ONCODAILY MEDICAL JOURNAL

abstract

The Effect of Virtual Reality on Pediatric Oncology Patients: A Systematic Review and Meta-analysis

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doi.org/10.69690/ODMJ-018-0425-1963

SIOP ASIA 2025
SAUDI ARABIA

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The Effect of Virtual Reality on Pediatric Oncology Patients: A Systematic Review and Meta-analysis

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DOI: *https://doi.org/10.69690/ODMJ-018-0425-1963*

Introduction: Pediatric cancer patients undergoing cancer treatment experience anxiety and pain frequently, which can negatively impact their treatment experience and outcomes. Virtual reality (VR) is one of many potential interventions to alleviate these symptoms. This systematic review and meta-analysis aimed to evaluate the effectiveness of VR in reducing anxiety and pain in pediatric oncology patients receiving cancer therapy.

Methodology: A computerized search was conducted in Medline, Web of Science, and CENTRAL databases for randomized controlled trials (RCTs) comparing VR interventions to control groups in pediatric oncology patients undergoing cancer treatment. The primary outcomes were self-reported and parent-reported anxiety and pain scores before and after the intervention. Secondary outcomes included pulse rate. The meta-analysis was performed using the random-effects model in RevMan (Review Manager) version 5.3 (Cochrane Collaboration).

Results: Five RCTs were included in the meta-analysis. VR interventions significantly reduced self-reported anxiety (Mean Difference = -2.68, 95% CI [-3.61, -1.76], $p < 0.00001$) and self-reported pain (Mean Difference = -1.61, 95% CI [-2.85, -0.37], $p = 0.01$) after the intervention compared to control groups. Parent-reported pain scores also showed a significant reduction in favor of the VR intervention (Mean Difference = -2.07, 95% CI [-3.50, -0.63], $p = 0.005$). No significant differences were observed in self-reported anxiety and pain before the intervention or in pulse rate between the VR and control groups.

Conclusion: This meta-analysis demonstrates that VR interventions are effective in reducing anxiety and pain in pediatric oncology patients undergoing cancer therapy. The results suggest that VR can be a valuable tool to improve the treatment experience and outcomes for this patient population. Further research is needed to determine the optimal VR protocols and discuss other effects of VR interventions in pediatric oncology care.