

### Article

Gibson, N., Chappell, A., Blackmore, A., et al. (2018). The effect of a running intervention on running ability and participation in children with cerebral palsy: a randomized controlled trial. *Disability and Rehabilitation*, 40(25), 3041-3049.

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### Adaptive Sports/Recreation Topic Categories

- Participation in Sports/Recreation
- Sports/Physical Activity Performance

### Research Question

- Can a running skill acquisition training intervention improve running ability, general high-level mobility and participation in children with cerebral palsy?

### Methodology

- Participants were children 9-18 years with cerebral palsy with Gross Motor Function Classification System levels I-III who were able to walk at least 10 meters unassisted.
- Exclusion criteria: medical condition that prevented safe participation in a vigorous exercise program, surgery in the last 6 months, or a cognitive or behavioral challenge that would interfere with participation.
- Randomized controlled trial design.
- Patients were stratified into four blocks based upon age (<13 years or ≥13 years) and High Level Mobility Assessment Tool score (HiMAT, score ≤ 25 or > 25) before being randomly assigned to intervention and control groups.
- Participants in the intervention group received individualized running training from a physical therapist for 12 weeks, delivered in a small group setting. The physical therapists assessed participants' running mechanics before designing an individualized program to improve neuromuscular control and improve strength in muscles critical for running. The 12-week intervention included two 1-hour group sessions per week plus an individualized home exercise program to be completed an additional two times per week.
- Participants in the control group received their usual therapy by their community therapist for the 12-week study.
- Primary outcome measures: improvement in running ability as measured by the Goal Attainment Scale (GAS), HiMAT, and Participation and Environment Measure for Children and Youth.
- Secondary outcome measures: aerobic fitness (10m shuttle run), anaerobic fitness (muscle power sprint test- 6 x 15-m), and agility (10 x 5-m sprint test, including 9 turns).

### Results

- Forty-two (21 control, 21 treatment) individuals with spastic cerebral palsy participated in this study. Between control and intervention groups, there were no significant differences in terms of gender, GMFCS level, topographical involvement, age, HiMAT score, height, or weight.
- At the end of 12 weeks, the participants in the treatment group demonstrated statistically significant increased achievement of running-related goals, as measured by the GAS, and increased frequency of participation at school

- There were no significant differences in HiMAT scores, aerobic fitness, anaerobic fitness, agility, or participation in activities in a community setting.

### **Discussion/Conclusion**

- This study highlights that access to a program that specifically targets running training can enhance functioning in the “Activities” and “Participation” components of the International Classification of Functioning, Disability, and Health model, even without significantly impacting abilities at the “Body Functions and Structures” level.

### **Article Strengths**

- Using the GAS as an outcome measure highlighted the efficacy of the intervention program in helping participants achieve their individually-set running goals.
- Detailed progression of the training program documented for reproducibility.

### **Article Weaknesses**

- Small sample size.
- Applicability mainly limited to individuals with spastic cerebral palsy with GMFCS I-II levels.
- Significant variation in attendance of group intervention sessions (ranged from 4 – 21 out the possible 24). Article did not discuss participants’ adherence to the home exercise component though diary was collected.
- The 12-week duration of the intervention may have been insufficient to detect changes in aerobic fitness, anaerobic fitness, and agility.
- There was no follow up to assess whether participants maintained their improvements in running ability and participation levels.

### **Take Home Messages**

- Running is a motor skill that can be trained in children with cerebral palsy.
- It is important to discuss specific therapy goals with the patient and family prior to designing an intervention program.
- Participation in an individualized running intervention based upon a patient’s personal goals may improve perceived running ability and confidence and enhance participation in school activities.
- More research is needed to identify intervention protocols that may demonstrate clinically significant changes in running ability at the ICF “Body Functions and Structures” level.