	0	9	1
Continuing an activity even when it becomes difficult	8	2	0
Understanding and following routines	2	7	1
Doing things that are part of being a family member, friend or student	6	2	2
Using his/her voice or words to indicate wants and needs	1	9	0
Talking with friends, family and others to share thoughts or ideas	6	4	0
Interacting with others in an appropriate way	6	4	0
Choosing and using objects appropriately	1	9	0
Noticing and responding to things around him/her	1	7	2

#### Results: Themes

"Feeling better about myself and what I can do" – This theme was prominent in participant, parent, and dive leaders interviews. All participants expressed pleasure from scuba diving and a majority indicated they believed they were successful.

**Participant:** "It just makes you feel good, like that I have done something new and I have tried something new and I liked it."

it: "My son, in his day to day life, doesn't smile like he does when he gets out of the water."

"(It's good) to finally find something that you're good at that other kids can't even do, it's a big deal."

"Within his universe now, he's a Rock Star - he's a diver. He can do anything now in his mind because he can dive. Wow! What else can I do? He starts

thinking that way and that's really what this is -a tool to help people imagine the possibilities in their lives..."

<u>Finding Sensory Freedom in the Water</u> – Participants discussed the intensity of sensory experience when in the water, especially how being underwater felt. Parents noted observable changes in the participants during and after a scuba diving sessions.

Participant: "When I'm under the water I get to. . . It's just quiet down there and you actually get to think to yourself, you know?"

ent: "....the first few times were the most profound and its almost that calming effect that he gets out of it . . . It's probably the most powerful therapy he has ever

had. It's certainly surpassed all the different types of sensory therapy that we have tried. You can't even compare the two; this was far more productive than any of those."

<u>Social Participation</u> – Participants, parents, and Diveheart leaders identified scuba diving as a facilitator for social participation. Diving in groups, having friends within the Diveheart organization and positive interactions with dive leaders were some of the key social features identified by participants.

Parent: "Diving is kind of an unusual sport.....and my son would be telling other people about it. So it's this thing that they can talk about that they know

something different than other people outside of the dive community, um, that gives them a sense of identity."

Leader: "They start out very tunnel vision, not talking to anyone else or anything else like that. . . slowly but surely they moved to being social butterflies."

**Not Defined by Disability, or "Everybody is Equal Underwater" -** The meaning of scuba diving is not just a "leisure" or "skill-building activity". While scuba diving does not, in and of itself, generalize to other occupations, each participant's identity was redefined in new ways through this occupation. This theme was prominent among participants, parents, and Diveheart leaders.

Participant: "it gives me a chance to do something I have never dreamed because of my disability. You can do something with others that are not disabled."

**rent:** "they are so much more capable of doing so many things, but so many times they are never given the opportunity or given the chance..."

Another parent described scuba diving as a unique experience that "set him (her child) apart in a very unique way that is not defined by his disability" "It's amazing in 15, 20 minutes we can have somebody using the ability they <u>do</u> have to move through the water independently . . . and it's powerful."

"Everybody can be themselves and whatever disability they have is no longer significant when they are at the pool – it's the same thing."



#### Discussion

Data gathered from the interviews indicate that the benefits of scuba diving for individuals with ASD include feeling better themselves, increased social participation, the feeling of freedom in the water, and freedom from being defined by their disability. Similar results were found in a previous study of three individuals with physical disabilities, which included enhancement self concept, freedom from impairment, and enhancement of social experience, and optimal experience (Carin-Levy and Jones, (2007).

The qualitative information gathered from interviews suggest that scuba diving builds confidence and can positively impact self perception. Participants took pride in being successful and doing something that not everyone does. The results suggest that scuba diving is a unique activity in which participants derive meaning and pleasure while also experiencing therapeutic benefits.

Scuba diving affords individuals an environment with less auditory and visual stimulation yet additional tactile and vestibular sensory inputs which they find to be positive, pleasing, and freeing (Lotan & Hadar-Frumer, 2004). As one parent explained, his son appeared more "in the moment" and calm both during and after scuba diving, and these benefits were seen for several weeks after the dive. A feeling of calm was described by another participant as "being quiet underwater" allowing him to think to himself.

Communication and social interaction are two areas impacted by an ASD diagnosis. However, scuba diving was topic for discussion with the participants and a facilitator of social participation with other peers and adults. Participants and dive leaders work together during dive sessions, which also creates an opportunity for positive social interaction.

All divers were treated as equals and their abilities are respected, therefore being free from the stigma of their disability. Scuba diving is an experience for all individuals regardless of disability; one's autism does not hold one back from participating successfully. Individuals are given opportunity to use the abilities they *do* have and are not reminded of their disabilities. Participants are encouraged to perform at a level they feel comfortable with, and as one leader stated, "everybody is equal underwater".

This occupation becomes a tool for individuals to *imagine their possibilities*. In that all participants were able to and wanted to dive on multiple occasions suggest that this activity was within their ability to complete. Overall, scuba diving seems to be a beneficial therapeutic activity for individuals with ASD on multiple levels.

### Implications for OT

Scuba diving can promote performance and participation as an occupation-based intervention for individuals with ASD. Occupational therapists should be involved in the development of these scuba diving programs in order to ensure the their therapeutic value.

#### References

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