

## Neurophysiology 2020: Effectiveness of meditation programs in empirically reducing stress and amplifying cognitive function and boosting individual health status: A review- Reshu Gupta, RUHS College of Medical Sciences

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Meditation had been believed to possess a multitude of putative beneficial effects which it could bestow upon its practitioner, but it was not until the 1960's that scientific exploration into the process began. Rigorous increase in randomized controlled trials on mindful interventions has been observed in past two decades. It has been shown, with increasing data, to harbor a myriad of positive effects, a few including, but not limited to, stress reduction, cognition enhancement, an increase in memory, boosted intelligence, etc. Such profound positive influences have led to it being rather commonly deployed to promote general health & treat stress & stress related conditions. Meditative modalities are broadly classified as those stressing on mindfulness, concentration, or automated self-transcendence. Certain popular modalities such as transcendental meditation follow the use of a mantra such that one transcends to a state where focused attention is absent. In contrast, others such as mindfulness-based stress reduction are based on present concentrated awareness. While it is not clear if these differences influence the result of practice, all classes are broadly considered 'meditation' & studied as such. The session shall evaluate the increasing evidence of mindfulness intervention by reviewing & discussing the effects of mindfulness interventions on boosting memory, recall, learning & reducing stress levels along with the psychological & neurobiological mechanisms of such interventions. This shall provide a robust understanding of the process involved in benefits of practicing mindfulness.

Mindfulness may be used to describe a variety of practices & processes; it is most often defined as a two-component process that includes: attention to present moment experience, coupled with, an attitude that is open, non-reactive, & accepting of things as they are. Over the past few decades, a wealth of research has developed in both academic journals & popular media on the benefits of mindfulness meditation for attention, negative mood, mental health, addictions, & many other factors. One premise in this area of research is that becoming mindful of an internal state or physiological function, such as one's breath, can hone abilities such as focused attention, working memory, & acceptance. In turn, this is thought to have long-term positive consequences on attention, body awareness, emotion regulation, & perspectives on the self when mindfulness is trained & practiced over an extended period.

Furthermore, the term "mindfulness" itself may represent multiple practices & processes & it is possible that this initial mindfulness meditation period is only partly related to the mindfulness state that may be generated by experienced

meditators. Nevertheless, we modeled our instructions after typical definitions used by Kabat-Zinn & others as embodied in the foundational meditations in MBSR. Specifically, these components include attention to the present moment that is characterized by an open, curious, & accepting attitude. As such, this mindfulness meditation period may not represent the deeper mindfulness states related with long-term training, but rather one's initial contact with a mindful state, as might occur during the initial meditation in an MBSR course.

In addition, it is also worth noting that, just as intensive or immersive forms of training in mindfulness meditation have their limitations, brief interventions might also have their limitations. Whereas participation in a days, weeks, or months-long mindfulness training program is limited by the time & resources involved, in addition to the motivation necessary for an individual to do so, a brief 10-min audio-guided meditation involves little to no motivation, time, or money. However, while long-term meditation training & practice has shown to reap broad & lasting benefits in cognitive abilities, psychological health & even physical health, the effects of brief meditation interventions on meditation-naïve individuals may be transient &/or fleeting & may not impact well-being or transfer to everyday life. Thus, as noted previously, future studies should continue to explore dose effects of meditation practice, as well as the timeline along which meditation interventions affect cognitive processes & mental & physical health.

Ultimately, although much remains to be studied, the current studies exp & our understanding of the initial effects of brief meditation & suggest that brief meditation impacts attention even in novice practitioners an effect that was discovered when controlling for neuroticism. In addition, it is worth noting that the current studies are not just useful for unlocking the wellness benefits of meditation; they may also be useful for the psychological study of attention in general. Indeed, by understanding how meditation affects certain components & neural mechanisms of attention, researchers may better understand the processes underlying this complex, multifaceted cognitive ability. Thus, the findings have theoretical, clinical, & methodological implications.