Pedal Power Pilot Study:
Young people with Cerebral Palsy's experiences of adapted dynamic cycling

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Cardiff Pedal Power is a charity providing adapted cycles and cycling opportunities for all ages and abilities. This three year mixed methods study aims to investigate the effects of 6 sessions of adapted dynamic cycling (ADC) for children and young people with Cerebral Palsy (CP), who may have difficulty participating in leisure activities.

Background

There are limited opportunities for young people with Cerebral Palsy (CP) to participate in healthy leisure activities, which can impact on their long term health and well being. Cycling is one activity that can be adapted for young people with CP. A pilot research study is being carried out looking at the effects of adapted dynamic cycling (ADC) for children and young people with CP. Within a sample of seventeen, three young people (Julia 14, Matthew 15 and Andrew 17 years) volunteered to be part of this study. This involved having bilateral lower limb muscle strength (quadriceps[Q] and hamstrings[H]) measured with a dynamometer and bilateral popliteal angles (PA) measured using Silicon COACH software (as an indication of hamstring length) before and after 6 sessions of ADC. H muscle shortening and reduced lower limb muscle strength are common impairments in CP. Participating in ADC may reduce these impairments and provide an opportunity for increasing activity levels and leisure participation. Participants were asked to keep a cycling diary and take part in an interview regarding their cycling experiences.

Julia

Julia used picture recognition and gestures for communication. Julia's mother, Sian, carried out one interview. Sian reported that *'….you can just see the joy in her face when she's on her bike….'*. Julia cycled with her special school and her cycling ability improved: *'…..she can't walk by herself, so she needs help getting off and on…but once she's on, she knows she's got to pedal…'* The family found the cycle hire facility *'so convenient*', as they had previously owned a bike which they had found hard to store and transport in their car. The opportunity for ADC provided Julia with a fun activity which she was happy to do on her own or participate with others. Julia was unable to attend follow-up lower limb muscle length and strength assessments and potential effects of ADC on these can therefore not be reported.

Matthew

Matthew used non verbal communication. His interview was carried out with 2 school carers, Mary and Alice. Matthew chose not to respond directly to the interviewer who was unfamiliar to him, but did respond to the carers when prompted. Matthew had his own adapted bike with 4 wheels, in school and used a trike at Pedal Power where the handle bars could be moved for him to get onto the trike. Matthew enjoyed the social participation aspects of ADC: Alice*: '…I think the difference in surroundings and the fact he's with newer people to socialise with…he likes the bit where you're putting him on the bike around everyone else…'* Mary*: '…so the motivation's got higher…'* Following 6 ADC sessions, bilateral Q strength increased by 34%, however, bilateral H strength and PA's remained unchanged.

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Andrew

Andrew did 2 interviews, but participated more in the second interview, his father participated in both. The diary entries were recorded at Pedal Power by the physiotherapist* where he rides a recumbent bike (see photograph). Andrew was able to describe his cycling experiences: *'…when I pedal it's like I'm <u>there</u> and I am <u>enjoying</u> it…we cycle in the park and I go <u>down</u> the slope…and then I <u>change</u> it…. you know… I put into 3 (gears) and it makes me fast…'* Dad describes his progress *'…he loves biking, obviously it gives him that independence…they've taken the footplates away..'* Andrew has progressed to going cycling with a carer (Bethan). Dad: *'…Bethan actually cycles with Andrew and they now do four circuits rather than the one or two he did before….'* Following 6 ADC sessions, right Q strength increased by 100%, left by 50% and left H strength by 43%. Right H strength and bilateral PA's remained unchanged. Cycling diary entries support improvements in pedalling strength and control in steering and speed of the bike.

Conclusion

Adapted dynamic cycling provided an opportunity for these three young people with CP to participate in a leisure activity which afforded them with health, social and well being benefits.