



Exploring the Effects of Swim Instruction on Motor Skills and Health of Children with Autism

Autism Spectrum Disorder (ASD) affects approximately 1 in 31 children in the United States and is commonly accompanied by motor impairments and low physical activity, which increase the risk for poor health outcomes. Many children with ASD experience significant delays in fine and gross motor skills, limiting participation in physical activity despite recommendations for at least 60 minutes of daily movement. Swimming is a preferred and accessible activity for many children with ASD and offers physical, social, and mental health benefits while also serving as a critical drowning prevention strategy, as children with ASD face substantially higher drowning risk than their peers. However, while swim instruction is known to improve water safety and swim skills, little research has examined its broader effects on motor development and health-related quality of life, particularly using standardized measures in community settings. This study addresses a critical gap in the literature by examining whether participation in a community-based swim instruction improves motor skills and health related quality of life (HRQoL) in young children with ASD.

Purpose

The purpose of this study was to investigate the short-term effects of swim instruction on motor skills and HRQoL in children with ASD. Specifically, the study examined outcomes following eight-weeks, 16-lessons, of swim instruction delivered in community settings.

Methods

A pretest–posttest design was used to evaluate changes in motor skills and HRQoL following swim instruction. Participants were recruited from a larger randomized controlled trial and included 28 children with ASD aged 5–9 years. This age range was selected due to developmental relevance for motor skill acquisition and heightened drowning risk. Participants completed 16, 30-minute swim instruction lessons over eight weeks at community swimming pools that met USA Swimming Foundation Swim Network Provider standards. Instruction emphasized graded skill progression from water orientation to independent swimming, along with water safety education. Lessons were delivered by trained instructors using evidence-informed strategies supportive of children with ASD.

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Motor skills were assessed using the Bruininks–Oseretsky Test of Motor Proficiency, Second Edition Short Form (BOT-2 SF), a standardized measure of fine and gross motor skills. HRQoL was assessed using the Child Health Questionnaire–Parent Form 28 (CHQ-PF28), a validated parent-reported measure capturing physical, emotional, and social domains of well-being. Assessments were conducted at baseline and following program completion. Nonparametric statistical analyses (Wilcoxon Matched Pairs Signed-Ranks Tests) were used to examine pre–post changes due to non-normal data distributions.

Key Findings

Motor Skills:

Children demonstrated statistically significant improvements in motor proficiency following swim instruction. Both BOT-2 SF total point scores and standard scores increased, with large effect sizes observed. Additionally, participants showed meaningful shifts in descriptive motor categories, with fewer children classified as “well-below average” and more moving into “below average” or “average” ranges. These findings indicate that swim instruction was associated with measurable improvements in overall motor performance.

Health-Related Quality of Life:

Select domains of HRQoL showed significant improvement following swim instruction. Parents reported improvements in 1) Role/Social Limitations due to Emotional/Behavioral Factors and 2) General Health Perceptions. However, decreases were observed in parent-reported Mental Health and Self-Esteem scores, and no significant changes were detected in overall physical or psychosocial health summary scores. These mixed findings suggest that while swim instruction may positively influence some aspects of daily functioning and perceived health, short-term participation may not be sufficient to improve all HRQoL domains.

Interpretation

Improvements in motor skills may reflect the combined effects of structured, repetitive practice; predictable routines; and the supportive properties of the aquatic environment, including buoyancy, resistance, and sensory input. These findings align with dynamic systems theory and prior aquatic-based intervention research.

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Changes in HRQoL may reflect both positive and challenging aspects of skill acquisition in community pool environments. While participation in a preferred activity may enhance perceived health and social-emotional functioning, sensory demands and the challenges of learning new skills may temporarily impact mental health and self-esteem. Longer intervention duration, environmental modifications, or complementary supports may be needed to optimize HRQoL outcomes.

Implications and Future Research

This study demonstrates that community-based swim instruction can significantly improve motor skills in young children with ASD and positively influence select HRQoL domains. These findings support swim instruction as a promising, developmentally meaningful intervention that addresses both health promotion and drowning prevention. Together, these findings provide a strong foundation for recreational therapists to expand accessible swim instruction programs to improve health, safety, and quality of life for children with ASD. Future research should examine optimal dosage and duration of swim instruction, long-term motor and HRQoL outcomes, comparisons of instruction models and integrate qualitative methods to capture family and child perspective.

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