



Biofeedback intervention effects for people with cerebral palsy: Insights from a systematic review

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Visuoperceptive disorders are the most frequent, with a significant impact on schooling and professional integration. Executive disorders is also observed, the intelligence quotient is within the limit of normal.

Conclusion Cognitive disorders presented by the patients in our study are consistent with those described in the literature in adult cerebral palsy with a predominance of visuoperceptive disorders, associated with executive disorders. These disorders have repercussions on schooling and professional integration. Routine screening of cognitive disorders must allow the establishment of a specific support at the time of transition. The accompaniment of adolescents with cerebral palsy should continue after the acquisition of diploma to promote their social and professional integrations.

Keywords Cerebral palsy; Cognitive disorders; Transition

Disclosure of interest The authors declare that they have no competing interest.

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Biofeedback intervention effects for people with cerebral palsy: Insights from a systematic review

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Introduction/Background Cerebral palsy (CP) is a neuromuscular condition affecting 1 in 400 children that limits activities of daily living. Essential elements to improving function are feedback and repetition. Feedback about a motor performance communicated back to the individual (e.g. biofeedback) can be a powerful tool for improving autonomy and self-efficacy. However, the most effective mechanisms of biofeedback, particularly for people with CP remain unknown. This study aimed to identify the qualities of biofeedback interventions most effective for people with cerebral palsy (CP) through systematic review.

Material and method Eight databases and references from relevant articles were searched. Included studies had participants diagnosed with CP and any quantitative study design with N > 3. Studies were evaluated using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework. Interventions needed to provide external feedback about the movement or performance. For available studies, effect sizes were compared to study characteristics (intervention duration/intensity, and feedback type).

Results Fifty-seven of the 205 full-texts reviewed were included. Overall, 79% of studies and 63% of measures showed post-intervention improvement. Studies with positive effects ($r = 0.47 \pm 0.26$) were longer, averaging 8 weeks and 150 minutes/week compared to studies with no changes ($r = 0.28 \pm 0.26$), which were 2 weeks and 80 minutes/week (Fig. 1). These studies also used multi-modal feedback (audio and visual) more commonly than unimodal feedback.

Conclusion This study shows that biofeedback interventions can be effective for people with CP. The confidence in the effect would

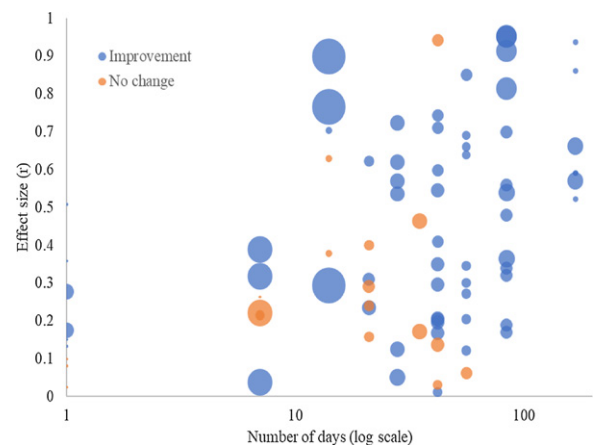


Fig. 1 Effect size by intervention duration (in days). Minutes/week indicated by bubble size, ranging from 5–750. Blue circles are measures with author indicated positive changes. Orange circles are measures with author indicated non-significant change. Time and effect size were retrievable for 81/152 measures.

be strengthened by a thoughtful paradigm, a standardized outcome toolbox, and adequate practice intensity. These insights could raise intervention efficacy to help people with CP improve motor activities.

Keywords Cerebral palsy; Biofeedback; Treatment outcome review

Disclosure of interest The authors declare that they have no competing interest.

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Structured home-based exercise program to improve ADL and participation among children with cerebral palsy

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Introduction/Background Motor function, activities of daily living (ADL) and participation are of primary concerns of parents or caregivers with cerebral palsy (CP) children. This structured home-based exercise program (SHEP) was developed to offer a practical exercise program, which includes all components of exercise for both upper and lower limbs to improve the above functions.

Material and method Eleven children participated in this study [7 males and 4 females, mean age 10y 3mo, standard deviation (SD) 3y] with Gross Motor Function Classification System (GMFCS) I–III. The multiple baseline study design was used to measure SHEP effects on ADL with Pediatric Evaluation in Disability Inventory – Computer Adaptive Test (PEDI-CAT), children's participation with Children's Assessment of Participation and Enjoyment (CAPE) questionnaire and motor function (GMFM-66). An exercise logbook was given and OMNI-RPE scale was taught to caregiver and children to monitor exercise intensity. Outcome assessments were done at pre-intervention, intervention and post-intervention phases. The intervention with SHEP phase was done for eight weeks. Two assessments were done at one month and three months post-intervention. Comparison between means of each phases were