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Cross-cultural study of Problematic Internet Use in nine European countries

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ABSTRACT

The main objective of the present study was to investigate the relationships between Problematic Internet Use (PIU) and time spent online, online activities and psychopathology, by taking cross-cultural and gender differences into account. The second objective was to provide the prevalence estimate of PIU among European Internet users. Our total sample consisted of 5593 Internet users (2129 men and 3464 women) of nine European countries, aged between 18 and 87 years old ($M = 25.81$; $SD = 8.61$). Recruited online, they completed several scales about their Internet use and psychopathology. PIU was related to time spent online at weekends, obsessive-compulsive symptoms, hostility and paranoid ideation among the total sample of women; among men phobic anxiety was also significant. Regression analyses performed in each sample also suggest the importance of obsessive-compulsive symptoms (in seven samples), somatization (four samples) and hostility (three samples). Many cross-cultural and gender differences have been observed in terms of relationships with psychopathology and online activities. Prevalence estimates of PIU ranged between 14.3% and 54.9%. PIU was more prevalent among women in the respective samples, including the total sample. This European research highlights relevant relationships between PIU, psychopathology and time spent online, as important differences with regards to these variables in respective samples. This study's cross-cultural design also allows a better understanding of gender differences in PIU.

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1. Introduction

Worldwide, Problematic Internet Use (PIU) and problematic gaming are gaining popularity among health professionals, the general population, and researchers. One the one hand, Internet addiction has no consensual definition (Spada, 2014), even if many authors state that Internet addiction or PIU refers to an excessive and/or inappropriate use of the Internet which can lead to psychological, social, academic or professional difficulties (Beard & Wolf, 2001). Therefore, PIU represents generalized PIU (Davis, 2001) and can include several specific uses, such as online gaming, gambling or pornography use (Laconi, Tricard, & Chabrol, 2015). Besides, the conceptualization of Internet addiction is

based on several models, including drug dependence and pathological gambling (Laconi, Rodgers, & Chabrol, 2014; Weinstein & Lejoyeux, 2010). Consequently its diagnostic criteria stem mostly from the Diagnostic and Statistical Manual of Mental Disorders (DSM), with no clear consensus among researchers.

On the other hand, gaming addiction emerged in the DSM-5 (APA, 2013) as *Internet Gaming Disorder* (IGD). Defined as a "persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress" (APA, 2013, p. 795), its nine diagnostic criteria are similar to those of PIU, such as withdrawal, tolerance, difficulty or inability to stop use, or consequences on individual's life. Many debates have been raised on the IGD since its introduction in section 3 of the DSM-5, suggesting a clear lack of clarity and differentiation between online and offline behaviors, and also between Internet addiction and gaming addiction (Laconi, Pirès, & Chabrol, 2017a, 2017b; Kuss, Griffiths, & Pontes, 2017a, 2017c, 2017b; Király, Griffiths, & Demetrovics, 2015).

PIU has been frequently related to psychopathology, such as depressive and anxiety disorders (Gámez-Guadix, 2014; Ho et al., 2014; Kaess et al., 2014; Liang, Zhou, Yuan, Shao, & Bian, 2016), pathological personality traits (Laconi et al., 2017a, 2017b; Floros, Siomos, Stogiannidou, Giouzepas, & Garyfallos, 2014; Gnisci, Perugini, Pedone, & Di Conza, 2011; Laconi, Andreoletti, Chauchard, Rodgers, & Chabrol, 2016) and other addictive disorders (Durkee et al., 2016; Gámez-Guadix, Calvete, Orue, & Las Hayas, 2015; Laconi et al., 2015). Studies using the Brief Symptom Inventory (BSI; Derogatis, 1993), a widely used scale to assess symptomatology, revealed significantly higher scores of each nine symptoms category (i.e., somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, phobic anxiety, hostility, paranoid ideation and psychoticism) among participants with PIU compared to non-problematic users, and significant correlations with PIU (Adalier & Balkan, 2012; Yen, Yen, Chen, Chung, & Chen, 2008). Studies using the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983) found similar results (Alavi, Maracy, Jannatifard, & Eslami, 2011; Dong, Lu, Zhou, & Zhao, 2011; Koukia, Mangoulia, & Alexiou, 2014; Koç, 2011; Taymur et al., 2016).

Prevalence rates vary considerably in PIU studies, although similar samples are used (Chakraborty, Basu, & Vijaya Kumar, 2010; Shaw & Black, 2008). In Europe, PIU affects around 1–12% of adults and adolescents (Petersen, Weymann, Schelb, Thiel, & Thomasius, 2009; Spada, 2014). Indeed, nine cross-cultural studies performed in European representative samples showed that the prevalence of problematic users was 1%–6.8% (Blinka et al., 2014; Durkee et al., 2012, 2016; Kaess et al., 2014, 2016; Sariyska et al., 2014; Smahel et al., 2012; Tsitsika et al., 2012, 2014). Among these studies, one half found that men were clearly more at risk (Durkee et al., 2012, 2016; Tsitsika et al., 2012, 2014); the other half found mixed results. Gender differences were not clearly demonstrated in recent studies, with some studies suggesting no gender differences (Kuss, Griffiths, & Binder, 2013).

Gender differences might have an influence on PIU and concurrent psychiatric disorders (Ko, Yen, Chen, Yeh, & Yen, 2009) as gender impacts time spent online and the online activities engaged in (Laconi et al., 2015), both of which influence PIU scores (Dufour et al., 2017; Durkee et al., 2012). The large differences and inconsistencies in previous results on PIU are mainly explained by methodological differences (APA, 2013; Laconi et al., 2014). Cross-cultural studies allow a better understanding of results given the use of the same methodology, timeline or statistical analysis. However, few cross-cultural studies have been performed on PIU, despite it being an international health issue. To our knowledge, only one cross-cultural study explored PIU among 989 adults of four European countries (Sariyska et al., 2014), the others being

focused on adolescents, and none exclusively among European users. PIU has been the subject of many studies since the last decade, but there is a need for cross-cultural empirical research.

Therefore, it seems particularly relevant to explore the similarities and differences between several large samples in a cross-cultural way (APA, 2013; Kuss et al., 2013). Accordingly, the main objective of the present study was to investigate the relationships between PIU and time spent online, online activities and psychopathology, by taking cross-cultural and gender differences into account. We assume that several differences will be observed, particularly between genders. The second objective was to provide the prevalence estimate of PIU among European Internet users with the hypothesis that the majority of participants in the respective subsamples will have high rates of PIU. Each sub-sample has been compared in terms of PIU prevalence estimate, with a consideration for gender differences.

2. Material and methods

2.1. Participants and procedure

All participants were recruited during December 2015 and May 2016 through an online website dedicated to the study. The website was available in nine languages and was advertised by the authors in their own countries. This study included Italy (Italian), Germany (Deutsch), France (French), Spain (Spanish), Poland (Polish), Turkey (Turkish), Hungary (Hungarian), Greece (Greek) and United Kingdom (English). Only participants aged of 18 and above were recruited. Information about the aims of the study, as well as anonymity and confidentiality of the data was provided at the beginning of the study. This study conformed to the 1964 Helsinki declaration and its later amendments, and received the approval from the ethics committee of a European university (*the name is preserved to maintain anonymity during the reviewing process*).

Participants who did not give their consent were first excluded ($n = 76$ in total), as were those who did not complete sociodemographic information including gender, age, countries of birth and residency ($n = 1048$). Then, we excluded participants who did not complete the Problematic Internet Use Questionnaire (PIUQ) or at least 90% of the questionnaire (i.e., only one missing answer was accepted and replaced by the PIUQ mean scores; $n = 842$) and the BSI or at least 10% of the questionnaire ($n = 407$). Therefore with 2376 excluded participants, the total completion rate was 70.18%. Our final sample included 5593 Internet users.

2.2. Measure

We assessed PIU with the short form of the PIUQ (Koronczai et al., 2011). Its nine items are rated on a 5-point scale from $1 =$ "never" to $5 =$ "always/almost always". Total scores vary from 9 to 45, with higher score indicating higher problematic use. Participants scoring higher than or equal to 22 were considered problematic Internet users. The PIUQ and its 9-item form present good psychometric properties (Laconi et al., 2014). In the present study, Cronbach' alphas ranged between $\alpha = 0.80$ and $\alpha = 0.90$. Double back-translation from the English version has been used to produce a complete translated version of each questionnaire and when no translated version was available.

The BSI (Derogatis, 1993) has been used in order to assess nine categories of psychopathological symptoms: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Each 53 items are rated on a 5-point scale from $0 =$ "not at all" to $4 =$ "extremely", with higher scores suggesting higher psychological distress. The BSI has good psychometric properties with internal