Interventions

Articles testing the applied science and implementation of mindfulness-based interventions


Associations

Articles examining the correlates and mechanisms of mindfulness

Canby, N. K., Eichel, K., Peters, S. I.,...Britton, W. B. (2020). Predictors of Out-of-Class Mindfulness...
Practice Adherence During and After a Mindfulness-Based Intervention. *Psychosomatic Medicine.* [link]


Strohmaier, S., Jones, F. W., Cane, J. E. (2020). **Effects of Length of Mindfulness Practice on Mindfulness, Depression, Anxiety, and Stress: A Randomized Controlled Experiment.** *Mindfulness.* [link]


Wenzel, M., Rowland, Z., Kubiak, T. (2020). **Like clouds in a windy sky: Mindfulness training reduces negative affect reactivity in daily life in a RCT.** *Stress and Health.* [link]

### Methods

*Articles developing empirical procedures to advance the measurement and methodology*


**Reviews**

*Articles reviewing content areas of mindfulness or conducting meta-analyses of published research*


**Trials**

*Research studies newly funded by the National Institutes of Health (October 2020)*

None reported.
Many critical tasks in daily life require sustained attention under stressful circumstances (e.g., air traffic control, combat, and emergency medical response) despite the fact that stress can deplete attention by overtaxing cognitive resources. Lapses of attention increase under conditions of acute stress. Mindfulness training can have beneficial effects on attention and stress, and researchers are interested in knowing the degree to which it can prevent stress-induced attentional impairment. Piil et al. [Journal of Cognitive Enhancement] tested the effects of mindfulness training compared to cognitive performance training on sustained attention following a stressor.

The researchers randomly assigned 48 Danish university students and staff members (average age = 38 years; 58% female) to either 30 days of mindfulness training using the Headspace app, or 30 days of cognitive training using the NeuroNation app. Headspace is a meditation application that teaches core mindfulness skills through guided audio meditations that include mindful breathing, open monitoring, and body scanning. NeuroNation is a cognitive training application consisting of short games intended to strengthen working memory, perceptual accuracy, verbal and arithmetic skills, and logical reasoning. Participants were instructed to use the apps 10 minutes daily for 10 days, 15 minutes daily for the next 10 days, and 20 minutes daily for the final 10 days.

At baseline and after completing one month of training, participants were exposed to a cold pressor stress task and then immediately asked to perform a sustained attention task. The cold pressor task in known to increase stress as measured by increases in sympathetic nervous system arousal (heart rate, blood pressure, stress hormones). Participants were instructed to put their non-dominant hand in a tank of circulating ice water until it became too uncomfortable to keep it there. Participants were then placed in front of a computer screen and instructed to press a space bar whenever a numeral between 0-9 appeared, except when the numeral was “3.” The researchers measured the percent of times participants refrained from pressing the space bar when a “3” appeared. Participants were also assessed on a measure of dispositional mindfulness (the Mindfulness Attention Awareness Scale) before and after training.

The results showed the mindfulness group performed significantly better on the computer-based sustained attention task than the cognitive training group (partial $\eta^2=0.12$; medium effect size). The amount of total time spent using the Headspace app correlated with better sustained attention performance ($r=0.56$) while time spent on the NeuroNation app did not ($r=0.23$). The mindfulness group had significantly higher mindfulness scores than the cognitive training group immediately following the intervention (partial $\eta^2=0.28$; large effect size).

Before training, the longer participants kept their hand in the ice water, the poorer their subsequent ability to sustain attention ($r=-0.64$ for mindfulness trainees; $r=-0.76$ for controls). After training, this held true for the cognitive trainees ($r=-0.71$) but not for the mindfulness trainees ($r=-0.10$). If keeping one’s hand in ice water longer is more physiologically stressful, this means stress levels were no longer correlated with attentional degradation within the mindfulness group.

The study shows that an app-based mindfulness training can improve sustained attention after a
stressor and mindfulness disposition compared to a cognitive training app. The study is limited by its lack of physiological stress measures, an assessment of sustained attention under non-stress conditions, and the unknown amount of time each group spent using the app. There is also inconclusive efficacy research on the NeuroNation app.

Children with cancer often have significant cognitive, emotional, behavioral, and academic problems. These result not only from the illness itself, but also the anxieties associated with diagnosis and prognosis, the negative side-effects of oncology treatments, and the lengthy separations from familiar settings and social supports entailed by hospitalization. Psychosocial interventions are needed that can more effectively bolster children's resilience over the course of arduous treatment.

Abedini et al. [Mindfulness] assessed the value of a modified version of Mindfulness-Based Cognitive Therapy for Children (MBCT-C) in reducing internalizing psychological problems (anxiety, depression, and somatization) and attentional problems in school-age children undergoing hospitalization for cancer.

The researchers randomly assigned 40 Iranian children hospitalized for cancer (age range = 11-13 years; 53% male) who met the diagnostic criteria for acute stress disorder and showed elevated internalizing and attentional problems to a modified version of MBCT-C or to treatment as usual. The children were continuously hospitalized throughout the length of the intervention.

MBCT-C was delivered in the Farsi language to small groups of 2-4 participants meeting 5 times a week. The standard MBCT-C protocol was modified to meet the children’s physical, motivational, and attentional needs and the demands of the hospital schedule. Group sessions were shortened to 45 minutes each, delivered over a shortened 4-week time-course, and without the usual raisin, yoga, and mindful movement meditations.

Treatment as usual included limited medical social worker support and a playroom available for 2 hours daily. Children were assessed before and after treatment and at 2-month follow-up for internalizing behavioral problems and attentional difficulties using a parent-completed behavioral checklist, and a child-completed self-report inventory.

The results showed significantly greater reductions in parent-rated (η²=.53) and child-rated (η²=.57) internalizing symptoms for the mindfulness group compared to controls. Parent-rated symptoms decreased 19 points and child-rated symptoms 20 points, while control parent- and child-rated symptoms dropped only 1 point. The mindfulness group also showed significantly greater decreases in attentional problems compared to controls on both parental (η²=.76) and child ratings (η²=.36). Parent-rated attentional problems decreased 15 points and child-rated attentional problems decreased 19 points for the mindfulness group while the control group remained essentially unchanged.

The study shows that MBCT-C modified to meet the needs of hospitalized children with cancer and acute stress disorder can significantly improve symptoms of anxiety, depression, somatization, and impairments in attention compared to treatment as usual. These improvements are sustained for at least 2-months after intervention. The study is limited by the absence of post-intervention outcome ratings by clinicians blind to group assignment, and the lack of an active control group which also promoted social interaction with other children with cancer.