Harnessing the Power of the Mind for Pain Relief

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Humans are hardwired to avoid and escape pain. It's there to help us survive, signaling an imminent threat that we need to evade.

But when pain becomes chronic, those danger signals don't stop ringing. People aren't born equipped to manage that kind of daily distress — making opioids an attractive, and often necessary, option. But research by psychological scientist Beth Darnall suggests that we may be able to learn to dampen these alarms ourselves through cognitive behavioral therapy (CBT).

Pain is both a sensory and an emotional experience, says Darnall, a professor of anesthesiology, perioperative and pain medicine at Stanford University. Persistent, negative cognitive responses to actual and anticipated pain have been shown to directly amplify pain processing in the brain, she explains, and can actually cause the nervous system to become more sensitive to pain over time.

But CBT, an established treatment for anxiety and depression with a robust evidence base, can also be employed to help patients curb the brain's natural tendency to focus on pain. This tendency, coupled with a sense of helplessness, can cultivate neural patterns that exacerbate experiences of pain, a phenomenon known as "pain catastrophizing."

Darnall's ongoing Effective Management of Pain and Opioid-Free Ways to Enhance Relief (EMPOWER) study aims to cut patients' prescriptions in half, but reducing opioid use is just the beginning — more importantly, she wants to equip patients with the tools to master chronic pain and regain control of their lives.

After receiving $8.8 million in funding for the EMPOWER study from the Patient-Centered Outcomes Research Institute (PCORI) in September of 2017, Darnall and her team began recruiting chronic pain patients interested in voluntarily reducing their use of opioids.

Personalized Tapering

Unlike the forced opioid tapering patients are sometimes faced with in clinical settings, the EMPOWER study asks participants to gradually reduce, but not eliminate, opioid use over a 12-month period. All participants, including those in the control group, work with an EMPOWER prescriber to develop a personalized prescription opioid tapering plan for their pain condition, whether it be low back pain, fibromyalgia, migraines, or any other pain condition.

Meanwhile, those randomized to the two experimental groups receive either 8 weeks of pain-CBT led by mental healthcare professionals or participate in 6-week chronic pain self-management groups led by peer leaders who have experienced chronic pain themselves.

By 2022, nearly 900 patients across six sites in California, Arizona, Utah, and Colorado are expected to have participated in the EMPOWER study, but they're far from the only people with chronic pain involved in the project, Darnall said. As a PCORI funded trial, the EMPOWER study has people with lived experience with chronic pain on its leadership team and study advisory board, and has involved patients throughout the study design process, from selecting the study outcomes to crafting weekly and monthly questionnaires that track participant well-being.

"The benefit of integrating the patient voice so carefully and strongly into the study is that we believe it will best assure that our results will be meaningful to patients," Darnall says. "Our methods will be broadly acceptable to patients, and therefore more widely adopted."

Reframing the Pain

The EMPOWER study builds on a series of uncontrolled pilot studies, including a 2014 trial of 57 patients at the Stanford Pain Management Center. There, Darnall and colleagues offered participants a clinician-led 2-hour single session of pain-CBT consisting of two parts: First, participants were taught how pain functions as a "sensopsychological experience," and then they were taught skills that can be used to self-treat it. These skills included techniques to restructure and reframe pain catastrophizing thoughts, deep breathing exercises, and progressive muscle relaxation.

Compared with baseline, patients surveyed at 2 and 4 weeks post-intervention reported significantly lower levels of rumination, magnification, and helplessness on the pain catastrophizing scale, a measurement that helps quantify an individual's pain experience. This suggests that even a single session of pain-CBT may offer chronic pain patients some measure of relief, Darnall wrote in the *Journal of Pain Research*. Darnall is currently investigating the efficacy of single-session pain-CBT in a randomized controlled trial, which is set to be completed in 2020.

In another study of 51 patients with chronic pain, Darnall found that patients were able to reduce their daily opioid dose from an average of 288 mg to 150 mg after just 4 months on an individualized prescription-tapering plan, without an increase in their self-reported pain intensity. Patients worked closely with their physician to address any anxiety or fear about tapering. The methods of this pilot suggest that outpatient opioid-tapering outcomes are enhanced by patient-provider partnerships that carefully attend to patients' needs, such as pausing the taper if desired.

The EMPOWER study aims to test these findings over the long-term by harnessing the power of the placebo effect — a term Darnall said is unfairly maligned.

"There's a negative connotation around placebo as if it means 'fake,' but that's not actually what it means," she says.

While the term is often used to dismiss untested, if not predatory, "alternative" medical practices, the placebo effect really just refers to a patient improving because they believe something, whether a sugar pill or a therapeutic intervention, will be beneficial, Darnall explained. Similarly, a patient in the same circumstances as another on paper can experience a nocebo effect if they perceive an element of their treatment to be harmful.

For chronic-pain sufferers who are considering tapering off opioids, these kinds of “nonspecific factors” could mean the difference between making an empowered choice or being backed into a corner.

“When patients believe and trust and feel supported, they do better,” Darnall says, “and at the end of the day that is what we care about.” œ

References

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