



# Mindfulness Meditation and Its Effects on Attention

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## Mindfulness Meditation

Mindfulness meditation is an ancient mindful practice that originally stems from Buddhist meditation traditions. This meditative technique requires both regulation of attention and nonreactive stance toward one's thoughts and feeling [1]. Mindfulness meditation practice involves a broad range of methods, including exercise such as sitting, slow walking, and body scans. It has been practiced widely for stress reduction and health promotion. In this mini review, I briefly reviewed mindfulness meditation's effect on attention and its application in intervention among people with attention deficits hyperactive disorder (ADHD).

## Mindfulness Meditation Effects on Attention

During mindfulness meditation, substantial attention control is required to stay in meditation. Because of repeated practicing effect on attention control, mediators often report improved attention control, and many studies have supported such effects. Recent research demonstrated that mindfulness meditation training can modify attentional networks [2,3]. Attention network model, proposed by Posner [4], consists three functionally distinct network: alerting, orienting, and executive attention. Alerting network is defined as readiness to attend to incoming event. Orienting network refers as selection of information to attend to. Executive network includes monitoring and resolving of conflicts.

Tang [3] reported significant improvement on executive attention network after 5 days mindful meditation training as compared with control group. Jha [2] compared attention network before and after training for mediators and control participants. For mediators who had experience with concentrative meditation, they have better conflict monitoring at the beginning. After mindful

mediation training, mediator who did not have previous experience improved their orienting performance. Both results suggested that mindfulness meditation may alter the attention system and improve executive attention network.

Stroop task is a classical cognitive paradigm measuring selective attention, inhibitory processing and conflict control. When the color word is presented in different color font (e.g., the word GREEN presented in red font), it will produce behavioral interference since word reading is thought to be a more automatic process. Wenk-Sormaz [5] reported significant improvements on interference control in mindfulness meditation group. In addition, Van den Hurk [6] reported a marginal significant association between Vipassana meditation practice and fewer interference. These two studies suggested that mindfulness meditation improved mediators' ability to control interference that was associated with executive attention network as well.

## Mindfulness Meditation in ADHD Practice

Attention deficit hyperactivity disorder (ADHD) is a developmental condition that continues into adulthood. People with ADHD are characterized with symptoms of inattention, impulsivity, hyperactivity and affective problems [7]. Adults with ADHD have impaired executive attention network [8].

Researchers in UCLA clinical and research program conducted an 8-week mindfulness training program for adolescents and adults with ADHD. The training program received high satisfaction from participants. Majority of participants reported reduction in their total ADHD symptoms. Significant improvement were observed in the tasks measuring attention conflict and set shifting [9]. Carboni

and colleagues assessed the impact of mindfulness training for four 8-year-old boys with ADHD and observed decreases in hyperactive behaviors from parent and teachers rating [10].

### Conclusion

Overall, current empirical studies support mindfulness meditation's positive effect on attention in healthy individuals, especially their ability to monitor and control conflict. In addition, mindful meditation practice has been applied in ADHD samples, and provided promising outcomes.

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### Conflict of Interests

No conflict of interests.

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