Handy Heroes Therapy Camp

The effectiveness of an intensive intervention using hybrid model of mCIMT with bimanual therapy to improve bimanual function in children with neurologic hemiplegia and perinatal brachial plexus injury

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Introduction

- Constraint induced movement therapy (CIMT) and modified CIMT (mCIMT) are effective upper extremity interventions to address unimanual impairments in children with hemiplegic cerebral palsy.
- Bimanual therapy is also emerging as an effective upper extremity intervention targeting impairments in bimanual coordination.
- Limited evidence supporting the effectiveness of CIMT and bimanual therapy in children with peripheral nerve injuries.
- Further evidence needed to study hybrid models combining CIMT and bimanual therapies as an effective treatment approach of transferring acquired unimanual skills to successful participation in bimanual activities.

Methods & Materials

- Quasi-experimental, intervention study
- Assessments: Assisting Hand Assessment (AHA) and ABILIHAND-Kids
- Participants: 22 subjects (ages 5-12 years, 6 boys, 16 girls)
  - Neurologic hemi (CP, stroke, TBI): N=17
  - PBPI (n=5)
  - Manual Ability Classification System (MACS): Level I (n=3), Level II (n=15), Level III (n=3), Level IV (n=1)

Hypothesis

Intensive, camp-based intervention using hybrid model of mCIMT + immediate/within-day bimanual therapy improves bimanual function in school aged children with neurologic hemiparesis and perinatal brachial plexus injury (PBPI)

Results

- Goal Setting, Set-Up/Grading, and Cues using MACS and AHA goals
- Set-Up/Grading:
  - Place all items on affected side; Hold various-sized fruits securely while cutting with non-affected hand
  - Cues: “Handy Hero hand squeeze” “Handy Hero hand grab"

Themed-Activity “Star Wars- Fruit Sabers”

Bimanual

- AHA Goals: Stabilizes by weight support; Moves upper arm
- MACS I: AHA Goals: Grasps off table; Release
- MACS II: AHA Goals: Chooses assisting hand; Stabilizes by grip
- MACS III: AHA Goals: Chooses assisting hand; Stabilizes by grip
- MACS IV: AHA Goals: Stabilizes by weight support; Moves upper arm

Data Analysis

Change in AHA and ABILIHAND-KIDS scores for intervention and carry over phases compared using one-sample t-tests: Statistical significance p<0.05

Results: Neuro Hemiplegia vs. PBPI

Intervention

Summer Day Camp Model:
- Hybrid Model: 2 hours of mCIMT + 4 hours of bimanual therapy per day x10 days
- Immediate transfer of unimanual gains from mCIMT to bimanual activities
- OT to camper ratio: 1:3 or 1:2
- All OT “counselors” certified in AHA and with extensive experience in hemiparesis and Ancillary therapists

Theme-based Curriculum:
- Motivation and empowerment lead to improved behavioral performance and persistence in demanding tasks
- Creative ways to practice challenging skills or tasks repetitively for motor learning

Goal Setting, Set-Up/Grading, and Cues using MACS and AHA goals

Intervention

Set-Up/Grading:
- Place all items near affected side; Hold medium sized painting tools steady without slippage
- Cues: “Handy Hero hand pinch” “Handy Hero hand let go on the table”

Conclusion

- Hybrid model appears to be effective in improving bimanual function for children with neurologic hemiparesis.
- Hybrid model may be potentially effective for children with PBPI.
- MACS II and III may benefit most from hybrid model.

Acknowledgements

- Thank you to all those involved in making Handy Heroes Therapy Camp a reality!
- Please scan QR code for references and camp information