Psychopathology and personality in problematic internet users

Elementi psicopatologici e di personalità associati all'uso problematico di internet

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SUMMARY. Few studies have addressed the issue of psychopathology and personality of individuals with problematic use of internet. In this study we research psychopathological symptoms, personality traits and predictive variables associated with problematic internet use. The study was conducted on a total of 343 students from four Italian Universities using Pathological Internet Use Scale, Big Five Questionnaire, and Symptom Check List 90 Revised. According to this study 52.7% of the sample shows a problematic internet use while only 7.6% don't suffer from any symptom. More than half of subjects admits to have got into arguments with a significant other over being online, and to have missed social engagements because of online activities. Subjects with problematic internet use scored higher in psychopathological scales. Low levels of Friendliness and Emotional Stability could predict the problematic use of internet. Problematic internet use may be associated with higher psychopathology levels and personality traits.

KEY WORDS. Problematic internet use, Big Five Questionnaire, personality, psychopathology, SCL-90-R.

RIASSUNTO. Pochi studi finora hanno affrontato il problema degli elementi psicopatologici e di personalità associati all'uso problematico di internet. In questo studio vengono analizzati: la psicopatologia, i tratti di personalità e le variabili predittive associati all'uso problematico di internet. Lo studio è stato condotto su un totale di 343 studenti provenienti da quattro università italiane ai quali sono stati somministrati: la Pathological Internet Use Scale, il Big Five Questionnaire e la Symptom Check List 90 Revised. Lo studio ha mostrato che il 52,7% del campione ha un utilizzo problematico di internet mentre solo il 7,6% non ha alcun sintomo. Più della metà dei soggetti ha ammesso di aver discusso con una persona significativa rispetto al fatto di essere spesso online e di aver perso degli impegni sociali a causa delle attività online. Chi ha ammesso di avere problemi di utilizzo di internet ha ottenuto punteggi più alti nelle scale psicopatologiche. Bassi livelli di Cordialità e Stabilità Emotiva potrebbero prevedere un uso problematico di internet. L'uso problematico di internet potrebbe essere associato a livelli più elevati di psicopatologia e a specifici tratti di personalità.

PAROLE CHIAVE. Uso problematico di internet, questionario Big Five, personalità, psicopatologia, SCL-90-R.

INTRODUCTION

Problematic internet use (PIU) is a relatively new entity, for which variants of criteria for impulse control disorders have been proposed, consisting of maladaptive preoccupation with internet use, i.e., irresistible preoccupation or excessive use, conceived as use longer than expected or planned, and clinically significant distress or impairment in social, occupational, or other areas of functioning as a result of internet preoccupation or use[1]. This 'technological addiction'[2] belongs to the 'new addictions', like gambling, shopping addiction, and sex addiction, in which the object is not a chemical substance, but a behavior or a legal, socially acceptable activity[3]. Nevertheless, among the 'new addictions', internet is the most likely to cause problem use due to its easy access, to the time-and-space freedom it allows, and to the sensation of power and control it conveys. In the general population, PIU concerns approximately 1% to 18 % of European users[4], and 6% to 11% American users[5]. A recent Italian study, conducted at High Schools and University Departments in L'Aquila, showed that 23% of the total sample had an internet problematic usage and the 0.7% of total student sample were internet abusers[6]. Similar results were obtained in another recent Italian study[7] where 68% of the student sample spend great amounts of time online and the 9% had a moderate risk to develop the internet abuse.

Adolescents and young adults are the principal users of internet and thus they have greater risk of PIU[8,9]. Usually men have higher PIU issues than the women[10] even if other

results are converging toward a homogenization of the frequency[11,12]. The solicitation to include PIU in the DSM-5[13,14] did not meet the consent of the DSM-5 Task Force, except for internet gaming disorder, which has been included among Condition for Further Study. However, the DSM-5 cautions not to confuse this proposed entity from excessive internet utilization not involving online game playing, like excessive use of social media, such as Facebook or Tweeter, viewing pornography online, and other types of internet addictive or compulsive use[15].

Despite positive effects of internet use on wellbeing were claimed by a longitudinal study[16], there are concerns about its increasing pervasiveness and possible destructive consequences which may result in PIU[17]. Internet addiction has been reported to be comorbid with psychiatric disorders[18,19] depression quite frequently[10,20-23], but also with attention deficit/hyperactivity disorder[24], social phobia[25,26], impulse control and addictive disorders[27], anxiety disorders[28], immature defense mechanism[29] and personality disorders[30,31]. PIU has been related to Cluster A[32,33], and particularly with schizotypal personality[34], Cluster B with borderline[18,31,32], antisocial traits[31,32] and narcissistic[31] and Cluster C with avoidant traits and obsessive-compulsive[18,35].

By now it is not clear to identify whether those psychopathologies are primary or secondary to PIU[36,37]. PIU may represent a social threat for the future, given its continuous expansion and the simultaneous change in social values and increasing impact on youths; in fact, adolescents with internet addiction have the same psychiatric outlook as adolescents with substance use disorders[38], while in high-school students the excessive internet use is related to psychiatric symptoms more than students reporting normal internet use[39].

In this research, we are mainly interested in the study of association between non pathological personality traits and PIU. There are few studies about this topic. Problematic users were found to rank high on self-reliance, emotional sensitivity/reactivity, vigilance, and nonconformist characteristics and low on self-disclosure[20]. Other studies found associations between internet addiction and low self-esteem[40], low sensation seeking[41], and high shyness[42].

Some studies about PIU used the Five Factor Model (FFM) of personality[43]. It has been observed a lack of relationship between personality and internet use, but lower emotional intelligence in high internet users[44]. In undergraduate students, extraversion and conscientiousness were inversely associated with internet use, and in a regression model they predicted it more strongly when the model included work drive[45]. Agreeableness, conscientiousness and emotional stability were found to be negatively correlated with unethical internet use in Malaysian university students[46]. In Australian undergraduate students, higher scores on impulsiveness items correlated with PIU[47]. In employees, conscientiousness correlated inversely with PIU[48].

As few studies have focused on non-pathological personality, the main objective of this research was to explore the relationships between PIU, the FFM of personality, and psychopathology. The second objective was to evaluate possible predictors of PIU among FFM and general psychopathology. Incidentally, we also evaluated the prevalence of PIU in our sample of Italian internet users and the differences according to the gender.

MATERIALS AND METHODS

Participants

The sample consisted of undergraduate and postgraduate students from four Italian Universities (Milano, Rome, Lecce, Palermo). From October 2015 to February 2016, a total of 343 students (97 from Milan; 101 from Rome; 74 from Lecce; 71 from Palermo) responded to a survey posted at each university website. All university sites posted the questionnaires in the same way. The students learned about the test online by visiting the Campus section or the Facebook profile of the University or were informed by their peers. Students wishing to complete the questionnaire obtained their personal ID access code through contacting the study referent by e-mail.

The mean age of our sample was 22.69 years; SD, 3.57; age range, 18-33 for the whole sample; 190 were female [55.4%] with a mean age of 22.99; SD, 3.59; 153 were male [44.6%] with a mean of 22.31; SD 3.53; age did not differ according to gender [t (341)=1.761; p=.079]).

Years of education did not differ significantly between male (15.11; SD=3.32) and female students (16.01; SD=2.60) [t (341)=1.671; p=.199].

Participants filled out an information sheet on the type of internet usage and on average time spent on the net. Everyone reported using the internet from their smartphone and computer; 58% reported using a tablet as well. The average time spent on the network was for men 2h17min (SD=32 min) and for women 2h25min (SD=48 min) [t (341)=1.769; p=.078].

Problematic internet use

PIU was assessed through the Pathological Internet Use Scale (PIU-S)[49]. This scale investigates PIU through responses to 13 (true/false) questions evaluating whether internet use was causing academic, work, or interpersonal problems, personal distress, withdrawal symptoms, or mood-alteration. In translating the PIU-S, we considered the peculiarities of psychological scales in the translation process[50] and trusted the English-to-Italian translation to a bilingual, English mother tongue psychologist and the back-translation to a bilingual, mainly Italian mother tongue psychiatrist. The translation was approved by the author (personal communication with the first author). Table 1 presents the original items of the PIU scale and the Italian translation. Internal consistency coefficient (α) of the Italian version of PIU Scale was 0.89. The split-half reliability coefficient was 0.81.

Psychopathology

Symptoms were assessed through the Symptom Check-List 90-Revised (SCL-90-R)[51]. This is a multidimensional self-rating 90-item scale to screen a broad range of psychological problems. Each of the 90 items is rated on a five-point Likert scale ranging from “not at all” to “extremely”, relating to the distress caused by the symptom. The nine primary symptom dimensions are: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety, paranoid ideation, and psychoticism. The checklist has three global indices of distress, the General Severity Index (GSI), a global index measuring overall mental distress, the Positive Symptom Total (PST), and the Positive Symptom Distress Index (PSDI).

Personality according to the FFM

Personality characteristics were assessed through the Big Five Questionnaire (BFQ)[52]. This questionnaire has been developed to assess the FFM of personality[53]. The construct validity of the BFQ scales has been demonstrated through their high correlations with similar scales of the NEO-PI for both Italian and American samples[54].

The BFQ contains 5 domain scales energy (dynamism and dominance facets), friendliness (cooperativeness and politeness facets), conscientiousness (scrupulousness and perseverance facets), emotional stability (emotion control and impulse control facets), and openness (openness to culture and openness to experiences facets). Each scale contains 24 items, half of which is positively and half negatively phrased as to the scale's label, to control a possible acquiescent response set. In addition, there is a lie (*L*) scale designed to measure a social desirability response set and the tendency to distort meanings of the scores. The *L* scale contains 12 items that are all positively phrased. For each of the 132 items in the questionnaire, there is a 5-point answer scale that ranges from complete disagreement (1= *very false for me*) to complete agreement (5= *very true for me*).

Procedure and statistical analysis

Frequencies and percentage of PIU were computed along with item analyses of the PIU-S. We divided the sample into three clusters of PIU level based on the total score on the PIU-S[49], i.e., No Symptoms (NS, a score of 0), Limited Symptoms (LS, PIU scale score 1-3), and Problematic Use (PU, PIU score ≥4). We performed ANOVA with *post hoc* Scheffé procedure to analyze differences in psychopathological symptoms and personality traits among the above three groups. Bivariate correlations were used to analyze the relationship between personality and psychopathological variables on one side, and internet use on the other. Assuming that areas measured through the BFQ are quite stable personality characteristics, regression analyses were used to identify personality predictors of PIU. PIU was entered as a dependent variable. Independent variables were each of the FFM dimensions. Because of the elevated number of contrasts, we set the level of alpha at .001. All statistics were carried-out through the SPSS-19.

RESULTS

Frequency of PIU

Table 1 shows the frequencies and percentage of 'pathological' response to PIU-S items. More than half of participants scored positive on item 1 (57.1%, getting into arguments with a significant other over being online) and 12 (50.7%, missing social occasions due to online activities). More than one third found it hard to stop thinking about online activities after some time they logged out (item 3, 38.2%). Item 8 was the least represented, suggesting that sleep reduction to increase time online could be very typical of PIU.

Mean PIU-S score was 3.39 (SD=2.36; range 0-9) with no differences between men and women (men, mean=3.52, SD=2.33; women, mean=3.28, SD=2.39; t (341)=-.929, p=.354). Table 2 shows the group distribution of PIU (see

Table 1. Original PIU items, Italian Version of PIU items, frequency and percentage of abnormal response in our sample (*N*=343).

	Original Version	Italian Version	Frequency (% abnormal response)
1*	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	196 (57.1 %)
2	I have been told I spend too much time online	Mi è stato detto che passo troppo tempo online	95 (27.7%)
3	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	131 (38.2 %)
4*	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	102 (29.7 %)
5	I feel guilty about the amount of time I spend online	Mi sento in colpa rispetto alla quantità di tempo che passo online	48 (14 %)
6	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	35 (10.2 %)
7	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	102 (29.7 %)
8	I have routinely cut short on sleep to spend more time online	Ho ridotto le ore di sonno per poter trascorrere più tempo online	26 (7.6 %)
9	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	47 (13.7 %)
10	I have missed classes or work because of online activities	Ho saltato lezioni o perso ore di lavoro per svolgere delle attività online	42 (12.2 %)
11	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	73 (21.3 %)
12	I have missed social engagements because of online activities	Ho mancato degli impegni sociali per essere online	174 (50.7 %)
13	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	92 (26.8 %)

* Reverse item

Table 2. Prevalence of problematic Internet use in our sample (*N*=343).

	Score	Frequencies	Percentage
No symptoms	0	26	7.6%
Low symptoms	1-3	174	39.7%
Problematic internet use	> 4	143	52.7%

procedure) in our sample. Only 7.6% of our sample had no symptoms, while a large majority scored high on the questionnaire, i.e., they had significant PIU (52.7%). In our sample, more than 90% of participants admitted that online activities had impacted their daily lives. The frequencies of men and women in the three categories (no, low, and high symptoms) are not significantly different (chi-square test available on request).

Psychopathology at different internet use levels

Table 3 shows the means, standard deviations, results from a series of ANOVAs on SCL-90-R subscales in the three level of internet use, and correlation with PIU scale. Subjects with PIU scored higher in every SCL-90-R subscale. Only this category reached a significant level of symptoms (Positive Symptom Total - PST), according to results on Italian population[55]. Scheffé comparisons showed that scores on every subscale differed significantly at least in the extreme groups. The correlations between total PIU-S scores and SCL-90-R subscales showed that all psychopathological scales were positively related to PIU.

Big five personality scales at different internet use levels

Table 4 shows means and standard deviations of the BFQ scale score distribution along the three internet use levels and the results of a series of ANOVAs. Problematic users had scored lower with respect to the other two groups on Friendliness and Emotional Stability, and only from the NS on the Energy. Friendliness and emotion stability (Table 4) were inversely correlated to the total PIU score (Energy was also inversely correlated, but this correlation was not so strong). Regression analyses show that low Friendliness and low Emotional Stability could predict PIU (Table 4).

DISCUSSION

This study aimed to correlate PIU, psychopathology and personality in adulthood. We compared three groups composed by individuals with no, limited, and problematic use of internet. The overall prevalence of PIU in our sample of Italian internet users (that was an incidental objectives of this

Table 3. Mean scores (Standard Deviations) on the SCL-90-R scales for each internet use group (NS: no symptoms; LS: limited symptoms; PU: problematic use), ANOVA (F) with *post hoc* Scheffé test, and correlations with the PIU scale.

	ANOVA				Correlation with PIU
	NS	LS	PU	*F*	*r*
Somatization	.36 (.31)°	.52 (.44)	.64 (.50)°	5.07*	.199*
Obsession-compulsion	.29 (.26)°	.60 (.57)°	1.07 (.56)°	47.37*	.530*
Interpersonal sensitivity	.22 (.18)	.53 (.48)	1.07 (.65)°°	50.46*	.542*
Depression	.36 (.31)	.52 (.45)	1.01 (.63)°°	39.84*	.511*
Anxiety	.27 (.27)	.40 (.42)	.76 (.61)°°	24.35*	.388*
Anger-hostility	.26 (.23)	.43 (.45)	.74 (.56)°°	20.28*	.388*
Phobic anxiety	.06 (.11)	.13 (.26)	.33 (.51)°°	12.54*	.233*
Paranoid ideation	.34 (.36)	.56 (.53)	1.11 (.71)°°	39.22*	.498*
Psychoticism	.16 (.22)	.26 (.31)	.64 (.57)°°	35.67*	.534*
GSI	.27	.45	.83°°	49.00*	.547*
PST	19.07	27,52	42.80°°	40.10*	.523*
PSDI	1.29	1.43	1.71°°	26.49*	.368*

GSI= Global Severity Index; PSDI= Positive Symptom Distress Index; PST= Positive Symptom Total.
*$p < .001$
Notes: a) cells with the ° symbol in the rows are significantly different (Scheffé test) *vs*. another in the same row; b) the cells with the symbol °° represent a value significantly different than the other two on the same row.

Table 4. Mean scores (Standard Deviations) on the Big-Five scales for each internet use group (NS, no symptoms, LS, limited symptoms, PU, problematic use), ANOVA (F) with *post hoc* Scheffé test, correlations with the PIU scale, and regression.

	ANOVA				Correlation with PIU	Regression	
	NS, mean (SD)	LS, mean (SD)	PU, mean (SD)	F	*r*	*B*	*t*
Energy	83.04° (8.95)	77.25 (9.15)	76.89° (10.89)	4.39*	-.155*	-.140	-2.591
Friendliness	84.69°(11.68)	77.52° (9.95)	72.62° (9.54)	20.33*	-.359*	-.280*	-4.957
Conscientiousness	81.04 (10.50)	82.21 (10.94)	81.99 (9.92)	.142	-.003	.034	.636
Emotional stability	76.38 (13.80)	74.27 (15.05)	65.99° (10.76)	17.48*	-.333*	-.225*	-3.883
Openness	90.42 (8.99)	84.36 (10.97)	84.59 (11.36)	3.54	-.079	.076	1.347
Lie	28.31 (5.48)	29.71 (6.31)	28.77 (5.33)	1.35	-.099	.038	.710

Notes: a) the first value in the cells indicates the mean, the second the standard deviation; b) cells with the ° symbol are significantly different from others in the same row (Scheffé test); c) ↑ indicates the highest mean; d) ↓ indicates the lowest mean

study) was very high. According to the PIU-Scale, more than 50% of our sample reported a PIU, with no gender differences. This rate appears higher than previous European rates, ranging from 1 to 18%[4,5,56], and recent Italian results, with a prevalence of 23%[6]. This could be the effect of recruitment bias and/or of the methodological approaches to the presence of PIU, that in this study was evaluated only through a self-report measure. For this reason, we do not consider it a safe outcome. However, to study the correlations between variables, we believe that this sample of high internet users has been very useful for empirical testing of research hypotheses.

PIU and general psychopathology

We found PIU to be related with likelihood of general psychiatric disorders, as reflected in higher scores of nine SCL-90-R subscales in PIU group. This first outcome is comparable with results of previous studies. Depression in PIU was found in the study of Dong et al.[57] and te Wildt[58]; obsessive-compulsive was found by Dong et al.[57] and Jang et al.[59]; broadband symptoms with anxiety, hostility, sensitivity and psychoticism were found by Dong et al.[57]. There are also similarities with results obtained by Yen et al.[38]. These authors used the SCL-90, but employed the Chen Internet Addiction Scale to investigate internet addiction, a scale providing a yes/no PIU cut-off without the stratification we used in this study. They also investigated a younger population than ours (15-21 years *vs*. 18-33 years). They found higher scores on the hostility, depression, and phobic anxiety SCL-90 scales, but differently from our results, they observed a lower level of anxiety in people scoring high on internet addiction, whereas we found higher anxiety, and also all other symptom scales, which all correlated with scores on the addiction questionnaire. Internet addiction and psychiatric symptoms may increase vulnerability to each other, with psychiatric symptoms leading to onset or persistence of internet addiction, and internet addiction precipitating psychiatric symptoms[38], but the generalized psychopathology we have found in our sample may reflect an increase in psychiatric symptoms severity due to age, and to long-lasting internet addiction persistence.

PIU and personality traits

We found energy, friendliness, and emotional stability to be lower in the heavier internet use group; these dimensions correlated inversely with the PIU-Scale scores. Individuals with low friendliness, (or disagreeableness) are argumentative, uncooperative, and harsh, showing lack of the appropriate social skills, and they are more likely to have negative social interactions[44,60,61].

Low emotional stability individuals (neurotic), feel anxious, angry, sad, and cope poorly with stress[60]. Emotional stability and problematic use of internet were inversely related also in Peters and Malesky[61], with the group of problematic internet users scoring lower than the other groups. Online communication offers neurotic individuals (low emotional stability) the opportunity to escape face-to-face interactions that may be more stressful for them. Online communication may also help neurotic individuals to avoid the distress caused by face-to-face interaction[61]. Internet is becoming a means of coping with stress. Still, neurotic individuals seem to simply be more comfortable with online interaction. Neurotic individuals, as well as introvert individuals, were reported to be able to better express themselves online than during face-to-face interaction[62]. Neurotic individuals are reported use internet to escape loneliness and to feel as if they are a part of a group[63]; this may be the pathways to excessive internet use.

Introvert individuals tend to fulfill their unmet social needs online[64]; this allows them to remain withdrawn from face-to-face social interaction, anonymous, and control the information they release to others[45,62]. While some previous research has found no relationship between introversion and excessive internet use[44], others have found that introverts are more likely to express their true selves online[62] and are more likely to be excessive internet users[46]. The big-five dimension that most closely approaches extraversion is openness; however, in our study openness did not significantly differ among internet use groups and did not correlate with any PIU scale.

Regression analysis showed that disagreeableness and emotional instability in our sample predicted PIU. This result is different from Buckner et al.[48], and Mottram and Fleming[47], who they find predominantly that low conscientiousness is predictive of misuse of the internet.

However, these two studies use different variables and research designs and are not comparable to the present study.

CONCLUSIONS

The present research appears as a significant contribution to the understanding of PIU. There is few research about PIU, psychopathology, normal personality traits. Our results confirm that PIU individuals have higher psychopathology then non pathological internet users. Among the others characteristics, depression, anxiety and sensitivity are preeminent in PIU subjects. The personality of PIU is constituted of low: energy, friendliness and emotional stability. The last two are significant predictors of PIU.

Our study has several limitations. Given that our online survey was posted through university sites, respondents have self-selected themselves, thus the sample may not be representative of all university students. Furthermore, self-reported measures are bound with higher inaccuracy. Additionally, the multiple questionnaire administration is subjected to the common method bias. Moreover, our design was cross-sectional, preventing inferences about the causal order of relationships from being drawn.

In view of the limitations just exposed, it would be important to replicate this study on a representative population of Italian socio-demographic variables and to extend the study to subjects over 33 years of age or below 15. Moreover, since it is unclear whether the variables of personality is primary, exacerbated or an effect of the PIU, it would be important to be able to carry out a longitudinal study on a sample of initially non-pathological subjects. In addition, the correlations and affinities between PIU profiles and subjects with other types of dependencies should be examined.

Conflict of interests: the authors have no conflict of interests to declare.

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