

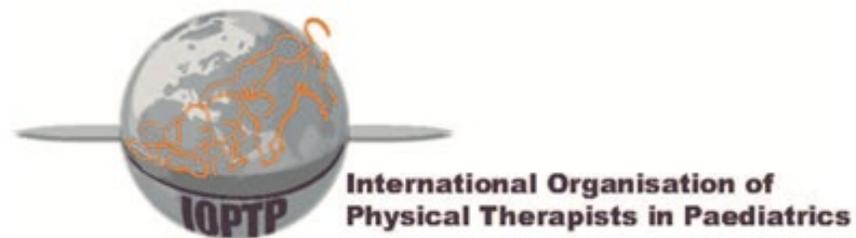


## Objective #3

\*Identify 'active ingredients' in activity-based interventions to promote child and family participation.

# Participate in physical activities

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# Training in children with physical disabilities

## Effects of High-Intensity Interval Training on Fitness and Health in Youth With Physical Disabilities

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Center of Excellence for Rehabilitation Medicine (Drs Zwinkels, Verschuren, and Visser-Meily), Brain Center Rudolf Magnus, University Medical Center Utrecht and De Hoogstraat Rehabilitation, Utrecht University, Utrecht, the Netherlands; Department of Sports (Dr Zwinkels), De Hoogstraat Rehabilitation, Utrecht, the Netherlands; Department of Rehabilitation (Drs Backx and Visser-Meily), Physical Therapy Science & Sports, Brain Center Rudolf Magnus, University Medical Center Utrecht, Utrecht, the Netherlands; University of Applied Sciences (Drs de Groot and Wittink), Utrecht, the Netherlands; Child Development and Exercise Center (Drs de Groot and Takken), University Medical Center Utrecht, Utrecht, the Netherlands; Netherlands Institute for Healthcare Services Research (Dr de Groot), Utrecht, the Netherlands.

**Purpose:** To investigate the effects of high-intensity interval training (HIT) on physical fitness and cardiometabolic health in youth with physical disabilities.

**Methods:** For this quasi-experimental study 70 participants were recruited from schools for special education and divided into runners and users of wheelchairs. HIT was performed for 8 weeks, twice a week, containing 30 seconds all-out exercises.

**Results:** Exercise adherence was 84.5%. Following HIT, there were improvements in anaerobic performance, agility, aerobic performance, and systolic and diastolic blood pressure. There were no changes in peak oxygen uptake ( $\dot{V}O_{2peak}$ ), arterial stiffness, body composition, lipid profile, and fasting glucose.

**Conclusions:** Both anaerobic and aerobic performance improved after HIT, with no changes in  $\dot{V}O_{2peak}$ . There were no effects on cardiometabolic health, except for a decrease in blood pressure. (Pediatr Phys Ther 2019;31:84–93)

**Key words:** adolescent, children, exercise training, health, physical disability, physical fitness

Physical Fitness



Physical Activity

# Evidence for increasing physical activity in children with physical disabilities: a systematic review

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## ABBREVIATIONS

AACPDM	American Academy for Cerebral Palsy and Developmental Medicine
ICF	International Classification of Functioning, Disability and Health
RCT	Randomized controlled trial

**AIM** To summarize the best evidence of interventions for increasing physical activity in children with physical disabilities.

**METHOD** A systematic review was conducted using an electronic search executed in Academic Search Elite, Academic Search Premier, CINAHL, Embase, MEDLINE, PEDro, PsychINFO, and SPORTDiscus up to February 2016. The selection of articles was performed independently by two researchers according to predetermined eligibility criteria. Data extraction, methodological quality, and levels of evidence were independently assessed by two researchers using a data-collection form from the Cochrane Collaboration and according to the guidelines of the American Academy for Cerebral Palsy and Developmental Medicine.

**RESULTS** Seven studies were included. Five randomized controlled trials ranged from strong level I to weak level II studies, and two pre-post design studies were classified as level IV. There is level I evidence for no effect of physical training on objectively measured physical activity, conflicting level II evidence for interventions with a behavioural component on the increase of objectively measured physical activity directly after the intervention, and level II evidence for no effect during follow-up. Results are limited to children with cerebral palsy as no other diagnoses were included.

**INTERPRETATION** Increasing physical activity in children with physical disabilities is very complex and demands further development and research.

Level I evidence

➤ **Physical training** ❌

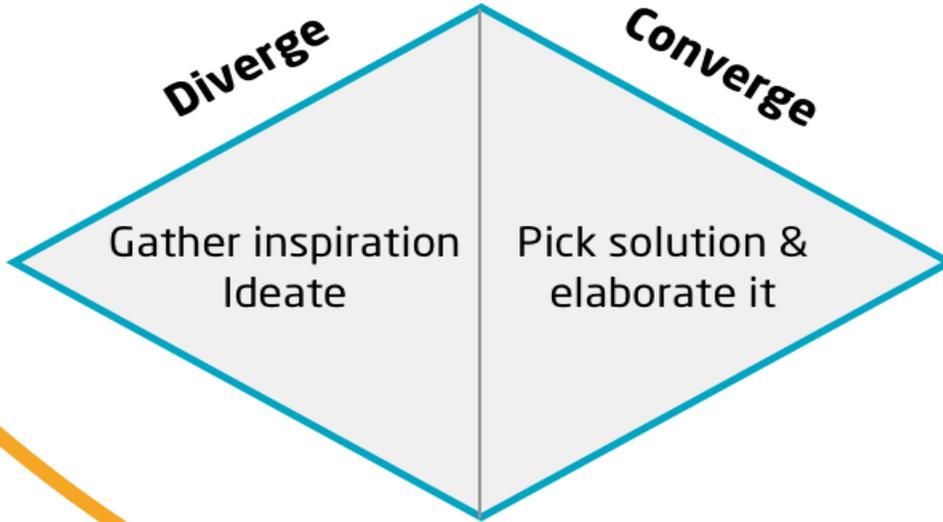
Level II evidence

Results limited to children with cerebral palsy



**Finding the vision and defining the foundation of whatever "it" you'll be building**

- Long-term goals
- Potential problems
- Questions to answer
- Assumptions to test



**Building a facade of "it"**



**Testing "it" with users**



**User feedback & insights**

GV Design Sprints outline - [medium.com/@skjoldbroder](https://medium.com/@skjoldbroder)

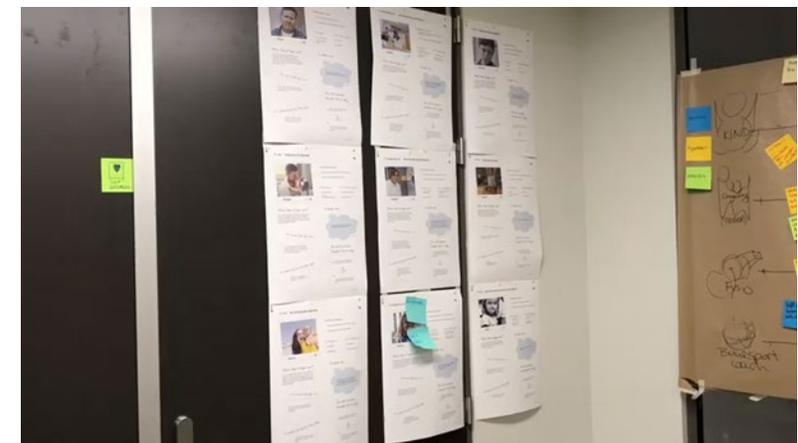




FIGURE 3 | Example of knowledge cards with the theme *stimulating self-efficacy*.

**TABLE 1** | Themes and subthemes.

<b>Stimulating self-efficacy</b>	<b>Stimulating autonomy</b>	<b>Focusing on possibilities</b>	<b>Focusing on the needs of the individual child</b>	<b>Collaborating with stakeholders</b>	<b>Connecting with a child's environment</b>	<b>Meaningful goal setting</b>
Fostering confidence	Being able to deny help	Focusing on abilities instead of obstacles	Using a tailored approach	Striving for equality	Have activities take place in daily life	Relevant goals
Fostering feeling secure	Knowing who is responsible	Creative solutions	Finding suitable solutions	Finding the right support	Have activities take place in a meaningful environment	Purposeful goals
Having insight in their own possibilities	Knowing their own boundaries	Having fun	Giving the child a central position	Sharing knowledge	Including the social environment	Goals focusing on participation
Being motivated	Being able to create their own solution	Challenging solutions	Listening to each other	Monitoring the child	Fostering visibility	
	Being able to try out activities	Small steps toward goal				
	Trial and error	Celebrating (actual) successes				



# Stimulating self-efficacy

- Feeling Confidence
- Feeling secure
- Insight in own possibilities
- Being motivated

*“We create feelings of insecurity and a delay in motor development if we can’t achieve that children know what their own competences are.”*





# Stimulating autonomy

- Being able to deny help
- Knowing who is responsible
- Knowing their own boundaries
- Being able to create own solutions
- Being able to try out activities
- Trial and error

*"I find it hard to give my child the opportunity to deny help and become independent."*

*"by doing and discovering a child will experience their boundaries. So, dare to search for their real boundaries."*

*"Often healthcare providers take control. For example, bus drivers often push children in a wheelchair to the school bus, even if these children are able to self-propel their wheelchair. What are the consequences of this behavior for a child's psyche?"*



# Focussing on possibilities

- Focusing on abilities instead of obstacles
- Creative solutions
- Having fun
- Challenging solutions
- Small steps toward goals
- Celebrating successes



*"ask what a child can do instead of what they can't do."*

*"We tried several sports, but here [at Framerrunning]...he can move although he has a huge physical limitation, yes it really is a solution".*





# Focusing on needs of the individual child

- Using a tailored approach
- Finding suitable solutions
- Giving the child a central position
- Listening to each other

*“often we talk about children when we have to talk with children.”*

*“It involves customization, while protocols do not take the real needs of a child into account.”*

*“I wish professionals would really listen to parents in an open conversation without prejudice caused by the diagnosis”*

*“It feels like fighting when I’m not heard.”*



# Collaborating with stakeholders

- Strive for equality between stakeholders
- Finding the right support
- Sharing knowledge
- Monitoring the child





# Connection with a child's environment

- Have activities take place in daily life
- Have activities take place in a meaningful environment
- Including the social environment
- Fostering visibility

*"Friends of a child sometimes come to my treatment so that these children can learn skills together and integrate this activity at home (for example when playing)."*

*"Involving parents is not just letting parents watch, but let them participate and experience"*

*"It is important to make yourself visible to other children in your own environment. The older you get, the more difficult this is."*



# Meaningful goal setting

- Relevant goals
- Purposeful goals
- Goals focusing on participation

*“it is important to set goals for the intervention together with children and their parents.”*

*“during an intervention, don’t solely focus on activities such as walking, but focus on participation, for example moving from one place to another.”*

# Opportunities

- Embed behavioral change in paediatric physiotherapy research, education, practice
- Provide paediatric physiotherapy in the meaningful context of the child and his/her parents
- Do not only focus on sports, but also on other physical activities such as active outside play





# Examples from the Netherlands



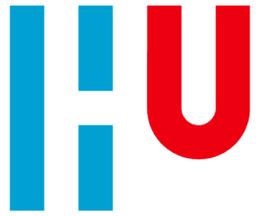
*“(P) Wheelchair training, that is very important I think,..... that they really learn to go up and down stairs..... a lot of places are not adjusted for wheelchairs... she can do much more now... and you can just go....your life becomes a lot more fun....”*

The What Moves You?! Toolkit.  
Incorporating behavioral change into  
PPT practice.





Fitkids Foundation



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International Organisation of  
Physical Therapists in Paediatrics

*There are no limitations,  
you only have to facilitate  
the opportunities ;-)*

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