

INTERNET ADDICTION IN PATIENTS WITH SUBSTANCE USE DISORDER

Ariella Pass, Daniel Kardefelt-Winther, Johan Franck

Abstract

Objective: The aim of this study was to further investigate the relationship between internet addiction and substance use disorder by exploring the prevalence of internet addiction among patients in a substance use disorder treatment clinic and to investigate the frequency with which internet addiction co-occurs with other psychiatric disorders in this population.

Method: A survey, containing questions based on the nine criteria for internet gaming disorder proposed in the research appendix to DSM-5, was administered at 24 outpatient clinics for substance use disorders within the Stockholm Centre for Dependency Disorders. Data concerning additional psychiatric diagnoses was collected from patient medical records. A total of 569 patients participated, after excluding those with missing data as well as participants who primarily gambled online, the final sample size was N=462.

Results: In total, 4.1% of the surveyed patients with substance use disorder met at least five out of nine internet addiction criteria at a level of “Fairly true” or higher, and reported at least “Some suffering” as a consequence of their internet use. An independent-samples t-test comparing the mean of the total internet addiction score between groups of patients with additional psychiatric diagnoses and the rest of the sample showed that participants with any one additional non-substance related psychiatric diagnosis as well as those with an anxiety diagnosis had significantly higher internet addiction scores than the rest of the sample. There were no significant differences in mean internet addiction scores between participants with ADHD or depression and the remaining sample.

Conclusions: This study provides preliminary evidence to suggest that internet addiction does not constitute a major clinical issue for patients in treatment for substance use disorder, lending little support to the suggestion that internet-related problem behaviours share pathophysiology with substance use disorders. Although patients with an anxiety disorder reported elevated internet addiction scores compared to the remaining sample this finding should be replicated in a population of patients who report with anxiety disorder as their primary problem. The presence of clinically relevant co-occurrence between internet addiction and substance use disorder needs to be further investigated in larger study populations, using clinical interviews to assess both diagnoses.

Key words: Internet addiction, excessive internet use, Internet gaming disorder, co-morbidity

Declaration of interest: none

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Introduction

There is an ongoing discussion concerning the conceptualization of addiction, increasingly pertinent because of the expansion of the addiction category in DSM-5. This category now includes a sub-category for non-substance related addictions, commonly referred to as behavioural addictions (American Psychiatric Association DSM-5 Task Force 2013). While there is some evidence of behavioural overlaps between manifestations of substance use syndromes and behavioural addictions, there is still a lack of consensus around whether the addiction framework is the most useful explanation for such behaviours (Billieux et al. 2015; Charlton and Danforth 2007; Griffiths et al. 2016; Griffiths, van Rooij et al. 2016; Kardefelt-Winther 2014a, 2015; Shaffer et al. 2000; Van Rooij and Prause 2014). Currently, the only disorder included in the DSM-5 category for behavioural addictions

is gambling disorder. In addition, internet gaming disorder was included in Appendix III as a potential disorder that warrants further research (American Psychiatric Association DSM-5 Task Force 2013). Before full inclusion in diagnostic manuals should be considered, it needs to be firmly established that internet gaming disorder or other internet-related behavioural addictions constitute a growing public health problem that causes significant life impairment for individual patients (Griffiths, van Rooij et al. 2016). While at present the literature on internet gaming disorder and internet addiction does describe a long list of negative consequences following excessive engagement in online gaming or internet use (Kuss and Griffiths 2012a), its impact and long-term consequences are still uncertain due to lack of longitudinal follow-up.

Without evidence that firmly links problematic forms of internet use to life impairment, speculation around the addictive potential of the internet might have

significant consequences (Wood 2008). For example, in Sweden there have been media reports, based on court records, of children being taken into compulsory care following the Care of Young Persons Act, because of problems related to 'computer game addiction' (Arnroth 2015). Such cases emphasize the need for an increased knowledge-base around the phenomenon of internet-related behavioural addictions to inform social services, and the judicial and health care systems.

Literature review

Currently, clinics for treating substance use disorders in Sweden do not offer treatment for behavioural addictions other than gambling disorder. As the public attention to internet-related problem behaviours increase, some researchers have suggested that addiction clinics should consider screening and providing treatment for internet addiction, in addition to existing screenings (Ho et al. 2014, Wölfling et al. 2013). Recent brain imaging and neuropsychological studies have found similarities between subjects with internet addiction and those with substance use disorder (Kuss and Griffiths 2012b). A number of empirical studies have also reported a possible co-occurrence between the two disorders (Ho et al. 2014, Ko et al. 2012, Ko et al. 2008, Korkeila et al. 2010, Kuss and Griffiths 2012a, Kuss et al. 2014, Lam et al. 2009, Spada 2014, Yen et al. 2009). These findings suggest that internet addiction may be overrepresented among patients already in addiction treatment programmes. Indeed, Volkow and Li (2005) have suggested that addiction-prone phenotypes for substance use disorder might also be more sensitive to non-substance reinforcers. Against that background, it is an interesting hypothesis that internet addiction might be overrepresented among substance use disorder patients.

Until this point, a majority of empirical studies on internet addiction have been conducted in non-clinical settings, commonly using cross-sectional survey research with community samples (Ho et al. 2014, Ko et al. 2012, Kuss et al. 2014) which limit the validity with regard to psychiatric co-morbidity. Hence, there is a need for studies that explore the prevalence of internet addiction in clinical populations where the presence of psychiatric disorders has been systematically established. If a co-occurrence between substance use disorder and internet addiction exists also in clinical populations, the next step would be to investigate how the disorders are related in order to understand whether certain groups of patients may be more vulnerable to excessive and problematic internet use as a partial consequence of their other psychiatric disorders or whether their internet use patterns might compound or cause other disorders. While little is known about the direction of co-occurring relationships, research on co-occurrence tends to suggest that existing vulnerabilities might increase the likelihood of developing problems related to internet use (Armstrong et al. 2000, Ho et al. 2014, Kardefelt-Winther 2014b, Ko et al. 2012, Lemmens et al. 2011).

To our knowledge, only one study so far has explored the co-occurrence of internet addiction and other psychiatric disorders in a clinical population. This study was conducted in a clinical sample of patients at inpatient rehabilitation centres for substance use disorder and gambling disorder in Germany (Wölfling et al. 2013). The study reported a prevalence of internet addiction of 4.2% and recommended that regular screening for internet addiction should be introduced in addiction treatment services. We argue that such a conclusion is premature, given the uncertainty surrounding the

conceptualization and assessment of internet addiction, its contested public health and clinical relevance and the scarce treatment research conducted (Griffiths, van Rooij, et al. 2016, Kuss and Lopez-Fernandez 2016, Spada 2014). However, the focus on clinical populations makes their study valuable, and we concur with the authors that there is a need for further investigation of a possible clinically relevant co-occurrence between internet addiction and substance use disorder. We argue that any serious discussion of co-occurrence needs to rely on evidence gathered from patients with clinically established psychiatric diagnoses, classified according to formal diagnostic criteria by a medical professional.

To that end, the present study has two aims. The first aim is to explore the prevalence of internet addiction among patients in a substance use disorder treatment clinic in Sweden. The second aim is to investigate the frequency of which internet addiction co-occurs with other psychiatric disorders in this population.

Methods

Sampling and procedure

This study used survey data collected from patients at 24 local outpatient clinics for substance use disorders within the Stockholm Centre for Dependency Disorders (total number of individual patients annually: 20.000, number of visits: 310.000), in the metropolitan area of Stockholm, Sweden (pop 2.2mi).

The survey was administered by medical professionals during visits and conducted in private. An informed consent procedure was applied and the participants were explicitly informed that participation is anonymous, that they could refuse to participate or discontinue participation at any point, and that their participation in no way would impact on their treatment or future visits to the clinic. In addition to survey data, the study also used data from computerized national medical records to establish the presence of psychiatric disorders by using the patient's social security number as identifier. Data from medical records was accessed solely by the main author of the manuscript. The study was approved by the Stockholm Regional Ethics Review Board (Dnr 2015/734-31).

The study started in June 2015 and was finalized in January 2016. Participants ranged between the ages of 18 to 76 years. The two exclusion criteria for data collection were 1) gambling disorder constituting the primary reason for dependency care and 2) the patient being under the age of 18, hence the units for gambling disorder and the units for adolescents were excluded. We collected data from a total of 569 patients. We excluded from data analysis all questionnaires with missing data for any of the nine questions for internet addiction. We also asked all patients what activities they spent the most time online on (*"Please circle the activity/activities on the internet that you spend the most time on"*) and excluded patients who reported that one of their primary online activities was gambling, as inclusion of patients who frequently gamble online might confound the assessment of internet addiction due to conceptual overlap between gambling disorder and internet addiction. The total number of excluded questionnaires were N=107. The final sample size was N=462.

Measures

Two demographic variables, gender (61.5 % male)

and age ($M=41.9$ years, $SD=12.8$) were assessed through the patients' social security numbers. Psychiatric diagnoses, substance related and non-substance related, set between January 2014 to January 2016, were assessed through the computerized medical records and coded as a binary variable in the dataset. Diagnoses in Swedish medical records are based on the International Classification of Diseases 10 (World Health Organization 1992) and set after assessment through patient meetings, with or without the help of structured/semi-structured diagnostic interviews, by a physician, most commonly a psychiatrist regarding psychiatric diagnoses.

We constructed a compound variable for anxiety disorders by including patients with diagnoses for anxiety unspecified, general anxiety disorder, obsessive compulsive disorder, post-traumatic stress disorder, social anxiety disorder and panic disorder. We constructed a compound variable called mixed substance use disorder by including patients with either mental and behavioural disorders due to multiple drug use and use of other psychoactive substances, or at least two diagnoses related to a specific substance (alcohol, opioids, stimulants, sedatives or hypnotics, cannabinoids or cocaine).

To measure internet addiction, the nine criteria included in DSM-5 (American Psychiatric Association DSM-5 Task Force 2013) were translated to Swedish. The criteria were modified to pertain to general internet use, in order to capture problems related to excessive internet use more broadly. Since it has been argued that other applications, such as social networking or pornography sites can be used in an addictive pattern (Griffiths 2016, Kuss and Griffiths 2011) we did not want to limit the questions to online gaming alone. Similar criteria, translated to Swedish, have been tested in Swedish populations with reports of good content validity and high internal consistency (Vadlin et al. 2015a, Vadlin et al. 2015b). A five point Likert scale was used, with responses ranging from "Not true" to "Very true". We added a question to assess how much suffering the internet use caused the individual, constructed as a 4-point Likert scale with a range from "No suffering" to "Extreme suffering".

Our final prevalence measure was determined by introducing a cut-off point requiring a patient to fulfil five or more criteria for internet addiction, together with reports on the suffering measure of at least "Some suffering" (step 2 on the 4-point scale). A criterion for internet addiction was considered to be met if the subject

marked at least "Fairly true" (step 4 on the 5-point Likert scale). Therefore, in this study, we have set strict requirements for a person to be considered as having internet addiction both by introducing a cut-off for each individual criterion, as well as introducing an indicator for self-reported suffering. This is in response to the critique against existing criteria and assessment scales used in internet addiction research, as these typically omit the assessment of self-reported suffering or life impairment which is a crucial feature of any psychiatric diagnosis (Billieux et al. 2015, Griffiths, van Rooij et al. 2016).

Results

Using the strict prevalence measure for internet addiction, 4.1% of the surveyed patients with substance use disorder met at least five out of nine internet addiction criteria at a level of "Fairly true" or higher, and reported at least "Some suffering" as a consequence of their internet use. The study participants reported their most frequent online activities as follows: 48.9% reported spending time on another activity than the ones we asked about, 62.3% used social media, 21.9% played games, 10% reported that they accessed pornography and 3.2% did not want to state. The question had a non-response rate of 1.9%. The total internet addiction score showed a wide range, with total scores ranging from 9 to 44, utilizing almost the full scale (Min: 9, Max: 45; $M=15.2$). The suffering measure showed a mean of 1.2 (range of 1 to 4). The primary substance use disorders were alcohol use disorder (51.3%), opiate use disorder (30.5%) and mixed substance use disorder (27.3%). In addition to a substance use disorder, 48.1% of the sample had a non-substance related psychiatric diagnose. The most common non-substance related psychiatric disorders were depression (18.6%), anxiety disorders (17.5%) and ADHD (17.3%).

To investigate the degree of co-occurrence between internet addiction and other psychiatric diagnoses in the causal direction that we have theorized, we grouped participants by their psychiatric diagnoses and conducted independent-samples t-tests to compare the mean of the total internet addiction score between groups of participants with a particular psychiatric diagnose and those without it. This was done for the most common non-substance related psychiatric diagnoses, as listed above.

Diagnosis	Mean Internet Addiction Score	SD	t	p
Two or more diagnoses				
Yes	16.1	7.31	2.50	p=.013
No	14.5	6.54		
Anxiety disorder				
Yes	17.2	7.52	2.84	p=.005
No	14.8	6.77		
Depression				
Yes	15.6	7.16	0.50	p=.612
No	15.2	6.92		
ADHD				
Yes	16.5	7.81	1.64	p=.110
No	15	6.75		

There was a significant difference in the mean internet addiction score for participants with any one additional non-substance related psychiatric diagnosis ($M=16.1$, $SD=7.31$) and those who only had a substance related diagnosis ($M=14.5$, $SD=6.54$); $t(460)=2.50$, $p = 0.013$.

We also found a significant difference between those with an anxiety diagnosis ($M=17.2$, $SD=7.52$) and the rest of the sample ($M=14.8$, $SD=6.77$); $t(460)=2.84$, $p = 0.005$.

There were no significant differences in mean internet addiction scores for participants with ADHD or depression and the remaining sample.

Discussion

This cross-sectional study showed an estimated prevalence rate of internet addiction of 4.1%, in a clinical sample of patients in treatment for substance use disorder in Sweden. This prevalence estimate is similar to findings from previous work in Germany that reported a prevalence rate of 4.2% (Wölfling et al. 2013) which lends validity to the present findings. While comparisons could be made with reported prevalence figures from studies conducted in community samples (seemingly ranging between 1% and 35%, (Spada 2014)), the considerable variability in reported prevalence figures indicates that the measurements suffer from problems with validity. Therefore, such a comparison would not be reliable. We conclude based on the present data that internet addiction does not constitute a major clinical issue for patients with substance use disorder. This finding could be interpreted as evidence against the often suggested shared pathophysiology between internet addiction and substance use disorder, which also puts into question the conceptualization of internet addiction as an addictive disorder. This is important given the recent suggestion by the World Health Organization to include "gaming disorder" in the sub-category of "Disorders due to addictive behaviours" in the next version of ICD-11. The suggested overlap between the two problem behaviours may stem more from the confirmatory approach to research in this area, as previously outlined by Billieux and colleagues (2015).

There are a number of limitations to this study. The convenience sampling procedure makes it difficult to generalize the findings from the present sample to the entire group of patients who visit outpatient clinics within the Stockholm Centre for Dependency Disorders. Another clear limitation was the use of a survey to screen for the prevalence of an internet addiction diagnosis. Even though we tried to apply strict cut-offs and introduced a measure of self-reported suffering, the survey-based assessment could have led to both under- and over-estimation of the internet addiction prevalence rate. The results regarding co-occurrence with non-substance related psychiatric disorders should be interpreted with caution as the analyses were based on comparisons of mean internet addiction scores in the full sample, rather than only those who met our strict criteria for having a possible internet addiction. Due to the low prevalence rate of internet addiction in the present sample, this group was too small to use as a basis for establishing co-occurrence with other psychiatric disorders. Finally, even though all of the psychiatric diagnoses were set by physicians, the clinical reality suggests a variety of expertise among the clinicians as well as variety of assessment tools used that we were not able to control for.

There was no significant difference in mean internet addiction scores between substance use disorder patients diagnosed with ADHD or depression and the remaining

sample. However, substance use disorder patients who suffered from any additional non-substance related psychiatric diagnosis reported significantly higher mean internet addiction scores than those without an additional non-substance related psychiatric diagnosis. There was also a significant difference in internet addiction scores between those with an anxiety disorder and those without. This is interesting in light of Young's (Young 1996, 1998) proposition that technology might be used to escape from dysphoric moods, which has later been extended and supported through empirical work (Kardefelt-Winther 2014b, Wang et al. 2015). However, if technology might be used to escape dysphoric moods, and if this explains partly the inflated internet addiction scores, we would also expect this from patients diagnosed with depression which was not the case here. It may be that patients with depression either do not find the same relief in using the internet to escape as patients with anxiety disorders, or the reduced activity related to depression might reduce internet activity as well. Future studies might usefully explore in-depth how patients with anxiety disorder and depression, with or without substance use disorder, use the internet in their lives, particularly for escapism, and whether problematic patterns of use are common and similar or different for the two patient groups. Furthermore, in this study we used a compound variable for anxiety disorder where several anxiety disorders were grouped together. As it seems plausible that specific anxiety disorders may contribute to internet-related problem behaviours, it would be of value for future studies to study different anxiety disorders separately.

Moving forward, greater statistical power would be necessary in future studies to establish the presence of a clinically relevant co-occurrence between internet addiction and substance use disorder as well as between internet addiction and non-substance related psychiatric disorders. Since internet use in general is more popular among young people, it would be relevant to include adolescent patients in future studies. However, due to the fact that the internet is such an integrated part of the lives of young people, it would be even more important for such a study to incorporate strict cut-offs and a measure of suffering for classification. Ideally, future studies would be complemented by clinical interviews with patients rather than relying solely on survey data.

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