

Problematic use of Internet in a sample of psychiatric outpatients: preliminary observations from the “real world”

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Summary. Objective. This study aims to explore the prevalence, characteristics, and psychopathology related to Problematic Use of Internet (PUI), including Internet Addiction (IA), within a sample of psychiatric outpatients. **Methods.** 143 psychiatric stable outpatients (18-65, mean age: 49; F=84) were included in this study, regardless of their categorical diagnosis. Socio-demographic, clinical, psychopathological, and Internet use-related data (PIU-Scale, Internet Addiction Test, devices, use, activities) were collected across the sample. **Results.** The prevalence of PUI ranged between 1% (IAT) and 25% (PIU-S), with a homogeneous distribution of PUI symptoms' severity among the four main psychopathological areas (depressive, bipolar, anxiety, and psychotic disorders). PUI was correlated with age and was higher in students as in the general population. Significant associations were found between PUI symptoms and both personality and eating disorders; PUI was also positively correlated with the presence of other addictions (e.g., alcohol and/or substances). A greater proportion of patients with PUI presented other forms of behavioural addiction compared to non-symptomatic patients. Social media and online shopping, as well as video-streaming, resulted to be the main forms of PUI among patients with problematic use of the Internet. **Discussion.** More studies are required among students diagnosed with eating and personality disorders. The association between PUI and other addictive disorders would support the hypothesis of their common shared pathophysiology. **Conclusion.** Healthcare providers and educators should be made aware of such risks. More studies are needed to confirm such preliminary findings.

Key words. Behavioural addictions, problematic use of Internet, Internet Addiction, psychopathology, psychiatric outpatients.

Introduction

Internet use has become part of daily life, and it has increased worldwide during the last decades.

Utilizzo problematico di Internet in un campione di pazienti psichiatrici ambulatoriali: osservazioni preliminari dal “mondo reale”.

Riassunto. Scopo. Il presente studio ha indagato prevalenza, caratteristiche ed eventuali aspetti psicopatologici associati al fenomeno dell'uso problematico di Internet (PUI), inclusa la dipendenza da Internet (IA), all'interno di un campione di pazienti psichiatrici ambulatoriali. **Metodi.** 143 pazienti psichiatrici in fase di compenso (18-65, età media: 49; F=84) sono stati inclusi nello studio, indipendentemente dalla categoria diagnostica. Sono state analizzate le variabili socio-demografiche, le caratteristiche psicopatologiche e le modalità di uso di Internet (PIU-Scale, Internet Addiction Test, dispositivi, uso, attività). **Risultati.** La prevalenza del PUI è risultata dell'1% (IAT) e del 25% (PIU-S), con una distribuzione omogenea della gravità dei sintomi legati al PUI tra le quattro principali aree psicopatologiche indagate (disturbi dello spettro depressivo, bipolare, ansioso e psicotico). Il PUI è risultato correlato con l'età ed era più presente tra gli studenti, come per la popolazione generale. Associazioni significative sono state riscontrate tra i sintomi legati al PUI e i disturbi di personalità e del comportamento alimentare; il fenomeno del PUI è risultato anche positivamente correlato con la presenza di altre dipendenze (per esempio alcool e/o sostanze). Una maggior proporzione di soggetti con PUI presentava altre forme di dipendenza comportamentale, rispetto ai pazienti non sintomatici. I social media e lo shopping online, così come il video-streaming, sono risultate le principali forme di PUI tra questi pazienti con uso problematico di Internet. **Discussione.** Più studi in merito sono necessari tra studenti con disturbi del comportamento alimentare e di personalità. L'associazione tra PUI e altre dipendenze supporterebbe l'ipotesi di una patofisiologia almeno parzialmente condivisa tra tali disturbi. **Conclusioni.** I professionisti della salute e gli educatori dovrebbero essere a conoscenza di questi rischi. Ulteriori studi sono necessari per confermare questi dati preliminari.

Parole chiave. Dipendenza da Internet, dipendenze comportamentali, pazienti psichiatrici ambulatoriali, psicopatologia, uso problematico di Internet.

Eurostat estimated that around 98% of Europeans accessed the internet at least once a week during 2021¹. Moreover, high Internet accessibility (ranging from 68% to 90%) has been reported within 2019

over about 10 years^{1,2}. In this scenario, characterized by a large and continuous access to the Internet, the Problematic Use of Internet (PUI) arises as a wide range of internet-related problematic behaviours, often classified as “non-substance addictions”³⁻⁵.

Conceptualized as «an Impulse-Control Disorder that does not involve poisoning»⁶, PUI and Internet Addiction (IA) are largely overlapping terms used to describe poorly controlled and risky behaviours related to a dysfunctional use of the Internet (e.g., online videogames, pornography, social media, among others)^{3,7,8}. However, PUI is considered a broader term referring to a heterogeneous and complex phenomenon including, as mentioned above, several forms of Internet dysfunctional use. Amongst various forms of PUI, only Internet Gaming Disorder (IGD) and Gambling Disorder (GD) have recently been included in the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5)⁹. Overall, PUI can lead to the development of addiction symptoms, such as tolerance, craving, and withdrawal symptoms^{3,10}. Such aspects are relevant from the public and mental health point of view^{3,10,11}, especially with the increased diffusion of PUI reported during the Covid-19 pandemic¹¹⁻¹³. On the other hand, IA should be considered as a more specific entity belonging to the groups of PUI and referring to the presence of addictive behaviours/symptomatology. A recent work estimated a high global prevalence of IA, among other forms of digital addictions¹⁴. Further, according to a recent metanalysis including 53,184 participants, a high prevalence for generalized IA¹⁵ was reported. PUI symptoms can be measured using specific questionnaires, such as the Problematic Internet Use Scale (PIU-S)^{16,17} or the Yung’s Internet Addiction Test (IAT)^{18,19}. These scales assess similar but slightly different constructs (respectively PUI and IA) with potential different diagnostic observations that should be better defined and taken into careful consideration while using these instruments.

Several studies have suggested that PUI and IA are particularly diffuse among adolescents, young adults, and students with damaging consequences on life quality and mental health^{14,20-23}. Typical psychiatric symptoms and disorders associated with PUI in adults and adolescents include insomnia²⁴, post-traumatic stress disorder (PTSD)²⁵ and bipolar symptoms²⁶, obsessive-compulsive, depressive, anxious, and attention deficit hyperactivity disorder (ADHD) features²⁷⁻³⁰. However, these latter symptomatologic associations have been considered not specific³¹. Further, a significant association between PUI/IA and co-occurring psychiatric disorders, especially anxiety/depressive disorders, ADHD³¹⁻³⁶, and autism spectrum disorders (ASD)³² has also been highlighted. Of concern are also the comorbidities with eating

disorders³⁷⁻³⁹, substance use disorders^{31,33,39,40}, including alcohol intake^{31,34,39-41}, other behavioural addictions⁴², and personality disorders^{43,44}.

Despite such extensive studies in adolescents and young adults reporting the association between PUI/IA and conditions of mental distress or psychopathological features, little is still known about this phenomenon and its correlates in patients with mental illness. Only a few studies have been conducted in adolescent and adult psychiatric patients with PUI/IA^{21,45-51}. Evidence suggests that PUI leads to worse outcomes in psychiatric disorders, e.g., excessive use of social networks for depression⁵², and increased suicidality^{40,53,54}. Moreover, subjects with PUI and psychiatric disorders have shown a lower quality of life compared to non-psychiatric patients⁵⁵.

Therefore, built on this previous limited evidence, the present study aims to explore the prevalence, characteristics, and psychopathology of PUI-related within a sample of psychiatric outpatients. Based on the reviewed literature, we expected to find a higher level of prevalence of PUI in psychiatric patients respect to the general population. Moreover, we hypothesized that PUI symptoms would be associated with younger age, and with the presence of other behavioural addictions, such as gambling or substance use. Further, we would like to assess if the two main instruments at hand to assess symptoms of PUI and IA, i.e., the Problematic Internet Use Scale (PIU-S)⁹ and the Yung’s Internet Addiction Test (IAT)¹¹, would lead to similar or different outcomes, and gain insight on how their results should be interpreted.

Methods

PARTICIPANTS

All patients referred to the outpatient psychiatric unit of Psychiatry and Clinical Psychopharmacology (University), A. Fiorini Hospital (Latina Province, Italy), were routinely considered for this study regardless of their categorical diagnosis. Inclusion criteria were the following: (i) age between 18 and 65 years; absence of (ii) acute psychiatric symptoms; (iii) neurodegenerative disorders; or (iv) moderate-to-severe intellectual disability. Patients who did not fulfil the mentioned inclusion criteria were excluded from the study. The primary diagnosis, determined by the clinical evaluation following the DSM-5⁹ criteria and reported in the medical records, was considered for all patients, including those with multiple diagnoses. Diagnoses were obtained from their medical records, and participants were subsequently divided into 8 groups, based on their main diagnosis, which were: Anxiety Disorder (AD); Depressive Disorder (DD); Psychotic Disorder (PSyD); Bipolar Disorder (BD); Eating Disorder (ED); Obsessive-Compulsive Disor-

der (OCD); Personality Disorder (PD), including all clusters (A, B and C); and Substance Use Disorder (SUD). Overall, a total of 143 patients (84 females and 59 males; with a mean age of 49; range 18-65 years), were included in this study.

After applying all the inclusion criteria, we collected a sample including 143 patients, 50 (35% of the sample) were with AD; 47 (32,9%) with DD; 17 (11,9%) with PSyD; 14 (9,8%) with BD; 7 (4,9%) with ED; 3 (2,1%) with OCD; 3 (2,1%) with PD; and 2 (1,4%) with SUD. Most of the patients had more than one diagnosis ($N = 105$; 73,4% vs 26,6% of single diagnosis), showing the following psychiatric comorbidities: PD (55,3%), DD (15,8%), SUD (13,2%), AD (10,5%) and ED (2%). For more details on descriptive statistics see Table 1.

MEASURES AND PROCEDURES

The anonymity of personal information was assured, and participants provided their written in-

formed consent. We used a semi-structured interview typically administered to all patients as per standard clinical practice, collecting the following data: (1) socio-demographic information (i.e., age, sex, residence, job status, education level, and marital status); and (2) clinical variables including psychiatric diagnosis; the presence of addictive disorders (behavioural addictions vs substance use disorder) and patient's insight; PUI was evaluated through the Problematic Internet Use Scale (PIU-S)⁹, the Yung's Internet Addiction Test (IAT)¹¹, and an inventory about both Internet device's hold/frequency of use, i.e., PC, smartphone, tablet, smartwatch and videogame console; and main online activities, i.e., none, social media, instant messaging, email, source platform, news sites, entertaining, online streaming, online shopping, gambling, gaming, massive multiplayer online role-playing game (MMORPG), pornography, and drug selling.

PIU-S is a self-report questionnaire having good psychometric properties and internal coherence (Cronbach's $\alpha = 0.88$)⁹. It is widely used to investigate the impact of Internet use on an individual's life (including school, work, relations, personal stress, withdrawal symptoms, and mood alterations). The scale consists of 13 dichotomous (0= “no”; 1= “yes”) items^{9,10}. The total score ranges between 0 to 13, and a cut-off of ≥ 4 is used to assess a problematic use of the Internet (PUI); a score of 1-3 points indicates a mild level of PUI symptoms^{9,10}; for the study, we used the official Italian version (Cronbach's $\alpha = 0.89$)¹⁰.

We also applied the Italian version of IAT, a self-administrated questionnaire with good psychometric proprieties (Cronbach's $\alpha = 0.82$)¹¹. IAT is commonly used to assess the presence of IA and includes 20 items rated on a 5-point Likert scale (from 1= “rarely” to 5= “always”). Typical addiction's symptoms (e.g., salience, excessive use, working neglect, anticipation, lack of control, and social neglect)¹¹ can be identified taking into account the scores: a score of 20-49 indicates normal Internet use, 50-79 is related to occasional or often PUI, a score ≥ 80 is suggestive of presence of IA^{11,12}.

All procedures of the study were conducted according to the Principles of Human Rights.

Results

PREVALENCE OF PUI

Overall, PUI prevalence was different when considering either the PIU-S (25%) or the IAT (1%), showing the differences in psychometric properties between the two questionnaires. More specifically, the receiver operating characteristic (ROC) analysis (the outcome was the admission of having a PUI) indicated that both tests have good diagnostic qualities with

Table 1. Socio-demographic data of the sample N (%).

Age	
18-34	35 (24.48%)
35-50	39 (27.27%)
51-65	69 (48.25%)
Residence	
Province	116 (81.12%)
City	27 (18.88%)
Marital status	
Unmarried	49 (34.27%)
Married	63 (44.06%)
Cohabiting	12 (8.39%)
Divorced	14 (9.79%)
Widowed	5 (3.50%)
Education level	
Elementary	13 (9.09%)
First Grade	49 (34.27%)
Second Grade	61 (42.66%)
University	20 (13.99%)
Job status	
Employee	39 (27.27)
Self-employed	8 (5.59%)
Student	13 (9.09%)
Occasional	6 (4.20%)
Stay-at-home	24 (16.78%)
Retired	21 (14.69%)
Unemployed	32 (22.38%)

the PIU-S being highly sensitive and lower specific, and the opposite for IAT. The suggested cut-off for the questionnaires is respectively 4.5 (PIU-S) and 36.5 (IAT). Considering the prevalence for the PIU-S items and the medium score for IAT one, the distribution of the single questions is shown in Table 2.

RELATIONSHIP BETWEEN PUI AND SOCIO-DEMOGRAPHIC DATA

We conducted a series of analyses in order to evaluate the relationship between the presence of PUI and socio-demographic variables of the sample. In all the analyses, we included both the scores at IAT and PIU-S as measures of PUI. For the continuous vari-

ables (e.g., age and education level), we used bivariate Pearson's correlation, whereas one-way ANOVA analysis was used to compare questionnaires' scores between groups for the categorical variables (e.g., residence, marital status, and job status). We found a significant negative correlation between PUI and age, with $r=-0.49, p<0.01$, and $r=-0.47, p<0.01$, respectively for PIU-S and IAT scores. We also found a significant effect on PUI symptoms of job status, $F_{6,136}=2.98, p<0.01$, for PIU-S score, but not for IAT score, with higher levels of PUI in students. Overall, this analysis indicated that young students had on average a higher presence of PUI. Analysis of the other socio-demographic variables did not show any significant effect on or relationship with PUI.

Table 2. PIU-Scale and IAT. Single items prevalence in the general sample of patients and patients/users with PUI.

Original version	Italian version	General (N=143)	Users with PUI (PIU-S \geq 4) (N=25)
PIU-S (prevalence %)			
*I have never gotten into arguments with a significant other over being online	Non ho mai discusso con una persona per me importante a causa del fatto di essere troppo spesso online	22%	55%
I have been told I spend too much time online	Mi è stato detto che passo troppo tempo online	29%	82%
If it has been a while since I last logged on, I find it hard to stop thinking about what will be waiting for me when I do	Se passa un po' di tempo dall'ultima volta che mi sono loggato, trovo difficile non pensare a cosa mi aspetta quando riaccenderò	20%	58%
*My work and/or school performance has not deteriorated since I started going online	Il mio rendimento scolastico/ lavorativo non è peggiorato da quando ho iniziato a stare online	15%	45%
I feel guilty about the amount of time I spend online	Mi sento in colpa rispetto alla quantità di tempo che passo online	17%	50%
I have gone online to make myself feel better when I was down or anxious	Vado su Internet per sentirmi meglio quando mi sento giù o sono ansioso	31%	79%
I have attempted to spend less time online but have not been able to	Ho provato a trascorrere meno tempo online ma non ne sono stato capace	15%	50%
I have routinely cut short on sleep to spend more time online	Ho ridotto le ore di sonno per poter trascorrere più tempo online	17%	53%
I have used online to talk to others at times when I was feeling isolated	Di solito parlo con altre persone su Internet nei momenti in cui mi sento isolato	28%	74%
I have missed classes or work because of online activities	Ho saltato lezioni o perso ore di lavoro per svolgere delle attività online	5%	18%
I have gotten into trouble with my employer or school because of being online	Mi sono messo nei guai col lavoro o con lo studio a causa del tempo trascorso online	6%	16%
I have missed social engagements because of online activities	Ho mancato degli impegni sociali per essere online	6%	16%
I have tried to hide from others how much time I am actually online	Ho provato a nascondere agli altri quanto tempo trascorro realmente online	8%	26%
* Reverse item			

(Continued)

(Continued) - Table 2.

Original version	Italian version		
IAT (medium score)		General	Users with PUI (PIU-S \geq 4)
A. How often do you find that you stay on-line longer than you intended?	Quanto spesso ti capita di stare on-line per più tempo rispetto a quanto avevi previsto?	1,8	2,9
B. How often do you neglect household chores to spend more time on-line?	Quanto spesso ti capita di rinunciare a svolgere le faccende domestiche per stare on-line?	1,5	2,1
C. How often do you prefer the excitement of the Internet to intimacy with your partner?	Quanto spesso ti capita di preferire l'euforia dello stare su Internet all'intimità con il tuo partner?	1,2	1,7
D. How often do you form new relationships with fellow on-line users?	Quanto spesso ti capita di stringere nuove relazioni/amicizie con individui conosciuti on-line?	1,3	1,7
E. How often do others in your life complain to you about the amount of time you spend on-line?	Quanto spesso le persone intorno a te ti rimproverano la quantità di tempo che spendi on-line?	1,5	2,5
F. How often do your grades or schoolwork suffer because of the amount of time you spend on-line?	Quanto spesso il tuo rendimento scolastico risente della quantità di tempo che spendi on-line?	1,2	1,7
G. How often do you check your e-mail before something else that you need to do?	Quanto spesso ti capita di controllare la tua e-mail /WhatsApp/telefono/notifiche dai social prima di svolgere i tuoi oneri?	2,3	3,4
H. How often does your job performance or productivity suffer because of the Internet?	Quanto spesso la tua performance e produttività lavorativa risentono del tempo che spendi su Internet?	1,3	1,9
I. How often do you become defensive or secretive when anyone asks you what you do on-line?	Quanto spesso ti capita di diventare riservato e vago quando qualcuno ti chiede cosa fai on-line?	1,5	2,5
L. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?	Quanto spesso ti capita di evadere da preoccupazioni e ansie della tua vita rilassandoti on-line?	2	3,3
M. How often do you find yourself anticipating when you will go on-line again?	Quanto spesso ti capita di anticipare il tempo in cui ritorni on-line?	1,6	2,6
N. How often do you fear that life without the Internet would be boring, empty, and joyless?	Quanto spesso ti capita di temere che la vita senza Internet risulterebbe noiosa, vuota, priva di gioia?	1,4	2,3
O. How often do you snap, yell, or act annoyed if someone bothers you while you are on-line?	Quanto spesso ti capita di reagire con rabbia perdendo il controllo se qualcuno ti disturba mentre sei on-line?	1,3	1,9
P. How often do you lose sleep due to late-night logins?	Quanto spesso ti capita di perdere ore di sonno per stare on-line?	1,3	1,9
Q. How often do you feel preoccupied with the Internet when off-line, or fantasize about being on-line?	Quanto spesso ti senti irrequieto o sofferente quando sei off-line o non vedi l'ora di essere on-line?	1,3	1,8
R. How often do you find yourself saying just a few more minutes when on-line?	Quanto spesso ti capita di dire a te stesso “ancora qualche minuto” quando sei on-line?	1,8	2,8

The table describes the comparison between the general sample and the patients/users with PUI: items with a prevalence \geq 50% (PIU-S: 2-6-9-3-1-8) or a score \geq 2.5 (IAT: G-L-A-T-R-M) are referred to coping strategies plus addiction's symptoms like withdrawal, social impairment, tolerance, and anticipation.

RELATIONSHIP BETWEEN PUI AND PSYCHOPATHOLOGY

A one-way ANOVA between groups was realized to evaluate the prevalence of PUI symptoms among different diagnostic groups. No significant main ef-

fect of the group on PUI severity as measured with both PIU-S and IAT was found concerning the main diagnostic groups (DD, PsyD, AD, and BD). However, the effect of the empirically derived diagnostic groups was significant for both PIU-S, $F_{5,155} = 4.39$,

$p < 0.01$, and IAT score, $F_{5,135} = 4.12$, $p < 0.01$. Post-hoc t-tests revealed that the two diagnostic categories of ED and PD reported higher scores respect to the other groups ($p < 0.05$ for all comparisons).

RELATIONSHIP BETWEEN PUI AND ADDICTIONS

An ANOVA test revealed an association between PUI severity and IA's insight of the patients with PUI (PIU-S, $F_{7,135} = 19.74$, $p < 0.01$; IAT, $F_{7,135} = 25.68$, $p < 0.01$), with more severe PUI linked to a reduced insight. Further, in post-hoc analysis, all comparisons related to items evaluating IA's insight were significant ($p < 0.05$).

A Pearson's Chi-Squared test was used to compare the PIU-S's severity group with the presence of another behavioural addiction: although the general effect was significant for "absence of behavioral addictions", post-hoc analysis showed that such addictive behaviors are more frequent in patients with mild-severe PUI (1-3-point score or more) symptoms ($p < 0.05$ for all comparisons). ANOVA analysis also revealed a link between the presence of current or past abuse of substances/alcohol and PUI in both scales (PIU-S, $F_{1,141} = 9.70$, $p < 0.01$; IAT, $F_{1,141} = 10.52$, $p < 0.01$). For more details see also Table 3.

CORRELATIONAL ANALYSIS BETWEEN PUI AND PATTERN OF INTERNET USE

As reported in Table 4, further analysis showed a positive association between PUI, PC, and smartphone use considering both scales. According to the

χ^2 test, instead, we found an association between PIU-S's severity symptoms and some specific activities: mild-severe PUI symptoms were associated with the prevalent use of social networks, instant messaging, source platforms, and online streaming.

Discussion

Although several psychiatric symptoms/disorders have been frequently associated with PUI/IA in adolescent and adult populations^{25-34,56,57}, limited evidence^{21,45-51} on PUI/IA among psychiatric patients is available. This observational study is thus one of the first investigations into the PUI phenomenon, conducted with a sample of psychiatric outpatients, irrespective of their categorical diagnosis. Among the 143 participants enrolled in this study, the prevalence of PUI was estimated between 1% (using the IAT score) and 25% (using the PIU-S score), with these questionnaires showing a different value according to their different intrinsic characteristics. As previously mentioned, the PIU-S and the IAT questionnaires are used to evaluate similar but different conditions, with the IA only being part of a wider and more complex PUI phenomenon. Such results highlight, in line with previous evidence^{58,59}, the need of a unique diagnostic tool to assess this form of behavioral addiction. Such findings would also suggest that IA and PUI, terms widely used in the literature to define the same construct, may be considered as two separate entities. IA appears to describe a more severe condition in comparison to the mild addictive behavior defined by the PUI umbrella.

Table 3. Results' summary of correlational and ANOVA analyses.

Variables	Test		p value	
	PIU-S	IAT	PIU-S	IAT
Socio-demographic data				
Sex	t=-0.36	t=-0.15	p=0.72	p=0.88
Age	r=-0.49	r=-0.47	p<0.01	p<0.01
Residence	F(6,136)=1.87	F(1,141)=1.4	p=0.24	p=0.33
Education level	F(1,141)=0.94	F(3,139)=1.54	p=0.21	p=0.20
Job status	F(6,136)=2.98	F(6,136)=1.87	p<0.01	p=0.09
Psychopathological data				
4 principal diagnostic spectrum (DD, PsyD, AD, BD)	F(3,125)=1.05	F(3,125)=0.52	p=0.37	p=0.67
4 principal diagnostic spectrum plus ED and PD	F(5,155)=4.39	F(5,135)=4.12	p<0.01	p<0.01
Dependency insight	F(7,135)=19.74	F(7,135)=25.68	p<0.01	p<0.01
Other dependencies				
Alcohol/Substances related	F(1,141)=9.70	F(1,141)=10.52	p<0.01	p<0.01
Behavioural addictions	$\chi^2(2)=11.99$	$\chi^2(1)=3.81$	p<0.05	p<0.05

Table 4. Relationship between PUI and online devices/activities.

Variables	Test		p value		Post-hoc analysis with PIU-S		
	PIU-S	IAT	PIU-S	IAT			
Principal devices							
PC	r=0.47	r=0.46	p<0.01	p<0.01			
Smartphone	r=0.39	r=0.36	p<0.01	p<0.01			
PC and smartphone	r=0.50	r=0.48	p<0.01	p<0.01			
Online specific activities					No PUI (0)	Mild symptoms (1-3)	PUI (≥4)
Social network	$\chi^2(2)=38.61$	$\chi^2(1)=8.11$	p<0.019	p<0.01	p<0.05 inverted effect	p<0.05	p<0.05
Instant messaging	$\chi^2(2)=23.70$	$\chi^2(1)=3.20$	p<0.01	p=0.07	p=0.16	p<0.01	p<0.01
Email/source platform	$\chi^2(2)=12.67$	$\chi^2(1)=0.41$	p<0.01	p=0.52	p=0.71	p<0.01	p<0.01
News pages	$\chi^2(2)=8.47$	$\chi^2(1)=0.28$	p<0.05	p=0.59	p<0.01 inverted effect	p=0.33	p=0.75
Entertaining and online streaming	$\chi^2(2)=19.59$	$\chi^2(1)=2.12$	p<0.01	p=0.14	p<0.01 inverted effect	p<0.01	p<0.01
Online shopping	$\chi^2(2)=21.45$	$\chi^2(1)=2.66$	p<0.01	p=0.10	p<0.01 inverted effect	p=0.75	p<0.05

In this study, the PUI phenomenon presented a homogenous distribution among the main psychopathological areas (AD, DD, PSyD, BD, OCD). This result confirmed previous evidence reporting a significant link between PUI, AD, DD and OCD^{27-31,34,56,57}. Further, it adds information on the potential link between PUI and the other diagnostic categories considered (BD; PSyD). This aspect is consistent with findings from a recent study which found no difference in mental health-related Internet use among psychiatric patients with different diagnoses⁴⁵. It is also in line with previous findings³¹ suggesting that, in psychiatric patients, PUI might not be only considered as a sign of addictive behaviors, but also as a way to cope with anxiety-depressive symptoms related to a spectrum of psychological disorders. In fact, according to the “mood enhancement hypothesis”, individuals may escape from negative emotions using recreational activities. Thus, such theory might help to understand the link between depressive/anxiety features and PUI⁶⁰.

Further, it has been found a strong correlation between PUI symptoms’ severity and PD, ED, and other addictions, including both behavioral and substance use (e.g., alcohol and/or substances) disorders. These results are consistent with previous works revealing a significant association between PUI and (i) PD, especially personality clusters A and B (e.g., borderline) and obsessive-compulsive or avoidant traits^{43,44}; (ii) ED^{37-39,61}; (iii) alcohol abuse and addictive disorders^{31,33,34,39-42}.

The relation between PUI and both addictive behaviors and past/current alcohol/substance abuse found in the sample would provide some support to the theory hypothesizing the presence of a common neurobiological mechanism underlying all these disorders^{62,63}, with recent evidence suggesting the involvement of compulsive and impulsive features in several forms of PUI⁶⁰. In fact, evidence suggests the potential role of impulsivity/compulsivity circuits and prefrontal functions (e.g., executive control functions)^{60,62,63} in the generation of PUI, with a continuous call for more studies on this topic.

The level of PUI in this sample of psychiatric outpatients was significantly associated with both age and job status, with younger patients, mainly students, reporting more severe PUI symptoms. These results are consistent with data in the literature reporting a wide presence worldwide of PUI among adolescents, young adults, and students (e.g.,^{14,20-23,42,64-69}), and confirm such demographic variables as relevant risk factors linked to the development of PUI. The findings from our study are also in line with evidence from two recent studies reporting IA in young psychiatric patients^{21,47} and with a study describing the association between PUI, lower age and psychiatric comorbidity in a sample of more than three hundred adult psychiatric patients⁴⁶.

PUI/IA has been linked *per se* to several psychopathological conditions^{25-34,56,57} and to the worsening of their prognosis^{26,40,53} or of patients’ quality of

life^{51,55}. Thus, the results of the present study would highlight the importance for clinicians to monitor Internet usage patterns in psychiatric patients, especially if young, regardless of their diagnosis. Patients in mental health treatment who have behavioral addictions and comorbid PUI might benefit from more targeted education surrounding how to avoid using the Internet to reinforce those behaviors (e.g., using the Internet for online gambling, purchasing drugs or alcohol, or perpetuating disordered eating). This might potentially help to avoid the addictive effect of PUI-related psychopathology in worsening the psychiatric disorders' specific features.

Limitations

This study has the strength to have investigated the PUI phenomenon in a sample of psychiatric outpatients collecting observations from the "real world", while also adding the comparison between IA and PUI. Nevertheless, it also has several limitations: (1) its transnosographic with non-randomized recruitment design does not allow a specific analysis of the PUI phenomenon for each psychiatric categorical diagnosis, with a limited number of subjects for each diagnostic group; (2) participants were evaluated in only one center, thus results of the present study are only preliminary and should be interpreted with caution; (3) diagnoses are clustered, which may influence the homogeneity shown in the spread of PUI among participants; (4) further, data were related to patients' self-reports, with the potential risk of social bias; (5) only psychiatric outpatients in a stable psychopathological condition have been enrolled in such a study, this might have defined a potential selection bias; (6) part of the study was conducted during the COVID-19 pandemic, which is suggested to have contributed to the worsening of PUI^{15-17,60} and this might have influenced the results of our study. Finally, (7) another limiting element *per se* is the lack of a standardized model for the recognition of PUI and its classification, suggesting, in line with previous research^{58,59} the necessity to introduce unanimous diagnostic criteria.

Conclusions

PUI is a growing health concern, and the present study adds further evidence on the association between PUI and psychiatric disorders, with the prevalence of PUI in young students, especially those diagnosed with eating disorders and personality disorders, confirming previous findings. The association between PUI and other addictive disorders would also support the hypothesis of their common shared

pathophysiology. Healthcare providers and educators should be made aware of such risks. Further, longitudinal studies are needed to confirm these preliminary findings and to better define the directionality of the complex relationship between PUI and psychiatric disorders.

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