

Physical activity and sports in children with disabilities in Flanders

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Abstract

The paper describes physical activity and discusses benefits and opportunities but also obstacles of physical activity and sports in children with disabilities.

Introduction

It is well known that physical activity (PA) is an important factor to improve fitness and health in all people with and without disabilities. Children with disabilities, however, are known to participate less in PA than their typically developing peers (1, 2). PA is necessary for an optimal physical, emotional and psychosocial development, but is not easy to obtain for children with disabilities. In 2015 Verschuren et al. published recommendations on PA and avoidance of sedentary behavior for people with cerebral palsy (CP) based on the previous WHO guidelines (3). The recent WHO guidelines now include recommendations on PA in children, adolescents (at least 60 minutes per day of moderate to vigorous activity) and adults (150-300 minutes/week moderate to vigorous aerobic activity, including muscle and bone strengthening exercise at least 3 times/week) living with disabilities (4).

In order to promote PA in children with disabilities, understanding barriers and facilitators is important. Reasons for the lower level of PA are complex and multifactorial (5). They can be found in the , their and the (6). It is also important to realize that health related benefits of PA can be attained during . Promotion of PA should thus not only focus on organized sports and activities, but also on occupational, transportation related and leisure activities in e.g. a school or familial context. The Physical Activity for People with Disabilities conceptual model is an integrated model of physical activity behavior and explores its relation with functioning and disability. This model can help health professionals to understand the facilitators and barriers in individuals with disabilities (7).

The goal of this study was to describe habitual PA, investigate motivation and barriers and discuss local examples to enhance habitual PA in children with CP in specific and people with neuromotor disabilities in general. We present the results of two local studies, a first study describing habitual PA in 6-9 year old children with CP and a second study exploring motivation and barriers to join organized PA in children and adults in Antwerp. Finally we share our local experience of organizing PA and sports, specifically for children and adolescents with motor disabilities, based on three examples: a sports club, a sport-specific organization and an advice center for individual PA.

Methods

Exploring physical activity in children with cerebral palsy in Flanders

For this clinical trial, all ambulatory children with CP (Gross Motor Functioning Classification Scale (GMFCS) I-III), attending either the CP reference center of Antwerp (CePra) or UZ Leuven, born in 2009 or 2010 were identified (8, 9). They were asked to fill in two questionnaires (Children Assessment and Performance Scale (CAPE) and Activities Scale for Kids-Performance (ASKp)) and a coded diary on PA for seven consecutive days.

The **ASKp** is a 30-item questionnaire with seven sub-domains measuring what the child did in the previous week at the levels of personal care, dressing, other skills, locomotion, play and transfers and thus indicates a child's physical functioning (10, 11). The **CAPE** is a 55-item questionnaire and gives information about five dimensions of participation in the last four months: diversity, intensity, enjoyment, with whom and where (12).

The **coded activity diary** was used for determining the activity levels (13). It was completed for seven consecutive days (five schooldays and two weekend days). Activities during twenty-four hours were converted to metabolic equivalents values and multiplied by 30 min (METs*minutes) (14). MET values can be divided in four activity levels: corresponding to sedentary (≤ 1 METs), light ($>1 - < 3$ METs), moderate (3-6 METs) and vigorous activity (> 6 METs).

Exploring motivation and barriers in sports participation in people with disabilities in Antwerp

All participants (or their parents) of two local sports clubs for people with disabilities ([Spinnaker](#) and [Wapper](#)), were asked about their motivation and barriers to participate in sports activities.

Participants were asked if one or more motivational aspects (global health, improved cardiorespiratory fitness, social contacts, performance, leisure or others) and one or more barriers (distance (to far), transport, financial aspects, health, lack of material, sports club or (different) sports, familial reasons or others) were applicable.

Description of local initiatives to enhance PA in people with disabilities

Local initiatives at different levels will be discussed:

- a sports club offering different sports for children and adults with motor disabilities
- a sports organization promoting a single sport for the specific target population of children with neuromotor disorders
- an advice center for mobility and PA through cycling for children and adults

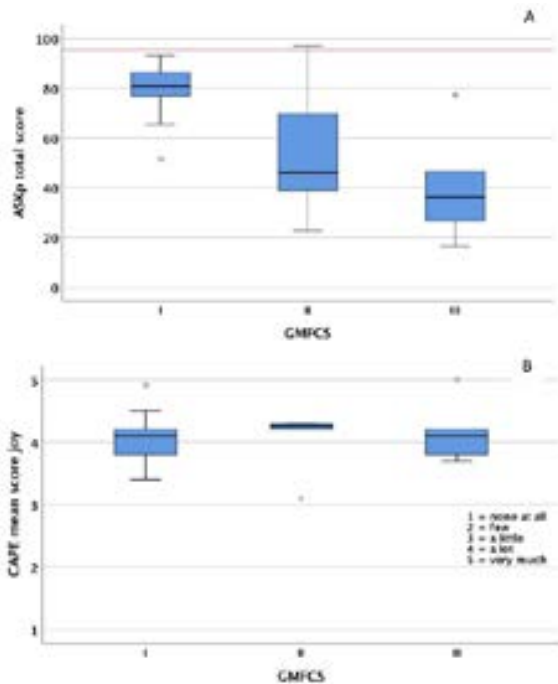
Results

Exploring physical activity in children with cerebral palsy in Flanders

Of 130 children born in 2009 or 2010 attending the two CP reference centers, 110 children were reached and 35 children (GMFCS I: n=22; GMFCS II: n=7; GMFCS III: n=6) returned complete questionnaires and diaries on PA. Of those 35 children all children received physiotherapy and 85% participated in sports (17/22 in GMFCS I, 6/7 in GMFCS II and 4/6 in GMFCS III).

ASKp scores were near normal in GMFCS I but were decreased in most children with GMFCS II-III (Figure 1A). Mean participation time in sport activities was 147 minutes [0 - 420] with higher values for GMFCS I-II (GMFCS I; 146 minutes [0-420], GMFCS II: 165 minutes [0-420] compared to GMFCS III (70 minutes [0-120]) per week with joy in all GMFCS-levels (Figure 1B). Figure 2 gives the individual amounts of moderate and vigorous activity during school, semi-school (Wednesday) and weekend days from the coded diary.

Figure 1: Subjective measure of habitual physical activity in GMFCS level I-III
 A: Total score on the Activity Scale for Kids performance (AsKp) (red line, mean value of typical developing children, maximum= 100)
 B: score Children Assessment and Performance Scale (CAPE) subscore joy



Exploring motivation and barriers in sports participation in people with disabilities in Antwerp

With 97/128 returned questionnaires for Spinnaker and 44/86 for Wapper there was a response rate of respectively 75% and 51%.

Most cited **motivation to participate** in sport activities is leisure in all age groups (63% in children, 81% in adolescents and 69% in adults, see figure 3). More than half of the participants had two or more reasons to participate. In the 65/141 participants with only one reason, leisure was most cited, 3 times more than the second most cited cardiorespiratory fitness. If more than one reason was cited, leisure was still most cited, 19% more than social contact and almost twice as much (80% more) as cardiorespiratory fitness.

All children (or their parents) experienced at least one **barrier to participate** in sports activities. In adults 46% did not experience barriers at all (see figure 4). If only one single reason was cited, this was always transport. Other reasons not to participate were diverse, including 'I don't know where to look', 'want to, but did not do it yet', 'not possible yet in combination with school', 'not all clubs fit my need', 'not offered in my region', 'I don't know which sport I can do with my handicap'.

Local initiatives to enhance PA in children with disabilities

Sports club

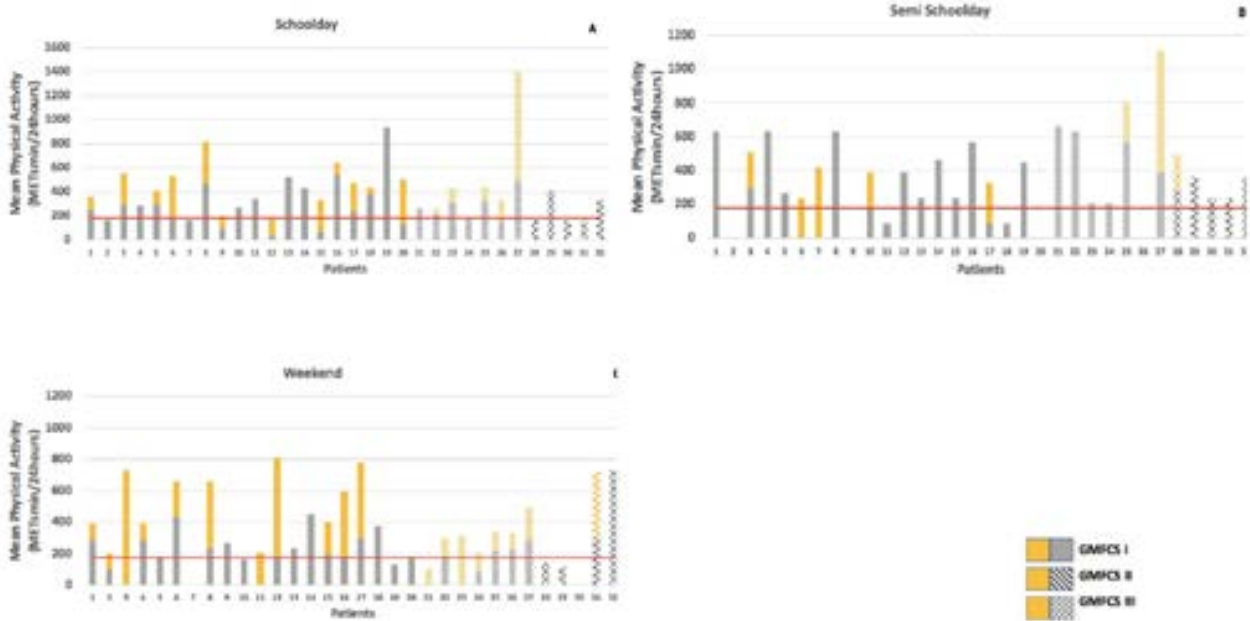
started already in 1976 as a sports club with a more recreational character as part of the former Sint-Jozefinstituut, now Heder, a special school and rehabilitation center for children and youth with physical or mental disorders in Antwerp. In the early '90s the offer became limited to people with physical disabilities, as this target group experienced most barriers to be physical active. Furthermore the offered sports were from that point on limited to sports with an 'official' character, meaning that there were opportunities for competition and transfer to regular circuits. The sports offered at Spinnaker have a clear link with the children attending school at Heder. The main goal of this sports club is to get the children acquainted with sports and PA and its values and benefits so they can take that positive experience to carry on in their future adult lives.

Sports organization

In 2015 a first CP soccer team for children restarted out of the need for an offer for children with neuromotor disorders. After the Paralympic medals (1984 and 1988) and diverse adult championships till 1994, CP-football in general and for children

Figure 2: Mean habitual physical activity during schooldays (A), semi-schooldays (B) and weekend days (C) for individual patients as obtained by a coded diary sorted by GMFCS level.

Moderate activity in grey, vigorous activity in yellow. GMFCS = Gross Motor Function Classification System, MET = metabolic equivalent of tasks, MTSdayMO = Metabolic equivalent of tasks per day Moderate, MTSdayVI Metabolic equivalent of tasks per day vigorous.



in particular had become somewhat forgotten in Belgium. Children with neuromotor disorders were therefore directed to a more general offer for children and adults with different kinds of limitations (G-sports). However for a child with motor impairments it is difficult to compete with children with mental disorders and normal motor capacities and they often gave up soccer due to a lack of enjoyment in general G-sport. Not long after the first team, different regular soccer clubs arose, at first for children with CP (in analogy with International Federation of CP (IFCP) football). Nowadays, about ten teams offer soccer especially for children with neuromotor disorders within the Belgian Football Association (VoetbalVlaanderen) under the umbrella of CP+ soccer, the '+' indicating that children with other neuromotor disorders are also welcome. The sports organizations, in close collaboration with Parantee-Psylos who supports clubs and federations in Flanders, plays an important role in promotion and enhances initiatives that brings different clubs together, allowing this initiatives to grow.

Advice center

Not all children choose to participate in organized sports and the health benefits of PA also exist when exercising in other contexts. Furthermore cycling is an ideal way to combine transport and habitual PA. Therefore initiatives to enhance PA outside an organized sports context are of great value. In 2010, a local center for individual advice on cycling was developed by UZ Pellenberg with support of the Province Vlaams-Brabant and VZW Move to Improve, a foundation with the goal to optimize care for children with neuromotor (movement) difficulties in order to find sustainable solutions to help those children to move more and better, based on movement evaluation and scientific research. Children (and adults) who experience difficulties with learning to or riding a bike due to their impairment can find objective and independent information and council at the Fietsadviescentrum at the UZ Pellenberg. A large part of the advices

Figure 3: Number of participants per motivational aspect for A: children (<13 years - light grey), B: adolescents (14-18 year - dark grey), C: adults (>18 year - black). D: percentage of participants per group that cited a specific reason (x-axis). CRF= cardiorespiratory fitness

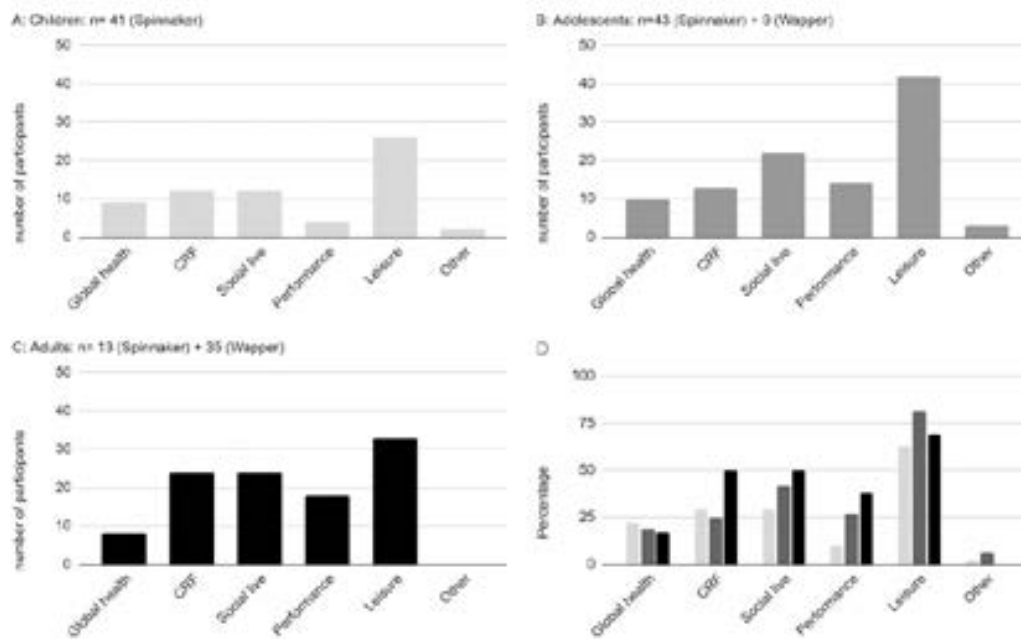
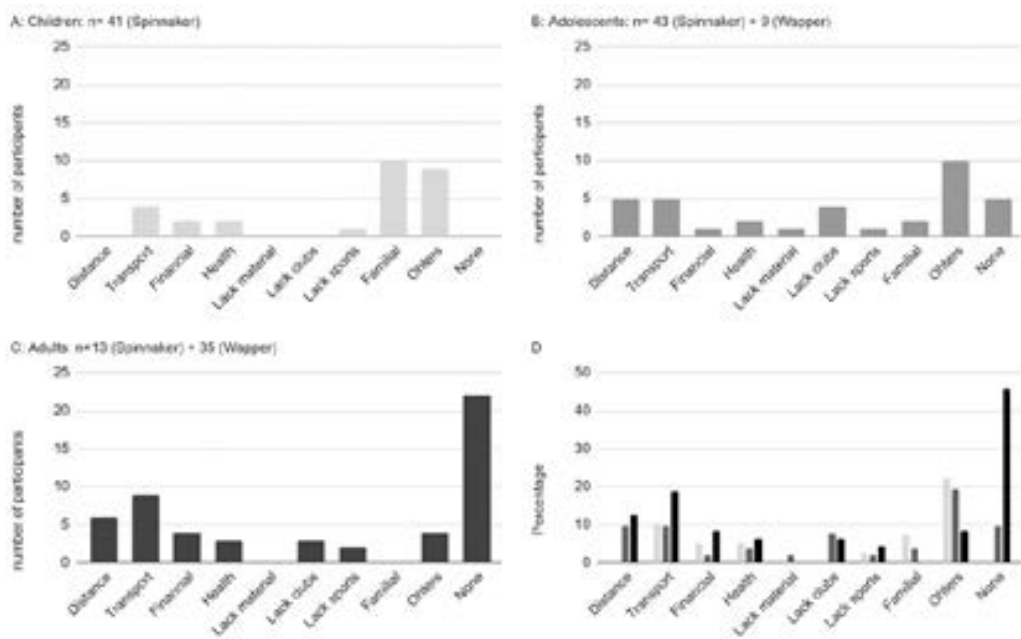


Figure 4: Number of participants for A: children (<13 years - light grey), B: adolescents (14-18 year - dark grey), C: adults (>18 year - black) and D: percentage of participants citing a barrier per group and per perceived barrier.



(30%) is given to children between 6 and 12 years. A special fitted bike is not always necessary, often small adaptations to a normal bike are sufficient to get the children mobile, active and in charge of their own mobility.

Discussion

The goal of this study was to describe PA, investigate motivation and barriers and discuss local examples to enhance PA in children with CP in specific and people with neuromotor disabilities in general.

Results show that it is possible for ambulant children with CP to **reach the recommendations on PA by the WHO**, regardless of GMFCS level. The main motivation to participate in sports activities was a meaningful leisure activity, regardless of age. Almost half of the adults could participate without experiencing barriers.

However, in the first study, only 35/130 children aged between 6-9 years participated, partially to the time-consuming questionnaires and diaries, so extrapolation to the entire population of children with CP remains difficult. In order to have an idea of the habitual PA in the individual child with neuromotor disabilities, PA can be monitored in clinical practice with commercial activity trackers.

The second study confirmed that **motivation** and **barriers** can be **multidimensional**, with more than half of the participants having more than one single motivation (5, 6). Most of the participants with a singular reason were motivated to participate in sports as part of meaningful leisure activities, before personal health or cardiorespiratory fitness. In the selected population, all children, adolescents and adults had already found their way to organized sports. Still, half of the adults reported that transport and distance to a club remains a barrier. For the children, these barriers were almost not existing, as they participated at the school they were attending (Spinnaker being located at Heder).

As confirmed by our results, **organizing sports activities locally** and nearby can help to overcome barriers. The goal of is to get the children acquainted with different kinds of sports and PA in order to give them positive experiences they can carry on to adolescence and adulthood. Our experience in CP+ soccer also highlights the importance of local clubs. Although at the beginning several parents were willing to drive up to an hour to give their child the opportunity to experience enjoyment on a soccer field every weekend, as soon as new clubs arose, they changed to a club nearby. CP+ soccer arose out of the need to have an offer especially for children with neuromotor disorders, as inclusion in the existing G-teams (for people with mental disorders and good motor capacities) was difficult. VoetbalVlaanderen and Parantee-Psylos have done a great effort to enhance soccer for this specific target population, enabling a quick growth of number of clubs and thus also number of children participating in soccer regularly. Their enhancement is imperative as children want to do more than just train with their teammates in one club. In order to stay in the game, they also want the experience of real matches, tournaments and opponents, in one word real inclusion into the world of soccer. As clubs and trainers almost always are volunteers, **support on the level of sport-specific or general organizations** is imperative, so that they can focus on the sportive aspect and the participants.

Although all children (and adults) should be physical active on a regular basis and avoid sedentary behavior, not all children with neuromotor disorders, just as typical developing children, are prone to (team) sports (4). It is therefore important to promote not only sports but habitual PA in general. The cycling advice center is an excellent example of how habitual PA in children with neuromotor disorders can be enhanced. Although the advice center does not focus on children in particular, 30% of the advices are given to children in primary school. At this age they become too old to be transported in a buggy and moving around autonomously becomes important. The advice center had financial support from VZW Move to Improve to be able to acquire test models and is still funded by SportVlaanderen. Without these financial injections it would not be possible to give the **individual advice** needed, as every patient experiences different barriers.

For all three initiatives we still experience that it is difficult for parents to find their way to them. Often they are positively surprised when hearing of the existing offers. In our experience this is not due to a lack of promotion from the different sports organizations. Often parents are reluctant because they either underestimate the capacities of their child or they are not able to match them with the (for them too abstract) offer from different sports clubs. So-called mouth to mouth information from different clinical professionals or parent (organization)s is often the necessary boost to join organized sports. Establishing a visible collaboration between organizations with an offer for children with disabilities and specific reference centers for children with disabilities

can help to **promote habitual PA** and sport to those children who did not find their way yet. Enhancing the link between existing initiatives such as the online search tool from [Parantee-Psylos](#) and clinical care can help to further improve to the level of individual council, which is key as a child with a motor disorder and normal mental capacities needs a different approach than an adult with mere mental disabilities. Furthermore establishing an interest and obviousness of the need to be physical active and avoid sedentary behavior in the young child with disabilities will help them to keep being active as an adult with physical (less pain, less fatigue, better cardiorespiratory fitness,...) and psycho-social benefits (inclusion, meaningful leisure,...) of improved quality of life.

Conclusion

In conclusion, although barriers exist, all children with neuromotor disorders should be able to find their way to and participate in habitual PA and organized sports. Clinicians can play an important role to help parents understand that a neuromotor disorders is no reason not to be physical active, as habitual PA not only enhances physical health but also inclusion and social well-being. Sports clubs, organizations and advice centers should become anchored not only in the care of children with motor disabilities, but also in their local society so that inclusion in PA for people with disabilities becomes evident and no longer an exception for intrinsically motivated children and parents.

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