



# MINDFULNESS & HRV BIOFEEDBACK: POTENTIAL AS A TREATMENT FOR SOCIAL MEDIA/SMARTPHONE ADDICTION

C. Chirumbolo<sup>2</sup>, S. Ellis<sup>2</sup>, K. Gatto<sup>2</sup>, K. Meister<sup>2</sup>, M. Semby, ND<sup>1</sup>, D. Simon<sup>2</sup>, J. Warbrick<sup>2</sup>, E. Takeuchi-Miller ND<sup>1</sup>, M. Roth, ND<sup>1</sup>  
<sup>1</sup>Naturopathic Doctor, <sup>2</sup>ND Candidate of Bastyr University, CA Classes 2021, 2022, and 2023

## Background & Purpose

With about 3 billion people worldwide using smartphones, social scientists are concerned about anxiety, depression, disruptions at work & family and decrease in inter-personal skills. A form of “internet addiction” called Internet Gaming Disorder is now included in ICD-11 and DSM-5. Social media addiction or smartphone use disorder (SUD) is associated with loneliness, decreased emotional and thought regulation, social withdrawal, escapism from real life into an online world and increased correlation between time spent online and BMI. The purpose of this poster abstract is to review published literature to answer the question whether mindfulness and breath/HRV biofeedback can play a role in treating SUD? Our research question was prompted by increased general awareness of social media addiction as a pressing issue in today’s world and studies reporting that HRV reduces during activities such as internet gaming addiction.

## Methodology

A search was conducted using Pubmed database and MeSH terms which include: social media, smartphone, addiction, mindfulness, biofeedback and HRV. Using the MeSH terms provided above, 25 articles were found using the PubMed database. These articles were published between 2010 and 2020 and the full text was accessible via Bastyr University Library. Of the 25 articles, 15 were excluded based on relevance, language, and full text accessibility. The references for the 10 articles that were included are detailed below.

## Results

HRV biofeedback can be used as a treatment for social media addiction. According to Porges’ Polyvagal Theory and Neurovisceral Integration Perspective, HRV is a reflection of self-regulation capacity and can be used as a bio-marker of an individual’s ability to regulate behavior, cognition and emotions. A meta-analysis of 123 studies found a significant but small effect showing that higher HRV is correlated with increased top-down self-regulation.

## Results continued

Additionally, studies have observed those with Internet Gaming Disorder demonstrate suppressed HF-HRV while playing online games. Social scientists have postulated that social media addiction is an “urge driven disorder with a strong compulsive component.” In other words, those who use social media compulsively are unable to regulate their emotions, behavior and time spent on smart devices displaying difficulty exerting executive control. Furthermore, it appears that popular social media apps, messenger platforms and online games are actually developed with the purpose of prolonging usage and thereby increasing the addictive nature of these applications. Social media addiction is negatively correlated with mindfulness and those addicted are likely to choose emotion focused coping rather than problem focused coping. The solution to this problem lies in discovering how to unlock patterns of behavior that have been reinforced over years.

## Results continued

Using reward-based learning to decouple the link between craving and smoking by using an informal, in the moment mindfulness practice. According to Jud Brewer, for a “behavior to be [changed,] reinforced and sustained, its reward value must be greater than the behavior it is replacing.” If individuals can learn to appreciate the paucity of emotional reward from addictive behavior, then there is a chance to substitute it with the more rewarding mindfulness.

## Conclusion

HRV biofeedback can be effective as an adjunct treatment for SUD owing to its ability for increasing emotional self-regulation and impulse control. HRV biofeedback is safe to use, easy accessible, has no side effects, is free/economical and can be deployed for acute or chronic use. Additionally, it is not contraindicated with any other potential interventions for addiction to social media.

## References

1. Montag, C., Lachmann, B., Herrlich, M., & Zweg, K. (2019). Addictive Features of Social Media/Messenger Platforms and Freemium Games against the Background of Psychological and Economic Theories. *International Journal of Environmental Research and Public Health*, 16(14), 2612. doi:10.3390/ijerph16142612
2. Lee, D., Hong, S. J., Jung, Y.-C., Park, J., Kim, I. Y., & Namkoong, K. (2018). Altered Heart Rate Variability During Gaming in Internet Gaming Disorder. *Cyberpsychology, Behavior, and Social Networking*, 21(4), 259–267. doi: 10.1089/cyber.2017.0486
3. Throuvala, M. A., Griffiths, M. D., Rennoldson, M. D., Kuss, D. J. (2020). Mind over Matter: Testing the Efficacy of an Online Randomized Controlled Trial to Reduce Distraction from Smartphone Use. *International journal of environmental research and public health*, 17(13), 4842. <https://doi.org/10.3390/ijerph17134842>
4. Regan, T., Harris, B., Van Loom, M., Nanavaty, N., Schueler, J., Engler, S., & Fields, S. A. (2020). Does mindfulness reduce the effects of risk factors for problematic smartphone use? Comparing frequency of use versus self-reported addiction. *Addictive behaviors*, 108, 106435.
5. Brewer, J. (2019). Mindfulness training for addictions: has neuroscience revealed a brain hack by which awareness subverts the addictive process?. *Current opinion in psychology*, 28, 198–203. <https://doi.org/10.1016/j.copsyc.2019.01.014>
6. Lan, Y., Ding, J. E., Li, W., Li, J., Zhang, Y., Liu, M., & Fu, H. (2018). A pilot study of a group mindfulness-based cognitive-behavioral intervention for smartphone addiction among university students. *Journal of behavioral addictions*, 7(4), 1171–1176. <https://doi.org/10.1556/2006.7.2018.103>
7. Garland, E. L., & Howard, M. O. (2018). Mindfulness-based treatment of addiction: current state of the field and envisioning the next wave of research. *Addiction science & clinical practice*, 13(1), 14. <https://doi.org/10.1186/s13722-018-0115-3>
8. Ferreri, F., Bourla, A., Mouchabac, S., & Karila, L. (2018). e-Addictology: An Overview of New Technologies for Assessing and Intervening in Addictive Behaviors. *Frontiers in psychiatry*, 9, 51. <https://doi.org/10.3389/fpsy.2018.00051>
9. Brewer, J. A., Elwafi, H. M., & Davis, J. H. (2013). Craving to quit: psychological models and neurobiological mechanisms of mindfulness training as treatment for addictions. *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors*, 27(2), 366–379. <https://doi.org/10.1037/a0028490>
10. Sitwili, K., & Charoensukmongkol, P. (2016). Face it, don't Facebook it: Impacts of Social Media Addiction on Mindfulness, Coping Strategies and the Consequence on Emotional Exhaustion, Stress and health : journal of the International Society for the Investigation of Stress, 32(4), 427–434. <https://doi.org/10.1002/smi.2637>