

Rx for pain relief: 30 minutes of storytelling

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If you know or have kids who've been suffering from the disruption of the pandemic, there may be a pharmaceutical-free way to alleviate their pain and stress: Read them a story.

Scientists in Brazil who studied the effect of storytelling and riddle-

based games on children hospitalized in an [intensive care unit](#) found that stories lowered the young patients' stress hormone levels, reduced their self-reported pain scores and resulted in them speaking more positively about hospitals, doctors and nurses.

"Our findings provide a psychophysiological basis for the short-term benefits of storytelling," the study authors wrote in the *Proceedings of the National Academy of Sciences*.

The results offer a simple and inexpensive intervention that could ease the physical and psychological pain of hospitalized children, the authors said. And they hint that storytelling could have a powerful effect on children's well-being beyond the [hospital setting](#)—including for those whose home and school lives have been left in disarray by the coronavirus.

The pandemic has "some kind of similarity to the ICU context, in the sense that we are locked in, we are extremely anxious, afraid of being sick, and you don't know when [things] are going to get better," said lead author Guilherme Brockington, a physicist at the Federal University of ABC in São Paulo, Brazil.

Humans love stories, whether it's telling them or hearing them. This is true from childhood to old age, and across language and culture. Studies suggest that love of the narrative may have played a critical adaptive role in human society and allowed us to influence our emotions and forge connections with one another. Psychologically, stories allow us to pull meaning out of a sometimes chaotic world and to learn the intricacies and pitfalls of social interactions through the safety of vicarious experience.

Mentally stimulating activities from childhood through old age seem to provide a "cognitive reserve," scientists say.

Researchers have a hypothesis for why stories have such an effect, an idea called "narrative transportation." By weaving a tapestry of language, text and imagination, stories immerse heart and mind. And as the [story](#) world becomes more immediate, more "real," the actual world becomes slightly more remote, or harder to access—at least for a little while.

"If you're listening to a story, your mind is transported to another place, away from the hospital and into this sort of imaginary realm," said Raymond Mar, a psychologist at York University in Toronto who was not involved in the study.

"These narrative transportations and mental simulations can help reframe personal experiences, broaden perspectives, deepen emotional processing abilities, increase empathy and regulate self-models and emotional experiences," the study authors wrote.

Storytelling, in other words, seems like a powerful tool that can be harnessed for good. That's why it's common for hospitals around the world to have storytelling programs for young patients.

Still, their benefits have remained largely anecdotal. For this study, Brockington and his colleagues wanted to build a case based on [scientific evidence](#).

To do so, the researchers focused their efforts on children in intensive care, who are already dealing with the hardship and pain associated with their illnesses. On top of that, being removed from home and school deprives them of routines that bring comfort and security, can interrupt their development and can affect them in other ways long after they've left the hospital.

The scientists recruited 81 children who had been admitted to the ICU at Rede D'Or São Luiz Jabaquara Hospital in São Paulo. They ranged in

age from 2 to 7 and suffered from similar conditions, such as respiratory problems brought on by asthma, bronchitis or pneumonia.

The children were randomly split into two groups. In the experimental group, 41 participated in a program in which a trained volunteer read a children's tale for 25 to 30 minutes. The patients were able to choose from one of eight stories typically found in Brazilian children's literature. (They could ask at any time to change stories or have one reread.)

In the [control group](#), the volunteer took on a different role, spending the same amount of time asking the remaining 40 children to solve amusing riddles. The idea was to control the amount of time, attention and social interaction each child would receive, regardless of whether they were getting riddles or stories.

The study team examined the children's responses on multiple levels. The researchers collected saliva samples from each participant before and after sessions to track changes in levels of cortisol (a hormone associated with stress) and oxytocin (a hormone linked to empathy and emotional processing).

The children also took a subjective test to report the level of pain they were feeling on a scale of 1 to 6, before and after each activity. Finally, they participated in a verbal free-association task by describing their impressions of seven cards depicting relevant subjects: nurse, doctor, hospital, medicine, patient, pain and book.

Across the board, the riddles and the stories had a positive impact. Cortisol levels dropped, oxytocin levels rose, and subjective pain reports eased.

There was one key difference: The stories appeared to be roughly twice

as effective as the riddles. Oxytocin levels rose ninefold after the storytelling intervention, versus a fivefold increase after the riddles. Cortisol levels dropped by about 60% for the children who heard stories, compared with a drop of 35% for those who worked on riddles.

As for pain, children who heard stories saw their average scores fall from 3.85 to 1.15 (a drop of 2.7 points), while the average pain scores for those with riddles fell from 3.72 to 2.18 (1.54 points).

In the word-association game, responses from the story group tended to be more positive for "hospital," "nurse" and "doctor" than those from the riddles group. For example, when looking at a picture of a hospital, a story child would call it a place where "people go to get better," while a riddles child would say it was where "people go when they are sick."

The evidence makes a strong case for the therapeutic power of stories, scientists said.

"Even just doing one psychophysiological measurement would have been impressive; to get two is great; to pair that with a diversity of other kinds of reports is truly a huge undertaking," Mar said. "And again, the most impressive thing is that you see pretty consistent results across all those four measurements."

The results speak to the power of narrative, the study authors said.

"You are going to another world through fantasy," Brockington said. For at least a little while, people can find themselves "in a better place, a less stressful place."

While the stories deployed in this study were lighthearted or amusing, Mar wondered whether stories with a theme related to the listener's plight might offer targeted aid. Mar also said he might broaden the

definition of stories to include other forms of narrative play.

"I think that any kind of imaginative roleplay that allows children to sort of work through what is currently potentially stressing them is likely to be helpful," he said.

And it's not just kids who need stories, said senior author Jorge Moll, a neuroscientist at the D'Or Institute for Research and Education in Rio de Janeiro. Adults can also benefit from letting a story transport them.

With families spending more time together at home during the pandemic, it might be an opportunity to return to long-lost traditions, such as swapping stories around a fire.

"I suspect those should be very beneficial for everyone," Moll said.

More information: Guilherme Brockington et al., "Storytelling increases oxytocin and positive emotions and decreases cortisol and pain in hospitalized children," *PNAS* (2021).

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