



Withdrawal symptoms in internet gaming disorder: A systematic review



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HIGHLIGHTS

- We review the literature on Internet gaming withdrawal and craving.
- Clinical qualitative studies of gaming withdrawal offer limited description.
- We identify 25 different scale items that measure withdrawal as an affective state.
- Internet gaming problems may arise without associated withdrawal symptoms.
- Research on the salient stimuli of Internet gaming may advance knowledge.

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ABSTRACT

Internet gaming disorder (IGD) is currently positioned in the appendix of the DSM-5 as a condition requiring further study. The aim of this review was to examine the state of current knowledge of gaming withdrawal symptomatology, given the importance of withdrawal in positioning the disorder as a behavioral addiction. A total of 34 studies, including 10 qualitative studies, 17 research reports on psychometric instruments, and 7 treatment studies, were evaluated. The results indicated that the available evidence on Internet gaming withdrawal is very underdeveloped. Internet gaming withdrawal is most consistently referred to as 'irritability' and 'restlessness' following cessation of the activity. There exists a concerning paucity of qualitative studies that provide detailed clinical descriptions of symptoms arising from cessation of internet gaming. This has arguably compromised efforts to quantify withdrawal symptoms in empirical studies of gaming populations. Treatment studies have not reported on the natural course of withdrawal and/or withdrawal symptom trajectory following intervention. It is concluded that many more qualitative clinical studies are needed, and should be prioritised, to develop our understanding of gaming withdrawal. This should improve clinical descriptions of problematic internet gaming and in turn improve the quantification of IGD withdrawal and thus treatments for harmful internet gaming.

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1. Introduction

There is a growing body of research suggesting that problematic use of internet gaming may, under certain conditions, be associated with clinically significant harm across multiple domains of functioning (King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013; Kuss & Griffiths, 2012; Sim, Gentile, Bricolo, Serpellini, & Gulamoydeen, 2012). However, there is currently no consensus on the classification of problematic internet gaming within mental health nomenclatural systems, including the DSM-5 and ICD (Griffiths et al., *in press*). For example, in August 2015, the World Health Organisation hosted an international meeting on behavioral disorders associated with excessive use of internet games to discuss proposals for a range of potential clinical descriptions and standard diagnostic guidelines. A key observation tabled in this meeting was the poorly established terminology used to refer to internet gaming problems, particularly in relation to core addiction concepts such as tolerance and withdrawal. Additionally, it was unclear what exactly problematic gamers were craving when experiencing withdrawal and how this craving might relate to tolerance. Although the concept of withdrawal has long been established as a physiological feature of substance use disorders such as alcohol, tobacco, and heroin addictions (Baynard, McIntyre, Hill, & Woodside, 2004; Hughes & Hatsukami, 1986; Koob, Maldonado, & Stinus, 1992), defining its presentation in disorders that do not involve the ingestion of a chemical substance has long proven to be a difficult task (Grant, Potenza, Weinstein, & Gorelick, 2010; Marks, 1990; Rosenthal & Lesieur, 1992), particularly in the case of internet gaming (Pies, 2009). The aim of this review was to systematically examine current knowledge of the nature of withdrawal symptoms in internet gaming, given the centrality of these symptoms in positioning the disorder as a behavioral addiction.

The historical development of the concept of problem video gaming has its roots in the field of problem gambling and substance use (Kardefelt-Winther, 2015). Early studies of video game arcade machine playing in the 1990s, for example, often employed assessment tools adapted from questionnaires used in pathological gambling research (e.g., Fisher, 1994). Similarly, core addiction concepts within substance dependence were often applied to video gaming behaviors, perhaps on the basis that these activities were viewed as being similarly absorbing, time-consuming, and liable to produce negative affective reactions among users (e.g., hostility, sadness) when they were unable to engage in the activity (Griffiths & Hunt, 1998). Similarly, within the frequently cited ‘components’ model (Griffiths, 2005), problematic internet gaming is characterised by aversive or unpleasant physical or psychological states that accompany a reduction or cessation of gaming activity. This is thought to be consistent with the typical definition of withdrawal in dependence syndromes that refers to repeated urges to engage in a particular behavioral sequence that produces mounting tension until the sequence is completed (Edwards, 1986). Following these approaches, it has perhaps been assumed (rather than empirically demonstrated) that internet gaming problems may be most appropriately conceptualised as having features that are identical to other addictive behaviors. Although this assumption has not gone unchallenged over the past two decades (Griffiths et al., *in press*; Kardefelt-Winther, 2015; Pies, 2009; Wood, 2008), it is clearly evident in contemporary nomenclature (e.g., DSM-5) and academia (Tao et al., 2010; Petry et al., 2014) that internet gaming problems should be viewed as functionally maintained by fear of withdrawal processes and symptoms.

The introduction of internet gaming disorder (IGD) to the appendix of the DSM-5 arguably represents the clearest formal endorsement of gaming as an addictive behavior. Its clinical description refers to “persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress” (American Psychiatric Association, 2013, p.795). Specifically, the criteria for IGD include: “withdrawal symptoms when internet gaming is taken away” with a qualifier that withdrawal is not necessarily physiological in nature (American Psychiatric Association, 2013, p.795). This adaptation of behavioral addiction criteria to internet gaming was viewed as a step forward for the field, which was often plagued by inconsistent approaches to conceptualisation and measurement (Griffiths, King, & Demetrovics, 2014). However, by the same token, the inclusion of withdrawal symptoms in clinical criteria must be sufficiently informed by research that demonstrates the presence and nature of withdrawal symptoms. There may be substantial risks associated with prematurely adopting new criteria prior to following a necessary process of validity testing. One such risk is that it could lead to the exclusion of other conceptualisations that could offer greater insight into the nature and course of problematic gaming, with associated benefits for treatment (e.g., identifying barriers to behavioral change). On this basis, it was considered timely to evaluate the evidence for considering withdrawal as a fundamental process in IGD presentations.

1.1. The present study

The primary aim of this review was to summarise and critique available empirical and treatment evidence on IGD withdrawal. A secondary aim was to critically examine whether the empirical literature aligns with the DSM-5 description of gaming withdrawal. Although several recent reviews of the internet gaming literature have examined aetiology and risk factors (Kuss & Griffiths, 2012), prevalence (Ferguson, Coulson, & Barnett, 2011), assessment (King et al., 2013; Lortie & Guitton, 2013), cognitive factors (King & Delfabbro, 2014), treatment efficacy (Winkler, Dörsing, Rief, Shen, & Glombiewski, 2013) and methodological quality of evidence (King, Delfabbro, Griffiths, & Gradisar, 2011), this review was distinctive due to its focus on withdrawal. No previous reviews have focussed specifically on evaluating internet gaming withdrawal symptoms, despite the disorder being widely considered, as well as positioned in the DSM-5, as a behavioral addiction. It was intended that this review would contribute to critical discussion of current formulations of harmful internet gaming, including the necessity of withdrawal within the DSM-5 classification of IGD.

2. Method

2.1. Study selection

An electronic database search of PsycINFO, PubMed, Scopus and Google Scholar was conducted, using the following search terms and logic: (patholog* OR problem* OR addict* OR compulsive OR dependen* OR disorder*) AND (video OR computer OR internet) gam*. Searches were limited to full-text articles published from 2000 to 2015, because studies conducted during this era of “internet gaming” were determined to be most relevant to internet gaming disorder (see King &

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