INPLASY

The Effects of Single Bouts of Physical Activity on Cognition in Individual with Intellectual Disabilities: A Systematic Review

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ADMINISTRATIVE INFORMATION

Support - National Science and Technology Council.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202450113

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 May 2024 and was last updated on 23 May 2024.

INTRODUCTION

Review question / Objective This study aims to synthesize the existing research to more clearly determine the impacts of single bouts of physical activity on cognition in this demographic, guiding future research and providing recommendations for employing exercise strategies to enhance cognitive performance in this population.

Rationale Individuals with intellectual disabilities often exhibit cognitive deficits across domains such as attention, executive functions, and memory, significantly impacting their daily functioning and quality of life. These cognitive skills are crucial for managing daily activities and adapting behaviors or thoughts in response to new demands, substantially influencing learning and job performance. Physical activity not only promotes physical fitness and cardiometabolic health in both individuals with and without intellectual disabilities but also has been shown to transiently enhance cognition post-exercise. This suggests it could serve as a transient, nonpharmacological method to boost cognitive function. However, the effects of single bouts of physical activity on the cognition of individuals with intellectual disabilities remain inconclusive.

Condition being studied Assessing changes in cognition following a single bout of physical activity in individual with intellectual disabilities. Cognition are crucial for managing daily activities and significantly impact quality oflife, including but not limited to attention, executive functions (EFs), and memory engagement.

METHODS

Search strategy PubMed and Scopus were used to search relevant literature. These two electronic databases encompass numerous several databases, including Medline, EMBASE, Compendex, World Textile Index, Fluidex, Geobase, Biobase (Falagas et al., 2008), and most journals in Web of Science (Mongeon & Paul-Hus, 2016). All identified articles published prior to May 2024 were included. Search terms were applied to titles and abstracts to identify potential articles for the review (see below). The analysis was restricted

to English language and original research articles published in peer-reviewed journals.
Scopus:
(TITLE-ABS ("intellectual disab*" OR "mental handicap" OR "mental retardation" OR "mental disab*" OR "intellectual developmental disab*" OR "developmental disab*" OR "learning disab*" OR "down syndrome*") AND TITLE-ABS ("physical activity" OR exercise) AND TITLE-ABS (cognition OR cognitive OR executive OR memory OR attention OR "information processing" OR updat* OR shift* OR switch* OR inhibition OR "inhibitory control" OR "inference control" OR flanker OR simon OR stroop OR "Go/No Go")) AND (LIMIT-TO (DOCTYPE , "ar"))
Pubmed:
(("intellectual disab*"[Title/Abstract] OR "mental handicap"[Title/Abstract] OR "mental retardation"[Title/Abstract] OR "mental disab*"[Title/Abstract] OR "intellectual developmental disab*"[Title/Abstract] OR "developmental disab*"[Title/Abstract] OR "learning disab*"[Title/Abstract] OR "down syndrome*"[Title/Abstract]) AND ("physical activity"[Title/Abstract] OR exercise[Title/Abstract])) AND (cognition[Title/Abstract] OR cognitive[Title/Abstract] OR executive[Title/Abstract] OR memory[Title/Abstract] OR attention[Title/Abstract] OR "information processing"[Title/Abstract] OR updat*[Title/Abstract] OR shift*[Title/Abstract] OR switch*[Title/Abstract] OR inhibition[Title/Abstract] OR "inhibitory control"[Title/Abstract] OR "inference control"[Title/Abstract] OR flanker[Title/Abstract] OR simon[Title/Abstract] OR stroop[Title/Abstract] OR "Go/No Go"[Title/Abstract]).

Participant or population Individual with Intellectual Disabilities.

Intervention The studies employ single bouts of physical activity as intervention approach. Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure.

Comparator The studies include at least one additional condition or group.

Study designs to be included Including crossover or parallel group comparison trials.

Eligibility criteria No additional inclusion or exclusion criteria in this stduy.

Information sources PubMed and Scopus.

Main outcome(s) PubMed and Scopus.

Quality assessment / Risk of bias analysis The quality of the included studies will be assessed using the Physiotherapy Evidence Database (PEDro) scale, which quantifies bias with a score out of 10; higher scores indicate superior methodological quality. The PEDro scale evaluates several types of bias, including allocation bias (through randomization and concealment of allocation), performance bias (via blinding of participants and personnel), and detection bias (through blinding of outcome assessments). Additional criteria assessed include eligibility requirements, baseline comparability, retention rates, intention-to-treat analysis, between-group statistical comparisons for at least one key outcome, and measures of point estimates and variability. When available, PEDro scores will be directly obtained from the database.

Strategy of data synthesis Two authors independently conducted the data extraction. Disagreements were discussed until a consensus was reached. The extracted information from eligible articles included study information (first author's name, publication year, and region), participant description (sample size, age, sex, and levels of intellectual disability), study design, intervention protocol (i.e., type, intensity, and duration), comparators, and outcomes.

Subgroup analysis Not applicable.

Sensitivity analysis Not applicable.

Language restriction English.

Country(ies) involved Taiwan and United States of America.

Keywords Physical actvity; Acute exercise; Cognition; Executive funciton; Disabilities.

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