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Study shows virtual reality headsets may help ease cancer pain

by Dennis Thompson



Virtual reality (VR) might be able to provide cancer patients significant pain relief, a new study says.

A small group of cancer patients reported a decrease in their pain after using VR headsets that allowed them to explore realistic underwater scenes, according to findings published in the journal *Scientific Reports*.

These self-reports were backed up by real-time imaging that showed significant changes in communication between pain-related neural circuits within the brain, researchers said.

"This study signals a new era in precision medicine where neuroimaging and digital therapeutics revolutionize pain assessment and treatment," lead researcher Somayeh Besharat Shafiei, an assistant professor of oncology at Roswell Park Comprehensive Cancer Center in Buffalo, N.Y., said in a news release.

"This combination therapy could reshape clinical pain management protocols, reduce reliance on opioids, and improve the quality of life for millions of cancer patients worldwide," she added.

An estimated 60% to 80% of cancer pain is not properly managed, with 40% of patients experiencing severe pain in the late stages of their lives, researchers said in background notes.

Distraction is one means of managing pain, by diverting attention away from agony through engaging thoughts or activities, researchers noted.

To see if VR could provide such a distraction, researchers asked 41 patients to wear a VR headset and explore an underwater world.

While using the VR, researchers had the patients wear a headcap that tracked their brain function using functional near-infrared spectroscopy. The cap provided a means of objectively measuring the response to distraction by pain circuits in the brain.

Researchers compared the VR patients' pain before and after using VR to 13 healthy patients and 93 cancer patients who wore the head caps for 10 minutes without VR.

More than 75% of cancer patients who used VR reported a decrease in their pain, an improvement well beyond the clinically relevant threshold of 30%, researchers said.

The brain imaging also showed that VR had an effect on the communication of pain signals within the brain, results show.

"Study findings highlight VR's potential as a useful, non-invasive pain management tool, capable of inducing significant reductions in perceived pain severity among cancer patients," the research team conclude in their paper.

More information: Somayeh B. Shafiei et al, Pain classification using functional near infrared spectroscopy and assessment of virtual reality effects in cancer pain management, *Scientific Reports* (2025). DOI: [10.1038/s41598-025-93678-y](https://doi.org/10.1038/s41598-025-93678-y)

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