



## HOT TOPICS

# Covid-19 and promising solutions to combat symptoms of stress, anxiety and depression

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Time and research will be of the essence when deducing the long-term consequences of the Covid-19 pandemic for global mental health and emotional well-being. Prior reports from viral outbreaks and emerging evidence from the recent pandemic point towards a potential “tsunami” of stress-related disorders in the aftermath of such traumatic events [1]. In addition to neurological and psychiatric symptoms, including psychosis and neurocognitive dementia-like symptoms observed in Covid-19 patients [2], world-wide surveys at the height of the pandemic suggest increased reports of depression, anxiety and distress across a considerable proportion of medical staff as well as the general public [3]. Grief for the loss of loved ones, helplessness and excessive worry over contracting or spreading the virus to other family members are all significant stressors that may collectively contribute to an imminent rise in symptoms of depression, anxiety and suicidal ideation. Furthermore, social distancing measures for combating the viral outbreak may also have unintended consequences, such as social isolation, loneliness, abrupt changes to daily habits, unemployment and financial insecurity, which have all been characterised as risk factors for major depressive and post-traumatic stress disorders with potentially long-lasting effects on brain physiology and function.

Hence, the psychological fallout of the Covid-19 pandemic is of particular concern, and as such, low-cost, scalable and readily deployable solutions will be of paramount importance to protect world’s population against the associated symptoms of mental ill-health. To this end, wearable devices and digital platforms that can be easily integrated into daily technologies like smartphones and tablets may provide viable routes for the delivery of mental healthcare, especially under isolation measures and during limited access to health services. In addition to tracking the individual’s cognition and mood in real-time, such solutions allow personalised interventions. For example, gaming and virtual reality solutions, telepsychiatry, guided meditation and mindfulness practices, may all prove beneficial in this context [4]. In particular, structured meditation and mindfulness trainings have been shown to improve emotional regulation, reduce stress, anxiety and depression, and prevent substance abuse—symptoms that have all been associated with the Covid-19 pandemic. In addition to short-term psychological benefits, recent reviews also indicate both structural and functional brain changes in regular practitioners of mindfulness and meditation trainings [5], with particular influence observed on the balance between attentional/cognitive control systems in the brain and those that are associated

with more automatic aspects of cognition, such as mindsets, mood and memory-retrieval [6]. Nevertheless, an important challenge in this context will be to motivate the continuous use of such digital and remote interventions. Novel and engaging platforms that integrate wearables, data analytics and software applications might be useful in facilitating the necessary level of user participation that is beneficial to the individual’s mental health. Collectively, the amalgamations of these personalised, scalable and low-cost interventions with “Big Data” analytical approaches may pave the way for innovative solutions to reduce stress-related symptoms and help us better prepare to promote cognitive resilience and mental health in daily life, and critically in times of global pandemics.

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**AUTHOR CONTRIBUTIONS**

All authors contributed equally to the drafting of this article.

**ADDITIONAL INFORMATION**

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