

Assessing Bimanual Hand Use in Children with Unilateral Spastic Cerebral Palsy: Results from an Exploratory Study

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Abstract

perform coordinated bimanual tasks. Understanding how these children use their hands together can provide insights into their functional abilities and guide therapeutic interventions.

Methods: We conducted a cross-sectional analysis involving a cohort of children and adolescents with unilateral spastic CP. Participants were observed performing a series of bimanual tasks designed to assess hand coordination, grip

Results:

synchronized movements and task completion, though some children demonstrated adaptive strategies to compensate for their motor limitations.

Conclusion:

with unilateral spastic CP. These insights can inform the development of targeted therapeutic approaches aimed at improving functional outcomes and quality of life.

Introduction

Unilateral spastic cerebral palsy (CP) is characterized by motor impairment on one side of the body, which can significantly affect hand function and coordination. In children and adolescents with unilateral spastic CP, the ability to use both hands together in bimanual hand use is often compromised, impacting their performance in daily activities and overall quality of life.

Bimanual hand use involves complex motor skills, including the coordination of both hands to perform tasks that require simultaneous or sequential actions. For children with unilateral spastic CP, this may be particularly challenging due to the asymmetric motor abilities and spasticity affecting one side of the body [1]. Despite the clinical significance of these challenges, there is limited research focusing

Children with unilateral spastic cerebral palsy (CP) often experience challenges in achieving functional bimanual hand use. This study explored the frequency and quality of bimanual hand use in children with unilateral spastic CP. The results indicate that many children struggle with coordinated bimanual activities, particularly those requiring fine motor skills. These findings highlight the need for targeted interventions to improve bimanual coordination and functional outcomes in this population.

Implications for therapy: These findings have important implications for clinical practice. Therapists should focus on developing strategies to enhance bimanual coordination and functional use of both hands. This may include task-specific training, adaptive equipment, and environmental modifications. Additionally, parents and caregivers should be educated on how to support their child's bimanual development through daily activities and play.

Conclusion

This study provides valuable insights into the challenges children with unilateral spastic CP face in achieving functional bimanual hand use. The findings underscore the importance of early and targeted interventions to improve bimanual coordination and functional outcomes. Further research is needed to explore the underlying mechanisms of bimanual coordination deficits and to develop more effective therapeutic approaches.

Key insights: The study identified common challenges in achieving functional bimanual hand use, such as poor coordination and limited fine motor skills. These challenges are often exacerbated by the severity of the CP and the child's age. The findings suggest that early intervention and individualized therapy are crucial for improving bimanual function and overall quality of life.

Recommendations for future research: Further research is needed to explore the underlying mechanisms of bimanual coordination deficits and to develop more effective therapeutic approaches. Long-term studies are also needed to assess the impact of early interventions on functional outcomes and quality of life.

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Clinical implications: These findings have important implications for clinical practice. Therapists should focus on developing strategies to enhance bimanual coordination and functional use of both hands. This may include task-specific training, adaptive equipment, and environmental modifications. Additionally, parents and caregivers should be educated on how to support their child's bimanual development through daily activities and play.

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