



AKADÉMIAI KIADÓ


Journal of Behavioral Addictions

DOI:
10.1556/2006.2020.00035
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REVIEW ARTICLE



Which conditions should be considered as disorders in the *International Classification of Diseases (ICD-11)* designation of “other specified disorders due to addictive behaviors”?

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Received: April 01, 2020 • Revised manuscript received: May 07, 2020 • Accepted: May 15, 2020

ABSTRACT

Background: Gambling and gaming disorders have been included as “disorders due to addictive behaviors” in the *International Classification of Diseases* (ICD-11). Other problematic behaviors may be considered as “other specified disorders due to addictive behaviors (6C5Y).” **Methods:** Narrative review, experts’ opinions. **Results:** We suggest the following meta-level criteria for considering potential addictive behaviors as fulfilling the category of “other specified disorders due to addictive behaviors”:

1. Clinical relevance: Empirical evidence from multiple scientific studies demonstrates that the specific potential addictive behavior is clinically relevant and individuals experience negative consequences and functional impairments in daily life due to the problematic and potentially addictive behavior.

2. Theoretical embedding: Current theories and theoretical models belonging to the field of research on addictive behaviors describe and explain most appropriately the candidate phenomenon of a potential addictive behavior.

3. Empirical evidence: Data based on self-reports, clinical interviews, surveys, behavioral experiments, and, if available, biological investigations (neural, physiological, genetic) suggest that psychological (and neurobiological) mechanisms involved in other addictive behaviors are also valid for the candidate phenomenon. Varying degrees of support for problematic forms of pornography use, buying and shopping, and use of social networks are available. These conditions may fit the category of “other specified disorders due to addictive behaviors”. **Conclusion:** It is important not to over-pathologize everyday-life behavior while concurrently not trivializing conditions that are of clinical importance and that deserve public health considerations. The proposed meta-level-criteria may help guide both research efforts and clinical practice.

KEYWORDS

Addictive behaviors, ICD-11, pornography-use disorder, buying-shopping disorder, problematic social-network use

INTRODUCTION

Gambling and gaming disorders have been designated as “disorders due to addictive behaviors” in the eleventh edition of the *International Classification of Diseases* (ICD-11) (World Health Organization, 2019). Although there has been considerable debate regarding whether it is appropriate to include gaming disorder in the ICD-11 (Dullur & Starcevic, 2018; van Rooij et al., 2018), numerous clinicians and researchers in addiction psychiatry and neuroscience support its inclusion (Brand, Rumpf, et al., 2019; Fineberg et al., 2018; King et al., 2018; Rumpf et al., 2018; Stein et al., 2018). Given that disorders due to substance use and addictive behaviors have been included in the ICD-11, the designation

termed “other specified disorders due to addictive behaviors” (coded as 6C5Y) warrants further evidence-based discussion. This descriptor reflects the view that other specific poorly controlled and problematic behaviors which may be considered as disorders due to addictive behaviors (beyond gambling and gaming) deserve attention (Potenza, Higuchi, & Brand, 2018). There is, however, no description of specific behaviors or criteria. We argue that it is important to be sufficiently conservative when considering the inclusion of potential disorders in this category in order to avoid over-pathologizing of everyday-life behaviors (Billieux, Schimmenti, Khazaal, Maurage, & Heeren, 2015; Starcevic, Billieux, & Schimmenti, 2018). Here we propose meta-level-criteria for considering problematic behaviors as other specified disorders due to addictive behaviors and discuss the validity of the criteria in relation to three possible conditions: pornography-use disorder, buying-shopping disorder, and social-network-use disorder.

META-LEVEL-CRITERIA FOR CONSIDERING ADDICTIVE BEHAVIORS AS OTHER SPECIFIED DISORDERS DUE TO ADDICTIVE BEHAVIORS

Like some potential addictive behaviors that may be considered for 6C5Y designation, disordered gaming is often conducted on the Internet. The three diagnostic guidelines for gaming disorder in the ICD-11 include impaired control over gaming, increasing priority of (and preoccupation with) gaming, and continuation or escalation of gaming despite experiencing negative consequences (World Health Organization, 2019). In addition, the behavioral pattern must lead to significant impairment in personal, family, social, educational, occupational, or other important life domains. These diagnostic guidelines should also be applied to potential addictive behaviors beyond gaming disorder (and gambling disorder, which shares diagnostic guidelines with gaming disorder). In addition to these diagnostic guidelines, we suggest three meta-level-criteria from a scientific perspective for considering potential addictive behaviors as fulfilling the ICD-11 category “other specified disorders due to addictive behaviors”. We propose these meta-level-criteria in order to help guide both research efforts and clinical practice.

Scientific evidence for clinical relevance

Criterion 1: Empirical evidence from multiple scientific studies, including ones involving treatment-seeking individuals, demonstrates that the specific potential addictive behavior is clinically relevant and individuals experience negative consequences and functional impairments in daily life due to the problematic and potentially addictive behavior.

Rationale: Functional impairment is a core criterion in many mental disorders, including in gaming and gambling disorders (Billieux et al., 2017; World Health Organization, 2019). Therefore, scientific studies should show that the



potential addictive behavior is related to functional impairment that justifies treatment (Stein et al., 2010). The phenomenon should be specific, which means that the problems experienced in daily life must be consequences attributed to the specific potentially addictive behaviors and not due to a wider range of different problematic behaviors or explained by other mental disorders (e.g., due to a manic episode).

Theoretical embedding

Criterion 2: Current theories and theoretical models belonging to the field of research on addictive behaviors describe and explain most appropriately the candidate phenomenon of a potential addictive behavior.

Rationale: If a behavioral phenomenon is considered a disorder due to addictive behaviors, the (neuroscientific) theories explaining addictive behaviors should be valid for the candidate phenomenon. Otherwise, it would not be justified to term the phenomenon an addiction, but perhaps rather an impulse-control disorder or obsessive-compulsive disorder. The current theories that are considered specifically relevant within substance-use disorders and behavioral addictions research include the incentive sensitization theory (Robinson & Berridge, 2008), impaired response inhibition and salience attribution (iRISA) model (Goldstein & Volkow, 2011), reward deficiency syndrome (Blum et al., 1996), dual-process approaches of addiction (Bechara, 2005; Everitt & Robbins, 2016) including those focusing on implicit cognitions (Stacy & Wiers, 2010; Wiers & Stacy, 2006), and more specific models of behavioral addictions. This last group includes such models as Davis' early model of Internet-use disorders (Davis, 2001), the cognitive-behavioral model of gaming disorder (Dong & Potenza, 2014), the tripartite model of gaming disorder (Wei, Zhang, Turel, Bechara, & He, 2017), and the interaction of person-affect-cognition-execution (I-PACE) model of specific Internet-use disorders (Brand, Young, Laier, Wölfling, & Potenza, 2016) and of addictive behaviors in general (Brand, Wegmann, et al., 2019). In the scientific literature discussing the candidate phenomenon, theories of addictive behaviors should be applicable and studies should show that the core processes underlying addictive behaviors are also involved in the candidate phenomenon (see next criterion). This situation is important in order to follow a theory-driven and hypotheses-testing approach instead of simply addressing some specific correlates of a potential addictive behavior.

Empirical evidence for underlying mechanisms

Criterion 3: Data based on self-reports, clinical interviews, surveys, behavioral experiments, and, if available, biological investigations (neural, physiological, genetic) suggest that psychological (and neurobiological) mechanisms involved in other addictive behaviors (cf., Potenza, 2017) are also valid for the candidate phenomenon.

Rationale: We argue that it is important to have data from multiple studies that have used various methods to examine specific processes underlying the candidate phenomenon before one may consider the classification of a behavioral

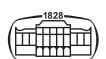
condition as disorder due to addictive behaviors. The studies should confirm that the theoretical considerations of addictive behaviors seem to be valid for the candidate phenomenon. This also implies that it is not enough if only a very few studies, for example using a new screening instrument, have addressed a new potential addictive behavior to use the term "disorder due to addictive behaviors." Moreover, studies must include sufficient and rigorous methods with respect to samples and assessment instruments (Rumpf et al., 2019). Only when reliable and valid sets of data from multiple studies (and from different working groups) – as has been considered a criterion of reliability of screening tools in the field (King et al., 2020) – are available showing that theory-driven hypotheses on specific aspects of the addictive behavior have been confirmed, the respective definition as an addictive behavior may be valid. This is important also in terms of avoiding over-pathologizing everyday-life behaviors as addictions (Billieux, Schimmenti, et al., 2015) as mentioned above in the section on functional impairment. A summary of the three meta-level-criteria proposed, including the hierarchical organization and questions to be answered when considering the classification of a candidate phenomenon as an "other specified disorder due to addictive behaviors" is visualized in Fig. 1.

EVALUATION OF THE SCIENTIFIC EVIDENCE SUPPORTING THE APPROPRIATENESS OF SPECIFIC TYPES OF BEHAVIORAL ADDICTIONS WITHIN THE ICD-11 CATEGORY OF "OTHER SPECIFIED DISORDERS DUE TO ADDICTIVE BEHAVIORS"

Varying degrees of support for problematic forms of pornography use, buying and shopping, and use of social networks are available. The evidence will be summarized in the next sections. Note that we are not suggesting the inclusion of new disorders in the ICD-11. Rather, we aim to emphasize that some specific potentially addictive behaviors are discussed in the literature, which are currently not included as specific disorders in the ICD-11, but which may fit the category of "other specified disorders due to addictive behaviors" and consequently may be coded as 6C5Y in clinical practice. By defining more precisely the rationale for considering these three potentially addictive behaviors, we also aim to express that for some other phenomena, there may not be sufficient evidence to term them "addictive" behaviors.

Pornography-use disorder

Compulsive sexual behavior disorder, as has been included in the ICD-11 category of impulse-control disorders, may include a broad range of sexual behaviors including excessive viewing of pornography that constitutes a clinically relevant phenomenon (Brand, Blycker, & Potenza, 2019;



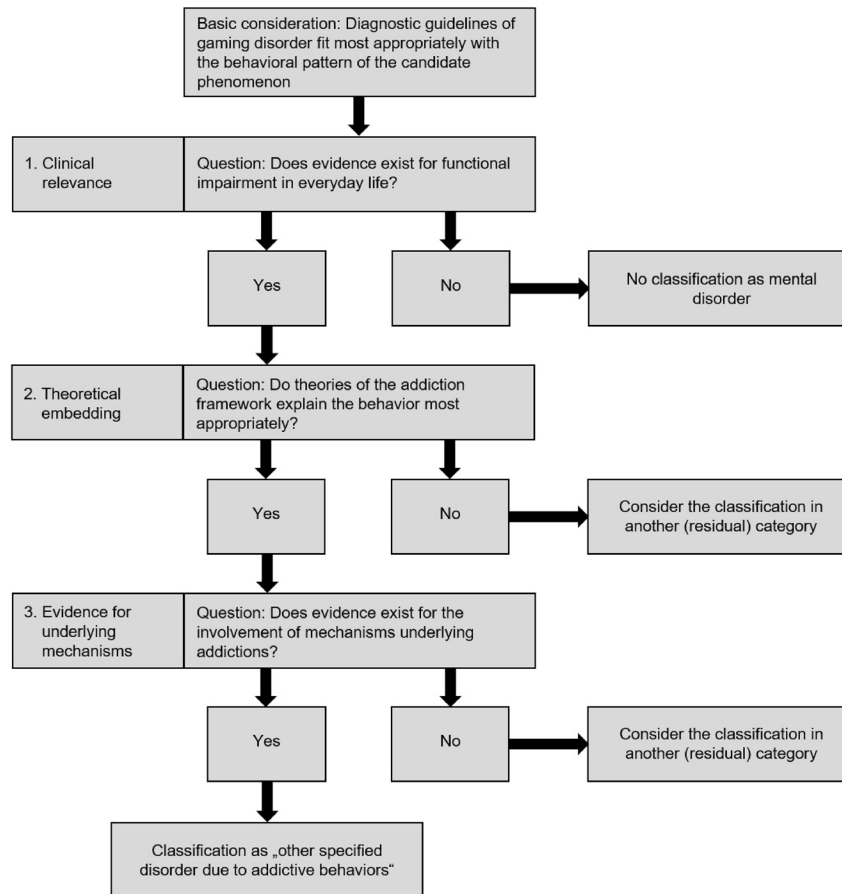


Fig. 1. Overview of the meta-level-criteria proposed for considering the classification of a candidate phenomenon as an “other specified disorder due to addictive behaviors”.

Kraus et al., 2018). The classification of compulsive sexual behavior disorder has been debated (Derbyshire & Grant, 2015), with some authors suggesting that the addiction framework is more appropriate (Gola & Potenza, 2018), which can be particularly the case for individuals suffering specifically from problems related to pornography use and not from other compulsive or impulsive sexual behaviors (Gola, Lewczuk, & Skorko, 2016; Kraus, Martino, & Potenza, 2016).

The diagnostic guidelines for gaming disorder share several features with those for compulsive sexual behavior disorder and may potentially be adopted by changing “gaming” to “pornography use.” These three core features have been considered central to problematic pornography use (Brand, Blycker, et al., 2019) and appear to fit appropriately the basic considerations (Fig. 1). Several studies have demonstrated the clinical relevance (criterion 1) of problematic pornography use, leading to functional impairment in daily life including jeopardizing work and personal relationships, and justifying treatment (Gola & Potenza, 2016; Kraus, Meshberg-Cohen, Martino, Quinones, & Potenza, 2015; Kraus, Voon, & Potenza, 2016). In several studies and review articles, models from the addiction research (criterion 2) have been used to derive hypotheses and to explain the results (Brand, Antons,

Wegmann, & Potenza, 2019; Brand, Wegmann, et al., 2019; Brand, Young, et al., 2016; Stark et al., 2017; Wéry, Deleuze, Canale, & Billieux, 2018). Data from self-report, behavioral, electrophysiological, and neuroimaging studies demonstrate an involvement of psychological processes and underlying neural correlates that have been investigated and established to varying degrees for substance-use disorders and gambling/gaming disorders (criterion 3). Commonalities noted in prior studies include cue-reactivity and craving accompanied by increased activity in reward-related brain areas, attentional biases, disadvantageous decision-making, and (stimuli-specific) inhibitory control (e.g., Antons & Brand, 2018; Antons, Mueller, et al., 2019; Antons, Trotzke, Wegmann, & Brand, 2019; Bothe et al., 2019; Brand, Snagowski, Laier, & Maderwald, 2016; Gola et al., 2017; Klucken, Wehrum-Osinsky, Schweckendiek, Kruse, & Stark, 2016; Kowalewska et al., 2018; Mechelmans et al., 2014; Stark, Klucken, Potenza, Brand, & Strahler, 2018; Voon et al., 2014).

Based on evidence reviewed with respect to the three meta-level-criteria proposed, we suggest that pornography-use disorder is a condition that may be diagnosed with the ICD-11 category “other specified disorders due to addictive behaviors” based on the three core criteria for gaming disorder, modified with respect to pornography viewing

(Brand, Blycker, et al., 2019). One *conditio sine qua non* for considering pornography-use disorder within this category would be that the individual suffers solely and specifically from diminished control over pornography consumption (nowadays online pornography in most cases), which is not accompanied by further compulsive sexual behaviors (Kraus et al., 2018). Further, the behavior should be considered as an addictive behavior only if it is related to functional impairment and experiencing negative consequences in daily life, as it is also the case for gaming disorder (Billieux et al., 2017; World Health Organization, 2019). However, we also note that pornography-use disorder may currently be diagnosed with the current ICD-11 diagnosis of compulsive sexual behavior disorder given that pornography viewing and the frequently accompanying sexual behaviors (most frequently masturbation but potentially other sexual activities including partnered sex) may meet the criteria for compulsive sexual behavior disorder (Kraus & Sweeney, 2019). The diagnosis of compulsive sexual behavior disorder may fit for individuals who not only use pornography addictively, but who also suffer from other non-pornography-related compulsive sexual behaviors. The diagnosis of pornography-use disorder as other specified disorder due to addictive behaviors may be more adequate for individuals who exclusively suffer from poorly controlled pornography viewing (in most cases accompanied by masturbation). Whether or not a distinction between online and offline pornography use may be useful is currently debated, which is also the case for online/offline gaming (Király & Demetrovics, 2017).

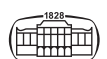
Buying-shopping disorder

Buying-shopping disorder has been defined by preoccupation with buying-shopping, diminished control over excessive buying of goods, which are often not needed and not used, and recurrent maladaptive buying-shopping behavior. The basic considerations (as suggested in Fig. 1) may be considered fulfilled given that diminished control over buying-shopping, increasing priority given to buying-shopping, and continuation or escalation of buying-shopping have been described as core features of buying-shopping disorder (Guerrero-Vaca et al., 2019; Weinstein, Maraz, Griffiths, Lejoyeux, & Demetrovics, 2016). The behavioral pattern leads to clinically significant distress and impairments in important areas of functioning (criterion 1) including a severe reduction of quality of life and personal relationships and an accumulation of debt (cf., Müller, Brand, et al., 2019). In recent articles on buying-shopping disorder, theories and concepts of addiction research are used (criterion 2), including, for example, dual-process approaches involving cue-reactivity and craving as well as diminished top-down control and disadvantageous decision-making (Brand, Wegmann, et al., 2019; Kyrios et al., 2018; Trotzke, Brand, & Starcke, 2017). Evidence for the validity of the concepts of the addiction research (criterion 3) in buying-shopping disorder comes from large-scale studies (Maraz, Urban, & Demetrovics, 2016; Maraz, van den Brink,

& Demetrovics, 2015), experimental studies (Jiang, Zhao, & Li, 2017; Nicolai, Darancó, & Moshagen, 2016), studies assessing (treatment-seeking) individuals with self-reported and behavioral measures (Derbyshire, Chamberlain, Odlaug, Schreiber, & Grant, 2014; Granero et al., 2016; Müller et al., 2012; Trotzke, Starcke, Pedersen, Müller, & Brand, 2015; Voth et al., 2014), skin-conductance responses to buying-shopping cues (Trotzke, Starcke, Pedersen, & Brand, 2014), and one neuroimaging study (Raab, Elger, Neuner, & Weber, 2011). Based on the evidence reviewed with respect to the three meta-level criteria proposed, we suggest that buying-shopping disorder may be considered as an “other specified disorder due to addictive behaviors” (Müller, Brand, et al., 2019), until it may be considered an own entity in upcoming revisions of the ICD. Given that there is also some evidence for differences in the phenomenology between offline and online buying-shopping behavior (Müller, Steins-Loeber, et al., 2019; Trotzke, Starcke, Müller, & Brand, 2015), when buying-shopping disorder is diagnosed as an addictive behavior, it may be useful to differentiate between buying-shopping disorder, predominantly offline or online, to be consistent with gambling and gaming disorders in the ICD-11, although this approach has been debated, as mentioned above (Király & Demetrovics, 2017).

Social-network-use disorder

The consideration of problematic use of social networks and other communication applications as a condition that may fit with the criteria for “other specified disorders due to addictive behaviors” is warranted and timely. Diminished control over the use of social networks, increasing priority given to the use of social networks, and continuation of using social networks despite experiencing negative consequences (basic considerations in Fig. 1) have been considered core features of problematic social-networks use (Andreassen, 2015), even though empirical evidence regarding specific features of problematic social-network use is mixed and still scarce compared to, for example, gaming disorder (Wegmann & Brand, 2020). Functional impairment in daily life due to the behavior (criterion 1) is still less intensively documented than in other behavioral addictions. Some studies report negative consequences in different life domains resulting from poorly controlled overuse of communication applications, such as social-networking sites, by some individuals (Guedes, Nardi, Guimarães, Machado, & King, 2016; Kuss & Griffiths, 2011). According to meta-analyses, systematic reviews, and nationally representative studies, excessive use of online social networks may be associated with mental health disorders, psychological distress, and decreased well-being (Bányai et al., 2017; Frost & Rickwood, 2017; Marino, Gini, Vieno, & Spada, 2018). Although negative consequences of poorly controlled social-network use can be significant and linked to functional impairment (Karaiskos, Tzavellas, Balta, & Paparrigopoulos, 2010), most studies have used convenience samples and defined the negative consequences in accordance with cut-off scores in screening instruments. The



theoretical embedding (criterion 2), however, is widely within the addiction framework (Billieux, Maurage, Lopez-Fernandez, Kuss, & Griffiths, 2015; Turel & Qahri-Saremi, 2016; Wegmann & Brand, 2019). Several neuroimaging and behavioral studies (criterion 3) demonstrate parallels between excessive use of social-network sites and substance-use, gambling and gaming disorders (cf., Wegmann, Mueller, Ostendorf, & Brand, 2018), including findings from experimental studies on cue reactivity (Wegmann, Stodt, & Brand, 2018), inhibitory control (Wegmann, Müller, Turel, & Brand, 2020), and attentional bias (Nikolaidou, Stanton, & Hinest, 2019) as well as initial results from a clinical sample (Leménager et al., 2016). In contrast, other studies reported preliminary data supporting preserved frontal lobe functioning in individuals displaying excessive social-network use (He, Turel, & Bechara, 2017; Turel, He, Xue, Xiao, & Bechara, 2014). Despite less definitive evidence and some mixed findings (e.g., neuroscience studies), it is likely that the key mechanisms involved in pathological use of social networks are potentially comparable with those involved in gaming disorder, although this needs direct investigation. The evidence with respect to functional impairment in daily life and findings from multi-methodological studies including clinical samples are arguably currently less convincing compared to pornography-use disorder and buying-shopping disorder. Nevertheless, the ICD-11 category “other specified disorders due to addictive behaviors” may currently be useful for diagnosing an individual whose social-network use is the primary source of psychological suffering and functional impairment, if the individually experienced functional impairment is directly related to poorly controlled use of social network. However, more studies, which include clinical samples, are needed before a final consensus can be reached about the validity of the category 6C5Y for poorly controlled use of social networks.

CONCLUSION

Establishing agreed-upon criteria for considering which behaviors may be diagnosed as “other specified disorders due to addictive behaviors” is helpful for both research and clinical practice. It is important not to over-pathologize everyday-life behaviors (Billieux, Schimmenti, et al., 2015; Kardefelt-Winther et al., 2017) while concurrently considering potential conditions associated with impairment (Billieux et al., 2017). For this reason, we have here considered conditions that fit with the ICD-11 category coded as 6C5Y and have not proposed new disorders. Jurisdictions around the world will likely decide individually how to use the ICD-11 and may therefore specify the coding of disorders within specific ICD-11 subcategories. For research, it is important to reach an international consensus about the consideration of specific disorders. We therefore propose these meta-level criteria for considering disorders that potentially fit the 6C5Y category. Again, we argue that it is important to be sufficiently conservative when using the term “addictive

behaviors,” which implies to use this term only for behavioral phenomena for which solid scientific evidence exists. In all cases, it is important to consider carefully functional impairment in daily life, to distinguish frequent behavioral engagement from a behavioral pattern that fulfills the criteria for disorders due to addictive behaviors. This is of particular importance in order not to trivialize conditions that are of clinical importance and that deserve public health considerations. We encourage the conduct of further studies on the considered conditions in representative samples with sound measures of the respective conditions and with the use of sound assessments of impairment and clinical relevance. In addition, we suggest more research that directly compares psychological and neurobiological processes potentially involved in the different types of addictive behaviors that are proposed.

Conflicts of interests: JB, ZD, NAF, DLK, SWK, KM, MNP, and HJR have been members of the WHO or other networks, expert groups or advisory groups on addictive behaviors, Internet use and/or CSBD.AM, JB, MB, SRC, ZD, NAF, DLK, MNP, and HJR are members or observers of the COST Action 16207 “European Network for Problematic Usage of the Internet”. AEG, NAF, and MNP have received grants/funding/support from pharmaceutical, legal or other relevant (business) entities, including consulting.

Authors’ contributions: MB and MNP wrote the manuscript. All co-authors contributed comments to the draft. The manuscript’s content was discussed with and approved by all co-authors.

Acknowledgments: This article/publication is based upon work from COST Action CA16207 “European Network for Problematic Usage of the Internet”, supported by COST (European Cooperation in Science and Technology), www.cost.eu/.

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