

## **Effects of Aquatic Therapy on Joint Mobility and Muscular Strength of an Adult Male with Spastic Cerebral Palsy**

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### **ABSTRACT**

Cerebral palsy (CP) is a neurological motor impairment syndrome caused by damage to the developing brain. Therapeutic aquatic exercise can be extremely beneficial when aiming to take pressure off of the back and lower extremities because water is proven to better support body weight and relieve joint stress. Aquatic therapy has also been seen to affect overall motor function, spasticity, and quality of life.

**PURPOSE:** To determine if aquatic therapy improves joint mobility, muscular strength, and quality of life in an adult with spastic quadriplegic cerebral palsy. **METHODS:** Single-subject six-week aquatic therapy intervention consisted of one-hour sessions, two days a week, with exercises targeting mobility and strength in the upper and lower extremities. Range of motion along with triceps and quadriceps strength were measured at week 0 and week 6. A goniometer was used to measure range of motion, a handheld dynamometer was used to measure muscular strength. A word jumbled with positive, neutral and negative emotionally descriptive words was shown to the participant pre and post each training session. The participant identified an emotionally descriptive word that related to their current state.

**RESULTS:** Statistically significant differences were found in joint range of motion of the left shoulder flexion ( $t(2) = -6.15, p = 0.03$ ), right ankle dorsiflexion ( $t(2) = 4.46, p = 0.047$ ). Statistically significant differences in strength were identified in the left quadriceps ( $t(2) = -41, p = 0.0006$ ), right quadriceps ( $t(2) = -5.03, p = 0.04$ ), left triceps ( $t(2) = -6.91, p = 0.02$ ), and right triceps ( $t(2) = -22.3, p = 0.002$ ). The greatest percent increases were 219% for the left triceps strength, 218% for the left quadriceps strength, and 127% for the right quadriceps strength. Words typically selected pre-session included 'ready', 'anticipation' and 'happy' and post sessions were 'relaxed', 'recharged' and 'tired'. **CONCLUSION:** The aquatic therapy program improved joint mobility, muscular strength, and quality of life. In addition to the significant data, the percent increases contributed to the participant's neuromuscular adaptations. It's important to note the additional improvements that were enhanced due to participation in this program including more controlled daily living activities and new skills in and out the pool.