Feasibility and effectiveness of Cognitive Orientation to daily Occupational Performance (CO-OP) with children with executive functions deficits following acquired brain injury: a single case experimental design

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Introduction

Executive functions (EF) deficits are frequently observed following childhood acquired brain injury (ABI). These deficits have a strong impact on everyday life and occupational performance (the ability to choose, organize and perform meaningful activities providing satisfaction). CO-OP (Cognitive Orientation to daily Occupational Performance) is a cognitive approach for problem solving, that consists in guiding the individual towards discovery of efficient strategies, in order to improve their performance in daily life activities. CO-OP has rarely been used in childhood ABI.

Aims

1. To explore if the use of CO-OP with children with EF deficits following ABI could improve their occupational performance and their everyday executive functioning.

2. To evaluate if the OThope French pilot tool (Outil Thérapeutique pour l'Autodétermination d’Objectifs Pédagogiques en Engathérapie [therapeutic tool for self-determination of pedagogical goals in occupational therapy]) can facilitate the determination by the child of his/her problematic occupations.

Methods

o Participants

Two children, at least 7 months post-severe ABI (an 9-year-old boy who sustained severe traumatic brain injury and a 11-year old girl who sustained severe arterial ischemic stroke).

o Study design

Single case experimental design with multiple baselines across individuals and behaviors (and associated measures).

o Outcomes measures

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<td>OThope</td>
<td>To help children identify their problematic occupations</td>
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<td>GAS (Goal Attainment Scale)</td>
<td>- To formalize the expected results for each goal - To assess whether the control goal has remained stable, to demonstrate the specificity of the intervention - Use as repeated criterion measure (SCRED)</td>
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<td>BASC-C outcomes (Behavioral Assessment of the Dysexecutive Syndrome for Children)</td>
<td>To measure EF deficits by neuropsychological tests</td>
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<td>BRIEF (Behavior Rating Inventory of EF)</td>
<td>To measure the impact of EF deficits in everyday life, in family and school contexts</td>
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<td>CCT (Children's Cooking Task)</td>
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- To determine goals and to measure performance and satisfaction

- To evaluate if the control goal has remained stable, to demonstrate the specificity of the intervention

- To measure EF skills by neuropsychological tests

- To assess the impact of EF deficits in everyday life, in family and school contexts

- To assess EF in an ecological standardized task

- Child-chosen COPM goals and pre/post-intervention outcomes - Self-ratings. Performance and satisfaction: on a 0-100 scale (0: not able to perform the activity; performance score, % satisfaction satisfied with the way the activity is performed; 100: not able to perform the activity; performance score, % satisfaction perfectly satisfied with the way the activity is performed). A difference of 3 points between pre-intervention and post-intervention is statistically significant.

- Non-significant effect of the intervention

- Significant effect of the intervention

- Children's Cooking Task (CCT): number of errors and task duration

Results

- Both children were receptive to how to approach problematic situations through CO-OP. They were able to achieve the goals they had set and their occupational performance improved significantly.

- The effect of the CO-OP intervention on the goals, measured by repeated judgment criteria was consistent and significant.

- The neuropsychological test results improved.

- For P1, according to the BRIEF, parents and teacher ratings tended to be congruent at the end of the follow-up phase, with scores within age-expected norms, and significant progress displayed by statistical analysis. P2's teacher, although she reported more difficulties than parents, qualitatively perceived positive changes, especially at the beginning of the intervention.

- The performance in a ecological complex cooking task improved for P1 in immediate post-intervention (number of errors) and the task duration decreased for both patients.

- OThope was very useful in defining the goals, especially for P1.

Conclusion

These results are encouraging and suggest the effectiveness of CO-OP with children with executive functions deficits following acquired brain injury. They should be replicated in a larger number of cases, in order to refine the application of CO-OP to this population.