

Mindful brains

31 July 2018, by Tzipi Horowitz-Kraus And Emma Twait



Mindfulness meditation. Credit: [Ayelet Kravi](#)

In the world with so much buzz around us, it can be difficult to unplug from work and not think about the never-ending list of things to do. Stress accumulates.... If you can relate to these statements (let's be honest, most of us will), you might search for ways to de-stress, and people are becoming increasingly aware of using mindfulness to unwind from the perpetual to-do list.

Mindfulness, in the form of meditation practice, has been around for thousands of years, originating when Buddhism emerged in India. Jon Kabat-Zinn, one of the leaders of merging mindfulness with science without the religious aspect, [describes mindfulness](#) as focusing on the present moment with awareness and acceptance without judging. As mindfulness increased in popularity, it has emerged as a fruitful topic for investigation in the fields of neuroscience and psychology.

Differences in the function and structure of the brain have been found in long-term meditation practitioners, such as changes in brain activity within areas associated with [social and emotional behavior](#), and increased volume of the brain in regions involved in [memory, emotion regulation, and higher-order functioning](#). Even just a short-

term mindfulness-meditation intervention [in elementary school students](#) can lead to lowered social anxiety, aggression, and cortisol levels (related to lower stress levels).

The Dalai Lama [emphasized](#) in an interview with Western practitioners how compassion is related to the release of suffering. This philosophy has been transferred to [mindfulness training](#) and has been shown to aid in freeing the body from mental and physical stress and "self", as has historically been shown by meditators being able to [rest on a bed of nails](#).

How mindfulness improves cognitive abilities and mood

Summarizing the effects of mindfulness training across many studies in adults, we see an overall decrease in anxiety, depression, and stress in clinical and non-clinical groups. These effects were, importantly, similar to those seen following other forms of therapy, such as cognitive-behavioral therapy or pharmacological treatments. The mindfulness findings were further extended to a youth-only sample, where mindfulness was found to be particularly effective for treating [psychological symptoms](#). Mindfulness interventions therefore appear to be moderately effective in a wide variety of age groups and populations. These effects could be explained by mindfulness improving '[cognitive control](#)', a broad term referring to higher-order cognitive skills, such as attention shifting, cognitive flexibility, and planning.

Mindfulness focuses on attention and our ability to regulate our emotions, as the goal is to stay focused in the present moment and notice any thoughts or emotions that you might experience in that specific moment. Our ability to maintain this cognitive [control](#) can be influenced by behavioral and psychological problems in childhood and adolescence. This raises the question of whether training in cognitive control in early childhood can help prevent later behavioral and psychological issues. While we don't yet know the answer to this

question, it has been shown that ten hours of mindfulness training in 4-5 year old children can lead to significant improvements in cognitive control ([recent review](#)). Studies following up these children as they develop will help us to understand how long these effects persist for.

The brain mechanisms underlying these effects are still being researched. The ability to ignore physical pain just by focusing on external or internal stimuli requires the engagement of frontal brain regions that are also involved in cognitive control. Since there are several clinical populations who have difficulties with cognitive control (i.e., dyslexia, attention deficit hyperactivity disorder, depression, eating disorders), [mindfulness](#) can potentially be an option for [additional therapies](#) to normalize cognitive control abilities, and to improve overall functioning and outcomes for these populations.

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