

Diagnostic Category: Cerebral palsy Discipline: Occupational Therapy

Reference	N	Intervention (n)	Telerehabilitation programs:	Platform & clinician's involvement	Outcomes
Country Study Design Quality (for RCTs)	Sample description (dx specifics, age, gender)	vs. Comparison (n) Frequency & duration	I. Focus II. Nature III. Target IV. Receiving client		Child-related outcomes Parent-related outcomes (+) significant between-group differences for RCTs or within group improvements for non-RCTs (-) no significant between-group differences for RCTs or within group improvements for non-RCTs
Ferre et al., 2017 USA RCT PEDro score: 7/10 High quality	N= 24 Children with unilateral spastic CP Mean age: 5.5 ± 2.5 yrs Age range: 2.6 -10.1 yrs 10M:14F	Home-based hand-arm bimanual intensive therapy (H-HABIT; n=12) vs. Lower functional intensive training (LIFT-control; n=12) 2 hrs/day 5 days/week for 9 weeks (total 90 hrs)	I. Dexterity; bimanual hand function II. Caregivers were trained to provide H-HABIT or LIFT-control to their children at home. Both programs were performed in the context of child-friendly play. H-HABIT consisted of tasks were performed to improve reaching, grasping, releasing, in-hand manipulation, and using the affected hand. LIFT-control consisted of lower-limb tasks to improve balance, strength, and coordination with emphasis on the involved leg through activities such as: ball kicking, jumping through squares	Videoconference Hourly supervision continued on a weekly basis (1hr/week for 9 weeks). Clinician also monitored home training activities by checking logs submitted online.	At 9 weeks(post-treatment): (-) <i>Bimanual hand function: Assisting Hand Assessment</i> (+) <i>Dexterity: Box and Blocks Test</i> (+) <i>Occupational performance: COPM-Performance</i> (-) <i>Occupational performance satisfaction: COPM-Satisfaction</i>

			<p>(hopscotch), and walking through obstacle course. All participants continued to receive usual care.</p> <p>III. Child</p> <p>IV. Child/youth + Parent</p>		
<p>Golomb et al., 2010</p> <p>USA</p> <p>Case series</p>	<p>N= 3</p> <p>Adolescents with severe hemiplegic CP</p> <p>Mean age: 14.3 ± 1.1 yrs</p> <p>Age range: 13-15 yrs</p> <p>2M:1F</p>	<p>Videogame-based rehabilitation system</p> <p>30 mins/day</p> <p>5 days/week for 3 months</p>	<p>I. UE motor function</p> <p>II. Participants used a sensor glove that was fitted to the affected hand and attached to a remotely monitored videogame console installed in their home. Games were custom developed, focused on finger movement (finger flexion/extension or thumb movement), and included a screen avatar of the hand.</p> <p>III. Youth</p> <p>IV. Youth alone</p>	<p>VR games</p> <p>Finger ROM was monitored remotely by the 5DT sensor glove.</p>	<p>At 3 months (post-treatment):</p> <p>(+) <i>Grip strength: Jebsen Test</i></p> <p>(+) <i>Hand range of motion: Finger ROM</i></p>
<p>Reiferberg et al., 2017</p> <p>USA</p>	<p>N= 1</p> <p>Child with spastic hemiparetic CP</p>	<p>Game-Based Neurorehabilitation + Telehealth Technologies (GbN+TT) (n=1)</p>	<p>I. UE motor functions, strength, bilateral coordination, reaction speed</p> <p>II. Child was given equipment of GbN+TT at home; The game is called Timocco and is a motion-based</p>	<p>Web (including VR games) + video conference monitoring from clinician.</p> <p>Synchronous videoconferencing with the therapist was</p>	<p>At 12 weeks (post-8-week treatment + 4-week washout period):</p> <p>(+) <i>Bimanual hand function: Assisting Hand Assessment</i></p> <p>(+) <i>Fine and gross motor function.</i></p>

Case report	Age: 5 yrs M	7 hrs/week for 8 weeks (total 56 hours)	<p>gaming web application designed by an OT.</p> <p>To play Timocco games, the child stands in front of the webcam holding on to the colored balls. The webcam recognizes the balls, and the app translates movement of the balls into movement of gaming elements. For example, the Falling Fruits game is designed to challenge midline crossing, range of motion, and bilateral coordination. The child is depicted on screen as a monkey. The child must catch fruits as they fall from the top of the screen and sort them into the correct basket at the bottom.</p> <p>The researchers configured games to challenge the participant's bilateral coordination, midline crossing, motor control and accuracy, motor efficiency, range of motion, reaction speed, and upper body strength and to enable them to monitor on a weekly basis parameters such as duration of game play, number of correct movements, number of errors, and response time.</p> <p>III. Child</p> <p>IV. Child + parent</p>	<p>accomplished where the therapist was able to control the robot's pan and tilt functions while video conferencing with the child and parent.</p> <p>Also, a member of the research team conducted 30-min synchronous consultations with the participant and parents. This was done to monitor performance, problem-solve technological issues, coach parent, and provide feedback.</p>	<p>Bruininks-Oseretsky Test of Motor Proficiency second edition (BOT-2) (+) <i>Functional performance:</i> PEDI-CAT (+) <i>Functional upper-extremity use:</i> Pediatric Motor Activity Log (-) <i>Movement patterns and hand function:</i> Quality of Upper Extremity Skills Test (+) <i>Stress level:</i> PSS-14</p>
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