Practicing mindfulness with an app may improve children's mental health

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Many studies have found that practicing mindfulness—defined as cultivating an open-minded attention to the present moment—has benefits for children. Children who receive mindfulness training at

school have demonstrated improvements in attention and behavior, as well as greater mental health.

When the COVID-19 pandemic began in 2020, sending millions of students home from school, a group of MIT researchers wondered if remote, app-based mindfulness practices could offer similar benefits. In a study conducted during 2020 and 2021, they report that children who used a mindfulness app at home for 40 days showed improvements in several aspects of mental health, including reductions in stress and negative emotions such as loneliness and fear.

The findings suggest that remote, app-based mindfulness interventions, which could potentially reach a larger number of children than school-based approaches, could offer mental health benefits, the researchers say.

"There is growing and compelling scientific evidence that mindfulness can support mental well-being and promote mental health in diverse children and adults," says John Gabrieli, the Grover Hermann Professor of Health Sciences and Technology, a professor of brain and cognitive sciences at MIT, and the senior author of the study, which was published this week in the journal *Mindfulness*.

Researchers in Gabrieli's lab also recently reported that children who showed higher levels of mindfulness were more emotionally resilient to the negative impacts of the COVID-19 pandemic.

"To some extent, the impact of COVID is out of your control as an individual, but your ability to respond to it and to interpret it may be something that mindfulness can help with," says MIT graduate student Isaac Treves, who is the lead author of both studies.

Pandemic resilience

After the pandemic began in early 2020, Gabrieli's lab decided to investigate the effects of mindfulness on children who had to leave school and isolate from friends. In a study that was published in the journal *PLOS One* in July, the researchers explored whether mindfulness could boost children's resilience to negative emotions that the pandemic generated, such as frustration and loneliness.

Working with students between 8 and 10 years old, the researchers measured the children's mindfulness using a standardized assessment that captures their tendency to blame themselves, ruminate on negative thoughts, and suppress their feelings.

The researchers also asked the children questions about how much the pandemic had affected different aspects of their lives, as well as questions designed to assess their levels of anxiety, depression, stress, and negative emotions such as worry or fear.

Among children who showed the highest levels of mindfulness, there was no correlation between how much the pandemic impacted them and negative feelings. However, in children with lower levels of mindfulness, there was a strong correlation between COVID-19 impact and negative emotions.

The children in this study did not receive any kind of mindfulness training, so their responses reflect their tendency to be mindful at the time they answered the researchers' questions. The findings suggest that children with higher levels of mindfulness were less likely to get caught up in negative emotions or blame themselves for the negative things they experienced during the pandemic.

"This paper was our best attempt to look at mindfulness specifically in the context of COVID and to think about what are the factors that may help children adapt to the changing circumstances," Treves says. "The

takeaway is not that we shouldn't worry about pandemics because we can just help the kids with mindfulness. People are able to be resilient when they're in systems that support them, and in families that support them."

Remote interventions

The researchers then built on that study by exploring whether a remote, app-based intervention could effectively increase mindfulness and improve mental health. Researchers in Gabrieli's lab have previously shown that students who received mindfulness training in middle school showed better academic performance, received fewer suspensions, and reported less stress than those who did not receive the training.

For the new study, reported today in *Mindfulness*, the researchers worked with the same children they had recruited for the *PLOS One* study and divided them into three groups of about 80 students each.

One group received mindfulness training through an app created by Inner Explorer, a nonprofit that also develops school-based meditation programs. Those children were instructed to engage in mindfulness training five days a week, including relaxation exercises, breathing exercises, and other forms of meditation.

For comparison purposes, the other two groups were asked to use an app for listening to audiobooks (not related to mindfulness). One group was simply given the audiobook app and encouraged to listen at their own pace, while the other group also had weekly one-on-one virtual meetings with a facilitator.

At the beginning and end of the study, the researchers evaluated each participant's levels of mindfulness, along with measures of mental health such as anxiety, stress, and depression. They found that in all three groups, mental health improved over the course of the eight-week study,

and each group also showed increases in mindfulness and prosociality (engaging in helpful behavior).

Additionally, children in the mindfulness group showed some improvements that the other groups didn't, including a more significant decrease in stress. They also found that parents in the mindfulness group reported that their children experienced more significant decreases in negative emotions such as anger and sadness. Students who practiced the mindfulness exercises the most days showed the greatest benefits.

The researchers were surprised to see that there were no significant differences in measures of anxiety and depression between the mindfulness group and audiobook groups; they hypothesize that may be because students who interacted with a facilitator in one of the audiobook groups also experienced beneficial effects on their mental health.

Overall, the findings suggest that there is value in remote, app-based mindfulness training, especially if children engage with the exercises consistently and receive encouragement from parents, the researchers say. Apps also offer the ability to reach a larger number of children than school-based programs, which require more training and resources.

"There are a lot of great ways to incorporate mindfulness training into schools, but in general, it's more resource-intensive than having people download an app. So, in terms of pure scalability and cost-effectiveness, apps are useful," Treves says. "Another good thing about apps is that the kids can go at their own pace and repeat practices that they like, so there's more freedom of choice."

More information: Isaac N. Treves et al, At-Home use of App-Based Mindfulness for Children: A Randomized Active-Controlled Trial, *Mindfulness* (2023). DOI: 10.1007/s12671-023-02231-3

Isaac N. Treves et al, Mindfulness supports emotional resilience in children during the COVID-19 pandemic, *PLOS ONE* (2023). DOI: 10.1371/journal.pone.0278501

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