



Trajectories of abstinence-induced Internet gaming withdrawal symptoms: A prospective pilot study



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ABSTRACT

Internet Gaming Disorder (IGD) is positioned in the appendix of the DSM-5 as a condition requiring further study. The IGD criteria refer to withdrawal symptoms, including irritability, anxiety, or sadness, that follow cessation of Internet gaming (APA, 2013). The aim of this study was to prospectively examine the nature of Internet gaming withdrawal symptoms, if they occur, under gaming abstinence conditions. This study employed a repeated-measures protocol to examine the cognitive-affective reactions of participants undertaking an 84-h Internet gaming abstinence period. The sample included individuals who met the IGD criteria as well as those who regularly played Internet games but did not meet the IGD criteria. Outcome variables included affect (positive and negative), psychological distress (depression, anxiety, stress), and Internet gaming withdrawal symptoms (craving/urge, thoughts about gaming, inability to resist gaming). A total of 24 participants ($M_{age} = 24.6$ years, $SD = 5.8$) were recruited from online gaming communities, and completed a series of online surveys before, during, and after abstaining from Massively Multiplayer Online (MMO) games. Both the IGD group and the non-IGD group experienced an abstinence-induced decline in withdrawal symptomatology, negative affect, and psychological distress. The IGD group experienced its largest decline in withdrawal symptomatology within the first 24 h of abstinence. These preliminary data suggest that gaming withdrawal symptoms may follow, at least initially, negative linear and quadratic trends. Further prospective work in larger samples involving longer periods of abstinence is required to verify and expand upon these observations.

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1. Introduction

The historical development of the concept of problematic Internet gaming has its roots in the fields of problem gambling and substance addiction (Starcevic, 2013). Withdrawal is a key addiction concept that has been routinely applied in research on Internet gaming behaviors, on the assumption that gaming activities are liable to produce unwanted or aversive reactions for some users when they are unable to engage in the activity (Kaptis, King, Delfabbro, & Gradisar, 2016). As a condition requiring further study in the DSM-5, Internet Gaming Disorder (IGD) refers to persistent and recurrent Internet gaming associated with clinical impairment or distress (APA, 2013). Criterion 2 of IGD refers to 'withdrawal symptoms' characterized by feelings of irritability, anxiety, or sadness following the removal of Internet games. However, the evidence base on Internet gaming withdrawal is very underdeveloped and is largely composed of retrospective self-report survey-based studies that employ inconsistent definitions of withdrawal (see Kaptis et al., 2016). Similarly, there is a concerning paucity of

qualitative case studies and intervention studies that provide detailed clinical descriptions of symptoms arising from cessation of Internet gaming (Beranuy, Carbonell, & Griffiths, 2013; Chappell, Eatough, Davies, & Griffiths, 2006; King & Delfabbro, 2015; Griffiths, 2010). Therefore, the aim of this study was to examine the nature of Internet gaming withdrawal symptoms, if they occur, and their trajectories under abstinence conditions using a prospective measurement approach.

Withdrawal is considered a fundamental component of addiction (Griffiths, 2005). It is commonly defined as a dysphoric state arising from abstaining from an addictive behavior or substance (Grant, Potenza, Weinstein, & Gorelick, 2010; Tao et al., 2010). Although the presence of withdrawal is not technically necessary for an affirmative addiction diagnosis, the inclusion of withdrawal in the IGD classification (along with other addiction symptoms) is nevertheless foundational to positioning IGD as an addictive disorder (Karddefelt-Winther, 2015; Sim et al., 2012). On the one hand, the IGD classification might be considered a step forward because it has offered consistency to a field plagued by varying approaches to conceptualization and measurement (Griffiths, King, & Demetrovics, 2014; King, Haagsma, Delfabbro, Gradisar, and Griffiths, 2013; Petry et al., 2014). However, the premature adoption of a nomenclatural definition of problematic Internet gaming as an

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addiction without adequate empirical support also has numerous risks that arguably outweigh the initial benefit of consistency. One risk is the greater likelihood of failure to examine alternative conceptualizations that might be more appropriate to account for the nature and course of problematic gaming. Another potential negative consequence is the expenditure of resources on the trialing of treatment approaches tailored for addictive behavior, including those which may deliver negligible benefit (or even negative outcomes) for individuals with Internet gaming problems. It is therefore necessary for researchers to develop a sound research base that underpins the symptomatology of the IGD classification to guide diagnostic and treatment decision-making processes (King et al., 2013).

Research on problematic Internet gaming may benefit from adapting methodologies employed to assess withdrawal symptoms in other addictive disorders, such as gambling and alcoholism (de Castro, Fong, Rosenthal, & Tavares, 2007; Tavares, Zilberman, Hodgins, & El-Guebaly, 2005). To advance understanding of clinical phenomenology of a disorder, it is often helpful to conduct prospective studies with multiple observations over time, rather than relying solely on a single retrospective account. Several studies in the field of addiction have involved prospective assessment of withdrawal symptoms under abstinence or treatment conditions. Some studies of problematic gambling, for example, have conducted assessment of gambling craving during periods of abstinence (de Castro et al., 2007; Tavares et al., 2005; Wray & Dickerson, 1981). These studies have demonstrated that problem gamblers report strong craving under abstinence, at comparable levels to those reported by alcoholics. However, there has also been debate as to whether this craving may reflect the loss of an avoidant coping strategy rather than an inability to gamble (Blaszczynski, Walker, Sharpe, & Nower, 2008). Similarly, in studies of nicotine dependence, withdrawal symptoms have been assessed prospectively over periods of abstinence following pharmacological intervention (Javitz, Lerman, & Swan, 2012; Piper et al., 2011). A common finding in nicotine studies is the curvilinear trajectory of withdrawal, whereby symptoms initially increase followed by a gradual parabolic decline, highlighting the central mechanism by which addicted users experience heightened urges and mood changes that drive repeated use of a substance or activity (Hallgren et al., 2015; Haughey, Marshall, Schacht, Louis, & Hutchison, 2008). Although withdrawal symptoms have been examined closely in other fields of addiction, there have been no controlled studies that examine the withdrawal symptom profile of abstinent problematic Internet game users, including measurement of the strength of withdrawal effects or their trajectory over time. Examining withdrawal symptoms in IGD would assist not only in improving its description and quantification, but also inform our understanding of IGD's theorized similarity with other addictive disorders.

1.1. The present study

The aim of this study was to examine the psychological consequences of an 84-h period of Internet gaming abstinence among individuals who endorse the DSM-5 criteria for IGD. It was reasoned that a prospective study of Internet gaming withdrawal using an abstinence-based protocol may offer a novel insight into the presence, nature, and trajectory of Internet gaming withdrawal symptoms. If withdrawal symptoms are a useful clinical marker of IGD status, then withdrawal symptoms would be expected to be significantly greater among the IGD group than the control group at baseline and during abstinence. It was considered more difficult, however, to predict the withdrawal symptom trajectory of IGD without background data, and particularly given that withdrawal symptom profiles vary considerably across addictive disorders (Koob & Le Moal, 2008).

2. Method

2.1. Participants

A total of 24 participants (20 males, 4 females) aged 18 to 36 ($M = 24.6$, $SD = 5.1$) were recruited. There were 9 participants who met the criteria for Internet Gaming Disorder (IGD) and 15 who did not (i.e., non-IGD group) (NB: see *Internet Gaming Disorder criteria checklist*). Participants were predominantly Caucasian (71%), followed by Asian (21%) and Hispanic (8%). Participants were recruited via advertisements posted to the forums of four popular Massively Multiplayer Online Game (MMO) websites, and via paid targeted advertising on Facebook (specified audience: adult video-game players aged 18–25 years). In total, all advertisements were viewed 8236 times. Inclusion criteria were: (1) being at least 18 years old and (2) a current MMO player that played on a weekly basis. MMO players were targeted because they are considered to be more likely to report harmful patterns of gaming behavior than those who engage in other game types (Elliott, Golub, Ream, & Dunlap, 2012; Smyth, 2007). A total of 27 participants were initially recruited. Three individuals exited the study during the baseline survey. Thirty-one individuals declined the invitation to participate and/or expressed hostility that the 84-h abstinence period was too long. Participants who completed the study entered a draw to win a share of \$250 in gift vouchers.

2.2. Design and procedure

The study used a repeated-measures design to assess the psychological outcomes of an 84-h gaming abstinence period for individuals with or without an IGD classification. Outcome variables included affect (i.e., positive and negative affect), psychological distress (i.e., depression, anxiety, stress), and Internet gaming withdrawal symptoms (craving/urge, thoughts about gaming, inability to resist gaming). All participants were administered the baseline survey on Thursday, and then instructed to abstain from all video-gaming for a period of 84 h commencing Friday 12 am and concluding on the following Monday. The weekend period was chosen because it was expected that participants would have more available time for Internet gaming during this period and would therefore experience stronger urges to play. At 12 pm on each day of the abstinence period (i.e., Friday [Day 1] to Monday [Day 4]), online surveys were administered electronically via email link. The abstinence period concluded upon completion of the final survey. The retention rate across all surveys (i.e. Baseline to Day 4) was 100%. The time that surveys were completed was tracked automatically by the survey host, and survey data logs were checked to ensure that responses were completed at the specified time.

To increase compliance with the abstinence protocol, participants were asked to provide the details (i.e., usernames or 'gamertags') of their MMO accounts to enable the researchers to check whether they had been active on their account. Additionally, participants were asked to report at each survey whether they had 'relapsed' or logged onto their accounts in the course of the abstinence period. Finally, a series of open-ended questions asked participants about their experiences during abstinence, to explore any coping strategies, gaming-related attitudinal changes, and compensatory behaviors. While these measures could not ensure total compliance, participants did in fact report total compliance with the protocol and no participants were observed to play on their accounts during the abstinence period. As a further validity check, written feedback was examined and found to be consistent with their survey responses (see King, Kaptsis, Delfabbro, & Gradisar, 2016). An online survey was employed in lieu of a pen-and-paper survey for ease and convenience and also to enable time-stamp data on each survey for validity purposes. Data collection occurred from June to September 2015. Ethical approval was granted by the Social and Behavioural Research Ethics Committee (SBREC) at Flinders University, South Australia.

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