

Virtual Reality Not Helpful in Interventional Pain Procedures

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Las Vegas—Distractive techniques with virtual reality headsets may be useful in a variety of situations, but according to a recent study, such methods for reducing anxiety during interventional pain procedures in chronic pain patients may not be beneficial.

Results from the investigation indicated that VR offered no additional benefit in terms of either reducing anxiety or improving pain relief in this patient population. In fact, a small subset of VR patients actually asked to be removed from the study because the technology increased their anxiety levels.

“Emerging research has shown that virtual reality is a promising nonpharmacological tool to treat anxiety and pain in acute pain settings,” said Almas Khan, a clinical research assistant in the Department of Anesthesiology and Pain Medicine at the University of California, Davis Health, in Sacramento. “However, when it comes to the chronic pain setting, there is less research. So, in this randomized

controlled clinical study, we investigated a broad group of interventional pain procedures to assess differences in anxiety, pain, satisfaction of treatment and sedation requirements with and without virtual reality," she added.

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The researchers enrolled a total of 99 patients with chronic pain into the trial (mean age, 61.4 years; 72.5% women), all of whom underwent interventional pain procedures at UC Davis between 2020 and 2022. Of these, 49 participants were randomized to wear a VR headset (Oculus Quest, Oculus) that played a preselected audiovisual immersive relaxation environment during their procedures. Their 50 counterparts in the control group, on the other hand, underwent typical treatment without any audiovisual distraction.



Prior to treatment, individuals in both groups completed surveys assessing the Spielberger State-Trait Anxiety Inventory. During the procedure, participants rated their pain and anxiety on a standard 11-point visual analog scale (VAS). Finally, both groups completed a series of post-procedure surveys, including the State-Trait Anxiety Inventory, VAS pain and anxiety scales, overall satisfaction, and Patient Global Impression of Change.

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Multiple linear regression was used to evaluate the effect of procedure type (trigger point injection, nerve block, bursa injection, joint procedure, other), patient position (prone, supine, seated, lateral decubitus) and procedure duration (<10 minutes, 10-20 minutes, >20 minutes) on outcomes.

Positioning Important

Presenting at the 2022 spring meeting of the American Society of Regional Anesthesia and Pain Medicine (abstract 3169), the researchers explained that, with the exception of post-procedure VAS anxiety score, no significant differences were observed between groups in any of the measured parameters (Table).

Table. Primary Analysis of Anxiety, Pain and Change			
Survey	No VR	Yes VR	P value

Mean post-procedure STAI score (20-80)	30.9±9.48	31.00±11.1	0.59
Mean post-procedure STAI score (20-80)	35.70±11.4	33.10±11.40	0.52
Mean post-procedure VAS anxiety score (0-10)	2.35±2.24	1.33±1.81	0.00
Mean post-procedure VAS pain score (0-10)	3.61±2.36	3.02±2.45	0.42
Mean intra-procedure VAS anxiety score (0-10)	3.94±2.77	3.24±2.78	0.22
Mean intra-procedure VAS pain score (0-10)	5.41±2.47	5.51±2.69	0.60
Mean Patient Global Impression of Change (0-7)	4.27±1.87	4.57±1.92	0.44
Mean satisfaction (-5 to 5)	4.24±1.30	3.73±1.89	0.15
STAI, Spielberger State-Trait Anxiety Inventory; VR, virtual reality.			

Of note, the study also found no difference between groups with respect to post-procedure VAS pain scores for patients in the seated, supine and prone positions. However, there was a significant difference in the lateral decubitus position, where study group patients reported a mean VAS pain score of 1.74±0.81, compared with 4.95±1.07 for controls ($P=0.02$).

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“The two most common subject positions were seated and

supine," said co-investigator Fatima Yusuf, BS, a clinical research coordinator at UC Davis. "This is because these two positions are the easiest to actually put the VR headset on a patient. It was quite a bit more challenging with patients in the prone position, where the field of view with VR headsets can become incomplete and the headsets are bulky enough to be uncomfortable.

"Nevertheless, we're trying to find a way to continue the study in prone patients because that is the position that most pain procedures utilize," she added.

With respect to procedure time, no differences in post-procedure state and trait anxiety scores were found between groups for procedures longer than 20 minutes. On the other hand, the investigators found significantly lower state and trait anxiety scores in VR patients who underwent procedures that were 10 to 20 minutes in length ($P=0.02$), and only in trait anxiety for procedures less than 10 minutes ($P=0.04$).

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Confounding Study Elements

Session moderator Steven P. Cohen, MD, the chief of pain medicine and a professor of anesthesiology and critical care medicine, neurology, physical medicine and rehabilitation,

and psychiatry and behavioral sciences at Johns Hopkins Medicine, in Baltimore, said the wide range of procedures used in the investigation may have confounded its results.

"I'm curious why you didn't standardize the procedures," he commented. "You have 50 patients in each group, but they're undergoing a wide variety of procedures that are all very different. So, there's an awful lot of heterogeneity."

"We did perform a secondary analysis based on procedure type," Yusuf replied, "but it was difficult because we didn't have enough patients in each procedure type. So, it made more sense to do it across all procedures. But I agree that it would make more sense to compare one procedure with another rather than look at all of them together." The same research team performed a prior study comparing VR with controls during only trigger point injections, and found a trend toward improved pain and anxiety levels in patients using VR.

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Stuart A. Grant, MB ChB, the chief of regional anesthesiology at the University of North Carolina at Chapel Hill, questioned whether the VR headsets may have actually had a detrimental effect on patients' anxiety levels.

"One thing that comes out in the data when we talk to

patients is that they're sometimes troubled by the fact that they can't see what's going on," Grant said. "It seems like a good idea to play something calming, but then you can't see what the doctor is doing. Were there any folks who actually got more anxious with the VR?"

"Five patients actually did," Khan said. "They were in the VR group, and during the procedure they just felt too anxious or uncomfortable with the headset on, so they had to take it off. On the other hand, other patients we talked to also felt like they didn't want to see what was happening and were adamant that they wear the headset."

Principal investigator Naileshni Singh, MD, an associate clinical professor of anesthesiology and pain medicine at UC Davis, explained that although most VR studies take place in the acute pain setting, the current investigation used a chronic pain population, which can prove more challenging.

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"The 'dose' of VR used in this study—since this was a one-time intervention during a potentially painful procedure—may not have been robust enough to make a difference," Singh explained. "This should be a source of further investigation, along with the role that VR might play as a coping and psychological tool for those suffering with chronic pain."

“Lastly, this study adds to the clinical body of evidence in the use of consumer-based technology in a medical setting with few noted adverse effects,” Singh added.

—*Michael Vlessides*

All interviewees reported no relevant financial disclosures.