Physiotherapy interventions to improve gross motor skills in people with an intellectual disability aged six years and older: a systematic review.

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February 2016

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Abstract

Intellectual disability is a life-long condition occurring during the early developmental years, resulting in impaired learning ability, reduced adaptive behaviour skills, and decreased functional independence. It affects approximately one percent of the world's population, and affected individuals have poorer health outcomes. People with an intellectual disability may benefit from specific teaching and learning approaches in therapy interventions which accommodate their cognitive and behavioural needs.

Gross motor skills (GMSs) are larger movements of the body, such as standing and walking, which are typically attained before the age of six. Deficits in GMSs may occur due to congenital conditions, such as cerebral palsy or Down syndrome, in which there occurs altered neuromuscular coordination and tone. GMS deficits can negatively affect a person's functional independence.

People with an intellectual disability who also suffer from GMS deficits can benefit from physiotherapy interventions to help improve their GMSs. Previous research has reported improvements in walking and balance for this population. Much research has supported early intervention programmes for children aged under six years. There is a comparative lack of research for people with an intellectual disability aged older than this, and no prior systematic review. A systematic review would inform clinicians and consumers regarding identifying effective interventions.

The object of this thesis was to conduct a systematic review which investigated the effectiveness of physiotherapy interventions to improve GMSs in people with an intellectual disability aged six years and older. The data sources for identifying quantitative research were: PubMed, CINAHL, Embase and ProQuest. Reference lists of relevant identified papers were hand-searched. Papers published in English from 1-1-2008 to 22-10-14 were considered for inclusion. Types of eligible study designs were randomized controlled trial (RCT), pseudo-RCT, repeated measures, and case report.

Overall, 866 potential articles were identified, of which 42 were retrieved for full-text review, and seven were finally included. Critical appraisal was conducted by two reviewers independently using the Joanna Briggs Institute (JBI) appraisal checklists; no papers were excluded following critical appraisal. Data extraction was performed using JBI Meta Analysis of Statistics Assessment and Review Instrument (MAStARI) data extraction instruments.

High heterogeneity between the studies precluded meta-analysis of the results, and a narrative synthesis was completed instead. Two RCTs, two pseudo-RCTs, two repeated measures studies and one case report were included. Studies varied in regard to participants' intellectual disabilities, and also regarding the interventions used. All interventions were well tolerated with negligible adverse effects. Significant improvements were reported for: cadence and non-dimensionalized gait velocity following body-weight supported gait training; cadence following lower limb strengthening exercises; and for the Gross Motor Function Measure-88 measure following adapted Judo training. These results suggest that task-specific training may be useful. However, based on the critical appraisal the overall quality of evidence was low.

The systematic review found limited evidence supporting physiotherapy for improving GMSs in people with an intellectual disability. Further research is needed to validate the early significant findings identified in this review and to define effective physiotherapy approaches which meet the learning needs of people with an intellectual disability.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint award of this degree.

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Acknowledgements

I would like to formally acknowledge the thorough and expert supervisory support of Dr Jared Campbell and A/Prof Julian McNeil throughout my candidature. I also extend sincere thanks to Prof Alan Pearson for his valuable counsel in the development of the *a priori* research protocol. As well, I am grateful to Peter Hallett for co-reviewing the retrieved papers, Aderbal Aguiar Jr for the provision of raw data, and to Veronica Cimolin for providing summary statistical results.

During my candidature I have received ongoing and consistent encouragement from my family, most specially from my husband, daughter and mother. Dr Rebekah Das gave moral support at very timely intervals, and also helped me to refine my ideas during the early stages of writing this thesis.

I am also grateful for the support of The Joanna Briggs Institute, where I completed the studies reported in this thesis, and in particular to A/Prof Craig Lockwood, HDR Coordinator, for overseeing my Master of Clinical Science candidature within this School.

List of abbreviations

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
APA	Australian Physiotherapy Association
BMI	Body Mass Index
BOT-2	Bruininks-Oseretsky Test of Motor Proficiency, 2nd edition
BWS	body-weight supported
CP	cerebral palsy
DMD	Duchenne Muscular Dystrophy
DS	Down syndrome
GMAE	Gross Motor Ability Estimator
GMFCS	Gross Motor Function Classification Scale
GMFM	Gross Motor Function Measure
GMS	gross motor skill
HEP	home exercise programme
ICF	International Classification of Functioning, Disability and Health
ID	intellectual disability
ITT	Intention to treat
JBI	The Joanna Briggs Institute
MAStARI	Meta-Analysis of Statistics Assessment and Review Instrument
MDC	minimum detectable change
MID	minimum important difference
MMSE	Mini-Mental State Examination

MS	multiple sclerosis
N	No
N/A	not applicable
NDIS	National Disability Insurance Scheme
PBWSTT	partial body-weight supported treadmill training
PICO	Population, Intervention, Comparator, Outcome
PWS	Prader-Willi syndrome
QOL	quality of life
RCT	randomized controlled trial
SD	standard deviation
SR	systematic review
Ss	sample size
SWAPS	Supported Walker Ambulation Scale
OGS	Observational Gait Scale
UN CRPD	United Nations Charter on the Rights of Persons with Disabilities
WHO	World Health Organization
Y	Yes