



## Mini Review

## An overview of problematic Internet use



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## HIGHLIGHTS

- A brief overview of the body of literature on PIU
- An outline of key issues regarding the definition and diagnosis of PIU
- A focus on pharmacological and psychotherapeutic treatments available

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## ABSTRACT

Problematic Internet use (PIU), which has become a global social issue, can be broadly conceptualized as an inability to control one's use of the Internet which leads to negative consequences in daily life. The aim of this paper is to give a brief overview of the gradually evolving body of literature on PIU. This shows that the definitions and diagnostic criteria that have been proposed, and the assessment tools that have been developed, stress similarities between PIU, addictive behaviours and impulse-control disorders. Disagreements regarding diagnostic criteria and the lack of large epidemiological studies have resulted in difficulties in establishing the prevalence of PIU in the general population. Studies suggest high comorbidity rates between PIU and numerous psychiatric disorders highlighting the importance of focusing on comorbidity in treatment. There is growing evidence that genetic, personality and individual differences in automatic and controlled aspects of self-regulation may promote the development of PIU. Pharmacological and psychotherapeutic treatments specific to PIU have received limited testing in large, rigorous studies however preliminary evidence suggests that both psychotropic medications (Escitalopram, Naltrexone and Methylphenidate) and cognitive behaviour therapy may have some utility in the treatment of PIU. More research is needed on areas which remain unclear and contribute to the prognosis of PIU, in particular the temporal relationships between psychiatric disorder and PIU, mechanisms of comorbidity and the more subtle psychological changes that occur through Internet use.

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## 1. Introduction

Over the last twenty years global Internet users have grown to almost two and half billion (Internet World Stats, 2013). In the UK and USA over 80% of the population has access to the Internet (International Telecommunications Union, ITC, 2013). Similar access rates have been observed in Asia (particularly Japan, South Korea and Taiwan) and lower rates, in the range from 45.0 to 55.0%, in South America (ITC, 2013). Internet use is comparatively lower in Africa and the Middle East but respectively grew by more than 3600% and 2600% between 2000 and 2012 (Internet World Stats, 2013).

The growth in Internet use has been paralleled by emerging concerns about problematic Internet use (PIU), also variously termed Internet addiction (Brenner, 1997; Young, 1998), pathological Internet use (Davis, 2001) and Internet dependence (Scherer, 1997). PIU can be defined as “use of the Internet that creates psychological, social, school and/or work difficulties in a person's life” (Beard & Wolf, 2001, p.378). Scientific understanding of PIU has lagged behind media attention mainly because of inconsistencies in defining PIU, disagreement about its very existence, and the variable methodological approaches used in studying it (Aboujaoude, 2010). In spite of this, a global body of data unequivocally highlights the Internet's potential to bring about considerable psychological harm (Aboujaoude, 2010).

## 2. Definition and diagnosis

The diagnosis of PIU does not appear in any official diagnostic system, including DSM-V, and there are no widely accepted diagnostic criteria. Researchers investigating PIU still need to distinguish between dependence *on* the Internet, and dependence *to* the Internet, according to Griffiths (2000) who argues that a majority of individuals presenting with PIU are simply using it as a medium to fuel other addictive behaviours. Griffiths (2000) also argues that some behaviours engaged on the Internet (e.g., cybersex) may be behaviours that the individual would only carry out on the Internet because the medium is anonymous and disinhibiting. For these reasons, it is often argued that PIU may be more appropriately conceptualized within existing psychiatric disorders, for example as an aspect of problem gambling (Shaffer, Hall, & Bilt, 2000).

Nevertheless, a number of researchers have argued that PIU is a separate psychiatric entity, often proposing it to be an addictive behaviour (Potenza, 2006; Widianto & Griffiths, 2006; Yau, Crowley, Mayes, & Potenza, 2012) or an impulse-control disorder (American Psychiatric Association, 2000; Yau et al., 2012). The latter view suggests that PIU shares characteristics of an addictive behaviour, such as craving, tolerance and withdrawal (Block, 2008; Ko et al., 2009). Following this line of reasoning Block (2008) suggested four diagnostic criteria essential to a possible diagnosis of PIU as an addictive behaviour: (1) excessive Internet use, often associated with a loss of sense of time or a neglect of basic drives; (2) withdrawal, including feelings of anger, depression and tension when Internet is not accessible; (3) tolerance, including the need for better computer equipment, more software, or more hours of use; and (4) adverse consequences, including arguments, lying, poor school or vocational achievement, social isolation, and fatigue.

To date, only a handful of studies have attempted to empirically develop diagnostic criteria. Ko, Yen, Chen, and Yen (2005) tested a set of criteria in 468 Taiwanese secondary school students. Starting with 13 candidate criteria they eliminated those with low diagnostic accuracy and determined that a cut off of six out of the nine remaining criteria had the best diagnostic accuracy (specificity = 97.1%; sensitivity = 87.5%). In a further study Ko, Yen, Chen, Yang, et al. (2009) confirmed the diagnostic accuracy of their criteria in a cohort of 216 Taiwanese mature university students. The diagnostic criteria identified align themselves with Block's suggested structure however the relatively

small and unrepresentative nature of the samples used in the studies limits the generalisability of the findings.

Several self-report instruments have been developed to screen for, and help identify the severity of, PIU. The most commonly used ones are the Internet Addiction Test (Young, 1998), Young's Diagnostic Questionnaire (1998) and the Chen Internet Addiction Scale (Chen, Weng, Su, et al., 2003). As a group these self-report instruments show limited consensus on the underlying dimensions that constitute the condition (Beard, 2005).

## 3. Prevalence

Disagreements regarding diagnostic criteria and the lack of large epidemiological studies have resulted in difficulties establishing the prevalence of PIU in the general population. Only two large epidemiological studies examining the prevalence of PIU in the general population have been conducted in Norway (Bakken, Wenzel, Gøtestam, Johansson, & Oren, 2009) and the US (Aboujaoude, Koran, Gamel, Large, & Serpe, 2006) yielding, respectively, prevalence rates of 0.7% and 1.0%. Prevalence rates in adolescents have been researched more extensively. Results show that in European samples prevalence rates range from 1.0 to 9.0% (Kaltiala-Heino, Lintonen, & Rimpela, 2004; Pallanti, Bernardi, & Quercioli, 2006; Siomos, Dafouli, Braimiotis, Mouzas, & Angelopoulos, 2008; Vilella, Martinotti, Di Nicola, et al., 2010). In Middle Eastern samples similar prevalence rates (1.0–12.0%) have been observed (Canan, Ataoglu, Nichols, Yildirim, & Ozturk, 2009; Ghassemzadeh, Shahraray, & Moradi, 2008). In Asian samples prevalence rates appear higher, ranging from 2.0 to 18.0% (Cao & Su, 2007; Ko, Yen, Yen, Lin, & Yang, 2007; Ni, Yan, Chen, & Liu, 2009; Park, Kim, & Cho, 2008; Wang, Wang, & Fu, 2008). Similarly the prevalence rates for international university students have been reported as between 6.0 and 35.0% (Niemz, Griffiths, & Banyard, 2005; Zhu & Wu, 2004).

## 4. Comorbidity

PIU has been found to frequently be comorbid with other psychiatric disorders (Ko, Yen, Yen, Chen, & Chen, 2012). Research has shown that adolescents who display problem drinking are more likely to have PIU (Ko, Yen, Chen, Chen, & Yen, 2008). Some have argued that individuals presenting with difficulties in disengagement from Internet use may be at greater risk of gambling-related problems (Phillips, Ogeil, & Blaszczynski, 2012). Yoo et al. (2004) have also observed the association between attention-deficit hyperactivity disorder (ADHD) and PIU in elementary school children. Bernardi and Pallanti (2009) found that 14.0% of adults diagnosed with ADHD also had PIU.

Bernardi and Pallanti (2009) also reported that 7.0% of adult cases of PIU have a comorbid dysthymic disorder. Shapira, Goldsmith, Keck, Khosla, and McElroy (2000) found that problematic Internet users have a very high lifetime prevalence (70.0%) for bipolar affective disorder (Type I or II), compared to 15.0% for major depression. Yen, Ko, Yen, Wu, and Yang (2007) observed an association between PIU and depressive symptoms among adolescents in Taiwan. Ko, Yen, Chen, Yeh, and Yen (2009) conducted a prospective study which demonstrated that adolescents with depressive symptoms are more likely to become problematic Internet users in the two year follow-up period.

The association between social anxiety and PIU has been observed among adolescents in Taiwan (Yen, Lin, & Yang, 2007). Moreover, social anxiety symptoms appear to predict the emergence of PIU in a two-year follow-up study (Ko, Yen, Chen, Yang, et al., 2009; Ko, Yen, Chen, Yeh, & Yen, 2009). In addition, Bernardi and Pallanti (2009) found that 15.0% of adult cases of PIU were also presenting with a possible classification of social anxiety disorder. Milani and Di Ousaldella (2009) have also reported that adolescents with symptoms of problematic Internet use have worse interpersonal relationships.

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