



Efficacy of Non-Traditional Client-Centered Occupation-Based Hand Therapy in Pediatric Patients Diagnosed with Cerebral Palsy: A Systematic Review

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Abstract

Few published studies have explored client-centered occupation-based hand therapy interventions for children diagnosed with cerebral palsy (CP), other than constraint-induced movement therapy (CIMT). This systematic review was conducted to increase therapists’ understanding of alternate evidence-based intervention options for children diagnosed with CP. Viable options for effective client-centered occupation-based hand therapy interventions include technology and creative arts techniques.

Introduction

CP is one of the most diagnosed motor disability conditions in pediatrics in the United States (CDC, 2021). Typically, children diagnosed with CP will receive occupational therapy (OT) services for habilitation of activities (CDC, 2021). Although there are a variety of effective interventions, few are client-centered and occupation-based. Often traditional interventions, such as CIMT, are less enjoyable for clients (Roberts et al., 2005). This systematic review explores client-centered occupation-based options for hand intervention in children diagnosed with CP.

Methodology

Search Terms: Pediatric(s), Cerebral Palsy, occupation-based, occupational therapy, hand function, & hand therapy

Data Sources: PubMed, CINAHL, Ovid, Cochrane Library, & Scopus

Study Selection Criteria:

Inclusion Criteria: Peer-reviewed studies published between 2011-2021, English, & human subjects
Exclusion Criteria: Studies published before 2011, textbooks, book chapters, conference proceedings, non-English publications, qualitative studies, adult studies, non-occupation-based intervention studies, & CIMT studies.

Results

Basis of Intervention	Technology (n=7)	Creative Arts (n=2)	Clinic (n=2)	Home (n=2)
Types of Intervention	Wii, Xbox, Virtual Reality	Magic, Piano	Hand Arm Bimanual Intensive Training (HABIT), Client Chosen Play	Self-Care Activity, ADL Training
Outcome Measures	JTHFT PDMS-2 Dynamometry COPM BFMF MAS	Dynamometry GMFCS MAS AHA COPM CHEQ	PDMS-2 COPM PEDI	AHA COPM

JTHFT = Jebsen-Taylor Hand Function Test
PEDI = Pediatric Evaluation of Disability Inventory
PDMS-2 = Peabody Developmental Motor Scale - 2
COPM = Canadian Occupational Performance Measure
BFMF = Bimanual Fine Motor Function
MAS = Modified Ashworth Scale
AHA = Assisting Hand Assessment
GMFCS = Gross Motor Function Classification System
CHEQ = Children’s Hand-use Experience Questionnaire

Significant Findings

- Significant improvement in bilateral hand function was seen after receiving client-centered occupation-based interventions (n=13).
- Higher levels of satisfaction were reported by parents and children when participating in client-centered occupation-based interventions compared to traditional interventions, including CIMT (n=13).
- Immersive gaming interventions improved outcomes comparable to traditional interventions, such as CIMT (n=7).
- Significant increases in ROM and intrinsic strength were achieved after participating in piano interventions (n=1).
- Bimanual activity participation increased after magic intervention (n=1).
- Significantly greater fine motor improvement was seen in children who participated in play interventions chosen by the child rather than therapist-guided functional activity intervention (n=2).
- HABIT and self-care interventions showed lasting results at 6 months post-intervention (n=2).

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Discussion & Implications

All 13 studies reported higher levels of satisfaction with therapy while showing improvements in overall functioning. Of the 13 studies reviewed, nine exhibited increased functional hand use while performing ADLs and self-chosen activities. The other four studies reported increased overall hand use in non-functional activities. These findings indicate that non-traditional client-centered occupation-based interventions are efficacious treatment options for pediatric patients with CP. By using a client-centered approach and allowing children the ability to contribute to choosing their interventions, higher satisfaction outcomes were reported. This suggests the value of therapists using a client-centered approach to improve outcomes for children diagnosed with CP.

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