

MORE THAN A GAME: Integrating Interactive Technologies into Pediatric Cancer Rehabilitation. A scoping review.

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BACKGROUND

Pediatric cancer is a significant global health burden, affecting thousands of children annually. The most widespread types are leukemia, lymphoma, and brain tumors¹. This study presents a scoping review analyzing literature published in the last five years to evaluate the efficacy of virtual reality (VR), interactive games and artificial intelligence (AI) on physical and cognitive outcomes in pediatric oncological rehabilitation².

OBJECTIVES

The goal of this review is to analyze how complementary therapies, such as physiotherapy, VR and interactive games can help the process of cancer treatment.

METHODS

Authors searched for English-language articles published between 2020 and 2025 across the PubMed, Cochrane Library, and Scopus databases, using the following search strategy with Boolean operators to maximize sensitivity: ("games" OR "exergaming" OR "recreational games" OR "video games" OR "interactive games" OR "virtual reality" OR "VR" OR "artificial intelligence" OR "AI") AND ("physiotherapy" OR "rehabilitation") AND ("pediatric oncology"). Articles were screened by title and abstract according to the following inclusion criteria: (1) randomized controlled trials (RCTs); (2) publications in English; (3) articles published in peer-reviewed, indexed journals; (4) interventions focusing on digital or technological supports within pediatric oncological rehabilitation. The exclusion criteria were: (1) Non-randomized trials; (2) Systematic or narrative reviews, and meta-analyses; (3) Papers published in languages other than English; (4) studies not specifically addressing pediatric oncology or physical therapy. A PRISMA flowchart was developed to document the selection process. Following full-text assessment, four studies met the criteria and were included.

RESULTS

The findings indicate that digital rehabilitation is a rapidly evolving field. Evidence from completed studies suggests that exergaming and interactive protocols are effective in reducing the burden of cancer-related fatigue and improving overall physical activity levels during and after treatment. These interventions promote better functional capacity and help counteract the physical exhaustion and sleep disturbances common in this population. Furthermore, current research trends show an increasing focus on the neurocognitive benefits of these technologies. Several ongoing studies, involving remote or home-based platforms, are currently investigating how these tools improve long-term mental health and cognitive outcomes, with results expected soon.

CONCLUSION

Interactive technologies represent a promising addition to traditional rehabilitation in pediatric oncology. By providing engaging treatment options, these tools help mitigate the physical and

cognitive decline associated with oncological therapies. While preliminary results are positive, the ongoing nature of many trials suggests that the field is moving toward an integrated, technology-driven approach to pediatric care. Further research is essential to define protocols.

REFERENCES

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