



Kunnon Huone - fitness room for disabled children

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Kunnon Huone (KH) is a new, innovative fitness centre for children and adolescents - primarily those with minor or major developmental disorders, and other disabilities with problems in body awareness (Velickovic et al, 2005; Debu 2004). KH was founded in 2002, following a trip to the USA seeing first hand the positive physical, emotional, and motivational effects of treadmill training on a child with cerebral palsy (CP). Leading research confirm the positive effects of physical exercise on children with CP (Ragala-Pinkham MA et al 2005; Karan J. et al, 2002). KH undertakes research and development of fitness training and then tailors gym equipment to better help children with special needs

Fitness Room Training Study 2005

In 2004/05 KH conducted studies with funding assistance from the Sohlberg Foundation, and in 2005 in collaboration with the HUCHA Hospital for Children and Adolescents, performed a detailed study of circuit training with CP children.

Objective:

To evaluate the effect over 6 weeks of fitness room training on the development of muscle strength and improvement of the functioning of the lower limbs. The test group consisted of 7 school-age children with CP (table 1.)



Method:

Children participated in one-hour training sessions twice a week (for over 6 weeks) where the fitness training replaced some or all of their regular physiotherapy. 1-2 physiotherapists (and 1-2 assistants) supervised all sessions. The test group was evaluated before, and after the training period (table 2), to note improvement in body control, lower limb strength, coordination and rhythmic reciprocal movements.

Tab1: Test group

Sex	4 girls/3 boys
Dg	4 spastic diplegia 3 spastic hemiplegia
GMFCS	4 GMFCS II 3 GMFCS III
Age	8-14 years (ma. 10.6 years)

Tab2: Measurements

Good Strength Dynamometer Chair	Lower limb isometric strength	Knee ext. 80 Knee ext. 30 Knee flex. Ankle plant.flex Ankle dors.flex.
PCI - Physical Cost Index	Walk strain and energy consumption	PCI value = (pulse during exercise/min - pulse at rest/min) / average gait velocity/min
Functional tests: steptest treadmilltest 10x5m test min.sit.height GMFM 57&58	Activity and performance in upright position	Self selected gait velocity Coordination of lower limbs balance

Results:

Test group improved their self-selected gait velocity on the treadmill (by 36%, p.0,001, chart 1), and on the ground (by 17%). The PCI value improved 19%. Functional step-test which measured lower limb coordination, and control showed 16.7 % improvement (from 9.7% to 27.3%, p.0,004. Chart 2). Muscle strength also improved both in performing a knee extension and ankle plantar flexion (combined p.0,008. Chart 3) – some children mastered the complete knee extension movement following the study. The training however did not significantly improve the children's balance standing on one leg.

Chart 1: Results gait velocity

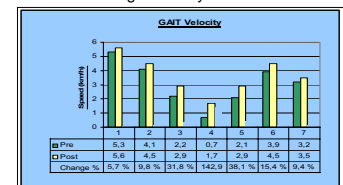


Chart 2: Results step-test

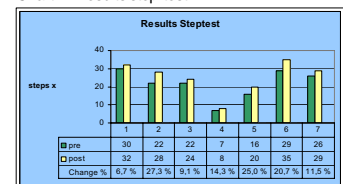
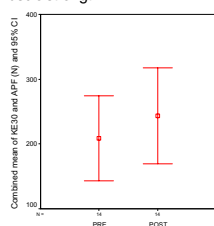


Chart 3: Results extension muscle strength



Conclusion:

Results of the muscle strength of the lower limb extensors, and the self-selected gait velocity were the most statistically significant (despite the short training period and small group size). Both parents and children saw the training as a huge success, producing an improvement in the children's well-being, fluidity of movement, and overall motivation (as most have continued fitness room training as their hobby). Results corroborated that carefully planned muscle strength training indicates to be a key tool in improving motor performance in children and adolescents with CP (Schlough et al 2004; Eagleton et al 2004).

KH, whose attendees are growing year on year, consists of 3 different multi-sensory environments, Ocean, Jungle, and Desert. The aims of these environments are to inspire and to motivate different kinds of children, to experience and train. The core aims of the group and individual classes are the improvement of physical performance and body awareness. Other key goals are to create social contacts; and to improve the child's ability to interact with others as well as improve the psychological well being of the children. (Ekeland et al 2005; Morton J.F. et al, 2005; Raustorp A. et al 2005; Koscielny R, 2004)

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