

research snapshot

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Playing to Move: Interactive Computer Play and Cerebral Palsy

What is this research about?

A growing trend is the use of interactive computer play (ICP) as therapy for people with cerebral palsy (CP). ICP involves manipulating an object in a computer game. Virtual reality (VR) technology is a type of ICP that allows the user to play in a space that mimics real-life settings. For people with CP, ICP offers the chance to improve motor control through repetitive tasks. It can also enable them to do physical activity, and socialize in multiplayer settings. How useful can ICP be as a therapy for those with CP?

What did the researchers do?

A computer-assisted search was done on 4 databases to find relevant studies completed until December 2012. They reviewed search results from a variety of subject and key words like: computer play, VR, exergames, gross motor, muscle strength and manual ability. The researchers focused on articles that:

- Used at least 5 participants with CP;
- Assessed ICP as a form of intervention to improve motor skills;
- Involved studies with objective outcomes and completed in English.

Then, the articles were placed under the American Academy of Neurology's system to classify evidence for therapeutic interventions and recommendations.

What you need to know:

Interactive Computer Play (ICP) probably improves lower extremity motor functions for people with CP. More research is needed to evaluate the impact of ICP on hand function and CVS fitness and to measure the amount and duration of ICP for people with varied forms of CP. This need includes studies with larger sample groups and randomized control trials.

Keeping with the classifications, the studies were then grouped into levels based on how well they proved that ICP could improve motor skills.

- Level A: Effective or ineffective results.
- Level B: Probably effective or ineffective.
- Level C: Possibly effective or ineffective.
- Level U: Inadequate or unproven.

In total, 17 articles were identified and reviewed. The studies focused on: upper extremity motor function (6); lower extremity motor function (5); promotion of cardiovascular (CVS) fitness (1); or a mix of these topics (5).

What did the researchers find?

ICP showed mixed results for improving upper extremity motor function (using their hands) in people with CP. Studies showed that ICP encouraged positive, engaging participation. However, most were

not able to prove that ICP interventions can improve hand or upper limb function. Only a few studies showed a significant improvement of hand function after ICP. The overall body of research on ICP in improving hand function scored a Level U, with a need for more research with larger samples.

The studies on lower extremity motor functions (big movements such as walking) showcased a range of ICP interventions. The studies scored a Level B, as they revealed that ICP is probably an effective way to improve lower extremity motor skills.

ICP studies aiming to improve CVS fitness used exergames, which are video games that engage people through physical activity. People with CP are at risk for CVS disease, diabetes, obesity and musculoskeletal pain. Exergames may promote more physical activity and social interaction opportunities with reduced barriers. However, the existing research on exergames on CVS fitness scored a Level U grade. There were conflicting results on the specific impacts of ICP interventions on CVS fitness and a lack of formal assessments before and after the use of exergames.

How can you use this research?

Clinicians may find this research useful. It shares insight on the existing evidence of ICP as a possible form of intervention for people with CP. Health policymakers may also find this useful to determine priority areas of need for future funding and research. More research is needed to explore the benefits of ICP for all people with varied forms of CP.

Families and people with CP may find this research helpful to consider activities that may support their motor control and CVS health. This may include commercial gaming tools that may offer opportunities to participate in more physical activity.

About the Researchers

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Interactive computer play, Cerebral palsy, Virtual reality, Exergames, Cardiovascular fitness, Motor functions, Evidence-based interventions, Evaluation

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