

Simon: A Very Special Olympian!

Benefits of Exercise on Children and Adolescents with Intellectual and Developmental Disability

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Recently I cheered on the Mens Basketball team at the 2013 Special Olympics Asia Pacific Games in Newcastle. The determination of the athletes was equally matched by family and friends watching and wildly cheering them on from the stands. All players had a talent and contributed something unique to the team. After the winning match the players were elated and posed beside their proud mothers and other relatives for a photoshoot akin to the professional league.

For those who haven't heard, the Special Olympics strives to create a better world by fostering the acceptance and inclusion of all people especially those with an intellectual disability. According to the Special Olympics, sports participation can shift the focus from disability to ability, from isolation to involvement. Special Olympics offer regional, state, national and international participation and competition in an array of sports.

Simon is a special Olympics Ambassador and has been competing in the Special Olympics for five years. He was selected to represent Australia in the Asia Pacific Games for basketball and his team won bronze. The highlight of Simon's involvement is the social contact. "The best parts of representing Australia were meeting people from different countries and meeting new people from different parts of Australia. Also walking into the Hunter Stadium wearing the Australian Uniform and winning the bronze medal for Australia". Simon trains twice a week, once golf and once basketball. He participates in quarterly regional competitions.

Simon's mother and carer Annie reports "My intention was for Simon to have fun and be involved in something other than reading and watching television. At first I did think 'how was he to cope?', as he is not very athletic, but I was proved wrong. His golf is exceptional for someone who has not received professional training and his height is an added bonus when he competes in basketball". "The socialisation for mums is very therapeutic. We meet for lunch or breakfast and compare giggles. As parents we do a lot of brainstorming when we meet, we catch up on the latest news for carers. For example there were some grants being offered recently which I heard about through networking with other parents which enabled me to apply".

I quizzed Simon and Annie about the benefits of participation in sport. Simon had positive things to say about meeting new friends and being excited when competitions were close. Annie reported "Physically his extraordinary transformation in body shape, he has really filled out in the upper body even though he only trains twice a week. At first the coach and I were very concerned as he would go bright red in the face and tire very early through lack of oxygen which would bring on his asthma. But now he can stay on court for hours and hardly gets tired at all".

Annie highlights the sense of community that is a result of Simon's involvement in the Special Olympics. "As far as a sense of community is concerned the Special Olympics has contributed so much to Simon's life. There are discos, birthdays and fundraisers." Annie hasn't noticed any differences in sleep patterns or moods since participating in exercise but his self esteem was noted- "Simon is not a competitive person at all and if he loses a game he always says 'at least I gave it a go'. But when he wins, he talks about it for days. He once said to me 'Mum I never thought I would ever be an Olympian!' - that's our benefit!"

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The Special Olympics caused me to reflect about sport and exercise and its relationship to health, mental health and wellbeing. We have all heard about the physical and mental benefits of exercise: expends energy, improves fitness and circulation, lowers heart disease, clears the mind, alleviates



stress, mild depression and anxiety but what about the benefits for children and adolescents with developmental and/or intellectual disabilities. I wanted to find the evidence. Like a hunter I hunted, my eyes scanning the written text whereby I swiftly realised the need for more large scale evidence.

Children and adolescents with developmental and intellectual disabilities experience greater rates of obesity than the general population. De, Small and Baur (2008) reported that in their study of 95 2-18 year olds visiting a developmental assessment clinic, 24% were overweight and 15% obese (a total of 40% combined). De et al note that compared to a study of school aged children the same year a total of only 23% were obese or overweight. De et al reported no significant differences across ages, sexes or level of intellectual disability or global development delay.

De, Small and Baur 2008 report that childhood obesity is associated with a number of health problems, including diabetes, hypertension, sleep-disordered breathing, orthopaedic complications, abnormal lipid profiles, stigmatisation, bullying, future risks of heart disease and cancer. They note that children with developmental disabilities have predisposing factors for obesity including co-existence of certain genetic conditions for obesity, use of anti-epileptic and anti psychotic medications that can cause weight gain combined with reduced levels of physical activity.

Lotan et al (2004) from Israel suggest that lack of physical fitness in those with an intellectual disability may lead to rapid ageing. In their study within a special school, they investigated a short term daily treadmill intervention. Children presenting with poor physical fitness demonstrated significant improvement. 15 children aged 5-10 years (4 mod ID, 8 severe, 3 profound) exercised daily over 2 months for an average of almost 20 mins per day. The children were test-

ed 2 months prior to, at the start and end of the intervention. Prior to the intervention the children walked for an average of 6.7 minutes, by the end of the program this had increased to 28.8 minutes. Speed also increased from 1.7 kph to 2.7kph, rates improved significantly for rest and during effort during the intervention. The researchers also found a correlation between functional ability and improved cardiovascular fitness.

Lack of physical activity by children with developmental and intellectual disabilities is not only an individual problem but lies within our social structures. Johnson (2009) reports that people with disabilities are less likely to be engaged in physical activity due to lack of access and lack of information on appropriate activities, lack of support from community and nature of disabilities. Johnson describes that this can lead to decreased circulation, poor self concept and decreased independence. In their meta-analysis documented benefits include: improvements in aerobic capacity, gross motor function and high levels of participant and parent satisfaction. Johnson notes that outcome measures should include assessment of social benefits, self esteem and body image.

A meta-analysis looking at 16 studies on exercise involving 133 children and adults with ASD by Sowa and Meulenbroek (2012) concluded that exercise does benefit motor and social skills with an overall improvement score of 37.5% across all studies.

Running in particular has a small evidence base that it may reduce aggression, self stimulation, and disruptive behaviour. Four case studies indicating the benefits of running were reported in Sowa and Meulenbroek's (2012) meta-analysis. One case study did report the significant reduction of aggressive behaviour of a 24 year old male as reported by staff members after a 20 minute daily running program (Allison et al 1991). Another study by Celiberti et al 1997 reported that physical self stimulation decreased and a 50% reduction in disruptive behaviour after three 6 minute jogs per week by a 5 year old, whereas walking had no effect. In a third study by Nicholson et al four 9 year olds with ASD (2 high functioning ASD 2 Asperger's) jogged for 12 minutes three times per week for 2 weeks and academic engagement time increased. In a fourth study by Rosenthal -Malek and Mitchell (1997) 5 males aged 14-15 years jogged for 20 minutes, self stimulatory behaviour reduced and work related performance increased (correct academic responding and number of completed tasks).

Oriel et al 2011 examined the effects of aerobic exercise on academic engagement in younger children with 9 ASD (3-6 years). They found that after 15 minutes of running 7 of the 9 students improved in correct responding. 5 of the 9 improved in on task time- however results were not statistically significant. Improvements were observed to continue for 30 minutes after exercise. Kern et al noted this threshold as being 90 mins.

McMahon and Gross 1987 found that self concept and physical fitness improved in a study involving 54 boys with a learning disability aged 7-12 after participating in aerobic

activity (distance running, aerobic dance and variants of soccer) for 25 mins, 5 days a week for 20 weeks when compared with a control group. No changes in academic achievement were observed.

Gabler-Halle, Halle and Chung 1993 describe several studies in their critical review on the effects of aerobic exercise on psychological and behavioural variables of individuals with developmental disabilities. In one study by Allen 1980, 12 1st – 5th grade boys participated in a 5-10 minute aerobic period (walking jogging or running) 3 days per week for 6 weeks reduced number of disruptive classroom behaviours by half for boys with behavioural and/or perceptual disorders. The greatest reduction in behaviours was noted the hour immediately following exercise. In a second study outlined by Gabler-Halle et al (1986) involved 25 teenagers with mild or moderate ID who were assigned to a 10 week Special Olympics swim training program or control group. They found a significant increase in self concept (Piers and Harris Self Concept Scale) and cardiovascular endurance. Gabler-Halle et al 1983 conclude that there are varying degrees of relationship between aerobic exercise and positive changes in intellectual functioning, behaviour and self concept in children and adults with ID and the need for more research as existing studies are correlational only. They suggest that a higher intensity in aerobic workout seemed to show the greatest effect. They also highlight the importance of choice for individual in participation.

In my search there were no studies that looked at the benefits of exercise on anxiety, depression, stress, self esteem, hostility /anger in children and teenagers with intellectual and/or developmental disabilities, as with non disabled peers. The effects of social team sports such as basketball, netball, soccer or cricket need investigating with larger sample sizes.

What does the existing research mean for teachers, parents and other professional staff? Where possible it is best to encourage choice in exercise, ideally the more intense the better- however any time spent less sedentary is a start. Classroom teachers could aim to introduce sport before a challenging academic task. Parents can look for opportunities in their community such as the Special Olympics to get their child more active and as Special Olympics Australia describe to give “continuing opportunities to develop physical fitness, demonstrate courage, experience joy and participate in a sharing of gifts, skills and friendship with their families, other Special Olympics athletes and the community.”

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