June 2023

More on disruption of the default mode network

In a recent editorial, "Is the contemporary mental health crisis among youth due to DMN disruption?" (Current Psychiatry, June 2023, p. 10-11,21, doi:10.12788/cp.0372), Dr. Nasrallah argued that "[Default mode network] DMN deactivation by excessive use of social media may explain the mental health decline in youth." He proposed that focused attention tasks such as "smartphones, video games, and social media" disrupt the activation of the DMN: "When another brain network, the attention network ... is activated … DMN activity declines." Dr. Nasrallah then suggested that reduced DMN activity—resulting from focused attention tasks like social media—is associated with mental health problems. Increased DMN activity, on the other hand, is positive, and results from "exercise, daydreaming, and sleep," activities that "have declined drastically with the widespread use of smartphones, video games, and social media." Finally, Dr. Nasrallah suggested that DMN activity can be increased via interventions such as meditation and psychedelics. The proposed causal model can therefore be summarized as: focused attention tasks like social media → increased attention network → reduced DMN → mental health problems in youth. This theory is implausible, for 4 reasons.

First, Dr. Nasrallah referred to the well-cited review by Whitfield-Gabrieli et al[1] regarding the relationship between DMN activation and mental health problems. However, this review shows that in mental health problems like "schizophrenia and depression, the DMN is often found to be hyperactivated and hyperconnected." This stands in contradiction with the theory of decreased DMN activity in youth with mental health problems, and would, according to Dr. Nasrallah's theory, call for more, not less, social media use.

Second, Dr. Nasrallah's theory implies a substantial relationship between social media use and mental health problems. The latest umbrella review on the topic included 25 reviews, of which the majority found either "inconsistent" results or only "weak evidence" for a relationship.[2] Additionally, a study of 355,358 adolescents found that digital technology use explains only 0.4% of the variance of well-being.[3]

Third, there are many focused attention tasks other than video games and social media, such as reading, doing math homework, and playing chess. Dr. Nasrallah's theory suggests that the World Health Organization should refrain from global efforts to get more kids into schools, given that this would increase the amount of focused attention tasks, reduce DMN activation, and increase the amount of mental health problems.

Fourth, youth mental health problems are multifactorial. Identified predictors include "female gender, low socioeconomic status, higher stress reactivity, conduct issues, substance misuse, and problems in peer and parental relationships."[4] Given that these factors are unrelated to the DMN, under-activation of the DMN cannot "explain" the youth mental health crisis, as the editorial suggested.

Eiko I. Fried, PhD
Department of Clinical Psychology
Leiden University
The Netherlands

References

1. Whitfield-Gabrieli S, Ford JM. Default mode network activity and connectivity in psychopathology. Annu Rev Clin Psychol. 2012;8:49-76. doi:10.1146/annurev-clinpsy-032511-143049
2. Valkenburg PM, Meier A, Beyens I. Social media use and its impact on adolescent mental health: an umbrella review of the evidence. Curr Opin Psychol. 2022;44:58-68. doi:10.1016/j.copsyc.2021.08.017
3. Orben A, Przybylski AK. The association between adolescent well-being and digital technology use. Nat Hum Behav. 2019;3(2):173-182. doi:10.1038/s41562-018-0506-1
4. Shore L, Toumbourou JW, Lewis AJ, et al. Review: longitudinal trajectories of child and adolescent depressive symptoms and their predictors - a systematic review and meta-analysis. Child Adolesc Ment Health. 2018;23(2):107-120. doi:10.1111/camh.12220

Disclosures
The author reports no financial relationships with any companies whose products are mentioned in this letter, or with manufacturers of competing products.

doi: 10.12788/cp.0413

Keep in touch!

letters@currentpsychiatry.com

OR

Comments & Controversies
Current Psychiatry
283-299 Market Street
2 Gateway Building, 4th Floor
Newark, NJ 07102

All letters are subject to editing.