

## INTRODUCTION

Aquatic therapy services are utilized as an intervention for individuals with cerebral palsy (CP). Recent efforts have been put forth to research benefits of using aquatic therapy for children and adolescents with CP. Due to new publications in aquatic therapy, there is a need to identify benefits across the International Classification of Functioning, Disability, and Health (ICF) Framework for children and adolescents with CP across Gross Motor Function Classification System (GMFCS) levels.



## OBJECTIVES

- (1) Provide an overview of current aquatic therapy literature for children and adolescents with CP across GMFCS levels
- (2) Discuss benefits for children and adolescents with CP participating in aquatic therapy based on the ICF Framework
- (3) Suggest recommendations for aquatic therapy for children and adolescents with CP
- (4) Identify limitations in current aquatic therapy literature and future research directions for children and adolescents with CP utilizing aquatic therapy interventions

## METHOD

**21 published articles were reviewed and given a level of evidence:**

- 4 Systematic Reviews
- 1 Randomized Controlled Trial
- 3 Controlled Trials
- 1 Cohort
- 4 Longitudinal Studies
- 5 Case Series
- 3 Case Reports



Children participating in aquatic therapy intervention.

## Evidence of aquatic therapy related to GMFCS Levels

- GMFCS Level I: 11 studies
- GMFCS Level II: 8 studies
- GMFCS Level III: 9 studies
- GMFCS Level IV: 5 studies
- GMFCS Level V: 2 studies
- 8 studies did not list GMFCS levels, rather described participants as ambulatory or having mobility deficits

## RECOMMENDATIONS

### Efficacy for Aquatic Therapy Intervention in Children and Adolescents with CP

- ICF Body Structure and Function: improves range of motion (ROM), strength, and endurance
- ICF Activity: improves gait, gross motor function, and body awareness
- ICF Participation: improves swimming skills, water orientation, enjoyment, self-esteem, performance satisfaction, and self-perception

	ICF: Body Structure and Function	ICF: Activity	ICF: Participation
GMFCS Levels I-III (Ambulatory)	<ul style="list-style-type: none"> <li>▪ Range of motion *</li> <li>▪ Strength ***</li> <li>▪ Endurance *                             <ul style="list-style-type: none"> <li>○ Energy Efficiency *****</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Gait **</li> <li>▪ Walking Velocity***</li> <li>▪ Gross Motor Function *****</li> </ul>	<ul style="list-style-type: none"> <li>▪ Social Participation *</li> <li>▪ Water Orientation, Swimming *</li> <li>▪ Task Performance, Swim Progression, Parent Satisfaction **</li> </ul>
GMFCS Levels IV-V (Non-ambulatory)	<ul style="list-style-type: none"> <li>▪ Strength *</li> <li>▪ Endurance                             <ul style="list-style-type: none"> <li>○ Energy Efficiency **</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Walking Velocity*</li> <li>▪ Gross Motor Function***</li> </ul>	<ul style="list-style-type: none"> <li>▪ Social Participation *</li> <li>▪ Water Orientation, Swimming *</li> <li>▪ Task Performance, Swim Progression, Parent Satisfaction *</li> </ul>

\* Number of studies referencing GMFCS levels and ICF domains. Studies not referencing GMFCS levels were not included in this table.



Children participating in an aquatic group therapy program.

## LIMITATIONS

### Inconclusive Findings for Aquatic Therapy Intervention in Children and Adolescents with CP

- ICF Body Structure and Function: spasticity
- ICF Activity: transferring aquatic gross motor skills to land-based function
- ICF Participation: quality of life
- Description of aquatic therapy varied.
- Treatment frequency and duration varied.

## CONCLUSIONS

Evidence supports aquatic therapy to improve ROM, strength, endurance, gait, gross motor function, body awareness, swimming skills, water orientation, enjoyment, self-esteem, satisfaction, and self-perception. However, there is a lack of evidence indicating benefits across all domains of the ICF using aquatic therapy intervention for all GMFCS levels.

Future research should focus on benefits of aquatic therapy intervention, especially for individuals GMFCS Level IV-V.

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