



## Commentary

Behavioural addictions: Classification and consequences<sup>☆</sup>

There is an increasing scientific and societal interest in the phenomenon of behavioural addictions, however the correct classification of this concept as well as its limitations remains a matter of debate. Traditionally, addiction refers to substance-induced dependencies. In recent years however, the term has increasingly been used for possible behavioral addictions as well, including gambling disorder, problematic Internet use and gaming, computer dependence, binge eating, compulsive buying, compulsive sexual activities, and excessive physical exercise. Until recently, a diagnostic category for non-substance-related behavioural (or process) addictions did not exist in the two international diagnostic systems of mental disorders, neither in the DSM-IV [1] nor in the ICD-10 [2]. During the fifth revision of the DSM (DSM-5, [3]) a new grouping of substance-related and addictive disorders was included, containing gambling disorder as the only behavioural addiction. Internet gaming disorder was considered as a “condition for further study” in the DSM-5 section III. Several years later and in the light of the upcoming revision of the International Classification of Diseases (eleventh edition: ICD-11), the question arises as to the most appropriate classification of gambling disorder and excessive computer and Internet use (especially Internet gaming disorder).

Recent research in different domains has provided convincing data to support the classification of gambling disorder and excessive Internet gaming as behavioural addictions and not as impulse-control-disorders as before [4]. The strongest arguments for subsuming gambling disorder or problematic internet gaming under a larger substance-related and addictive disorders category relate to the existence of similar diagnostic characteristics, such as preoccupation with or craving for the behaviour in question, diminished control over behavioural engagement and adverse psychosocial consequences related to the behaviour [5]. Even tolerance and withdrawal-like symptoms have been reported in gambling disorder [6]. In addition, high comorbidity rates exist between gambling disorder and substance-use disorders [7,8]. Even first-degree relatives of disordered gamblers show higher rates of substance related and behavioural addictions than relatives of healthy controls [9]. Neurobiological research has pointed towards shared mechanisms for gambling disorder and substance use disorders, such as disturbances in reinforcement learning, reward processing and cognitive control, with similar changes in neurocircuitry involved, such as the ventral striatum

and prefrontal cortex (see [10] for a recent review and [11] for meta-analysis).

When it comes to treatment, cognitive-behavioural treatment approaches, adapted from therapeutic manuals used in substance use disorders, have shown great promise in the treatment of behavioural addictions, including gambling disorder [12]. Pharmacological treatments currently being used in alcohol dependence and opioid addiction, such as  $\mu$ -opioid receptor antagonists and glutamatergic agents have shown promise in reducing gambling-related urges as well [13].

With respect to behavioral addictions other than gambling disorder, Internet gaming disorder, i.e. excessive involvement in Internet (video) games (not money-based Internet gambling) is currently the best-studied domain. The overall diagnostic criteria for internet gaming disorder follow those of substance use disorders and include preoccupation or obsession with internet games (similar to craving), withdrawal symptoms, tolerance, unsuccessful attempts to stop or curb playing Internet games, loss of interest in other life activities, continued use despite negative consequences, lying about the extent of the problem, and playing Internet games as a way to relieve anxiety or guilt. However, the methods for the exact assessment of gaming characteristics are still a matter of debate [14,15]. A growing number of neurocognitive and neuroimaging studies on Internet gaming disorder have begun to illuminate the neurobiological basis of this condition, in particular the alterations in brain activity associated with impulsivity, compulsivity and sensitivity to reward and punishment ([16] for a review). Patients with Internet gaming disorder exhibited decreased loss sensitivity and enhanced reactivity to gaming cues, enhanced impulsive choice behaviour and aberrant reward-based learning; revealing multiple similarities with gambling disorder and substance use disorders. In addition, cognitive-behavioural approaches have also been shown to be efficacious in the treatment of Internet gaming disorder [17].

These research findings have had an impact on the ongoing process of defining diagnostic criteria for ICD-11. The latest “Edition of the draft International Classification of Diseases for Mortality and Morbidity Statistics” (ICD-11 MMS) was released in October 2016 in Tokyo [18]. Here the following terms are proposed:

- “Gambling Disorder” (predominantly online or predominantly offline) and;
- “Gaming Disorder”.

Together with “Disorders due to substance use” they constitute the ICD-11 chapter of “Disorders due to substance use or addictive

<sup>☆</sup> The conclusions of this commentary have officially been endorsed by the European Psychiatric Association (EPA) and the national psychiatric societies of Belgium (Flemish Society), Germany, The Netherlands and Poland.

behaviours” [18]. However, this position has to be regarded as preliminary. Field trials are ongoing, which put the current concept to an empirical test.

In summary, different lines of evidence support the classification of gambling disorders and Internet gaming disorders as behavioural addictions. An appropriate classification and a clear diagnosis of gambling disorder and Internet gaming disorder seem mandatory to improve prevention and treatment strategies. However, at the current state of knowledge, the diagnosis of behavioural addictions should be limited to gaming and gambling disorders. There is no convincing evidence yet that excessive buying and compulsive sexual activities should be classified as addictions. This does not preclude that in individual patients with those problems, the addiction concept can be clinically useful.

### Disclosure of interest

The authors declare that they have no competing interest.

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### References

- [1] American Psychiatric Association (APA). Diagnostic and statistical manual of mental disorders, 4th ed., Washington, DC: American Psychiatric Association; 1994.
- [2] World Health Organization (WHO). International Classification of Diseases (ICD-10): clinical descriptions and diagnostic guidelines. Geneva: World Health Organization; 1992.
- [3] American Psychiatric Association (APA). Diagnostic and statistical manual of mental disorders, 5th ed., Washington, DC: American Psychiatric Association; 2013.
- [4] Mann K, Fauth-Bühler M, Higuchi S, Potenza MN, Saunders JB. Pathological gambling: a behavioural addiction. Letter to the editor. *World Psychiatry* 2016;15(3):297–8.
- [5] Demetrovics Z, Urban R, Naggyorki K, Farkas J, Griffiths MD, Papay O, et al. The development of the Problematic Online Gaming Questionnaire (POGQ). *PLoS One* 2012;7:e36417.
- [6] El-Guebaly N, Mudry T, Zohar J, Tavares H, Potenza MN. Compulsive features in behavioural addictions: the case of pathological gambling. *Addiction* 2012;107:1726–34.
- [7] Kessler RC, Hwang I, LaBrie R, Petukhova M, Sampson NA, Winters KC, et al. DSM-IV pathological gambling in the National Comorbidity Survey Replication. *Psychol Med* 2008;38:1351–60.
- [8] Petry NM, Stinson FS, Grant BF. Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry* 2005;66:564–74.
- [9] Mann K, Lemenager T, Zois E, Hoffmann S, Beutel M, Vogelgesang M, et al. Comorbidity, family history and personality traits in treatment seeking pathological gamblers compared with healthy controls. *Eur Psychiatry* 2016;42:120–8.
- [10] Fauth-Bühler M, Mann K, Potenza MN. Pathological gambling: a review of the neurobiological evidence relevant for its classification as an addictive disorder. *Addict Biol* 2016. <http://dx.doi.org/10.1111/adb.12378> [Epub ahead of print].
- [11] Luijten M, Schellekens AFA, Kühn S, Machielse MWJ, Sescousse G. Disruption of reward-processing in addiction unraveled by image based meta-analysis of fMRI studies. *JAMA Psychiatry* 2016;74:387–98.
- [12] Cowlshaw S, Merkouris S, Dowling N, Anderson C, Jackson A, Thomas S. Psychological therapies for pathological and problem gambling. *Cochrane Database Syst Rev* 2012;11:CD008937.
- [13] Grant JE, Odlaug BL, Schreiber LR. Pharmacological treatments in pathological gambling. *Br J Clin Pharmacol* 2014;77(2):375–81.
- [14] Griffiths MD, van Rooij AJ, Kardefelt-Winther D, Starcevic V, Kiraly O, Pallesen S, et al. Working towards an international consensus on criteria for assessing Internet gaming disorder: a critical commentary on Petry et al. (2014). *Addiction* 2016;111:167–75.
- [15] Petry NM, Rehbein F, Gentile DA, Lemmens JS, Rumpf HJ, Mossle T. An international consensus for assessing Internet gaming disorder using the new DSM-5 approach. *Addiction* 2014;109:1399–406.
- [16] Fauth-Bühler M, Mann K. Neurobiological correlates of Internet gaming disorder: similarities to pathological gambling. *Addict Behav* 2017;64:349–56. <http://dx.doi.org/10.1016/j.addbeh.2015.11.004>.
- [17] King DL, Delfabbro PH, Griffiths MD, Gradisar M. Assessing clinical trials of Internet addiction treatment: a systematic review and CONSORT evaluation. *Clin Psychol* 2011;31(7):1110–6 [Review].
- [18] World Health Organization (WHO). Website for ICD-11 Beta Draft (Mortality and Morbidity Statistics); 2016 [Foundation Id: <http://www.id.who.int/icd/entity/1602669465>].

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