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Mindfulness Meditation in Mental Health

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What is Mindfulness Meditation?

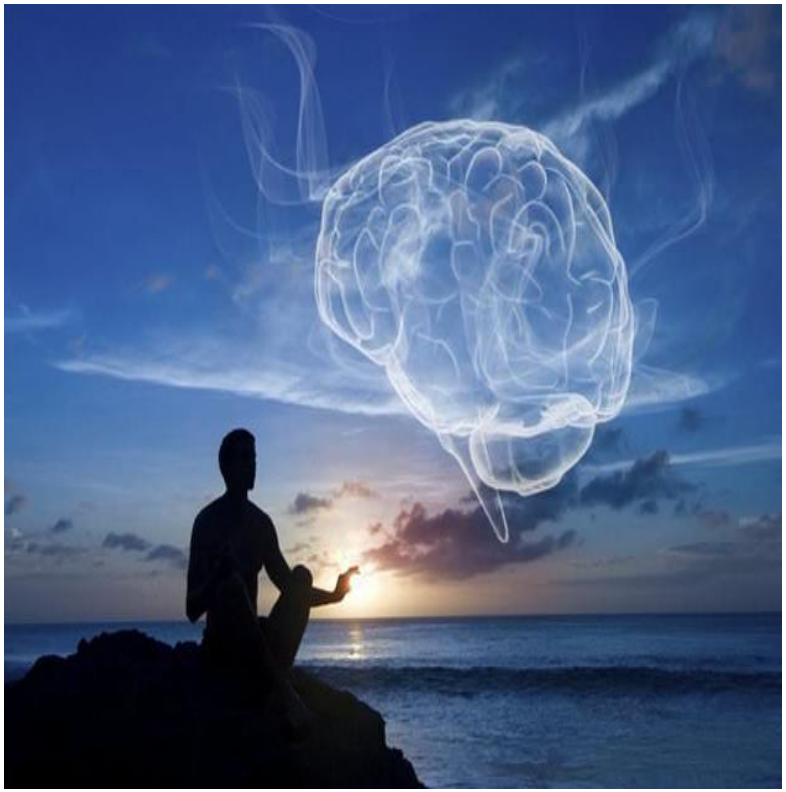
"There are few people I know on the planet who couldn't benefit more from a greater dose of awareness."

Jon Kabat-Zinn (on Bill Moyers, Healing and the Mind)

- Mindfulness Meditation is a family of meditation practices that shares an emphasis on reducing distraction and enhancing awareness of present moment experience, while adopting an attitude of openness or acceptance[1,2]
  - Most rely on principles from Mindfulness-based stress reduction (MBSR)[2]
  - Other mindfulness interventions:[1]
    - Mindfulness-based cognitive therapy (MBCT)
    - Mindfulness-based relapse prevention (MBRP)
    - Brief mindfulness meditation training interventions

1. Creswell JD, *Annu Rev. Psychol*., 2017;68: 491-516.
2. Wielgosz J et al., *Annu Rev. Psychol*, 2019;15: 285-316..

Mindfulness Meditation Techniques and Instructions



- Posture could be seated, lying on back, walking, or yoga positions
- Generally begin with a focal object of meditation, usually the sensations of breathing
- Instructed to adopt a non-aversive stance toward experience with an open quality of attention
- Attend moment-by-moment to the object in a “non-judgmental” way while also maintaining a relaxed awareness for distractions
- Recognize any distractions, without judgment or reactivity, and return attention to the object
  - Instructed not to suppress chain of thoughts but rather observe them as a mental event

Wielgosz J et al., *Annu Rev. Psychol*, 2019;15: 285-316.

Targeting Core Capacities

Meta-Awareness

- Capacity of individuals to monitor and report on the current contents and processes of their mind

Present-Centered Awareness

- Sustained attention to current mental content, as contrasted with retrospective or prospective thinking (i.e., mental time travel)

Nonreactivity to Experience

- Suspension of habitual affective reactions to the current contents of experience

Dereification

- Reduction in the habitual attribution of objective reality (reification) to the contents of thought and perception

Wielgosz J et al., *Annu Rev. Psychol*, 2019;15: 285-316.

Effect of Mindfulness Meditation on Neurobehavioral Systems

Cognitive Systems

- **Executive Functioning**
  - Results using neuropsychological testing have been mixed
- **Targeted Mindfulness Capacities**
  - Improvements found in meta-awareness, cognitive flexibility, memory specificity, & mind wandering
- **Attentional Capture**
  - Robust support for reductions in attentional capture as an important transdiagnostic mechanism by which mindfulness meditation can improve psychiatric symptoms

Affective Systems

- **Enhanced Emotion Awareness**
  - Results on improvements in interoception have been mixed
- **Altered Emotional Reactivity**
  - Repeated experience of affective states without avoidance may constitute a form of exposure leading to habituation or extinction of conditioned emotional reactions
- **Cognitive Reappraisal**
  - Behavioral evidence is currently lacking; however, reductions in stress has been shown to be mediated by self-reported reappraisal
- **Altered Reward Processing**
  - Evidence has emerged from study of reward-related disorders, such as smoking

Wielgosz J et al., *Annu Rev. Psychol*, 2019;15: 285-316.

Effectiveness of Mindfulness-based Interventions (MMBI) for Mental Health Disorders

MMBI vs. No Treatment	**MMBI > No Treatment** (*d*s = 0.35 to 0.89)	Depression Anxiety Pain Schizophrenia Weight/ Eating-related disorders Substance Use/ Addictions
MMBI vs. Active Control	**MMBI > Active Control:** (*d*s = 0.27 to 0.38)	Depression Substance Use/ Addictions
	MMBI = Active Control: (*d*s = 0.03 to 0.15)	Anxiety Pain Weight/ Eating-related disorders
MMBI vs. EBTs	**MMBI > EBTs:** (*d* = 0.42)	Smoking
	MMBI = EBTs: (*d*s = -0.01 to -0.18)	Depression Anxiety

Note. *d* = Cohen's d effect size.

Goldberg, SB et al. *Clinical Psychology Review*, 2018; 59: 52-60.

Implicated Mechanisms for Specific Mental Health Disorders

Depression

- Targets depressogenic cognitive processes (e.g., reduction in rumination)
- Reduces overly generalized autobiographical memory
- Increases ability to suppress irrelevant mental sets
- Decreases in default mode (DMN) activation and increases in DMN connectivity with the dorsolateral prefrontal cortex (PFC)

Anxiety

- Reduces repetitive negative thinking & associated activity in dorsomedial PFC
- Reduces reactivity to both cognitive & physiological symptoms of anxiety
- Increases activation in ventromedial PFC, anterior cingulate cortex (ACC), & insula
- Increases PFC-amygdala connectivity

Pain

- Activation in appraisal circuitry including the orbitofrontal cortex, ACC, and anterior insula
- Decreases affective reactivity
- Deactivation of sensory gating circuitry in the thalamus
- Reduces activity in the amygdala and salience network regions between cue and onset of painful stimuli

Substance Use

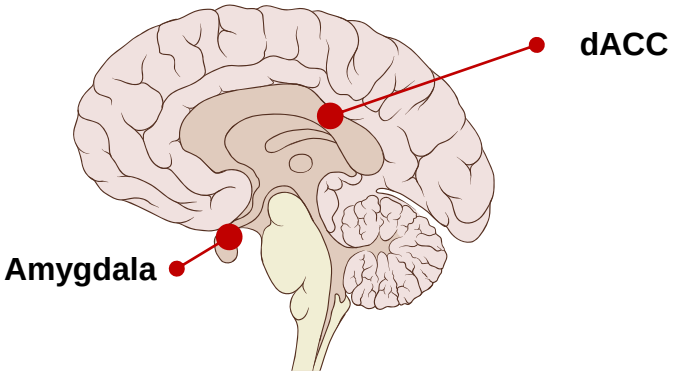
- Response inhibition/ extinction & changes in reward processing
- Lowers amygdala and insula activation in response to stress cues
- Reduces automaticity associated with substance use & decreases drug-use attentional bias
- Increases resting activation within the ACC and medial PFC

Wielgosz J et al., *Annu Rev. Psychol*, 2019;15: 285-316.

Mindfulness May Reduce Stress

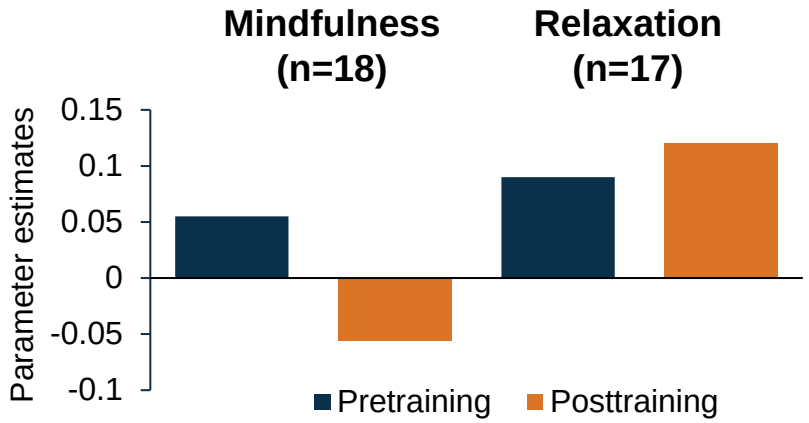
Study 1 (N=130)

Greater amygdala-ACC connectivity was observed in those with perceived stress vs unstressed adults (*P*<0.001)



Study 2

Mindfulness meditation training significantly decreased amygdala-ACC connectivity in unemployed job-seeking adults



Results from the first study showed that stress increased amygdala-ACC connectivity. In the second study, mindfulness meditation training, but not relaxation training, decreased this connectivity and improved perceived stress

ACC, anterior cingulate cortex; MRI, magnetic resonance imaging.
**P*<0.05, postretreat mindfulness compared with preretreat mindfulness parameter estimates
.

Taren et al. *Soc Cogn Affect Neurosci*. 2015;10:1758-1768.

Implementation Challenges & Advancements

(-) Teacher training and mindfulness experience is essential[1]

(+) Development & validation of measures of MMBI adherence & competency[1]

(-) Treatment dosage, the format of training, & practice setting may limit feasibility[1]

(+) Online delivery shows small but significant effects on depression, anxiety, & well-being[2]

(-) Cultural adaptations of traditional MMBIs are not available[1]

(+) Promising support for the utility of acceptance and mindfulness-based treatments with people from diverse, underserved backgrounds (overall *g* = .69)[3]

Note. MMBI = mindfulness-based interventions; g = Hedges' *g*

1. Wielgosz J et al., *Annu Rev. Psychol*, 2019;15: 285-316.
2. Spijkerman MPJ et al., *Clinical Psychology Review*, 2019; 45: 102-114.
3. Fuchs C et al., *Cogn Behav Pract*, 2013; 20: 1-12.

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Example Mindfulness Meditation Exercise

Summary

- Mindfulness meditation describes a family of practices that focuses on increasing attention and enhancing awareness of present moment experience
- Mechanistic evidence for mindfulness meditation improving functioning in positive and negative affective systems
- Mindfulness-based interventions can perform comparably to established treatments for symptoms of depression, anxiety, pain, & substance use
- While advances have been made to improve access and implementation, continued work is needed to address additional challenges

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