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Research

Physical activity stimulation program for children with cerebral palsy did not improve physical activity: a randomised trial

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KEY WORDS

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ABSTRACT

Question: In children with cerebral palsy, does a 6-month physical activity stimulation program improve physical activity, mobility capacity, fitness, fatigue and attitude towards sports more than usual paediatric physiotherapy? **Design:** Multicentre randomised controlled trial with concealed allocation, blinded assessments and intention-to-treat analysis. **Participants:** Forty-nine walking children (28 males) aged 7–13 years with spastic cerebral palsy and severity of the disability classified as Gross Motor Function Classification System level I–III. **Intervention:** The intervention group followed a 6-month physical activity stimulation program involving counselling through motivational interviewing, home-based physiotherapy, and 4 months of fitness training. The control group continued their usual paediatric physiotherapy. **Outcome measures:** Primary outcomes were walking activity (assessed objectively with an activity monitor) and parent-reported physical activity (Activity Questionnaire for Adults and Adolescents). Secondary outcomes were: mobility capacity, consisting of Gross Motor Function Measure-66 (GMFM-66), walking capacity and functional strength, fitness (aerobic and anaerobic capacity, muscle strength), self-reported fatigue, and attitude towards sport (child and parent). Assessments were performed at baseline, 4 months, 6 months and 12 months. **Results:** There were no significant intervention effects for physical activity or secondary outcomes at any assessment time. Positive trends were found for parent-reported time at moderate-to-vigorous intensity (between-group change ratio = 2.2, 95% CI 1.1 to 4.4) and GMFM-66 (mean between-group difference = 2.8 points, 95% CI 0.2 to 5.4) at 6 months, but not at 12 months. There was a trend for a small, but clinically irrelevant, improvement in the children's attitudes towards the disadvantages of sports at 6 months, and towards the advantages of sports at 12 months. **Conclusions:** This physical activity stimulation program, that combined fitness training, counselling and home-based therapy, was not effective in children with cerebral palsy. Further research should examine the potential of each component of the intervention for improving physical activity in this population. **Trial registration:** NTR2099. [Van Wely L, Balemans ACJ, Becher JG, Dallmeijer AJ (2014) Physical activity stimulation program for children with cerebral palsy did not improve physical activity: a randomised trial. *Journal of Physiotherapy* 60: XX–XX]

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Introduction

Maintaining physical activity is especially important for children with physical disabilities such as cerebral palsy because their impairments can interfere with daily activities and participation in sport.¹ Children with cerebral palsy have lower levels of fitness^{2,3} and physical activity⁴ than children with typical development, and show a decrease in physical activity with increasing mobility problems.⁵ Low levels of physical activity might lead to reduced levels of fitness and further deterioration of mobility, resulting in a vicious cycle of deconditioning and decreasing physical activity. Because physical activity behaviour may track into adolescence and

adulthood,⁶ it is important to intervene at an early stage to prevent school-age children with cerebral palsy from becoming even less active during adolescence.

'What a child can do' is not directly associated with 'what a child does do' in daily life.⁷ Therefore, treatment programs in paediatric physiotherapy should include physical activity counselling and fitness promotion.⁸ Exercise programs can improve the fitness levels of children with cerebral palsy,^{9,10} but only limited information is available on the effectiveness of interventions for children with cerebral palsy on physical activity. A 2-month internet-based physical-activity-counselling program¹¹ and a 9-month fitness-training program⁹ each reported non-significant but

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favourable trends in physical activity. A combination of fitness training and physical activity counselling may interrupt the vicious cycle of deconditioning in people with disabilities.¹ Additionally, recent work has addressed the need for home-based programs to improve the transfer of mobility-related skills practised in the therapy setting to the daily life situation.¹² This evidence motivated the development of the LEARN 2 MOVE 7-12 physical activity stimulation program, involving a lifestyle intervention with counselling and home-based physiotherapy, and a fitness training program.¹³

It was hypothesised that counselling focused on opportunities for increasing physical activity rather than on restrictions, in combination with practice of mobility-related skills in the home situation and fitness training, would work synergistically to break the vicious cycle of deconditioning. In addition, it was hypothesised that participation in the fitness-training component with other children with a disability would positively influence the children's and parents' attitudes towards sport, which is supposed to be a mediating factor for physical activity. Therefore the research question for this study was:

In children with cerebral palsy, does the 6-month LEARN 2 MOVE 7-12 physical activity stimulation program improve physical activity, mobility capacity, fitness, fatigue, and attitude towards sports more than usual paediatric physiotherapy?

Method

Design

This multi-centre, parallel-group randomised controlled trial with concealed allocation and blinded assessments was conducted in paediatric physiotherapy practices and special schools for children with disabilities in the Netherlands between September 2009 and February 2011. In a previous publication we described the study design extensively.¹³ The effects of the physical activity stimulation program on social participation, quality of life and self-perception will be reported in a separate paper. Participants were randomised 1:1 to the experimental or control intervention, with stratification by Gross Motor Function Classification System (GMFCS) level I versus level II/III. The GMFCS level I is walking without limitations, level II is walking with limitations and level III is walking with a hand-held mobility device.¹⁴ Sealed envelopes were used to conceal group allocation. Participants were informed of group allocation following the baseline assessments. The intervention group followed a 6-month physical activity stimulation program, involving a lifestyle intervention and 4 months of fitness training. The control group continued their usual paediatric physiotherapy. Outcomes were assessed in the hospital: at

baseline; at 4 months (ie, at the end of fitness training, when only walking capacity, functional strength and fitness were assessed); at 6 months (that is, at the end of the intervention); and at 12 months. The assessor (AB) was blinded to group allocation throughout the study. The parents' attitudes towards sport were only assessed at baseline and 12 months.

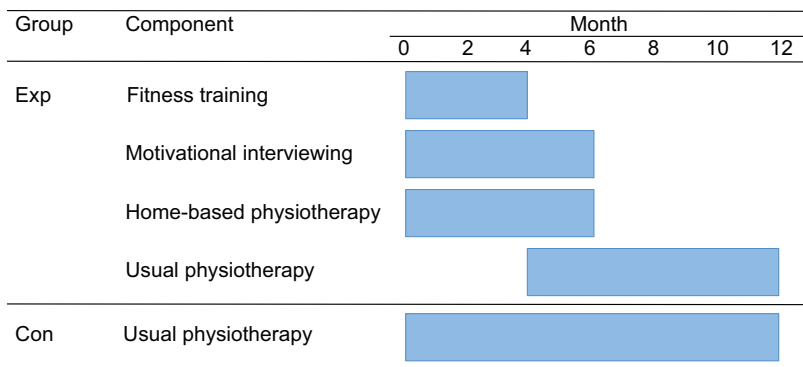
Participants, therapists and centres

Children with spastic cerebral palsy, aged 7–13 years who could walk were recruited via paediatric physiotherapy practices and special schools for children with disabilities. Inclusion criteria were: classification in GMFCS level I–III, understanding of the Dutch language and fulfilling at least one of the following criteria as determined in a telephone interview: less active than the international physical activity norm of less than 1 hour daily at >5 metabolic equivalents (METs), which is moderate or vigorous intensity;¹⁵ no regular participation in sports or (physiotherapeutic) fitness program (ie, less than three times a week for at least 20 minutes); and experience of problems related to mobility in daily life or sports. Exclusion criteria were: surgery in the previous 6 months, botulinum toxin treatment or serial casting in the previous 3 months (or planned), unstable seizures, contra-indications for physical training, severe behavioural problems, severe intellectual disability and a predominantly dyskinetic or ataxic movement disorder.

Intervention

The intervention group followed the physical activity stimulation program, which involved a lifestyle intervention and fitness training followed by usual physiotherapy. The control group undertook only usual physiotherapy. The components of the interventions are presented in Figure 1 and described in more detail elsewhere.¹³

The lifestyle intervention included counselling to motivate and coach the children and the parents to adopt more active lifestyles, as well as home-based physiotherapy. Parents and children received counselling at home by the researcher (LW) using the motivational interviewing technique.¹⁶ This client-centred interview style is aimed at eliciting behavioural change and offers strategies to deal with resistance to change. The key principle of this interview technique is that the client indicates which goals are feasible to achieve and what help is needed to achieve them. As a minimum, the coordinating researcher initiated three counselling sessions. The client could receive more counselling upon request. Home-based physiotherapy, aimed at increasing the capacity for daily activities in a situation relevant for the children, was tailored



Exp = experimental group, Con = control group.

Figure 1. Design of the experimental (physical activity stimulation program) and control group interventions.

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