The effectiveness of functional approach in gross motor function of children with cerebral palsy: systematic review & meta-analysis

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Introduction
Cerebral palsy is the leading cause of childhood disability, with a number of therapeutic interventions available for optimizing gross motor performance. Emerging novel conceptual frameworks (dynamic systems theories) have led to the development of the functional approach, which focuses in learning self-initiated activities, through environmental and task adaptations. Nevertheless, a systematic review and meta-analysis focused on the efficacy of functional approach on gross motor function has never been performed.

Purpose
A systematic review regarding the effectiveness of functional approach in the gross motor function in children with cerebral palsy, and a meta-analysis comparing functional approach and traditional child-focused approach.

Methods
Pubmed, EBSCO (MEDLINE, CINAHL plus etc) and Physiotherapy Evidence Database (PEDro) were searched from 1990 to March 2016. Selection criteria were studies, with experimental or quasi-experimental or cohort design, which included functional therapy for cerebral palsied children between 2-18 years old and reported gross motor function as an outcome measure. The methodological quality of selected randomized controlled trials (RCTs) was evaluated by PEDro scale. Meta-analysis of the RCTs was based on both fixed and random effects models. The effect size was expressed via Hedges’ g. The sample heterogeneity was assessed by Cochran’s Q test and I² index. P=0.05 was taken as level of significance.

Results
Nine studies reported improved of gross motor capacity using Gross Motor Function Measure (GMFM), four of which demonstrated positive effects on gross motor capability and performance via Pediatric Evaluation of Disability Inventory (PEDI). Three were pretest-posttest design, two were prospective studies and one was single subject design.

Two RCTs were of moderate and two RCTs were of high methodological quality. The RCTs contributed to the analysis for a total of 242 cerebral palsied children: 116 in the functional approach group and 126 children in the child-focused approach group.

The meta-analysis of RCTs showed no statistically significant difference in the effectiveness of functional approach compared to child-focused approach [Total fixed effects: p=0.931, g=-0.011] [Total Random effects: p=0.931, g=-0.011]. There was no also heterogeneity among the studies (Q=0.2 [DF=3, P=0.977] and I² = 0% (95% CI: 0%-0%).

Figure 2. Forest plot for the difference of effectiveness between functional and child focused approach.

Conclusions
The functional approach is suggested as an effective physiotherapeutic intervention of improving the gross motor function in children with cerebral palsy. The functional approach is shown to be equally efficacious with traditional, child-focused intervention.

Clinical Implications
Clinical physiotherapists can effectively apply the functional approach in children with cerebral palsy. The equal effectiveness of functional and child-focused approaches allows physiotherapists to choose any of the two interventions that best suits their rehabilitation philosophy and/or the individual circumstances of the child and family.

References

Figure 3. Funnel plot of meta-analysis data.

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