

# The truth about mindfulness

Many bold claims have been made about the wildly popular practice. Do they stand up?

**Jo Marchant** investigates

**T**HERE is nothing wrong with thinking. It is what makes us human. Our ability to remember the past and imagine the future has made us the most successful species on the planet. But can we **take it too far**? Scientists and **self-help gurus** alike argue that spending too much time **ruminating on** our worries can make us stressed and miserable, while blinding us to the joys of what is happening right now. The cure, we are told, is to be more **mindful**. The practice of mindfulness – paying attention to our experience in a non-judgemental, accepting way – promises to help us escape the tyranny of our thoughts, **boosting our mood, performance and health along the way**.

At this point, there can't be many people on the planet who haven't tried mindfulness at least once. Secular versions of the practice were first developed from Buddhist roots in the 1970s, **paving the way for** scientific studies into its effects on the mind. Since it **burst into the mainstream** in the 1990s, high-profile research papers and media reports have claimed dramatic changes in brain structure and function, and benefits ranging from **sharper attention** to boosted mood, memory and a younger-looking brain.

Mindfulness is now prescribed by doctors, taught in schools, provided by employers and is readily available to download on our smartphones. It is no longer a fringe topic, but **part of daily life**. "Now, everyone's got the app,"

says Kieran Fox, a neuroscientist at Stanford University in California.

In recent years, though, some researchers have begun to **urge caution**, warning that the benefits of the practice have been **hyped** and **potential harms** ignored. It is also unclear whether apps, the way most people now access this practice, work the same way as formal training. So, what is the truth about mindfulness? Does it really work, and if so, what can it do?

Fox is one of those arguing that we need to **temper our expectations**. He spent time living with Tibetan monks and says the techniques he learned help him to **stay focused** and to keep problems and stresses in perspective. "I meditate every day," he says. "To not have that in my life is almost unthinkable." But he is concerned that the benefits have been **exaggerated**. "There's all sorts of biases in the research," he says.

Part of the problem is that not all of the early studies were well designed. Many didn't compare mindfulness interventions with suitable controls, says Fox, which makes it hard to distinguish benefits from a **placebo effect**. **Another challenge is that** we still don't have a good scientific definition of what mindfulness really is, or rigorous ways to measure the extent to which people are in a mindful state.

Psychologist Miguel Farias at the University of Coventry, UK, agrees. He has analysed studies apparently showing that meditation ➤



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## The road to pandemic recovery

The events of the past year or so have led to a focus on mental health like never before. For stressed health workers, people isolated during lockdown, those recovering from chronic illness or worried about losing their jobs or seeing entire industries collapse, the coronavirus pandemic has presented a multi-pronged attack on mental health and well-being.

Fadel Zeidan, who heads the Center for Mindfulness at the University of California, San Diego (UCSD), says that he is expecting a covid-related surge in drug addiction and post-traumatic stress disorder (PTSD). Early studies bear this out. One survey has indicated that after China's strict lockdown, rates of PTSD among adults across 31 provinces reached nearly 80 per cent. Almost a third of adults in the US and Italy are estimated to have been similarly affected.



Mindfulness may aid emotional recovery after the pandemic

Could mindfulness training help people to ride out the rest of the pandemic and to recover afterwards? There is little hard evidence so far, but a survey of thousands of people in Italy in March and April 2020, when the country was under lockdown, concluded that those who were naturally mindful – able to pay attention to what they were sensing without judging it – experienced less psychological distress.

One advantage for delivering mindfulness meditation during a pandemic is that guided sessions work just as well online as those delivered in person. Several research centres, including Zeidan's and the Oxford Mindfulness Centre in the UK, have been offering free online mindfulness sessions since lockdowns were imposed in March 2020. The Oxford sessions and podcasts have been accessed by tens of thousands of people, and based on unpublished data collected on 400 participants, Zeidan says the sessions at UCSD's Sanford Institute for Empathy and Compassion have successfully reduced stress, depression and anxiety. People also report feeling less lonely and more socially connected, he says.

Nicholas Van Dam, at the University of Melbourne in Australia, says coronavirus lockdowns have not only increased the need for emotional support, but have also prompted people to rethink what is important in their lives. "Mindfulness meditation may fit the bill for some, while also helping people to answer some of those big questions," he says.

interventions, including mindfulness, make people more compassionate. He found that if you exclude studies without an active control, and where the meditation teacher is a co-author on the paper, the effect disappears. "The effect is driven by experimenter biases and a less robust methodology," he says.

So what is the real story? Recent meta-analyses, in which data from multiple trials are combined to try to iron out variations, have concluded that mindfulness meditation does indeed have benefits, including small improvements in executive function – the ability to control and monitor behaviour when trying to complete a task or reach a goal. There was also some evidence of improvements in attention. Another analysis of 136 trials including more than 11,000 participants, also published in January, found that mindfulness-based interventions are generally helpful for anxiety, distress and negative mood, with small to moderate effects, but little support for a boost to memory.

Overall, the consensus from the research is that the effects of mindfulness meditation, although often useful, aren't necessarily greater than those of other proven treatments. We also know that while some people get considerable benefits, there is a lot of variation in how people respond, for reasons that we don't yet fully understand.

Rather than being a magic bullet, then, mindfulness provides another effective option to manage mental well-being and health. Willem Kuyken, director of the Oxford Mindfulness Centre at the University of Oxford, studies mindfulness-based cognitive

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**60 to 80 minutes of mindfulness reduced pain by 45 per cent: double that of a clinical dose of morphine**



therapy (MBCT), which is **tailored for** people who have suffered **recurrent depression**, to help them **stay well**. He says there is now **robust evidence** that MBCT is effective, even if it is no more so than other treatments such as drugs or cognitive behavioural therapy. Far from being a disappointment, “I think that’s great”, says Kuyken. It shows both that the field has matured past those early hyperbolic claims, and that mindfulness does have significant effects. That means greater choice for patients, particularly for those who prefer to avoid drug treatment, with all the **side effects** that can **entail**.

If it does work, an obvious question is, how? Any measurable change in cognition or mood must reflect altered activity in the brain, and numerous brain-imaging studies have attempted to **pinpoint** exactly what these effects are. The complexity of the task is “humbling”, says Fox, who recently reviewed brain-imaging studies of meditation.

These kinds of studies suggest that mindfulness, in common with other forms of meditation, activates the dorsal anterior cingulate cortex. This brain area links the prefrontal cortex with the limbic system and is involved in top-down processes such as control of attention. That makes sense because engaging and disengaging attention is the very basis of mindfulness.

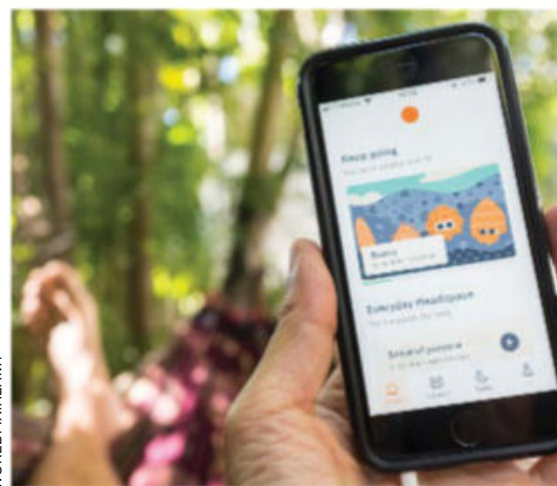
Another key area affected is the insula, which plays a role in our internal sense of our own body, things like being aware of our own heart rate. **Put simply**, Fox says, this

implies that meditation really does help us to **get out of our heads** and into our bodies, where we are more connected with our experience in the present moment.

## Hurt blocker

New brain-imaging research is also providing clues about how mindfulness can help people suffering with **chronic pain**. Neuroscientist Fadel Zeidan, who heads the Center for Mindfulness at the University of California, San Diego, induces pain in volunteers while scanning their brain activity using fMRI. Some are taught to practise mindfulness meditation during the sessions, whereas others are given a placebo or participate in

**Most people access mindfulness through apps, but few are proven to be effective**



**It’s no magic bullet, but mindfulness can be an effective tool to manage mental health and well-being**

a control technique in which they are simply told to take deep breaths.

Zeidan says that even 60 to 80 minutes of mindfulness training reduced pain in almost all of the hundreds of subjects he has tried it on. On average, he says, their reported pain is eased by 45 per cent, an effect he estimates as double that of a clinical dose of morphine.

**Intriguingly**, mindfulness appears to work differently from other methods of pain relief. Alternatives such as placebo, prayer, hypnosis or drugs all work by triggering the release of endogenous opioids, internal painkillers that **dampen pain-related signals** in the spinal cord. But chemicals that block this process don’t dent mindfulness-related pain relief. And the effect itself seems to feel different too. “Mindfulness impacts the emotional dimension of pain much more dramatically than the sensory dimension,” says Zeidan.

In other words, people report that they are still aware of the pain, but it just doesn’t bother them as much. This is backed up by clinical trials. For example, in a 2020 trial targeting migraines, people given mindfulness training had just as many headaches, but any associated disability and depression was reduced.

Zeidan also sees “a unique pattern of activation” in fMRI brain scans. Whereas the opioid pathway activates a brain area called the periaqueductal gray, mindfulness doesn’t. Instead, he says, activity in the prefrontal cortex shuts down the thalamus, which relays sensory signals such as pain to the rest of the cortex for processing. The fMRI

It is free, simple to learn and can be done when you like. Mindfulness is nothing if not convenient



RICHARD DRURY/GETTY IMAGES

results suggest that mindfulness helps them to **reframe** the pain as neutral sensory information, says Zeidan, rather than **dwelling on** it as an unpleasant and **emotionally laden threat**. Over time, this ability might help to protect people with chronic pain from **spiralling into** anxiety and depression. Studies by Zeidan and others hint that mindfulness may also **ease fear** and **emotional pain**, by reducing connectivity between the prefrontal cortex and the amygdala, which is involved in our emotional response to threat.

There is some evidence that, over time, these changes in brain activation during meditation alter the structure of the brain, increasing **grey matter** in the prefrontal cortex, for example, and shrinking the amygdala, potentially protecting against stress.

## Practice, practice

**There is a catch**, however. Although you might see a small effect from mindfulness meditation within a few weeks or hours, **lasting change** is likely to **require regular practice**.

Perhaps the easiest way to achieve this is via phone apps, but it is **worth considering that** not all apps are equal. A 2015 review found that of the hundreds of mindfulness apps that were available, fewer than 5 per cent offered **good-quality training**. “When you subject meditation to the pressures of marketing and capitalism, you end up with the shiniest version, not necessarily the one that works the

## “ Transcendent states, triggered by mindfulness, may act to restart the brain

best,” says Nicholas Van Dam, a psychologist at the University of Melbourne in Australia. “I think many companies are more interested in initial subscribers than they are in providing programmes that actually work.” Those that have been tested and shown to be effective in trials include Headspace, which came out top in the 2015 review, Insight Timer and Calm.

**The final thing to consider is** the potential **adverse effects** of meditation. Concerned that such experiences have been “**put under the rug**”, Farias recently analysed 83 meditation studies and found that just over 8 per cent of participants **suffered adverse effects**. Most common were **increases in** anxiety or depression, but, more rarely, participants reported psychosis or **suicidal thoughts**. **Little is known about** what drives these effects, he says. But **anecdotal reports** suggest that they may be more likely during intensive retreats. Overall, the rate of adverse effects is no

higher than with other types of psychotherapy, and is lower than many drug therapies. But it is important to know that the experience isn’t guaranteed to be positive, says Van Dam. Mindfulness isn’t about feeling blissed out, but experiencing life as it really is, he says. “For some, exploring the depths of the mind for the first time can be painful.”

As mindfulness finds a new place in medicine alongside other effective treatments, David Yaden, who studies mindfulness at Johns Hopkins University in Maryland, is taking another look at the rare but extreme transcendent states that can be triggered by both intensive meditation training and psychedelic drugs. During such episodes, the sense of self shrinks or dissolves, and people commonly report feeling at one with the universe. Evidence is **accruing** – particularly through studies of psychedelic drugs such as psilocybin – that such states are beneficial, with subjects reporting **reduced anxiety and depression**, and **increased happiness**, optimism and even acceptance of death. Unlike the incremental gains of routine mindfulness training, these effects can be dramatic and life-changing. “People rate them as among the most meaningful experiences of their entire lives,” says Yaden.

He is now studying whether mindfulness and drug-induced transcendent states work in similar ways. Zeidan thinks they might. “It’s a restart mechanism,” he says. “Restarting on the breath, or restarting with the aid of a psychedelic, we believe can ‘control-alt-delete’ the subject or the patient for them to wake up and come out of the experience with a new perspective.”

Here, too, studies are at an early stage, and, as ever, the challenge is to strengthen the research while reining in the hype. Mindfulness **holds “so much promise** for so many reasons”, says Van Dam. But it won’t necessarily be for everyone or solve all the world’s problems, he says. “It’s **far from a quick fix.**” ■



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