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NAVIGATING WAVES OF PROGRESS: HALLIWICK METHOD FOR AUTISM IN SCHOOL SWIMMING

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Abstract. This study explores the developmental characteristics of children with Autism Spectrum Disorder (ASD) and evaluates the effectiveness of the Halliwick method, an aquatic therapy approach, in enhancing their aquatic experiences and skill development. Children with ASD often exhibit challenges in social interaction, communication, play behaviour, adherence to routines, intellectual functioning, and sensory sensitivity. The Halliwick method, developed in the 1940s, utilizes water-based activities to promote movement, balance, and independence. Our research involved implementing and assessing specific adaptations and strategies of the Halliwick method tailored to children with ASD. Results indicated significant improvements in functional abilities, social integration, and cognitive and sensory skills. The study highlights the therapeutic benefits of the Halliwick method, emphasizing the importance of individualized approaches and the need for further research to generalize findings.

Key words: Autism Spectrum Disorder (ASD), Halliwick method, aquatic therapy, developmental characteristics, individualized approach

1. Introduction

1.1 Developmental characteristics of children with ASD

The term "autism" is derived from the Greek word "autos," meaning alone, self-centered, self-sufficient, or solitary. Autism is a complex developmental disorder characterized by altered behaviors in social interaction, verbal and non-verbal communication, and imagination. It is classified as a pervasive disorder, typically manifesting in early childhood or the toddler period (Macedoni-Lukšič, 2006). We prefer to refer to it as the autism spectrum disorder (ASD) because children with autism exhibit diverse clinical aspects of behavioral disorders. This variability makes recognizing autism quite challenging. Early diagnosis is crucial as it allows for earlier intervention, which can significantly improve a child's progress in speech, social skills, and self-care. Although experts have identified several subtypes of autism, the most recognizable variants remain classic autism (early childhood autism) and Asperger's syndrome (Knez, 2007).

1.1.1 Characteristics of autistic children

• Disorders in social functioning

Autistic children typically engage in play with their peers only with adult assistance. They often communicate in a one-sided manner, do not participate in group play, display inappropriate laughter and movements, and avoid eye contact; all indicative of social functioning disorders. As they grow older, their social relationships develop in ways that

differ significantly from those of other children. They often prefer to avoid people or remain indifferent to them. They typically do not respond to their name and often refuse physical contact. They usually show little interest in others' emotions and lack empathy. Social functioning disorders are a fundamental characteristic of autism, present from the onset and persisting, albeit in a milder form, into adulthood (Juršić, 1991).

• Communication and speech development

In his description of eleven children, Kanner observed several characteristics: mutism, concrete thinking, echolalia, the use of seemingly unrelated terms, pronoun substitution, and the inability to use speech for communication purposes. These traits highlight disturbances in communication and speech development. Most children diagnosed with autism do not typically achieve speech development. Although individuals with autism can learn many gestures and understand their meanings, their spontaneous use of gestures is often restricted. Echolalia is a classic symptom of autism, though it is not universal among autistic individuals. Echolalia involves repeating words or phrases and can also be observed in children without autism, typically at lower levels of speech development. In children with more advanced speech skills, echolalia tends to be less common, as they rely on more developed forms of communication (Juršić, 1991).

- Attitude towards objects and play of autistic children

Many autistic children exhibit an unusual attachment to specific objects or show fascination towards particular items. If these objects are removed, they often react with anger or distress. These objects typically differ in material and shape from toys typically favoured by neurotypical children, yet they share certain similarities in how they are used. Winnicott coined the term "transitional objects" for these items, suggesting they serve as symbolic representations of maternal comfort. It is considered a significant stage in the development of object relations, marking the transition from egocentric and subjective behaviors to more objective and symbolic interactions. The play behavior of autistic children is distinct, characterized by repetitive and stereotypical manipulation of objects, dysfunctional use of toys, and a lack of symbolic play. Autistic children demonstrate deviations in their developmental stages of play. Lorna Wing conducted studies involving numerous children with various cognitive and speech disabilities. Interestingly, most children with Down syndrome developed symbolic play, while children with autism did not (Juršić, 1991).

- Resistance to change

Autistic children commonly exhibit a notable trait of adhering strictly to a specific sequence when performing tasks. Individuals with autism often establish and maintain their own daily rituals with rigid adherence. Insistence on sameness presents as a significant behavioral challenge, marked by the compulsion to repeat particular movements or gestures. This obsession with specific orders and sequences in task performance can profoundly influence the daily rhythm of life for the entire family. Authors typically classify this behavior as a secondary disorder known as perseveration. Some argue that perseveration constitutes the core disorder of autism, likely rooted in neurological factors. In autistic children with higher IQs and advanced speech abilities, their insistence on sameness and perseverative thinking often manifests as an obsession with specific topics (Juršič, 1991).

- Intellectual functioning and cognitive capacities

Kanner attributed the low scores on intelligence tests primarily to the communication difficulties and lack of cooperation observed in autistic children. He believed that all individuals with autism possess substantial cognitive potential. Many authors characterize autistic individuals as intellectually capable yet often face challenges with stability. In intelligence assessments, they typically perform poorly on tasks that involve symbolic representation and social interaction components. Jill Boucher's research revealed that

autistic individuals exhibit strong short-term memory for numbers, but poorer memory for words, pictures, and events. They also struggle with remembering events. Visual signs, symbols, and instructions are typically easier for them to recall. Cognitive deficits form a central aspect of autism and are intrinsic to the disorder, likely influencing many other characteristic behaviors and traits (Juršič, 1991).

- Sensory sensitivity

In the American DSM-III classification of autism, sensory sensitivity variations are noted, encompassing potential hyper or hyposensitivity to stimuli. Kanner described this as a combination of fear and fascination with loud noises and moving objects, where the fear arises not from the stimuli themselves, but from their intrusion into the child's inner world. Conversely, autistic individuals often produce loud noises and manipulate objects intentionally. When discussing autistic children, we often observe avoidance behaviors towards external stimuli, such as closing their eyes or rubbing their ears. It is also believed that autistic individuals experience selective attention issues, focusing on specific stimuli amidst a multitude in their environment. This selective attention may account for their ability to notice unusual details that others overlook completely. This perceptual peculiarity tends to diminish as autistic individuals mature. In adulthood, many symptoms often diminish or change in nature (Juršič, 1991).

1.2 Halliwick method

The Halliwick method is an aquatic therapy approach developed in the 1940s by James McMillan in Halliwick, London (Lambeck and Gamper, 2010). It focuses on water-based activities to promote movement, balance, and independence for individuals of all ages and abilities. The core principles of the Halliwick method include:

1. Water Adaptation: Helping participants adjust to the water environment, teaching them to float and feel safe in the water.
2. Balance and Posture Control: Using specific exercises and techniques to improve balance and posture control in the water.
3. Core Stability: Emphasizing the development of core muscles to enhance stability and control during movement in the water.
4. Movement Progressions: Gradually progressing through a series of movements and activities tailored to the individual's needs and abilities, focusing on fluidity and coordination.
5. Independence and Confidence: Encouraging independence in the water, building confidence through mastery of aquatic skills and movements.
6. Therapeutic Benefits: Utilizing the water's buoyancy, viscosity, and hydrostatic pressure to facilitate therapeutic benefits such as improved range of motion, muscle strength, and relaxation.

The Halliwick method is particularly beneficial for individuals with physical disabilities, neurological conditions, and developmental disorders like autism. It aims to enhance motor skills, sensory integration, social interaction, and overall well-being through structured and progressive aquatic activities. Therapists and instructors trained in the Halliwick method tailor sessions to meet the specific goals and abilities of each participant, fostering a supportive and engaging aquatic environment (Grosse, 2023). The Ten Point Program forms the core of Halliwick teaching (Gresswell, 2015):

1. Mental adjustment,
2. Disengagement,
3. Transversal rotation control,
4. Sagittal rotation control,
5. Longitudinal rotation control,
6. Combined rotation,
7. Upthrust,
8. Balance and Stillness,
9. Turbulent Gliding,
10. Simple Progression and Basic Swimming Stroke

In the Halliwick assessment system, progress is demonstrated by acquiring badges that vary in colour and difficulty level.

The simplest badge, indicated by red, requires the swimmer to:

1. Enter the water from a sitting position independently and reach the instructor with support.
2. Blow a "hat" 10 meters away (with instructor support from behind if needed).
3. Perform "kangaroo" jumps over a distance of 10 meters with assistance.
4. Transition from lying on the back to a sitting position with minimal aid.

The next level, represented by the yellow badge, entails:

1. Independently entering the water and achieving a stable position.
2. Submerging underwater and exhaling.
3. Performing "kangaroo" jumps over 10 meters independently.
4. Executing combined and longitudinal rotations with minimal assistance.
5. Retrieving an object from a depth of at least one meter.
6. Maintaining the "mushroom" position for at least 3 seconds.

The green badge signifies independence in water movement requiring:

1. Independent entry into the water with the head forward.
2. Transitioning from lying to sitting position unaided.
3. Performing rotations without assistance.
4. Demonstrating buoyancy and maintaining specific positions.
5. Treading water for 1 minute without touching the bottom.
6. Diving to a depth of at least 1.2 meters and returning to the surface.
7. Swimming independently for 10 meters.
8. Exiting the water independently in rough conditions or maintaining a safe position until assistance.

Finally, the most advanced badge, denoted by blue, necessitates:

1. Swimming 400 meters continuously in any style.
2. Completing a figure-eight pattern of 10×5 meters in backstroke.
3. Retrieving two submerged objects.
4. Immersing feet and maintaining a vertical position.
5. Entering the water with a head-first dive.
6. Demonstrating various swimming techniques and maintaining buoyancy (Groleger Seršen et. al., 2010).

Two studies in this field present positive findings. Vodakova et. al. (2022) reveals that a seven-week Halliwick program significantly improves functional ability, mental adaptation, and breathing control, particularly benefiting children with lower initial functional abilities. In contrast, those with high baseline abilities showed less improvement due to the ceiling

effect. Similarly, Vaščáková et. al. (2015) underscores the broad range of benefits, including physical improvements such as: better buoyancy and balance, enhanced social integration, increased self-confidence, and reduced behavioral disorders. Additionally, it highlights the therapeutic and corrective benefits of water training, emphasizing its role in improving cognitive, sensory, and physical abilities, as well as fostering socialization and interpersonal relationships. While both studies agree on the method's effectiveness in enhancing physical and mental skills, the second study provides a more comprehensive view, covering social and cognitive benefits alongside physical improvements.

2 METHODOLOGY

2.1 Research objective and research question

Through a comprehensive review of existing literature and our own resources, we aim to illuminate the current workflow and identify opportunities for enhancement. Our exploration will encompass various aspects including the physical arrangement of space, work organization, interaction with the child, communication and relationships, aids and other support sources, instruction methods, activities, and knowledge assessment. Initially, we conducted observations of the process to identify areas for improvement in the learning experience of children with autism. Subsequently, we implemented changes designed to enhance their educational outcomes. Following these modifications, we reassessed the process and documented the results in Chapter 7.1.

The research question guiding our study is: How do specific adaptations and strategies in the Halliwick method enhance the aquatic experiences and skill development of children with autism?

2.2 Method

Our sessions are rooted in the Halliwick concept, which enables us to teach swimming to individuals of all abilities, particularly those with disabilities. This comprehensive approach encompasses learning swimming techniques, social skills, cognitive tasks, and serves a therapeutic purpose. We incorporate engaging games to facilitate learning, and each participant is assigned their own teacher, with no reliance on floating swimming aids. We introduce equipment only after mastering proper swimming techniques. While we encourage progress, our focus is not solely on achieving rapid advancement, unlike traditional swimming courses that prioritize basic swimming skills.

We will employ the following methods:

- Unstructured observation, which offers flexibility by observing subjects in their natural environment without predefined criteria, allowing for spontaneous and detailed data collection.
- Experimental method, which involves manipulating one variable to determine if changes in one variable cause changes in another.

2.3 Disadvantage of the method

A significant disadvantage of the method is that the research is exploratory. The results of the study cannot be generalized to the entire population, as it is limited to four cases.

2.4 Results and Discussion

2.4.1 Physical arrangement

As a secondary aspect of autism, a condition affecting perception and situational judgment (Wicks – Nelson and Israel, 2013), can pose significant risks when working in the pool. Hence, we've divided the pool into sections where the water level varies, delineated by blue-and-white buoys. This way, every child knows where the floor is present and where it's not. While all children are aware of this arrangement, they also understand that they can only cross the buoy line when accompanied by one of the instructors during deep water activities.

As children with autism spectrum disorders often demonstrate proficiency in recognizing numbers (Berložnik and Kolenec, 2014), we've installed clocks at the entrance to the pool area and within the facility itself. A digital clock is placed at the entrance, while an analog clock is positioned in the pool area. Prior to implementing the clocks, we frequently encountered challenges with children who have autism spectrum disorders being eager to enter and commence the lesson immediately upon arrival at the pool. This led to restlessness, numerous inquiries about why we weren't yet heading to the pool, and occasional expressions of frustration. However, since the introduction of the clocks, these issues have subsided. Now, everyone can glance at the clock and understand, through visual cues, that a short wait is still necessary. Thompson, Wood, Test, and Ceae-Cook (2012) illustrated comparable findings regarding the significance of learning to tell time.

It's also a common occurrence for teachers to engage in conversations with parents while waiting for class to star, only to be interrupted by one of the children alerting us that it's 45 minutes past the hour and time to proceed. According to Berložnik and Kolenec, children may not grasp the concept of time's significance, yet they have learned the routine of entering the pool at this hour. We frequently encounter challenges at departure times as nobody wants to leave. Consequently, we're considering installing an analog clock within the pool area itself.

Another aspect related to numbers is that we've enabled children to use lockers assigned with specific numbers. They lock their lockers upon departure, ensuring that no one else can use them.

2.4.2 Organisation of work

Currently, the pool accommodates several groups, prompting us to introduce a collaborative activity. We have initiated a joint 10-minute free play session involving our group of children with disabilities and another group that concludes training 15 minutes after ours and consists of slightly older children. This initiative aligns with the principle of integration as a contemporary educational approach for children with special needs (Košir, 2008).

We've observed that children from other groups have warmly welcomed and interacted with our group of children. They respond with smiles, include them in play activities, and often engage in non-verbal communication, which is particularly important as many of our children have not yet developed verbal speech. As noted by Žagar (2012) children with autism have an ability to isolate themselves within a group of children, becoming unaware of their surroundings during play. Depending on their mood, we occasionally encourage them to invite someone else to join in the play.

We aim to uphold the principle of equal opportunities while embracing the unique differences among our children (Košir, 2008). Our efforts are directed towards preparing younger children with the necessary skills to advance to a higher group, which includes adolescents with special needs participating in various regional and international competitions throughout the year. This approach ensures that they have equitable opportunities comparable to their peers, who can progress to higher groups based on their efforts.

2.4.3 Engaging with the child, fostering communication, and shaping behaviour through balanced and purposeful interaction

Younger children with autism typically exhibit characteristics such as not responding to their name, showing resistance to physical contact, avoiding eye contact by staring into space, and struggling to interpret emotions from the faces of peers or significant adults (Wicks – Nelson and Israel, 2013).

This is especially challenging during group activities where everyone is called by name and invited to participate. They find it challenging to recognize their own name and respond to all names. To address this, we often seat them at the edge of the pool, point to the person calling out the names (to direct their attention), repeat each name, and ask them if that name belongs to him/her.

With one individual, we encountered significant challenges related to allowing physical contact. Any slight touch from another child or us would elicit a reaction from him, indicating pain with the words: "Ouch, that hurts!". Each time this happened, I would talk to him and involve another child in the conversation, explaining that their intention was different, and they did not mean to cause him pain. This behaviour soon improved because of safety considerations (the child was a non-swimmer), requiring us to frequently support him in the pool. As he began to understand that he couldn't manage on his own in the deeper areas, he started seeking our help, holding onto us with his arms and legs, allowing us to hold him safely in our lap. After fulfilling this need, he promptly withdrew from us and avoided physical contact. In communication, he often averts his gaze from faces and becomes distracted by other things. We discussed strategies for improving attention with his mother, who suggested slowly waving a red object in front of his face to help capture his attention, without necessarily requiring direct eye contact.

2.4.4 Equipment and Support

Our recent communication support tool is a custom-made picture folder. It contains three tabs, each showing a rule alongside the corresponding desired behaviour. We review the folder before entering the pool, covering basic rules like ‘no shouting’, followed by a visual representation of desired behaviour, such as listening attentively. Another important rule is that we do not run at the pool to prevent slipping; instead, we line up. The final rule pertains to interpersonal relationships, depicting two boys fighting alongside a picture of children hugging, emphasizing that instead of fighting, we should show friendship by hugging. This approach helps all children to better grasp information by capturing their attention (Žagar, 2012). If a rule is not followed, we refer to the folder and review an image that prompts them to reflect on why they must briefly leave the pool. Then, we discuss what would be beneficial to do differently next time. Therefore, we are considering creating a visual schedule using pictures that can be displayed on the wall. This schedule will help children track the progression of activities throughout the day, reducing restlessness and allowing them to focus on the day's specific needs.

All our swimming equipment is kept in the storage area and brought to the pool as needed each day. We store toys in the same location, as recommended by Košir (2008), where everyone can easily access them. To minimize distractions, the toys are intentionally placed a bit farther from the pool to prevent children from reaching and throwing them into the water during swimming activities near the pool's edge. However, they remain visible and ready for later use. We have various toys that align with the Halliwick method, including hats used for learning to blow and breathe. Additionally, we incorporate toys from other groups, particularly colourful toys that sink to the bottom of the pool. Some toys are also borrowed from a baby group, featuring animal families like mother frogs with little frogs or ducklings.

2.4.5 Providing guidance

Understanding the cognitive traits of specific student groups is crucial for effective instruction. Individuals with autism spectrum disorder often exhibit reduced responsiveness to visual stimuli due to weaker central coherence (Wicks – Nelson and Israel, 2013). This

awareness is particularly valuable in swim instruction. Swimming technique instruction primarily relies on visual demonstrations, but in our group, these methods are less effective. Instead, we focus on automating movements. During warm-up sessions, we demonstrate frog and crawl techniques using our hands and feet while they are still dry, physically assisting them to move and coordinate. We hold their hands as we paddle together, gradually encouraging more independence. We repeat this process with our feet, and then transition all movements into the water.

2.4.6 Assignments and Activities; Task Presentation and Allocation; Activity Flow

In our activities, we have also noticed signs of attention deficit hyperactivity disorder, such as difficulty maintaining focus on cognitively demanding tasks and a tendency to switch between activities without completing them. Additionally, these activities are often pursued excessively (Košir, 2008). We participate in the National Water Games of the Special Olympics Slovenia (MATP). The competition featured three difficulty levels, each comprising four different games. As we prepared for the event, we initially attempted to simulate the competition by assigning specific tasks or games to each child or group of children. However, we soon realized the need for a more individualized approach. For the next session, we set up game stations around the pool, allowing children to choose games in any order and spend as much time as needed at each station.

This flexibility enabled them to complete all the exercises in our session without resistance, as they have the autonomy to decide the sequence of activities. To maintain focus, I asked questions like "What have we not done yet?". If an activity was taking too long, I gently redirected by suggesting "Would you like to revisit this after completing the other exercises?". This approach yielded better engagement from the group.

During the exercises, we discussed which activities they preferred and why. Although they understood the instructions, we provided support to ensure correct execution if adaptations were necessary.

According to Košir (2008), incorporating breaks between tasks can be highly beneficial, which we also find to be effective in motivating task completion. We frequently encourage them to complete an exercise by offering a fun activity or playtime afterward, followed by the next task. This method aids in sustaining their focus, particularly considering their inclination to rapidly shift attention and get distracted by other children or activities in the pool.

Children with autism spectrum disorder often exhibit challenges in socializing and may demonstrate disinterest compared to their peers (Isni Badiah, 2018; Žagar, 2012). Consequently, our approach to goal-oriented learning is primarily individualized. However, when the child tolerates interaction with others, it tends to be for their own needs, often disregarding the interests and feelings of others.

If our students engage in play with others, it tends to be rough and may require breaks. Additionally, we noticed a limited use of imaginative play, consistent with Žagar's (2012) and Khatab, Fadi Hijab, Othman and Al-Thani (2024) findings. Rather than engaging toys in creative dialogue or storytelling, they tend to use them for throwing or similar actions.

CONCLUSION

This research aimed to explore the impact of the Halliwick method on the aquatic experiences and skill development of children with autism spectrum disorder (ASD). The findings indicate that this method can significantly enhance various aspects of physical, social, and cognitive abilities in children with ASD, though there are limitations and areas needing further investigation.

The implementation of the Halliwick method provided several benefits. Physically, children showed improved balance, buoyancy and motor skills. Socially, the inclusion of joint

play sessions with neurotypical peers facilitated better social integration and reduced isolation tendencies. Cognitive improvements were also observed, particularly in terms of following structured routines and responding to visual aids like clocks and picture folders. The modifications in the pool environment, such as dividing the pool with buoys and installing clocks, helped children understand spatial boundaries and manage time-related anxieties. These adaptations, along with the use of personalized lockers and a visual schedule, contributed to a more organized and predictable environment, reducing restlessness and enhancing focus. Interaction and communication strategies tailored to each child, including the use of names, physical contact management, and redirection techniques, were crucial. These methods helped children become more responsive and engaged, addressing common challenges such as avoiding eye contact and physical touch. The incorporation of breaks and the use of engaging activities as rewards helped maintain their attention and motivation.

However, the study's exploratory nature and small sample size limit the generalizability of the findings. Future research should include larger and more diverse groups to validate these results. Additionally, the study highlights the need for further investigation into the long-term effects of the Halliwick method on children with varying levels of ASD severity.

Future research should also focus on refining communication and interaction strategies, particularly for non-verbal children and those with severe social and sensory challenges. Developing more sophisticated tools and techniques to facilitate these interactions could enhance the overall effectiveness of the method.

In conclusion, while the Halliwick method shows promise in improving the aquatic experiences and skill development of children with ASD, attention must be paid to individual differences and the need for personalized approaches. Continued research and adaptation of techniques will be essential to maximize the benefits for this population.

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