Digital Technologies and Addictions

July 11, 2014

Editor's Note: This editorial was written by Marc N. Potenza, MD, PhD. Dr. Potenza is Professor of Psychiatry in the Child Study and Neurobiology Department at Yale University School of Medicine, Director of the Problem Gambling Clinic, Director of the Center of Excellence in Gambling Research, and Director of Women and Addictive Disorders Core of Women's Health Research at Yale University.

During the past two decades, there have been substantial changes in the capabilities, availabilities, and use of digital technologies. These changes have multiple implications, both bad and good, with respect to the development, prevention and treatment of addiction. Negative implications include the possibility for some people to engage excessively in the use of digital technologies, and this pattern of behavior has been termed Internet addiction by some people (1).

In anticipation of the fifth edition of the Diagnostic and Statistical Manual (DSM-5) (2), a Substance Use and Related Disorders Workgroup considered excessive or problematic patterns of Internet use and formulated a set of diagnostic criteria for Internet gaming disorder (3). Given inconsistencies in the definition and thresholding of problematic or interfering patterns of Internet use, and limited available data, Internet gaming disorder only is available in the DSM-5 in section 3, a location reserved for fostering research. Although the inclusion of Internet gaming disorder in the DSM-5 is promoting research into how best to define and classify excessive engagement in the use of the Internet for video-gaming (4, 5), there exists debate regarding the diagnostic entity. For example, the proposed diagnostic entity might conflate excessive patterns of Internet use and excessive patterns of video-gaming, and both similarities and differences in the correlates of problematic Internet use and problematic videogaming have been observed (6-8). Additionally, people might engage problematically in video-gaming independent of the Internet, and others could develop problems with Internet use independent of gaming (e.g., through using the Internet for social networking or other purposes) (9). Key stakeholders also have debated whether problematic Internet use should be considered a distinct diagnostic entity, and whether a diagnosis should be based on the type of problematic Internet use (e.g., providing a diagnosis of gambling disorder for people who use the Internet to gamble excessively). Despite these potential problems, ongoing efforts to harmonize research across geographically and culturally diverse regions are underway (10), and such concerted efforts should provide important information that will be helpful in understanding how best to diagnose and classify individuals with maladaptive patterns of behaviors involving the use of digital technologies.

As research efforts progress into how to best define and assess excessive patterns of the use of digital technologies, clinicians might face potential challenges. For example, clinicians might be in the position of trying to help people with Internet gaming disorder or other problematic forms of digital technology, and they may have scarce data on the disorder(s) and how best to identify and treat individuals with these problems. Further, existing data suggest high comorbidity between problematic Internet and/or gaming behaviors and psychiatric conditions including mood, anxiety, attention-deficit and substance-use disorders (11). As such, individuals, and perhaps particularly youth and young adults, with such conditions might be at elevated risk for technology-related problems, and screening and assessment for problematic use of digital technologies within these populations appears particularly relevant. Given proposed cognitive models for Internet gaming disorder and other problematic forms of digital technology use (12-14), adaptations of cognitive-behavioral therapies could be helpful in treatment efforts (15). Currently, although clinicians and researchers have employed and evaluated to varying extents treatments for Internet gaming disorder and other problematic forms of digital technology (16), these evaluations typically have not included well-powered, randomized controlled trials, although efforts under (for are way example, http://clinicaltrials.gov/show/NCT01434589). The findings of such studies will provide valuable information in efforts to help people whose use of digital technologies interferes with life function in other domains.

Digital technologies also offer significant promise in understanding, preventing and treating addiction. For example, the widespread availability and use of smartphones can facilitate the accumulation of large amounts of data through ecological momentary assessment and provide insight into addictive behaviors (17). Such information could be coupled with global positioning to provide insight into patterns of addictive behaviors that may be used to target interventions for high-risk times and/or places (18, 19). Such approaches ultimately may be linked

to smartphone apps to help people in recovery from addictions. Most such apps developed to date to help people with addictions have yet to be systematically evaluated (20). Digital technologies also hold significant potential for standardizing the delivery of therapies and increasing the availability of treatments in a cost-effective manner (21-23). Coordinated efforts that utilize validated digital technologies hold significant promise in reducing the global impact of addiction and other forms of mental illness (24). As such, it is hoped and anticipated that the upside of digital technologies with respect to preventing and treating addictions will outweigh the potential downsides relating to excessive and interfering patterns of usage, although both are important to consider from public health perspectives.

- Marc N. Potenza, MD, PhD

What do you think? Please use the comment link below to provide feedback on this article.

Disclosures: The author reports that he has no financial conflicts of interest with respect to the content of this manuscript. Dr. Potenza has received financial support or compensation for the following: Dr. Potenza has consulted for and advised Lundbeck, Ironwood and Shire pharmaceuticals; has received research support from the Mohegan Sun Casino and the National Center for Responsible Gaming; has participated in surveys, mailings or telephone consultations related to drug addiction, impulse control disorders or other health topics; has consulted for legal and gambling entities on issues related to gambling behaviors and disorders; provides clinical care in a Problem Gambling Services Program; has performed grant reviews for the National Institutes of Health and other agencies; has edited journals and journal sections; has given academic lectures in grand rounds, CME events and other clinical or scientific venues; and has generated books or book chapters for publishers of mental health texts.

Acknowledgements: This research was funded in part by NIH grants from NIDA (P20 DA027844, R01 DA018647, R01 DA035058, P50 DA09241), the National Center for Responsible Gaming, the Connecticut State Department of Mental Health and Addictions Services, and the Connecticut Mental Health Center. The funding agencies did not provide input or comment on the content of the manuscript, and the content of the manuscript reflects the contributions and thoughts of the author and not necessarily reflect the views of the funding agencies.

References

 $1.\ \text{Yau YHC},\ \text{Crowley MJ},\ \text{Mayes LC},\ \text{Potenza MN}.\ \text{Are internet use and video-game playing addictive}$

- behaviors? Biological, clinical and public health implications for youths and adults. Minerva Psichiatrica. 2012;53:153-70.
- 2. Association AP. Diagnostic and Statistical Manual of Mental Disorders. Fifth Edition. Washington, DC: American Psychiatric Association; 2013.
- 3. Petry NM, O'Brien CP. Internet gaming disorder and the DSM-5. Addiction. 2013;108:1186-7.
- 4. Ko CH, Yen JY, Chen SH, Wang PW, Chen CS, Yen CF. Evaluation of the diagnostic criteria of Internet gaming disorder in the DSM-5 among young adults in Taiwan. J Psychiatr Res. in press.
- 5. Cho H, Kwon M, Choi JH, Lee SK, Choi JS, Choi SW, et al. Development of the Internet addiction scale based on the Internet Gaming Disorder criteria suggested in DSM-5. Addict Behav. 2014;39:1361-6.
- 6. Desai RA, Krishnan-Sarin S, Cavallo DA, Potenza MN. Video-gaming among high school students: health correlates, gender differences and problematic gaming. Pediatrics. 2010;126:e1414-e24.
- 7. Liu TC, Desai RA, Krishnan-Sarin S, Cavallo DA, Potenza MN. Problematic Internet Use and Health in Adolescents: Data from a High School Survey in Connecticut. J Clin Psychiatry. 2011;72:836-45.
- 8. Yau YHC, Potenza MN, White MA. Problematic Internet Use, Mental Health and Impulse Control in an Online Survey of Adults. J Behav Addiction. 2013;2(2):72-81.
- 9. Potenza MN. Non-substance addictive behaviors in the context of DSM-5. Addict Behav. 2014;39:1-2.
- 10. Petry NM, Rehbein F, Gentile DA, Lemmens JS, Rumpf HJ, Mößle T, et al. An international consensus for assessing internet gaming disorder using the new DSM-5 approach. Addiction. in press.
- 11. Ho RC, Zhang MW, Tsang TY, Toh AH, Pan F, Lu Y, et al. The association between internet addiction and psychiatric co-morbidity: a meta-analysis. BMC Psychiatry. 2014;14(1):183.
- 12. King DL, Delfabbro PH. The cognitive psychology of Internet gaming disorder. Clin Psychol Rev. 2014;34(4):298-308.
- 13. Dong G, Potenza MN. A cognitive model of Internet addiction: Theoretical underpinnings and clinical implications. J Psychiatr Res. in press.
- 14. Brand M, Young KS, Laier C. Prefrontal Control and Internet Addiction: A Theoretical Model and Review of Neuropsychological and Neuroimaging Findings. Front Human Neurosci. 2014;8:375.
- 15. King DL, Delfabbro PH. Internet Gaming Disorder Treatment: A Review of Definitions of Diagnosis and Treatment Outcome. J Clin Psychol. in press.
- 16. Przepiorka AM, Blachnio A, Miziak B, Czuczwar SA. Clinical approaches to treatment of Internet addiction. Pharmacol Rep. 2014;66(2):187-91.
- 17. Shiffman S. Conceptualizing analyses of ecological momentary assessment data. Nicotine Tob Res. 2014;16(S2):S76-S87.
- 18. Mitchell JT, Schick RS, Hallyburton M, Dennis MF, Kollins SH, Beckham JC, et al. Combined Ecological Momentary Assessment and Global Positioning System Tracking to Assess Smoking

- Behavior: A Proof of Concept Study. J Dual Diagn. 2014;10(1):19-29.
- 19. Epstein DH, Tyburski M, Craig IM, Phillips KA, Jobes ML, Vahabzadeh M, et al. Real-time tracking of neighborhood surroundings and mood in urban drug misusers: application of a new method to study behavior in its geographical context. Drug Alcohol Depend. 2014;134:22-9.
- 20. Savic M, Best D, Rodda S, Lubman DI. Exploring the focus and experiences of smartphone applications for addiction recovery. J Addict Dis. 2013;32(3):310-9.
- 21. Carroll KM, Ball SA, Martino S, Nich C, Babuscio TA, Nuro KF, et al. Computer-Assisted Delivery of Cognitive-Behavioral Therapy for Addiction: A Randomized Trial of CBT4CBT. Am J Psychiatry. 2008;165:881-8.
- 22. Carroll KM, Kiluk BD, Nich C, Gordon MA, Portnoy GA, Marino DR, et al. Computer-assisted delivery of cognitive-behavioral therapy: efficacy and durability of CBT4CBT among cocaine-dependent individuals maintained on methadone. Am J Psychiatry. 2014;171(4):436-44.
- 23. Olmstead TA, Ostrow CD, Carroll KM. Cost-effectiveness of computer-assisted training in cognitive-behavioral therapy as an adjunct to standard care for addiction. Drug Alcohol Depend. 2010;110(3):200-7.
- 24. Rebello TJ, Marques A, Gureje O, Pike KM. Innovative strategies for closing the mental health treatment gap globally. Curr Opin Psychiatry. 2014;27(4):308-14.