Physiological and Psychological Benefits of Motion-Sensing Games for Individuals with Disabilities: A Literature Review

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INTRODUCTION

Individuals with disabilities often experience motor, sensory, or cognitive limitations, which hinder participation in physical activity and motor skill learning.

Advantages of Motion-Sensing Games:

- **Environmental flexibility - Can be performed indoors without constraints of time or space.**
- **Immediate feedback - Provide real-time, multimodal sensory feedback.**
- **Application fields - Increasingly adopted in special education and rehabilitation settings.**

Motion-sensing games may enhance activity participation, motor performance, and psychological motivation, serving as a complementary approach to traditional rehabilitation.

METHODOLOGY

This study adopted a literature review approach, synthesizing recent domestic and international research on active video gaming, somatosensory games, and motion-sensing game interventions. The reviewed studies included individuals with physical disabilities, intellectual disabilities, autism spectrum disorder, cerebral palsy, and neurodegenerative diseases. Eligible studies comprised randomized controlled trials, quasi-experimental studies, and systematic reviews, examining the physiological and psychological effects of motion-sensing game interventions.

RESULT

Table 1 summarizes the physiological and psychological effects of motion-sensing game interventions reported across the reviewed studies involving individuals with disabilities :

Outcome Domain	Key Findings	Notes / Limitations
Physiological Effects	・Improved balance performance ・Enhanced hand–eye coordination ・Increased gross motor function ・Improvements in selected physical fitness indicators	Effects vary depending on intervention duration, game type, and exercise intensity
Psychological Effects	・Increased learning and exercise motivation ・Higher participation willingness ・Improved exercise enjoyment	Positive effects reported across multiple disability populations
Feasibility & Acceptance	・High feasibility in educational and rehabilitation settings ・High participant acceptance and adherence	Particularly suitable for indoor and low-barrier interventions
Functional Transfer	・Mixed evidence for transfer to daily functional activities	Long-term functional outcomes remain inconclusive
Long-Term Effects	・Inconsistent findings regarding sustained benefits	Limited by short intervention periods and small sample sizes
Comparison with Traditional Rehabilitation	・Comparable short-term benefits in some studies ・No consistent superiority over conventional therapy	More standardized and controlled studies are needed



CONCLUSION

Implications

- Motion-sensing games reduce barriers to physical activity participation for individuals with disabilities.
- These interventions provide both physiological benefits and psychological support.
- Motion-sensing games demonstrate strong practical potential as adjunct strategies in educational and rehabilitation settings.

Future Directions

- Conduct studies with larger sample sizes to strengthen empirical evidence.
- Implement long-term follow-up designs to examine sustained effects.
- Develop standardized intervention protocols to clarify health promotion and functional transfer outcomes.

THE HEALTH BENEFITS OF STACKING CUPS FOR INDIVIDUALS WITH DISABILITIES: A LITERATURE REVIEW



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INTRODUCTION

Individuals with disabilities often face cognitive or physical limitations that restrict safe participation in traditional sports, resulting in insufficient physical activity

Characteristics of Sport Stacking:

- High Accessibility:
- Low cost, minimal space requirements, limited influence from weather conditions, and simple operation.
- High Adaptability:
- The level of difficulty can be flexibly adjusted according to individual abilities, aligning with the principles of adaptive physical education.

→Previous studies indicate that sport stacking improves motor and cognitive functions, suggesting its potential for health promotion.

RESULTS

1. General population studies reported significant improvements in hand–eye coordination, bilateral coordination, reaction time, fine motor skills, and balance.
2. Improvements in attention, attentional control, and emotional regulation were also observed.
3. In individuals with disabilities, sport stacking improved fine motor skills, visual–motor integration, and upper-limb motor control.
4. Some studies reported non-significant effects, possibly due to short intervention durations, small sample sizes, or methodological differences.
5. The literature suggests that interventions lasting at least 8–12 weeks yield more stable outcomes.

METHODOLOGY

Identification of Research Topic and Objectives

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Search Strategy Development(n=595)
- Keywords: "sport stacking", "cup stacking", and related Chinese terms
- Databases: Google Scholar, Scopus, and online academic databases

↓ Removal of duplicate records(n=430)

Read the title and abstract(n=165)

↓ Articles unrelated to health promotion, purely news reports, or studies mentioning sport stacking without empirical data were excluded.(n=55)

Full-text articles were reviewed based on predefined inclusion and exclusion criteria, with a focus on study design, participants, intervention protocols, and outcome measures.(n=110)

↓ Studies lacking comparison conditions, adequate sample sizes, or clear disability classifications were excluded.(n=88)

Studies Included in the Review
Total studies included: n = 22
17 intervention studies, 5 assessment-related studies

This review followed a systematic literature review process with multi-stage screening and predefined inclusion and exclusion criteria.

CONCLUSION

Sport stacking is a safe, flexible, and low-barrier activity that enhances motor and selected cognitive–emotional functions in individuals with disabilities, demonstrating strong potential for health promotion.

Future Research Recommendations:

- Conduct more systematic intervention studies across different disability types and age groups
- Extend intervention durations and standardize instructional protocols
- Explore the long-term application of sport stacking in adaptive physical education and rehabilitation programs
- Provide empirical evidence to support its integration into health promotion and adaptive physical activity curriculum design for individuals with disabilitie