Prevalence of Pathological Internet Use among University Students and Correlations with Self-Esteem, the General Health Questionnaire (GHQ), and Disinhibition

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ABSTRACT

Over the last few years, there has been increased interest in the addictive potential of the Internet. The current study was an attempt to replicate common findings in the literature and provide more evidence for the existence of Internet addiction among students—a population considered to be especially vulnerable. A total of 371 British students responded to the questionnaire, which included the Pathological Internet Use (PIU) scale, the General Health Questionnaire (GHQ-12), a self-esteem scale, and two measures of disinhibition. Results showed that 18.3% of the sample were considered to be pathological Internet users, whose excessive use of the Internet was causing academic, social, and interpersonal problems. Other results showed that pathological Internet users had lower self-esteem and were more socially disinhibited. However, there was no significant difference in GHQ scores. These results are discussed in relation to the methodological shortcomings of research in the area as a whole.

INTRODUCTION

THE EXPLOSIVE GROWTH of the Internet in the last decade has had a huge impact on psychological research in understanding its role in communication and interpersonal behaviour. There has been increased interest in the addictive potential of the Internet[1] and the effect this can have on psychological well being. Symptoms of Internet Addiction Disorder (sometimes referred to in literature as "pathological Internet use" or "Internet dependency") often include increased preoccupation with online activities, tolerance (e.g., spending increased amounts of time in chat rooms) and symptoms of withdrawal when not online (e.g., anxiety, depression).[2] Griffiths[1] has added salience (whereby the Internet becomes the most important thing in the person's life), mood modification (where the Internet is used to change mood states),

and relapse (where the person returns to the addictive behavior, even after a period of abstinence).

Early research on computer addicts were attempts to describe a typical user. Shotton[3] found that a typical computer addict was male, technologically sophisticated, highly educated, introverted, and less sociable. Following on from Young's studies[4,5] on Internet addiction, there have been a growing number of academic papers about excessive use of the Internet. These can roughly be divided into five categories:

- Studies that compare excessive Internet users with non-excessive users[5,6]
- Case studies of excessive Internet users[4,7–9]
- Studies that examine the psychometric properties of excessive Internet use[10–12]
- Studies examining the relationship of excessive Internet use with other behaviors, e.g., psychi-

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atric problems, depression, loneliness, academic performance)[13–15]

- Studies that have examined vulnerable groups of excessive Internet use, e.g., students[16,17]

Kandell[2] reports there are a number of reasons why college students are particularly vulnerable to becoming addicted to the Internet. Beginning student life is challenging, as it involves developing one's sense of identity (e.g., gaining independence, deciding on a career path, fitting in with peers). These factors can cause psychological symptoms such as depression or stress if the student is finding it difficult to adapt. Parents play a crucial role in that, if they do not allow their child enough independence at home, the student will have problems and may turn to addictive behaviors as a coping mechanism.

Another important part of student life is to develop intimate relationships with romantic partners. If someone is finding it difficult to form romantic relationships because of, for example, shyness or low self-confidence, the Internet provides a perfect medium for interaction through chat rooms or e-mail. However, this type of communication is not as emotional or rich as face-to-face interaction, and the person only gets to see the good aspects of their chat partner. Internet behavior is characterized by disinhibition[18] (i.e., people reveal things about themselves that they would not ordinarily do in real life because of the anonymity of the Internet), so many people find this aspect of the Internet liberating.

Another factor for increased addiction among students is the availability of the Internet. While people in the wider society tend to pay for the amount of time they spend on the Internet, students are most often provided with free and readily available access. In some universities, access is even provided in Halls of Residence, and 24-h access is often available in computer laboratories.

The few empirical studies that exist on Internet addiction have been conducted in the United States and have focused on the U.S. college student population, which is culturally biased and not representative of the whole population of Internet users. However, there have been a number of consistencies found within the literature. Scherer[16] collected data from 531 South American college students to assess the relationship between Internet dependency and patterns of Internet use. The results showed that 13% of weekly Internet users showed dependent patterns that interfered with work, social life, or job performance. Of the sample, 71% of the dependent users were male, while only 29%

were female. The finding that Internet dependent users are more likely to be male is consistent within offline studies.

Anderson[19] conducted a study to extend the findings of Scherer.[16] In order to investigate the differences in the subjects studied by the students and their Internet use, the "majors" were classified into hard sciences (e.g., chemistry, computer science, engineering), arts and sciences (e.g., biology, criminal justice, psychology), and liberal arts (business, English, history). The hard science group were found to spend significantly more time online than the arts and science or the liberal arts group. Furthermore, 9.8% of the sample fitted the criteria for Internet dependence, 93 of whom were male and 13 female. The most common major for fitting the criteria for Internet dependence was computer science (54% of the dependent Internet users), while 74% of the hard science group fitted the criteria, compared to 16% for arts and science and 10% for liberal arts. He found average use to be 100 min per day, with dependents averaging 229 min compared to non-dependents, who averaged 73 min. LaRose et al.[20] found evidence for a relationship between Internet use and reduction in depression among college students. They suggested that students used the Internet for social support, rather than to replace it.

Low self-esteem has been linked to addictive behaviors.[21] Craig[22] reported that people who hold negative evaluations about themselves use addictive substances to escape or withdraw from their low self beliefs. Armstrong et al.[11] investigated whether low self-esteem was also associated with Internet addiction, and found that self-esteem was a good predictor of Internet addiction and amount of time spent online per week. However, the relationship is not clear, as—like depression—low self-esteem may be a consequence rather than a cause of the addiction.

The "disinhibition effect" is also a phenomenon that has been observed in online behavior. People will say and do things on the Internet that they would not ordinarily do in real life. A number of interacting factors contribute to this effect, including anonymity, invisibility, and asynchronicity.[23] Joinson[18] found that, in computer-mediated communication, people disclosed more personal information about themselves compared to face-to-face communication. Factors affecting this were anonymity (i.e., reduced public self-awareness) and heightened private self-awareness. Further to this, Morahan-Martin and Schumacher[24] found that PI users were more socially disinhibited online than non-addicts. However, Armstrong et al.[11] did not find that disinhibition was a good predictor of Internet addiction.

The aim of the current study was to extend research on Internet addiction sample of students from different universities across the United Kingdom, and to see if the patterns of Internet use and abuse found in the literature are also evident among British students. The study was an attempt to replicate findings by Morahan-Martin and Schumacher[24] using their operational definition of "pathological Internet use" and to extend the findings by investigating the relationship among PIU, self-esteem, non-psychotic illness (as measured by the GHQ-12), and disinhibition.

The study also attempted to partly replicate Anderson's[19] findings that Internet dependent students were more likely to study hard science courses. Based on the research outline above, two hypotheses relating to demographics were that PI users were more likely to be males and are likely to study hard science courses and PI users would spend more hours per week using the Internet. Based on the study by Morahan-Martin and Schumacher,[24] it was further hypothesized that PI users would be more socially disinhibited online. The study here extends that of Morahan-Martin and Schumacher's, by including a hypothesis with two variables measuring self-esteem and General Health. As with many other addictions like substance abuse, Internet addiction may be linked to underlying psychological or psychiatric problems that may have contributed to the development of the disorder, or worsened the symptoms. For this reason, the current study included a General Health Questionnaire (GHQ-12) to investigate any correlation between non-psychotic illness and Internet addiction. As a consequence, it was hypothesized that PI users would have lower self-esteem scores and higher scores on the GHQ.

METHODS

Participants

An e-mail entitled "Internet Survey" was sent to class lists from the Nottingham Trent University. The degree courses that were chosen included computing, chemistry, physics, engineering, psychology, law, business studies, English, and journalism. A link to the questionnaire was provided, which students had to click on to fill in the questionnaire. Most participants were recruited from the Nottingham Trent University, as these e-mail addresses were easily accessible. However, in order to obtain a more diverse sample, e-mail addresses of students from other universities were obtained through personal contacts, and these participants were asked to forward the e-mail to other students. Data was collected over a period of 4 weeks. The questionnaire was completed by a self-selecting sample of 371 students (54% female; 46% were male). The mean age of the sample was 21.5 years (SD = 5 years). The participants were from both undergraduate and postgraduate course. For the purpose of this study, they were categorized into hard sciences (computing, chemistry, physics, and engineering), soft sciences (psychology and social sciences, law, business studies), and liberal arts (media studies, English, journalism), based on the classification used by Anderson.[19]

Measures

A questionnaire was created from a number of different standardized measures which assessed demographics, Pathological Internet Use (PIU), General Health, self-esteem, social confidence, and the socially liberating effects of being online.

Demographics. This section included questions about the participants age, sex, course, year of course, years of Internet use (experience), and weekly Internet use.

Pathological Internet Use Scale. This scale was taken from Morahan-Martin and Schumacher,[24] who found it to have high internal reliability. It comprised 13 items relating to problems that excessive Internet use could be causing such as academic/social problems, interpersonal problems, mood-altering symptoms, and withdrawal symptoms. For example, items included "I have been told I spend too much time online," "I have routinely cut short on sleep to spend more time online," and "I have got into trouble with my employer or school because of being online."

General Health Questionnaire. The GHQ-12 devised by Goldberg[25] was used to detect non-psychotic psychiatric morbidity in the general population (e.g., anxiety, depression, self-confidence). It includes 12 items and uses a four-point Likert scale to assess general health at the present time. For example, items included "Have you recently been able to enjoy your normal day-to-day activities?," "Have you recently been able to concentrate on whatever you're doing?," and "Have you recently been losing confidence in yourself?"

Self-Esteem Scale. The Rosenberg Self-Esteem Scale[27] contained 10 items with a four-point Likert

scale and provides an overall evaluation of one's worth or value. For example, items included "I feel that I have a number of good qualities," "I certainly feel useless at times," and "I am able to do things as well as most other people."

Social confidence and socially liberating scales. These were taken from Morahan-Martin and Schumacher[24] and were used to assess the disinhibitory effects of the Internet. They also used a four-point Likert scale. For example, items included "I prefer communicating online to face-to-face communication." "Most of my friends I know from online," and "My online friends understand me better than other people."

Procedure

An e-mail was sent with the title "Internet Survey," which asked the participants to click on the link and fill in the questionnaire for the purpose of a study. Participants were told they would remain anonymous. However, they were given the opportunity to provide their e-mail address if they wanted to find out the results of the study. After 4 weeks of data collection, the data were analyzed.

Statistical analysis

A number of statistical tests were applied to the data including analysis of variance, chi-squares, and multiple regression.

RESULTS

Demographics

PIU was grouped into three categories based on the classification by Morahan-Martin and Schumacher[24]: No Symptoms (NS = 0), Limited Symptoms (LS = 1–3), and PIU (4+). Table 1 shows that 18.3% of the whole sample reached the criteria for PI use as defined by Morahan-Martin and Schu-

macher.[24] Males were significantly more likely than females to be PI users (28.7% vs. 9.5%; χ^2 = 22.59, $p < 0.01$) and females were more likely than males to have no symptoms (37.5% vs. 22.2%; χ^2 = 10.16, $p < 0.01$). Table 2 shows that males had a higher average number of pathological symptoms (mean = 2.6) than females (mean = 1.5). An analysis of variance (ANOVA) revealed that the difference was significant (F[1,369] = 21.46; $p < 0.01$).

Weekly use, age, and experience

Weekly use was a grouping variable. It was found that 37.7% ($n = 140$) reported 1–4 h per week, 25.7% ($n = 95$) reported 5–9 h, 16.2% ($n = 60$) reported 10–14 h, 5.9% ($n = 22$) reported 15–19 h, and 13.2% ($n = 49$) reported more than 20 h per week. A significant difference was found between the groups in weekly use (F[2,363] = 16.83; $p < 0.01$), with PI users reporting greater use (10–14 h per week) compared to those with limited symptoms (5–9 h) and no symptoms (0–9 h). A significant difference was also found between weekly use and mean PIU scores, with more hours per week indicating higher PIU scores (F[4,361] = 9.45; $p < 0.01$) (Table 3). No significant difference was found between groups in age (F[2,364] = 0.81; $p = 0.45$). However, this was expected because of the small variance.

Course and incidence of PIU

To investigate the differences among the degree course and PIU, courses were grouped into hard sciences composed of computing, chemistry, physics, and engineering ($n = 79$), soft sciences composed of psychology, social sciences, sport science, law, and business studies ($n = 275$), and liberal arts (media studies, English, design, and journalism ($n = 11$). Since the liberal arts group was too small, only the other two groups were compared. It was found that 88.6% ($n = 70$) of the hard science group were males, 34.3% of whom had PI use. Furthermore,

TABLE 1. GENDER DIFFERENCES IN INCIDENCE OF PIU (%)

	Total (n = 371)	Male (n = 171)	Female (n = 200)
NS	30.5% (n = 113)	22.2% (n = 38)	37.5% (n = 75)
LS	51.2% (n = 371)	49.1% (n = 84)	53.0% (n = 106)
PIU	18.3% (n = 68)	28.7% (n = 49)	9.5% (n = 19)

PIU, Pathological Internet Use; NS, No Symptoms; LS, Limited Symptoms.

TABLE 2.   GENDER DIFFERENCES IN MEAN PIU SCORES

	Mean	SD
MALE ($n = 171$)	2.6	2.7
FEMALE ($n = 200$)	1.5	2.0
TOTAL ($n = 371$)	2.0	2.5

PIU, Pathological Internet Use.

11% ($n = 9$) of the hard science group were females, one of whom had PI use. The hard science group scored significantly higher on the PIU scale (2.9 vs. 1.6; $F[1,352] = 24.75$; $p < 0.01$). The hard science group was also found to use the Internet more hours per week: mean of 3.0 (10–14 h per week) compared to a mean of 2.1 (5–9 h per week); $F[1,348] = 30.88$; $p < 0.01$.

Differences among the GHQ, socially liberating scale, social confidence, and self-esteem

Course. Hard and soft science differed significantly on the socially liberating scale ($F[1,352] = 48.02$; $p < 0.01$), with the hard science group scoring lower, indicating that they are more liberated online. The hard science group also scored significantly lower on the social confidence scale ($F[1,352] = 45.47$; $p < 0.01$), indicating that they are more confident online, No significant difference was found between the groups on the self-esteem scale ($F[1,352] = 2.85$; $p = 0.092$). Similarly, no significant difference was found between the groups on the GHQ ($F[1,352] = 2.62$; $p = 0.106$).

Pathological Internet Use. No significant difference was found between the groups (NS, LS, and PIU) on the GHQ ($F[2,368] = 2.15$; $p = 0.118$). Significant differences were found on the other scales, with PI users more likely to be more socially liber-

TABLE 3.   WEEKLY INTERNET USE
BY MEAN PIU SCORE

Hours per week	Percentage of sample in each category	Mean PIU score
0–4	37.7	1.3
5–9	25.7	1.8
10–14	16.2	2.8
15–19	5.9	2.0
20+	13.2	3.6

PIU, Pathological Internet Use.

ated ($F[2,368] = 77.44$; $p < 0.01$) and more socially confident ($F[2,368] = 117.47$; $p < 0.01$). PI users were also more likely to have lower self-esteem scores (mean = 19.0) compared to those with limited symptoms (mean = 21.4) and no symptoms (mean = 22.3); $F[2,368] = 6.80$; $p < 0.01$. A stepwise multiple regression analysis was used to determine which variables best predicted the scores on the PIU scale. The most important predictors of PIU were the social confidence and socially liberating scales, which predicted 44.3% of the variance ($F[2,368] = 148.09$; $p < 0.01$). A standardized β coefficient of -0.47 indicated that people with higher social confidence scored higher on the PIU scale, and a standardized β coefficient of -0.24 indicated that people who were more socially liberated online scored higher on the PIU scale. The added variables self-esteem, GHQ, and gender did not predict any more of the variance in PIU.

DISCUSSION

The current study sought to investigate the incidence of PIU among a sample of British students, and look for correlations with standardized measures of general health, self-esteem, and two measures of disinhibition. The findings showed that 30.5% of the 371 students who responded reported no symptoms of PIU, while just over half (51%) reported one to three symptoms, suggesting that they may be experiencing some problems as a result of excessive Internet use. It was also found that 18% of the sample reported four or more symptoms and were considered to be PI users, as defined by Morahan-Martin and Schumacher.[24]

These results were consistent with findings from other studies on Internet addiction among students (e.g., 13% by Scherer[16]; 9.8% by Anderson[19]; 8.1% by Morahan-Martin and Schumacher[24]). However, the percentage found in this study is somewhat higher than other studies. This may be due to a methodological problem of the definition and criteria used to measure PIUs. Although over half of the sample reported limited symptoms (one to three affirmative responses on the PIU scale) and almost one fifth were PI users (four or more affirmative responses), it is very unlikely that this is a true addiction and it is this widespread. One of the problems could be that the cut-off point for PIU is too liberal. Perhaps, PIU should be considered only if the person reports six or more symptoms.

Another limitation to the study was that although the questionnaire was e-mailed to a large number of students, only a small percent of those

e-mailed actually responded. The students that responded were self-selected and those classed as PI users may have been more motivated to respond than those who did not experience any problems related to excessive Internet. This could explain the high percentage of pathological uses, and why Internet addiction may be over-represented in the popular press and literature. As a consequence, the conclusions that are drawn only relate to this particular set of students who wanted to participate in the study. It could be argued that the results are biased towards a population demonstrating psychological problems as they were self-selected.

The first hypothesis that pathological users were more likely to be males was supported with males being almost three times as likely to be PI users (male PIU 28.7%; female PIU 9.5%). Additionally, males had a higher average PIU score compared to females. This is consistent with Anderson[19] who found males were seven times more likely to be dependent than females, Scherer[16] who found that males were almost three times more likely, and Morahan-Martin and Schumacher[24] who found male PIU to be four times higher. However, general online surveys with self-selected samples, such as Young,[5] have found a higher number of dependent females and Brenner[6] found no gender differences in his sample. However, in Young's[5] study, a higher number of females responded to the survey, so it could be possible that males were less likely to respond and admit that they were experiencing problems.

The reason why most studies have found a higher incidence of PIU in males could be because as Griffiths[26] points out that males are more likely to use the Internet to fuel other addictions such as gambling and computer games. One of the limitations of this study is that it did not ask what activities the students engaged in on the Internet. Griffiths[1] suggests that some activities are probably more addictive than others (e.g., chat rooms, role playing games). It could be the case that many students simply use the Internet for educational or information-seeking purposes, or to maintain contact with friends who they no longer see so often. Future studies could therefore be improved by including questions about what students use the Internet for.

The hypothesis that pathological users would be more likely to be doing hard science courses was also supported. The hard science group spent more hours per week on the Internet compared to the soft science group. However, this may be because the vast majority of the hard science group were males (87%). These results were consistent with

findings by Anderson,[19] who found that the hard science group spent 123 min per day compared to the arts and science group (79 min per day). However, Scherer[16] did not find differences in Internet addiction among different academic majors in college students. The hard science group scored significantly higher on the PIU scale than the soft science group and were found to be more socially disinhibited online. However, no difference was found between hard science and soft science on the self-esteem scale or the GHQ-12.

The hypothesis that PI users would spend more hours per week online was supported in that PI users spent more hours online per week (10–14 h) compared to those with limited symptoms (5–9 h) and no symptoms (0–9 h). Just over 13% reported more than 20 h per week online, of which 5.7% were PI users. This is consistent with the findings of Anderson,[19] Scherer,[16] and Young.[5] However, 10–14 h per week is not a very significant amount of time for an addictive behavior, since other addictive behaviors can take over people's lives. For a behavior to interfere with a person's life to the extent that it is causing interpersonal, academic, and social problems, it is unlikely that 10–14 h per week is causing such problems. Again, there is the methodological problem that the results are perhaps overrepresenting pathological users because the cut-off point for addiction is too low.

The hypothesis that pathological users would be more socially disinhibited online was also supported. Pathological users were more friendly, liberated and open online, had more friends online, and had shared intimate secrets online. This is consistent with results by Morahan-Martin and Schumacher.[24] Additionally, the two scales used to measure disinhibition (socially liberating and social confidence scales) were the best significant predictors of PI use, which predicted 44.3% of the variance in PIU. However, these findings are not consistent with Armstrong et al.,[11] who found that impulsivity (as measured by disinhibition) was not a good predictor of Internet addiction and showed no relationship to Internet addiction.

The hypothesis that pathological users would score lower on the self-esteem scale was supported. However, the prediction that pathological users would score higher on the GHQ-12 was not. This finding has important implications in terms of the negative effects of Internet addiction on health. The finding that PI users did not score higher on the GHQ-12, a reliable and standardized measure of non-psychotic illness, shows that those identified as pathologically addicted showed no detriments in psychological well-being as a result of excessive In-

ternet use. This finding questions whether the measure of PIU is actually measuring the concept of addiction, since one would expect a behavioral addiction to have some negative effects on psychological health. The finding is not consistent with other studies that have found a relationship between clinical depression and Internet addiction (e.g., Young and Rodgers[15]). Again, the direction of the relationship cannot be determined from this study. Longitudinal studies into the long-term effects of excessive Internet use would be useful to discover the causal relationship between addiction and depression.

The finding that PI users had lower self-esteem is consistent with Armstrong et al.,[11] who found that self-esteem was a good predictor of Internet addiction and amount of time spent online per week. However, it is still unclear as to whether a poor self-esteem is a cause or consequence of excessive Internet use. It could be the case that a low self-esteem drives people to using the Internet as an escape, as suggested by Craig[22]—especially if students are finding it difficult to adapt to life away from home and fit in with others. Alternatively, it could be argued that Internet addiction leads people to becoming socially isolated, and they are no longer able to socialize in a normal way.

The finding of higher disinhibition and lower self-esteem in PI users deserves more discussion. The anonymity and asynchronicity of communication on the Internet is appealing to many users, as it allows people to present a desirable image of themselves, which people may find very liberating. The findings in this study showed that people have pretended to be someone of the opposite sex, pretended they are someone else, feel completely absorbed, and open up more in online communication. Students, in particular, are vulnerable to Internet addiction because some find it difficult to make friends and fit in.[2] For these reasons, they may choose the Internet as a "safe haven" as the Internet is free of boundaries such as gender, race, class, age, and appearance. In this study, PI users reported that going online made it easier for them to make friends and to escape pressures.

The finding that self-esteem was lower in PI users may be related to the disinhibitory effects of the Internet. If people have a low opinion of themselves and find it difficult to socialize because of their shyness or lack of self-esteem, they may use the Internet as an alternative form of socializing, in which they can open up and gain confidence without having to interact face to face. However, as it was men-

tioned earlier, the direction of the relationship is unclear, as a low self-esteem may be a consequence of excessive Internet use, rather than a cause.

A problem that is evident throughout the literature is that different studies have used different criteria for defining Internet addiction. There are no defined borders as to what "Internet addiction" is, therefore, most studies to date are of an exploratory nature. Future research needs to develop a clear definition of Internet addiction, so that studies are measuring the true components of addiction. Some theorists believe that the best way to define Internet addiction is to base the criteria on recognised DSM criteria for other addictions. Young,[5] for example, based the criteria for Internet dependency on the DSM-IV criteria for psychoactive substance dependence,[27] which feature the core components of addiction (i.e., salience, tolerance, mood modification, withdrawal, conflict, and relapse).[1] However, relatively little is known about Internet addiction, and other theorists have argued that it is more similar to impulse control disorders such as gambling and eating disorders rather than substance abuse disorders.[11]

It is clear that "Internet addiction" is a complex phenomenon that involves many different types of behavior and probably different types of addiction. These important differences tend to be overlooked in the design of these types of studies. There is clearly scope for more in-depth and comprehensive discussion of the factors involved in problematic Internet use, including the possibility that it is not problematic at all. With regards to the instrumentation, the PIU scale may be helpful as a rough and general index of pathological internet use, it is important to remember that "Internet addiction" has yet to be validated as a genuine pathological state. With such scales, researchers are measuring the level of dysfunctional behaviors without truly understanding what specific psychological condition, if any, underlies it. The major concern about studies such as these is that they focus on correlations among general and somewhat ambiguous psychological concepts using scales that have yet to be validated and that tend to overly simplify a complex phenomenon.

Despite all these limitations, this study has supported other research into the addictive potential of the Internet and the increased vulnerability of college students. It has shown that male students, and particularly males in hard science courses, are vulnerable to becoming addicted and experiencing negative consequences in terms of their academic performance and social life, and inability to restrict

their time online, for example. Future research needs to address the implications of the growing number of Internet addicts among the student population. Anderson[19] has suggested limiting student access to the Internet or monitoring the activities they carry out. However, this solution is not practical as many students have unlimited access at home and in halls of residence. Rather than developing preventative methods, other researchers have developed treatment strategies for PI use (e.g., Young[29]), which focus on helping the PI user develop effective coping strategies to change the addictive behavior. Young[29] has also suggested that college counselling centers should increase awareness of the problems associated with excessive Internet use among staff and students alike.

Case studies of Internet addicts may provide more insight into the specific nature of the disorder (e.g., Griffiths[8]). Although evidence from large-scale surveys is valuable for indicating the scale of the problem, the number of "real" addicts may be largely overrepresented. The development of specific clinical criteria from both case studies and quantitative evidence will help to identify those who are genuinely affected by Internet addiction, and provide them with appropriate treatment options.

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