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Psychosocial correlates of internet gaming disorder: Psychopathology, life satisfaction, and impulsivity



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ABSTRACT

"Internet Gaming Disorder" (IGD) was included as a "Condition for Further Study" in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Frequent gamers have previously been shown to exhibit core symptoms of addiction, along with significant impairments in psychosocial functioning. However, there remains a lack of consensus regarding the conceptualization and assessment of video game addiction. We examined the utility of nine questions (Cronbach's $\alpha = 0.64$), based directly on proposed DSM-5 diagnostic criteria for IGD, in capturing problems related to excess use of online video games. Regular video game users ($n = 257$) completed an online questionnaire assessing demographics, symptoms of IGD, general psychopathology, life satisfaction, self-esteem, and impulsivity. Participants meeting criteria for IGD (8.7%, $n = 21$) played video games significantly more often ($p = 0.04$) and for more hours at a time ($p = 0.002$), and experienced significantly greater subjective urges to use video games ($p < 0.001$). Furthermore, those with IGD endorsed significantly more symptoms of depression ($p < 0.001$), anxiety ($p < 0.001$), and stress ($p = 0.01$), lower life satisfaction ($p < 0.001$), and elevated motor ($p = 0.02$) and attentional impulsivity ($p = 0.01$). Proposed DSM-5 diagnostic criteria for IGD appear to capture a clinically meaningful cluster of symptoms that is associated with marked impairments in multiple aspects of psychosocial functioning.

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1. Introduction

Addiction has traditionally been conceptualized as compulsive drug-seeking behavior, characterized by the presence of tolerance, withdrawal, and craving (O'Brien, Volkow, & Li, 2006). However, this view of addiction may be overly limited, given growing evidence to suggest significant parallels between substance and non-substance or behavioral addictions (Potenza, 2006, 2009). The recent re-classification of "Gambling Disorder" (formerly known as "Pathological Gambling") from an "Impulse Control Disorder" to the new category of "Substance-Related and Addictive Disorders" in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) formalizes the increasing recognition of the addictive potential of excess engagement in habitual or repetitive behaviors such as gambling (Albrecht, Kirschner, & Grusser, 2007; APA, 2013, APA et al., 2000). Research strongly supports the view of Gambling

Disorder as an addiction: problem gamblers report symptoms of tolerance (i.e., the need to increase betting over time), withdrawal (i.e., anger or irritability when unable to gamble), and craving, exhibit attentional biases towards gambling-related cues and rising heart rates in anticipation of winning, display diminished cognitive control and increased impulsivity, and run the risk of relapse even after prolonged periods of abstinence (Blaszczynski, Walker, Sharpe, & Nower, 2008; Cunningham-Williams, Gattis, Dore, Shi, & Spitznagel, 2009; Goudriaan, Yucel, & van Holst, 2014; Tavares, Zilberman, Hodgins, & el-Guebaly, 2005; van Holst et al., 2012; Wulfert, Roland, Hartley, Wang, & Franco, 2005). Excess engagement in gambling also activates brain areas typically associated with substance addiction, such as the frontal cortices and striatal complexes (Goudriaan et al., 2014; Koehler et al., 2013; Kuss & Griffiths, 2012; Leeman & Potenza, 2013).

Along with extensive research on Gambling Disorder, there has been a steady increase in studies of other hypothesized behavioral addictions, including maladaptive or excessive engagement in tanning bed use (Harrington et al., 2011; Mosher & Danoff-Burg, 2010; Nolan, Taylor, Liguori, & Feldman, 2009), shopping (Clark & Calleja, 2008; Davenport, Houston, & Griffiths, 2012; Lo & Harvey,

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2012), sexual activity (Bancroft & Vukadinovic, 2004; Hall, 2011), exercise (Adams, Miller, & Kraus, 2003; Berczik et al., 2014), and various activities related to the internet, including use of e-mail or text messaging, sexual preoccupations, and online social networking (Block, 2008; Chou, Condron, & Belland, 2005; Griffiths, 2001; Hormes, Kearns, & Timko, 2014; Lu et al., 2011; Young, 1999, 1998, 2004). Given the high prevalence of reported problems related to online video gaming, “Internet Gaming Disorder” (IGD) was included as a “Condition for Further Study” in the DSM-5, along with a call for research to establish with more certainty the extent to which excess, maladaptive, or repetitive use of online video games may parallel addictions to drugs of abuse (APA, 2013).

1.1. Literature review

Preliminary research supports the hypothesized addictive potential of video games, with gamers frequently reporting increasing amounts of time spent gaming, a subjective loss of control over use, and withdrawal symptoms and strong urges when not engaged in the activity (Funk, Baldacci, Pasold, & Baumgardner, 2004; Gentile et al., 2011; Holtz & Appel, 2011; Mentzoni et al., 2011; Rehbein, Mossle, Arnaud, & Rumpf, 2013; van Holst et al., 2012). Time spent gaming has also been shown to be positively associated with psychosocial impairment, including low mood or depression, anxiety, social phobia, lower life satisfaction, and impaired school performance (Brunborg et al., 2013; Gentile, 2009; Mentzoni et al., 2011). Recent studies have also focused on identifying risk factors for the development of problem gaming, along with mechanisms that may maintain the problematic behavior. It has been suggested that - much like Gambling Disorder - problematic video game use develops via both, negative (i.e., avoidance of negative affective states) and positive reinforcement (i.e., receipt of actual or fictional rewards or access to more advanced stages of the game) (Choi, Lee, Choi, & Kim, 2007; Yee, 2006). More time spent gaming, lower social competence, elevated impulsivity, decreases in happiness, and experiences of “flow” or altered perceptions of time have been identified as additional risk factors for the development of problems related to excess gaming (Gentile et al., 2011; Hull, Williams, & Griffiths, 2013). The presence of problem gaming has furthermore been shown to be associated with impaired response inhibitions in the presence of game-related cues, suggesting that the attentional biases characteristic of clinically recognized addictive disorders may also serve to maintain problem gaming via an increased risk of relapse (van Holst et al., 2012).

In spite of growing evidence to support the addictive potential of excess video game use there remains a lack of consensus regarding its operational definition and proper assessment (Hussain & Griffiths, 2009; Mentzoni et al., 2011; van Rooij, Schoenmakers, Vermulst, Van Den Eijnden, & Van De Mheen, 2011). Earlier studies sought to capture symptoms of excess video game use using modified assessments of other hypothesized behavioral addictions, such as the Exercise Addiction Inventory (Hussain & Griffiths, 2009). More recent studies have primarily utilized different versions of the Gaming (or Game) Addiction Scale to quantify addiction-like symptoms in relation to video game use (Festl, Scharkow, & Quandt, 2013; Hull et al., 2013; Hussain, Griffiths, & Baguley, 2012; Mentzoni et al., 2011). This scale is rather lengthy, however, which can complicate administration in both clinical and research settings. Briefer versions of the Game Addiction Scale have not yet been psychometrically validated (Hussain & Griffiths, 2009; Kim, Namkoong, Ku, & Kim, 2008). Other studies have utilized general measures such as the Compulsive Internet Use Scale (van Rooij et al., 2011), which lack specificity in the assessment of problems uniquely characteristic of

excess use of video games. Suggested criteria for categorizing respondents as “addicted” to video games also vary markedly across existing studies: some utilize a threshold of two symptoms to identify “problem gamers,” others look for three or four criteria endorsed to assign a diagnosis of “gaming addiction,” while the DSM proposes a threshold of five criteria for a formal diagnosis of IGD (APA, 2013; Brunborg et al., 2013; Gruesser, Thalemann, & Griffiths, 2007). Some have also called for a distinction between “core” (i.e., relapse, withdrawal, conflict, and problems) and “peripheral” criteria to differentiate “addicted” versus “highly engaged” gamers (Brunborg et al., 2013).

Prevalence estimates of problems related to excess use of video games vary drastically across studies, which may at least in part be due to the divergence in approaches to assessment. For example, a study of U.S. adolescents estimated that 8.5% of respondents met criteria for “gaming addiction” (Gentile, 2009), while estimated prevalence of “video game addiction” ranged from 1.9% to 2.3% in the Netherlands (Lemmens, Valkenburg, & Peter, 2009), and was found to be even lower in Germany (0.2%) and Norway (0.6%) (Festl et al., 2013; Mentzoni et al., 2011). By contrast, estimated prevalence of “gaming addiction” in Taiwan was estimated to be around 46% (Wan & Chiou, 2006).

1.2. Aims and hypothesis

The present study was designed to examine psychosocial correlates of excessive video game use using a brief set of nine questions that are directly based on the proposed DSM-5 criteria for IGD and capture the core components of addiction used to diagnose alcohol and other substance use disorders, as well as behavioral addiction to gambling, including tolerance, withdrawal, mood modification, and salience (Hussain & Griffiths, 2009). Of note, a similar approach has been utilized previously to capture symptoms related to excess engagement in online social networking (Hormes et al., 2014), indoor tanning (Mosher & Danoff-Burg, 2010; Zeller, Lazovich, Forster, & Widome, 2006), and binge eating (Cassin & von Ranson, 2007), as well as food addiction (Gearhardt, Corbin, & Brownell, 2009). We hypothesized that the proposed brief set of questions would successfully capture problems related to excessive use of online video games, including its association with marked impairments in psychosocial functioning.

2. Material and methods

All methods were approved by the local Institutional Review Board. All respondents were informed of the nature and purpose of the study and consented prior to participation.

2.1. Participants

A total of 297 individuals completed the study questionnaire via the secure online server SurveyMonkey. Participants younger than age 18 or not indicating their age ($n = 40$, 13.5%) were excluded from the analyses, resulting in a final sample of 257 respondents. Respondents included students at a large Northeastern University (66.5%, $n = 171$) who received research participation credit, and individuals recruited from the community via announcements posted to message boards in online communities for video game users (33.5%, $n = 86$) who completed the survey without compensation.

2.2. Measures

Respondents provided information on their gaming habits, including frequency of video game use, number of hours spent

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