*ORIGINAL ARTICLE*

**Observational Study**

# Problematic Internet use in drug addicts under treatment in public rehab centers

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## Abstract

*BACKGROUND*
Problematic Internet use (PIU) or Internet addiction has been recognized to be a behavioral addiction characterized by excessive or poorly controlled preoccupations, urges, or behaviors regarding computer use and Internet access that leads to impairment or distress resembling substance abuse.

*AIM*
To investigate the prevalence and characteristics of Internet use and abuse in a group of drug addicts from Southern Italy, by means of a specific questionnaire ["Questionario sull'Utilizzo delle Nuove Tecnologie" (QUNT)].

*METHODS*
All subjects (183) were heavy smokers, almost 50% of them used heroin and/or opioid compounds, 30% alcohol, 10% cannabis, 8% cocaine, and 5% were polydrug users. Almost 10% of the individuals were also suffering from gambling disorder.

*RESULTS*
The time spent online was more than 4 hours a day in the total sample, with a slight prevalence in male subjects. Cocaine and cannabis users spent more than 6 hours online, significantly more than opioid and alcohol abusers. Distribution of the QUNT factors was not different in both sexes. Cocaine users showed higher scores at the "loss of control", "pornography addiction", and "addiction to social networks" factors, for the stimulant effect of this substance. Moreover, 15 out of the total 17 cocaine users were pathological gamblers. Positive and statistically significant relationships were observed between some QUNT factors and body mass index.

*CONCLUSION*

These findings indicate that PIU is less severe in subjects taking sedative substances, such as heroin/opioids and alcohol, than in subjects taking stimulants. Alternatively, it may be used as a "stimulant" trigger in cocaine and cannabis users. Flattening effect of abuse drugs was noted on possible sex-related differences in QUNT items. We observed a sort of "protective" effect of a love relationship and/or living together with a partner, as those engaged subjects showed lower scores on different items than single subjects or those living alone. The relationship between time spent online (and related sedentary lifestyle) and body mass index would suggest that Internet use might be a contributing factor to increasing weight gain and obesity amongst adolescents and young adults worldwide. Our findings also highlighted the specific vulnerability of drug addicts who use stimulants, rather than sedative compounds, to other kinds of behavioral addictions, such as gambling disorder.

**Key words:** Internet; Problematic Internet use; Behavioral addictions; Drug abuse; Rehab centers

**Core tip:** This study investigated the characteristics of Internet use and problematic Internet use (PIU) in drug addicts through a specific questionnaire. The findings indicated that PIU is more common in subjects taking cocaine and cannabis than in subjects taking opioids or alcohol, and that the also affected by pathological gambling disorder. This suggests a favoring role of stimulant drugs towards the development of behavioral addictions. The relationship between time spent online and body mass index indicates that Internet use might be a factor that promotes weight gain and obesity. Addiction prevention should take into consideration PIU, which currently represents a worldwide epidemic.

## INTRODUCTION

New technologies, when used appropriately, undoubtedly constitute a resource that can greatly improve the quality of an individual's life. The Internet is probably one of the biggest revolutions of the last few years because it has transformed the way of communicating, exchanging information, participating in real-time events thousands of kilometers away, and finding easily and rapidly any kind of information[1,2]. In the same way, it should be noted that the mismatched use of the Internet constitutes, especially where predisposing psychopathological factors are present, a real risk for a subject's mental health, as it may become a problem out of his/her control.

In particular, the abuse of the Internet represents the most dangerous and probable threat that may cause serious impairment to the social, psychological, working, and emotional individual adjustments. Over the last 15 years, the number of Internet users has increased by 1000%[3] , as documented by the Internet World Stats, Pigdom, a society that features up to date world Internet usage, population statistics, and other issues[3]. Not surprisingly, as a result, studies on abuse of the Internet have proliferated. This problem is not yet well understood, and research on its etiology is still at its beginning[4].

Problematic Internet use (PIU) or Internet addiction is a behavioral addiction[5] that can be defined as "use of the Internet that creates psychological, social, school, and/or work difficulties in a person's life"[6].

Increasing literature on PIU led the American Psychiatric Association to include Internet Gaming Disorder in section 3 of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5), but the current opinion is that more data are needed before incorporating it in the manual as a condition with a nosological dignity[7-9]. In 2008, Block[7] suggested four diagnostic criteria essential to a possible diagnosis of PIU

as an addictive behavior, as follows: "Excessive Internet use associated with a loss of sense of time; withdrawal, including feelings of anger, depression and tension when Internet is not accessible; tolerance, including the need for better computer equipment, more software, or more hours of use, and adverse consequences, including arguments, lying, poor school/work or vocational achievement, social isolation, and fatigue"[7].

Generally, PIU subjects are not aware that they have a problem[10-12] that may progressively impair family, school, work, or social life[13] or lead to severe social withdrawal[12,14] and even suicide[12,15-17]. Several studies have documented the negative consequences of PIU, but the literature does not reflect a consistent conceptualization of this behavior[18,19]. Specifically, it is unclear whether PIU should be classified as a type of behavioral addiction[19], an impulse control disorder, a subtype of obsessive-compulsive disorder[20-24], or an impaired way of coping with stress[25-27].

The most common symptoms of PIU are similar to those of substance use disorders (SUDs) according to DSM-5[28] including unpredictable behavior and mood[14,15], craving, excessive concerns about Internet activities, and inability to reduce its use[29,30]. Some researchers made some parallelisms with behavioral addictions, including gambling disorder[22,31]. Again, neurobiological studies indicate that PIU shares with SUDs several neurobiological characteristics[15,32-34]. Although PIU has been found frequently comorbid with other psychiatric disorders[35], the literature on the relationship between PIU and SUDs is meager.

The same is true for data on PIU prevalence and characteristics in our country. Therefore, the present study aimed at exploring these phenomena in a peculiar population constituted by individuals following a rehab program for drug addictions in public centers (Servizio Tossicodipendenze, SERT) through a questionnaire called "Questionario sull'Utilizzo delle Nuove Tecnologie" (QUNT) that we had created for this purpose.

## MATERIALS AND METHODS

### Self-assessment questionnaire
A specific interactive platform and website (http://dronet.araneus.it/questionario) on new technologies were created on an external server. The platform allowed access to the self-assessment questionnaire only *via* the Internet.

At the same time, a self-assessment questionnaire referred to the acronym QUNT was developed. The QUNT consists of two sections, one for demographic data and another consisting of 101 items (Appendix 1). Forty-five out of the total 101 items had five possible answers, according to a Likert five-point scale with 1 indicating "completely false" and 5 indicating "completely true"; three items were multiple-choice questions; ten were focused on the use of "instant messaging" (with five possible answers, according to a Likert five-point scale with 1 indicating "completely false" and 5 indicating "completely true"), and 42 items on the use of "social networks" (instant messaging: Whatsapp, Telegram, Skype, and social networks: Facebook, Twitter and Instagram) (with five possible answers, according to a Likert five-point scale with 1 indicating "completely false" and 5 indicating "completely true"). The item #101 was actually a question on the satisfaction/utility or not with the questionnaire. The items considered of greater relevance were put together in order to identify factors built according to *a priori* criteria extrapolated from the data available in the scientific literature[6,26,29]. These factors were "time spent online" (item 2, 3, 4, 5, 6, 7, 25, 33), "social withdrawal" (item 8, 10, 18, 22, 30, 35), "abstraction from reality" (item 11, 13, 24), "loss of control" (item 19, 20, 32, 36), "addiction to pornography" (item 26, 27), "ludopathy" (item 40, 41, 42, 43), and "addiction to social networks" (49, 50, 51, 52, 53, 54, 55, 56, 57). The "addiction to social networks" factor was further divided into the following sub-factors: "Addiction to Facebook" (item 61-75), "addiction to Twitter" (item 76-86), and "addiction to Instagram" (item 86-97). The factor scores were calculated as the sum of the scores obtained in each item divided by the maximum score in percentage. We established the answer 4 (between 4 and 6 hr/d) or 5 (> 6 hr/d) of item 2 "time spent online". As the cut-off points to identify the presence of, respectively, possible or certain/severe PIU, in agreement with current literature, although controversies do exist[8]. In no way it was possible to identify the participants whose anonymity was warranted.

### Data collection procedure
The link for QUNT was communicated to the offices in charge of the territorial outpatient's services for drug-addicted individuals, SERTs, located in the Calabria region, in order to ask their patients to fill it in. A total of 1500 subjects were asked to

fill in the questionnaire on a voluntary basis. The present study was approved by the Ethics Committee at Pisa University.

### Statistical analysis

The independent *t*-test was applied to compare the mean scores of the factors on the basis of these variables: Sex (M/F); single (yes/no living together (yes/no). One-way analysis of variance followed by Bonferroni's test for *post-hoc* was used to assess the comparisons of body mass index (BMI) categories. The $\chi^2$ analysis was used to compare categorical variables. All statistics were carried out by the Statistical Package for Social Sciences (SPSS), version 22 (Armonk, NY, United States)[36].

## RESULTS

### Characteristics of the study population

The returned questionnaires numbered 183, of which 148 (80.87%) were from men and 35 (19.13%) were from women, out of the total 1500 invitations. The majority of the subjects (86, 47%) had completed 8 years of school, 73 (39.9%) the high school, 14 (7.7%) 5 years of primary school, and 10 (5.5%) were graduated. Ninety-two (50.3%) subjects were single, 64 (14.8%) were married, and 27 (14.8%) were involved in a love relationship. The mean length of attendance at the public rehab center was between 1 and 60 mo (mean ± standard deviation (SD): 32 ± 20).

### Types of substance abuse and/or behavioral addiction

The most abused drugs were heroin or opioids (*n* = 88, 48.1%), alcohol (*n* = 55, 30.1%), cannabis (*n* = 20, 9.8%), cocaine (*n* = 17, 7.7%), and amphetamines (*n* = 3, 1.6%). Polydrug abuse (amphetamine, cannabis, cocaine, ecstasy) was present in nine (4.9%) individuals, while gambling disorder was diagnosed in 18 (9.3%). All 183 subjects were heavy smokers (Table 1).

The smartphone was found to be the most common device utilized by all subjects to access the Internet. The time spent online was similar in men and women, 4.12 ± 2.9 h. Interestingly, the time spent online by 30% of cocaine and 25% of cannabis users was significantly higher (> 6 h) than that of the other groups.

### QUNT factors and gender

The distribution of the QUNT factors was not different in the two sexes; however, men using cannabis showed a trend towards higher scores (mean ± SD) at the following factors: "Social withdrawal" (2.44 ± 0.38 *vs* 2.23 ± 0.39, *P* < 0.001) and "abstraction from reality" (3.12 ± 1.74 *vs* 2.24 ± 0.46, *P* < 0.001). Cocaine users showed a higher score than the other subjects at the "loss of control" (3.64 ± 1.12 *vs* 2.51 ± 0.36, *P* < 0.001), "pornography addiction" (3.59 ± 1.44 *vs* 2.54 ± 0.41, *P* < 0.001), and "addiction to social networks" (3.22 ± 0.98 *vs* 2.66 ± 0.76, *P* < 0.001) factors.

### QUNT factors and affective relationship

The analysis of the difference in QUNT factors regarding being single (*n* = 92) or involved in a love relationship (*n* = 91) showed that single subjects had higher scores at the following factors (mean ± SD): "Time spent online" (2.95 ± 0.47 *vs* 2.17 ± 0.44, *P* < 0.001); "social withdrawal" (1.40 ± 0.35 *vs* 1.34 ± 0.32, *P* < 0.001); "abstraction from reality" (1.90 ± 0.40 *vs* 1.56 ± 0.62, *P* < 0.001); "addiction to pornography" (3.12 ± 0.88 *vs* 1.99 ± 0.79, *P* < 0.001); and "addiction to social networks" (2.89 ± 1.08 *vs* 2.06 ± 0.33, *P* < 0.001).

The analysis of the differences between partners living (72) or not living together (17) with the partner showed some significant differences. The following factors showed higher scores in subjects who did not live with the partner *vs* those who lived with the partner: "Time spent online" (3.03 ± 0.53 *vs* 2.16 ± 0.76, *P* < 0.001), "addiction to pornography" (3.15 ± 0.99 *vs* 2.33 ± 0.71, *P* < 0.001), "ludopathy" (3.42 ± 1.08 *vs* 2.96 ± 0.66, *P* < 0.001), and "addiction to social networks" (2.99 ± 0.91 *vs* 2.01 ± 0.44, *P* < 0.001).

### QUNT factors and BMI

The total sample was then subdivided according to the BMI values. Fifteen subjects had a BMI below 18.50 (underweight, UW), 69 between 18.51 and 24.9 (normal weight, NW), 60 between 25 and 30 (overweight, OW), 26 between 30.1 and 34.9 (first degree of obesity, OB1), and 13 greater than 35 (second degree of obesity, OB2). The categories OB1 and OB2 were merged in the category "Obese" (OB). The comparisons of QUNT factor scores in the four BMI categories are reported in Table 2, which shows that the greater the BMI values the greater the scores. Moreover, as shown in Figure 1, as BMI increased the percentage scores of the five factors, "time spent online", "social

| Table 1 Types of substance abuse and/or behavioral addiction | |
| --- | --- |
| | *n* (%) |
| Heroin or opioids | 88 (48.1) |
| Alcohol | 55 (30.1) |
| Cannabis | 20 (9.8) |
| Cocaine | 17 (7.7) |
| Amphetamines | 3 (1.6) |
| Polydrug abuse | 9 (4.9) |
| Gambling disorder | 18 (9.3) |
| Smokers | 183 (100) |

withdrawal", "abstraction from reality", "ludopathy", and "addiction to social network", also trended upward. Finally, fifteen of the total cocaine users were also pathological gamblers (mainly online gamers) and showed a significantly higher score at the "ludopathy" factor (3.20 ± 0.45 *vs* 2.86 ± 0.51, $P < 0.001$).

## DISCUSSION

The present study reports the results of a collaborative survey investigating the prevalence and characteristics of Internet use by new technologies (PCs, smartphones and tablets), as well as of PIU, amongst subjects undergoing a program of rehabilitation in public rehab centers in a region from southern Italy. According to our knowledge, this is the first study carried out in this peculiar adult population, as previously only samples of adolescents were investigated[37].

Several subjects received the invitation from their psychiatrists/psychologists to fill in a questionnaire, the so-called QUNT, which was developed by us for this purpose. The specificity of the QUNT, as compared with those utilized in different studies, is that it is very detailed in order to assess the variety of individual features of both Internet use and PIU. The item 2 "time spent online" was considered crucial to identify the possible presence of PIU when it was between 4 and 6 hr/d (answer 4), or of severe PIU, when it was > 6 hr/d (answer 5).

About 10% of the subjects returned the QUNTs correctly filled in that were valid for statistical analyses. This can be ascribed to the peculiar personality of drug addicts, especially chronic ones that represent the majority of our sample, and it would indicate both a low propensity to collaborative studies and compliance as well as amotivation[38]. The most used device (100% of subjects) to access the Internet was the smartphone. There was a high preponderance of men over women, which reflects the distribution of sexes in public rehab centers in Italy, in agreement with national data showing that the ratio male:female is 4:1[39].

All subjects were heavy smokers, almost 50% of them used heroin and/or opioid compounds, 30% alcohol, 10% cannabis, 8% cocaine, and 5% were polydrug users. Only three subjects were amphetamine users and, therefore, were not included in the statistical analyses. Almost 10% of individuals were also suffering from gambling disorder, while the presence of other psychiatric disorders was set as an exclusion criterion.

The time spent online was quite high, more than 4 hr/d in the total sample, with a slight, albeit not significant prevalence in male subjects. Cocaine and cannabis users spent more than 6 hr/d online, significantly more than opioid and alcohol abusers. Therefore, they were probably affected by a severe PIU, according to the setpoint defined by us (answer 5 of item 2) and literature data[12,40-42]. Taken together, these findings indicate that although PIU is possibly present in all categories of drug addicts, it is less severe in subjects taking sedative substances, such as heroin/opioids and alcohol. Alternatively, it may be used as a "stimulant" trigger in cocaine and cannabis users. This is supported by the high prevalence of gaming disorder amongst cocaine abusers, in agreement with literature data[43-45].

The analysis of the distribution of the QUNT factors showed no sex-related differences and a slight trend towards higher scores at the "social withdrawal" and "abstraction from reality" items in men. This is in contrast with a previous study carried out in healthy subjects that revealed significant differences between men and women. A possible explanation might be the flattening effects of abused drugs that tend to "minimize" sex differences[46]. As compared with the other groups, cocaine
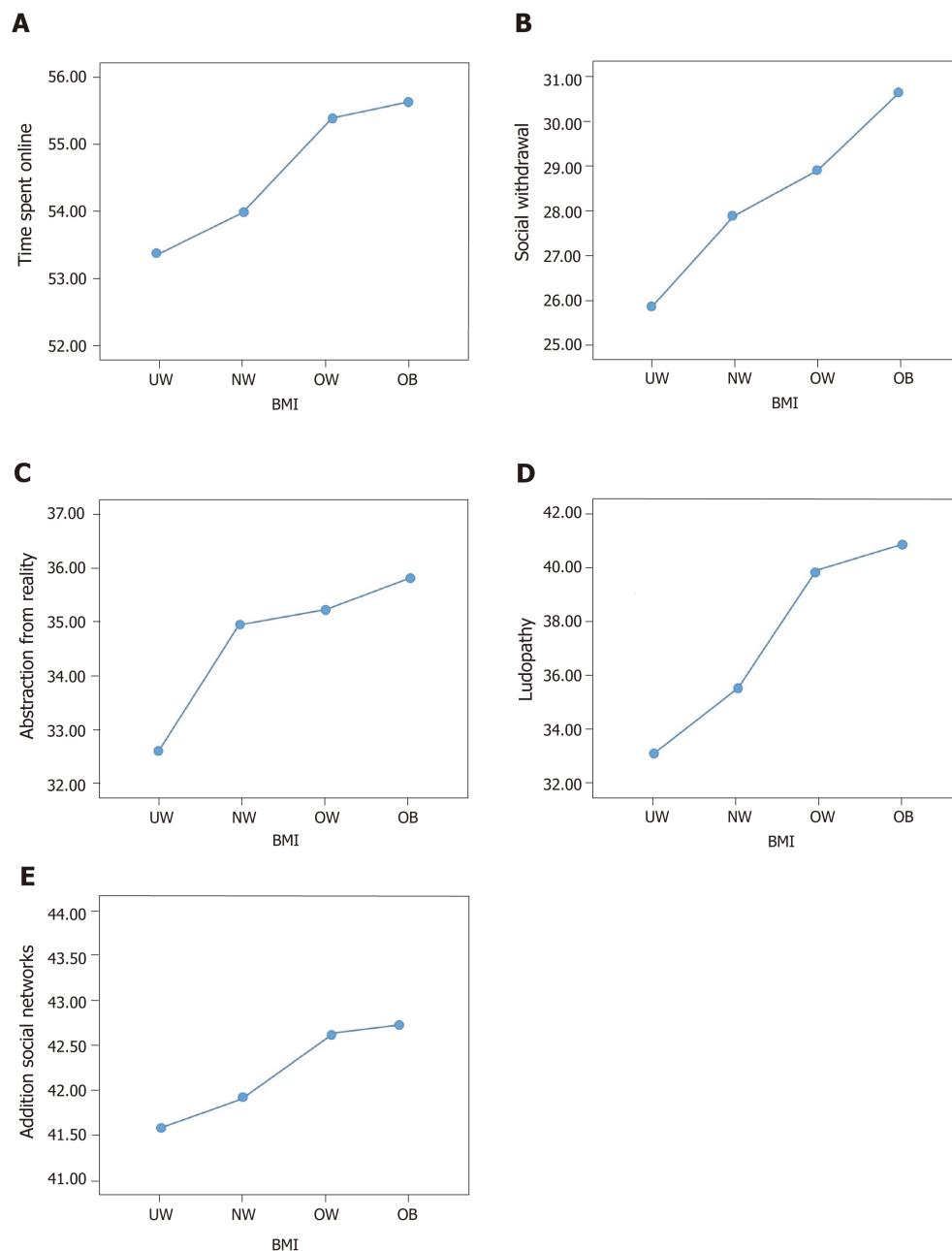
**Figure 1 Trend of the percentage scores of some QUNT factors and body mass index.** A: Time spent online; B: Social withdrawal; C: Abstraction from reality; D: Ludopathy; E: Addiction to social networks. BMI: Body mass index; UW: Underweight; NW: Normal weight; OW: Overweight; OB: Obesity; QUNT: Questionario sull'Utilizzo delle Nuove Tecnologie.

users showed higher scores at the "loss of control", "pornography addiction", and "addiction to social networks" factors. This is not surprising given the stimulant effect of this substance[47].

Our findings confirmed the "protective" effects of a love relationship and/or living together with a partner[48], as single subjects or those living alone with no family support showed higher scores on different items, specifically "time spent online", "social withdrawal", "abstraction from reality", "addiction to pornography", and "addiction to social networks". This clearly indicates that Internet was mainly used for passing time or recreation.

Not surprisingly, those subjects who spent more time online, as shown by the higher score of the "time spent online", "social withdrawal", "abstraction from reality", and "addiction to social network" factors, had a higher BMI. Therefore, the excessive use of the Internet can be considered another factor that increases sedentary behaviors[49], and it may be particularly risky in drug addicts who are already more vulnerable subjects already exposed to different medical diseases[50]. Reduced sleeping time and altered circadian rhythms due to PIU are other factors that may increase the

**Table 2 Comparisons of the QUNT factor scores in the four BMI categories**

| Factors | UW | NW | OW | OB | F | P value | Post-hoc comparison:Significantfor P < 0.05 |
|---|---|---|---|---|---|---|---|
| Time spent online | 53.44 ± 13.68 | 53.80 ± 13.12 | 54.91 ± 12.71 | 55.83 ± 14.10 | 3.87 | 0.009 | OW > UW |
| Social withdrawal | 25.39 ± 6.35 | 27.55 ± 7.61 | 28.73 ± 8.94 | 30.81 ± 10.14 | 9.91 | 0.001 | OW > UW; OB > UW; OB > NW |
| Abstraction from reality | 32.33 ± 10.02 | 34.90 ± 10.13 | 35.11 ± 12.98 | 36.11 ± 13.44 | 2.69 | 0.045 | None |
| Loss of control | 28,10 ± 9.11 | 29.79 ± 10.11 | 31.04 ± 12.49 | 31.21 ± 10.87 | 1.95 | 1.98 | None |
| Addiction to pornography | 43.32 ± 12.28 | 41.95 ± 13.70 | 41.34 ± 11.03 | 42.09 ± 13.45 | 1.55 | 0.250 | None |
| Ludopathy | 33.26 ± 13.17 | 36.23 ± 10.85 | 39.88 ± 22.91 | 41.16 ± 22.39 | 4.28 | 0.005 | OW > NW |
| Addiction to instant messaging | 54.05 ± 18.33 | 56.02 ± 16.47 | 56.24 ± 18.36 | 55.60 ± 17.09 | 1.72 | 0.197 | None |
| Addiction to social networks | 41.60 ± 12.61 | 42.13 ± 13.15 | 41.80 ± 12.19 | 44.14 ± 18.90 | 1.81 | 0.187 | None |

QUNT: Questionario sull'Utilizzo delle Nuove Tecnologie; BMI: Body mass Index; UW: Underweight; NW: Normal weight; OW: Overweight; OB: Obesity.

probability of metabolic, medical, and psychiatric disorders[11,16,51] as well as of a disruption of work, family, social, or school performance[52,53].

Finally, the majority (15 out of the total 17) of cocaine users were also pathological gamblers (mainly online gamers), and showed a significantly higher score at the "ludopathy" factor. This would suggest a specific vulnerability of drug addicts to other kinds of addictions, especially if they use stimulants rather than sedative drugs[43]. Our study has some limitations that should be acknowledged. The QUNT questionnaire was not validated, although this is quite common in studies in this field[12,40-42]. The prevalence of PIU was inferred from one item only, but it was a corollary of the main objective of the study exploring primarily the characteristics of Internet use. Similarly, no information was gathered on emotional distress or disturbed behaviors that are currently under investigation.

Taken together, our results suggest that the excessive use of Internet through smartphones is very common in drug addicts, as shown by their time spent online, and that PIU is very common in these individuals, especially in those taking cocaine and cannabis. The relationship between time spent online (and related sedentary lifestyle) and BMI would suggest that Internet use might be a contributing factor for increased weight and obesity amongst adolescents and young adults world-wide[49,54]. Our findings would suggest specific vulnerability of drug addicts, mainly if they use stimulants rather than sedative compounds, not only to other kinds of pharmacological but also to behavioral addictions, such as PIU or pathological gaming. Prevention of addictions should take into consideration the novel, and still poorly explored, domain of behavioral addictions, especially of PIU that today represents a worldwide epidemic[12,54-56].

## ARTICLE HIGHLIGHTS

### Research background
Problematic Internet use (PIU) is a novel behavioral addiction characterized by excessive Internet use that is becoming an increasing problem worldwide. Although no agreement exists on precise diagnostic criteria, PIU is considered a behavioral addiction sharing with substance use disorders (SUDs) and other addictions several features and perhaps neurobiological underpinnings.

### Research motivation
Unfortunately, no information is available on the prevalence of PIU amongst drug-addicted subjects, in spite of the given evidence, that these individuals tend to be affected by polydrug use and also by behavioral addictions, as if the presence of one or more addictions would represent a sort of vulnerability towards a worsening of the clinical picture through the onset of other kinds of these disorders.

### Research objectives
The investigation of the possible existence and prevalence of PIU amongst drug-addicts under treatment in rehab centers would permit the implementation of specific treatments to prevent the onset of other kind of addictions that could worsen the clinical picture and the rehabilitation programs.

### Research methods
A specific questionnaire to be filled online, the so-called Questionario sull'Utilizzo delle Nuove

Tecnologie (QUNT), was developed to explore the prevalence and characteristics of both Internet use and PIU. The QUNT consists of two sections, one for demographic data and another consisting of 101 items grouped in factors built according to *a priori* criteria extrapolated from the data available in scientific literature. All subjects who volunteered to participate in the study (*n* = 183) reported that the QUNT was useful and were satisfied with it. The factor scores were calculated as the sum of the scores obtained in each item divided by the maximum score in percentage. We chose the answer 4 (between 4 and 6 hr/d), and the answer 5 (> 6 hr/d) of item 2 "time spent online". In order to identify the body mass index (points for, respectively, the possible or certain (and severe) presence of PIU.

### Research results

The time spent online was more than 4 hr/d in the total sample, with a slight, although not significant, prevalence amongst male subjects. Cocaine and cannabis users spent more than 6 hours online, significantly more than opioid and alcohol users. The distribution of the QUNT factors was not different in both sexes. Cocaine users showed higher scores at the "loss of control", "pornography addiction", and "addiction to social networks", probably because of the stimulant effect of this substance. Moreover, 15 out of the total 17 cocaine users were also pathological gamblers. Positive and statistically significant relationships were also observed between some QUNT factors and body mass index (BMI). These results, while showing that PIU is common amongst stimulant drug abusers, require to be replicated in larger samples from other countries. Nevertheless, they underline the risk of behavioral addictions in drug addicts, a problem that should be taken into account when planning prevention and intervention strategies.

### Research conclusions

The new findings of this study are represented by the large percentage of PIU amongst drug addicts, especially if they use cocaine or cannabis. This suggests that, although the abuse of Internet is present in all drug addicts, PIU is less common in subjects taking sedative substances, such as heroin/opioids and alcohol, while it may become a sort of "stimulant" trigger in cocaine and cannabis users, as supported by the high prevalence of pathological gaming amongst cocaine abusers. Further, PIU is more frequent in single subjects or subjects living alone, a result stressing the protective effects of loving or social relationships in general against the onset of addictions. Those subjects who spent more time online, as shown by the higher score of the "time spent online", "social withdrawal", "abstraction from reality", and "addiction to social network" factors, had a higher BMI. Therefore, the excessive use of the Internet can be considered as another factor increasing sedentary behaviors that may be particularly risky in drug addicts, subjects already prone to different medical diseases. Reduced sleeping time and disrupted circadian rhythms due to PIU are other factors that may increase the probability of metabolic, medical, and psychiatric disorders as well as the impairment of work, family, social, or school performance.

### Research perspectives

The findings of the present study indicate that behavioral addictions, such as PIU, can broaden polydrug use, especially in subjects taking stimulants or cannabis. In addition, PIU may be considered another factor increasing negative life habits, already impaired in drug addicts, while promoting sedentary behaviors and maladjustments in different individual's domains. Future studies should take into consideration the impact of PIU on drug addicts by means of specific instru-ments to assess it, in order to prevent, not only its detrimental consequences, but also those related to a broadening of addictive behaviors.

## ACKNOWLEDGEMENTS

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