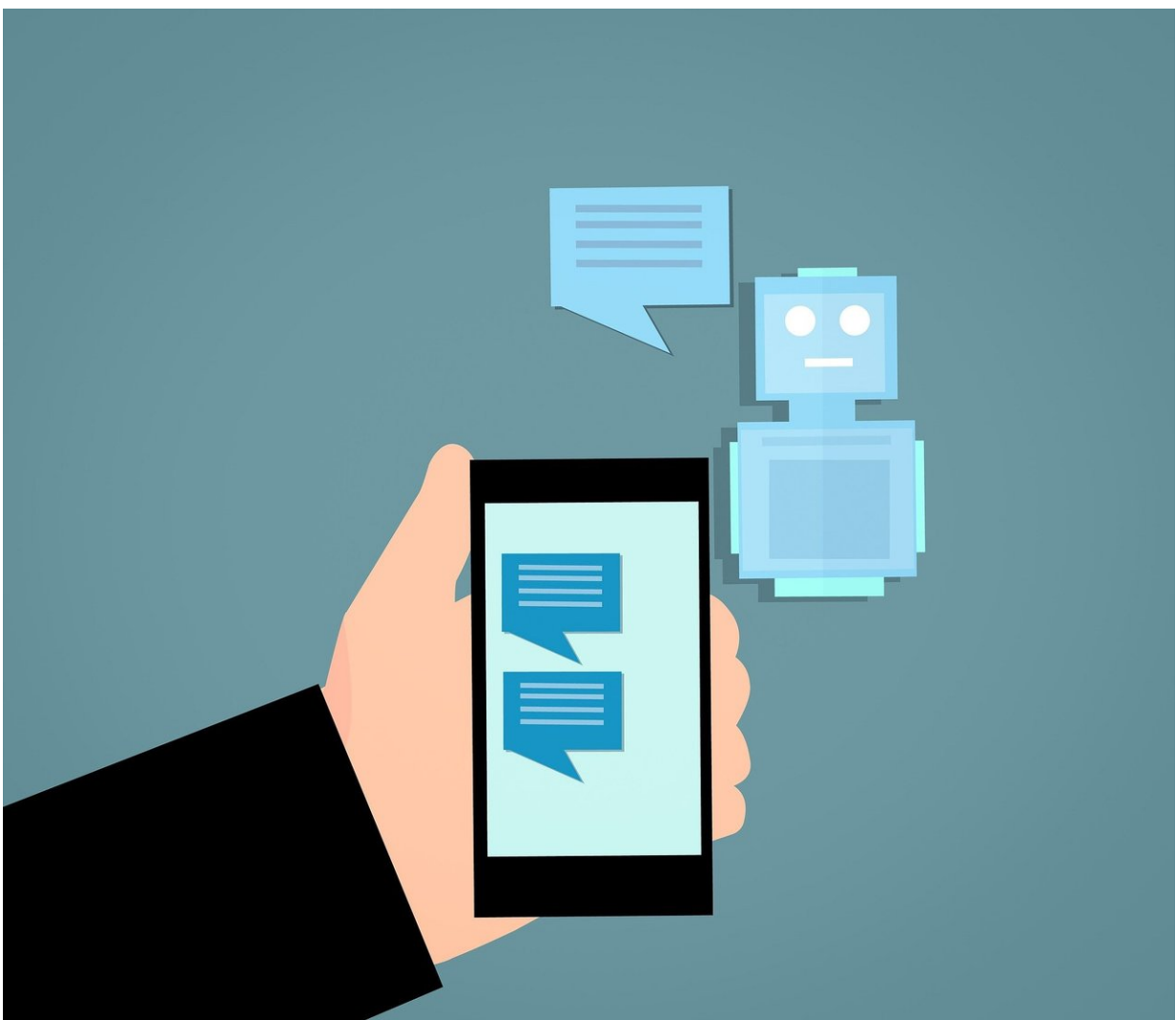


When COVID delayed patients' joint replacement surgeries, a chatbot improved their mental and physical health

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When patients' hip or knee replacements were delayed in response to COVID-19 surges, chatbots delivering encouraging messages not only benefited the mental health of patients—they also experienced boosts to their physical health, too. A paper in the *Journal of Arthroplasty* showed that twice as many of the patients who received the messages informed by psychotherapy experienced meaningful clinical improvements compared to those who didn't.

"We think it is very significant that we saw benefits in both mental and physical [health](#)," said the study's lead author, Christopher Anthony, MD, associate director of Hip Preservation at Penn Medicine and an assistant professor of Orthopaedic Surgery in the Perelman School of Medicine at the University of Pennsylvania. "This demonstrates the importance of the relatively unexplored area between a patient's psychological well-being and their joint function."

Amid the COVID-19 pandemic, especially in its early stages, elective surgeries at hospitals across the United States were postponed as surges in the virus strained hospitals. Among the elective surgeries pushed back were those for replacing painful joints. As such, Anthony and others wanted to help these [patients](#) manage their pain and boost their hopes while their surgeries were on hold.

The study team employed an automated system that delivered [text](#) messages twice a day to the delayed joint replacement patients. Every text was informed by a psychotherapeutic concept called Acceptance and Commitment Therapy (ACT), which emphasizes a focus on a patient's own goals for themselves and their health while directly addressing feelings of pain or disappointment.

For example, one message said, in part, "If you are experiencing some

pain today, we encourage you to acknowledge it and then turn your focus to the things in your life that matter most to you."

A total of 90 patients were recruited and randomly divided in half, with one group receiving the text messages. Each patient was enrolled for two weeks and their conditions were clinically assessed at the beginning and end of the time period.

Overall, patients enrolled in the text messaging system scored better on all measured outcomes except for anxiety—in which neither group showed improvement. Among the [mental health](#) measures, 31 percent of patients receiving texts experienced a clinically significant improvement, compared to 25 percent not receiving texts. And while 15 percent of those in the texting program experienced a decline in mental health, more than twice as many outside of the program experienced one, too.

But the benefits of the texting program appeared to extend beyond mental health into the physical. Of those who received texts, 38 percent reported improved [physical health](#) over the study period, compared to just 17 percent of those not receiving the texts. In measures specifically related to their joint health, roughly 24 percent of patients getting the texts had significant improvement. Just 2.5 percent of those who didn't receive the messages had the same improvement.

The texting program is the same one that Anthony previously used to carefully decrease the number of prescription opioid pills used by joint replacement patients following surgery. That effort was shown to result in a third fewer opioids being taken that also coincided with a reduction in experiences of pain. With the evidence he's gathered across these studies, Anthony believes that a program like this could have significant benefits in future crises.

"We would like to see our methods utilized by others and implemented

in practice given the ongoing pandemic needs," Anthony said. "We really think this could help some people."

More information: Chris A. Anthony et al, A Psychological Intervention Delivered by Automated Mobile Phone Messaging Stabilized Hip and Knee Function During the COVID-19 Pandemic: A Randomized Controlled Trial, *The Journal of Arthroplasty* (2021). [DOI: 10.1016/j.arth.2021.12.006](https://doi.org/10.1016/j.arth.2021.12.006)

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