Virtual Reality for Chronic Pain Treatment

Virtual reality (VR) is a computer technology that immerses a user in a completely different reality. The application of VR in acute pain settings is well established. However, in chronic pain, the applications and outcome parameters influenced by VR are less clear.

A review aimed to systematically identify all outcome parameters that are reported in relation to VR in patients with chronic pain.

A total of 4 electronic bibliographic databases (PubMed, Scopus, Web of Science, and Embase) were searched for relevant studies. Multilevel random-effect meta-analyses were performed, whereby the standardized mean difference was chosen as the effect size to denote the difference between measurements before and after a VR intervention.

The initial database search identified 1430 studies, of which 41 (2.87%) were eventually included in the systematic review. Evidence has been found for the effects of VR on pain, functioning, mobility, functional capacity, psychological outcomes, quality of life, neuropsychological outcomes, and physical sensations. The overall effect size (a total of 194 effect sizes from 25 studies) based on a three-level meta-analysis was estimated at 1.22 (95% CI 0.55-1.89; z=3.56; P<.001), in favor of improvements after a VR intervention. When categorizing effect sizes, the overall effect sizes were reported as follows: 1.60 (95% CI 0.83-2.36; z=4.09; P<.001) for the effect of VR on pain (n=31), 1.40 (95% CI 0.13-2.67; z=2.17; P=.03) for functioning (n=60), 0.49 (95% CI -0.71 to 1.68; z=0.80; P=.42) for mobility (n=24), and 0.34 (95% CI -1.52 to 2.20; z=0.36; P=.72) for functional capacity (n=21).

This systematic review revealed a broad range of outcome variables influenced by an intervention of VR technology, with statistically significant pain relief and improvements in functioning. These findings indicate that VR not only has applications in acute pain management but also in chronic pain settings, whereby VR might be able to become a promising first-line intervention as a complementary chronic pain treatment. Trial registration: PROSPERO International Prospective Register of Systematic Reviews CRD42021227016; https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=227016 [1)].

1)
Goudman L, Jansen J, Billot M, Vets N, De Smedt A, Roulaud M, Rigoard P, Moens M. Virtual Reality Applications in Chronic Pain Management: Systematic Review and Meta-analysis. JMIR Serious Games. 2022 May 10;10(2):e34402. doi: 10.2196/34402. PMID: 35536641.