

BACKGROUND

Autism Spectrum Disorder (ASD) comprises a group of heterogeneous neurobehavioral conditions characterised by impairments in social communication and the presence of stereotyped, rigid or repetitive behaviours. Physiotherapy and structured exercise programs have shown beneficial effects on executive functions in children with ASD, particularly regarding cognitive flexibility and inhibitory control¹. Building on these findings, virtual and digital technologies (including exergaming) have been increasingly implemented to promote physical and motor outcomes. These tools provide engaging, interactive options for therapists and caregivers to support motor development alongside traditional physiotherapy².

OBJECTIVE

This scoping review aims to examine the contribution of technologies and game-based interventions within pediatric physiotherapy, with a specific focus on children with ASD, adopting an interdisciplinary perspective.

METHODS

Authors searched for English articles published from 2015 up to 2025 on the electronic databases PubMed, Cochrane Library and PeDro using the following keywords, combined to maximize the sensitivity of the search strategy: ("Video Games" OR videogame* OR "video game*" OR game* OR exergam* OR "recreational game*" OR "interactive game*" OR "Virtual Reality" OR "virtual reality" OR VR OR "Artificial Intelligence" OR "artificial intelligence" OR AI) AND ("Autism Spectrum Disorder" OR "autism spectrum disorder" OR autism OR autistic OR ASD). Articles were screened by title and abstract, using the following inclusion criteria: (1) randomized controlled trials; (2) written in English language; (3) published on indexed journals; and (4) dealing with ASD and innovative techniques in paediatric rehabilitation field. Exclusion criteria were (1) non-randomized trials; (2) reviews; (3) papers written in other languages than English; and (4) data not dealing with ASD and paediatric physiotherapy. A PRISMA flowchart of the selection and screening method was created, and a total of 32 studies were included in this scoping review.

RESULTS

All the selected articles demonstrated that virtual reality, video games, exergaming and outdoor physical activity positively influence motor skills and social behaviours in children with ASD, supporting their integration into physiotherapy practice. The Cochrane Risk of Bias for RCT tool was used for the randomized controlled trials included in the review.

CONCLUSION

Technological and game-based interventions appear to be valuable adjuncts in pediatric physiotherapy for children with ASD, supporting gains in motor skills, engagement, and social behaviours. Future research should explore how emerging technologies can be integrated into personalised physiotherapy programs for children with ASD. Strengthening collaboration between physiotherapists, engineers, educators, and families will be essential to design interventions that are accessible, motivating, and truly responsive to each child's developmental profile.

REFERENCES

1. Genovese A, Butler MG. The Autism Spectrum: Behavioral, Psychiatric and Genetic Associations. *Genes (Basel)*. 2023 Mar 9;14(3):677. doi: 10.3390/genes14030677. PMID: 36980949; PMCID: PMC10048473.

2. Corey J, Tsai JM, Mhadeshwar A, Srinivasan S, Bhat A. Digital motor intervention effects on motor performance of individuals with developmental disabilities: a systematic review. *J Intellect Disabil Res.* 2024 Nov;68(11):1221-1252. doi: 10.1111/jir.13169. Epub 2024 Aug 29. PMID: 39210565.