

# Internet Addiction among Students: Prevalence and psychological problems in Japan

JMAJ 49(7•8): 279–283, 2006

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**Key words** Internet addiction, Diagnostic criteria, Prevalence, Psychological problem

The explosive growth of the Internet in the last decade has had a huge impact on communication and interpersonal behavior. Psychological research during the same period has sought to increase understanding of this impact. The Internet was originally designed to facilitate communication and research activities. However, the dramatic increase in the use of the Internet in recent years has led to pathological use (Internet addiction). The effect of Internet addiction includes the impairment of academic performance, psychological well-being, and interaction with peers and family members.

To understand the current status in Japan, this study reviews the prevalence of Internet addiction among students and compares it with that in foreign countries. It also introduces psychological problems concerned with Internet addiction and mobile phone E-mail encountered in a primary care practice.

## Definition of Internet Addiction

Addictive use of the internet is a new phenomenon that many practitioners are unaware of and consequently unprepared to treat. Some practitioners are unfamiliar with the Internet, making its seductive powers difficult to understand. Sometimes its impact on the afflicted person's life is underestimated as many practitioners do not recognize the legitimacy of the disorder. Hence, this paper starts with a review of the diagnostic criteria of internet addiction to help pre-

pare clinicians for this issue.

The best method clinically to detect compulsive use of the internet is to compare it with criteria for other established addictions. Of all the diagnoses referenced in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)<sup>1</sup> pathological gambling was viewed as most akin to this phenomenon. Prior research defined internet addiction as an impulse control disorder that does not entail an intoxicant.

Using pathological gambling as a model, Young<sup>2</sup> developed eight items of criteria of Internet dependency that modified the DSM-IV criteria to be used as a screening device to differentiate “dependent” from “non-dependent” users. The questions are shown in Table 1.

Patients are considered “addicted” when answering “yes” to five or more of the questions and when their behavior cannot be better accounted for by a manic episode. The cut off score of “five” is consistent with the number of criteria used for pathological gambling and seen as an adequate number of criteria to differentiate normal from pathological internet use.

Official criteria for the diagnosis of Internet Addiction Disorder (IAD) along with more information on IAD and subscription information for the Internet Addiction Support Group (IASG) are available on Ivan Goldberg's website.<sup>3</sup>

## Screening Devices for Internet Addiction

How do patients know if they are already addicted

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**Table 1 Diagnostic criteria for Internet addiction according to DSM-IV<sup>2</sup>**

1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate the next on-line session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay on-line longer than originally intended?
6. Have you jeopardized or risked the loss of a significant relationship, job, educational or career opportunity because of the Internet?
7. Have you lied to family members, therapist, or others to conceal the extent of your involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (for example, feelings of helplessness, guilt, anxiety, depression)?

**Table 2 Internet Addiction Test (IAT)<sup>2</sup>**

To assess level of addiction, answer the following questions using this scale: 1=Rarely, 2=Occasionally, 3=Frequently, 4=Often, 5=Always.
1. How often do you find that you stay on-line longer than you intended?
2. How often do you neglect household chores to spend more time on-line?
3. How often do you prefer the excitement of the Internet to intimacy with your partner?
4. How often do you form new relationships with fellow on-line users?
5. How often do others in your life complain to you about the amount of time you spend on-line?
6. How often do your grades or school work suffer because of the amount of time you spend on-line?
7. How often do you check your e-mail before something else that you need to do?
8. How often does your job performance or productivity suffer because of the Internet?
9. How often do you become defensive or secretive when anyone asks you what you do on-line?
10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?
11. How often do you find yourself anticipating when you will go on-line again?
12. How often do you fear that life without the Internet would be boring, empty, and joyless?
13. How often do you snap, yell, or act annoyed if someone bothers you while you are on-line?
14. How often do you lose sleep due to late-night log-ins?
15. How often do you feel preoccupied with the Internet when off-line, or fantasize about being on-line?
16. How often do you find yourself saying "just a few more minutes" when on-line?
17. How often do you try to cut down the amount of time you spend on-line and fail?
18. How often do you try to hide how long you've been on-line?
19. How often do you choose to spend more time on-line over going out with others?
20. How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back on-line?

**Table 3 Prevalence of Internet addiction among students**

Year	Authors	Country	Subjects	Number of Subjects	Percentage of Internet Addiction	Assessment Tool
1997	Scherer <sup>5</sup>	South America	college	531	13.0	Internet dependence
2000	Chou & Hsiao <sup>6</sup>	Taiwan	college	910	5.9	IAS
2000	Morahan-Martin & Schumacher <sup>4</sup>	US	college	283	8.1	PIU scale
2001	Anderson <sup>7</sup>	US	college	1,300	9.8	Internet dependence
2001	Wang <sup>8</sup>	Australia	college	293	9.6	IAD
2002	Mingyi <sup>9</sup>	China	college	500	6.4	IAD
2002	Lin & Tsai <sup>10</sup>	Taiwan	high school	753	11.7	Chinese IAS
2004	Johansson & Gotestam <sup>11</sup>	Norway	12–18 years	3,237	10.7	IAS 40 or more
2004	Sato <sup>12</sup>	Japan	college	242	9.1	IAS 40 or more
2005	Niemz et al. <sup>13</sup>	UK	college	371	18.3	PIU scale
2006	Kim et al. <sup>14</sup>	Korea	high school	1,573	39.6	IAS 40 or more

(IAS: Internet Addiction Scale; PIU: Pathological Internet Use; IAD: Internet Addiction Disorder)

or rapidly tumbling toward trouble? Everyone's situation is different, and it's not simply a matter of time spent on-line. Some patients feel they are addicted with only twenty hours of Internet use, while others who spent forty hours on-line insist it is not a problem to them. It's more important to measure the damage their Internet use causes in their life. What conflicts have emerged in family, relationships, work, or school?

The Internet Addiction Test (IAT) developed by Young<sup>2</sup> appears in his book, *Caught in the Net*. This is a simple exercise that helps people in two ways: 1) If patients already know or strongly believe they are addicted to the Internet, this guide will assist them in identifying the areas in their life most impacted by their excessive Net use; and 2) If they are not sure whether they are addicted or not, this will help determine the answer and begin to assess the damage done. When answering, respondents should only consider the time they spent on-line for non-academic or non-job related purposes. The IAT has been already translated into Japanese and can be used by clinicians for screening in their clinic if they want to rule out Internet addiction (Table 2). After patients have answered all the questions, add the numbers they selected for each response

to obtain a final score. The higher their score, the greater their level of addiction and the greater the number of problems their Internet usage causes. Here's a general scale to help measure their score:

20–49 points: You are an average on-line user. You may surf the Web a bit too long at times, but you have control over your usage.

50–79 points: You are experiencing occasional or frequent problems because of the Internet. You should consider its full impact on your life.

80–100 points: Your Internet usage is causing significant problems in your life. You should evaluate the impact of the Internet on your life and address the problems directly caused by your Internet usage.

Another scale includes Pathological Internet Use Scale (PIUS) developed by Morahan-Martin and Schumacher.<sup>4</sup>

### Prevalence of Internet Addiction

The prevalence of Internet addiction is shown in Table 3. These studies were undertaken using varying instruments, and show that 8–10% of college students have Internet dependence.<sup>4–14</sup> These results were obtained from many college student

**Table 4 Gender difference in addiction<sup>15</sup>**

Addiction	Gender Difference	Addiction	Gender Difference
<b>Substances</b>		<b>Activities</b>	
Alcohol	M>W	Exercise	M=W
Cigarettes	M>W	Television	M=W
Caffeine	M<W	Internet use	M>W
Chocolate	M<W	Video games	M>W
		Gambling	M>W

population studies and are similar to results in Japan, but primary care physicians may also need data based on community samples.

It is difficult to predict the future prospects of Internet dependence. It might be on the increase, or it may fade out. Before drawing any conclusions about this, it is necessary to perform a prevalence study of Internet addiction on a large scale in Japan. Case studies of Internet addicts may also provide more insight into the specific nature of the disorder.

### Characteristics of Internet Addiction

With regard to gender and addiction, Greenberg et al.<sup>15</sup> reported an interesting pattern of gender differences in addictive tendencies (Table 4). Analyses on the individual substances and activities revealed that men reported greater level of addiction to cigarettes, alcohol, video games, gambling, and internet use. On the other hand, women reported greater levels of addiction to chocolate and caffeine. No significant differences were found for exercise or television. Men tend to be addicted to the Internet.

Furthermore, low self-esteem has been linked

to addictive behaviors. Armstrong et al. investigated whether low self-esteem was associated with Internet addiction, and found that self-esteem was a good predictor of Internet addiction and amount of time spent on-line per week. According to Kim et al.<sup>14</sup> the level of depression and suicidal ideation were highest in the Internet-addicts group. Further studies should investigate the direct relationship between psychological health problems and Internet dependence.

### Future Problems of Internet Addiction in Japan

Recently, the use of E-mail on mobile phones among adolescents in Japan has been increasing. New and serious psychological problems have arisen relative to the spread of mobile phones. Some Japanese adolescents with school refusal use the mobile phone E-mail to communicate with their friends excessively. I encountered two cases of high school students with school refusal in a primary care practice. They sent E-mail to their friends more than 200 times a day. They could not stop using mobile phone E-mail, and then were exhausted from sending mail all day, which resulted in depression. They had developed addictive and compulsive behavior to E-mail use on mobile phones, which impaired their academic performance, psychological well-being, and interpersonal relationships with friends and family members.

As shown in the case vignettes of these two high school students, new psychological problems have developed as a result of the change of communication media in Japan. We should pay more attention to adolescents' feelings and then propose possible solutions for problematic behavior among students.

### References

- American Psychiatric Association. Diagnostic and Statistical Manual of the Mental Disorders, 4th ed. Washington DC: American Psychiatric Publishing, Inc.; 1994.
- Young KS. Caught in the Net: How to Recognize the Sign of Internet Addiction and a Winning Strategy for Recovery. New York: John Wiley & Sons; 1996. (Odashima Y. Mainichi Publishing Co.; 1998, translated in Japanese)
- Goldberg I. Internet Addictive Disorder (IAD) Diagnostic Criteria. Available on line at <http://www.psycom.net/iadcriteria.html>
- Morahan-Martin J, Schumacher P. Incidences and correlates of pathological Internet use among college students. *Computers in Human Behavior*. 2000;16:13-29.
- Schere K. College life on-line: healthy and unhealthy Internet use. *J of College Student Development*. 1997;38:655-665.
- Chou C, Hsiao MC. Internet addiction, usage, gratification, and pleasure experience: The Taiwan college students' case. *Computers and Education*. 2000;35:65-80.
- Anderson KJ. Internet use among college students: an exploratory study. *J Am Coll Health*. 2001;50:21-26.
- Wang W. Internet dependency and psychosocial maturity among college students. *Int J Hum Comp*. 2001;55:919-938.
- Mingyi Q. Internet abuse raises concern. Available on line at <http://www.china.org.cn/english/25467.htm>
- Lin SSJ, Tsai CC. Sensation seeking and Internet dependence

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- of Taiwanese high school adolescents. *Comput Hum Behav.* 2002;18:411–426.
11. Johansson A, Gotestam K. Internet addiction: Characteristics of a questionnaire and prevalence in Norwegian youth (12–18 years). *Scand J Psychol.* 2004;45:223–229.
  12. Sato T. Psychiatric consultation in the Internet addiction. *Jpn J Psychiat.* 2004;9:345–351. (in Japanese)
  13. Niemz K, Griffiths M, Banyard P. Prevalence of pathological Internet use among university students and correlations with self-esteem, the General Health Questionnaire (GHQ), and Disinhibition. *Cyberpsychol Behav.* 2005;8:562–570.
  14. Kim K, Ryu E, Chon MY, et al. Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: A questionnaire survey. *Int J Nurs Stud.* 2006;43:185–192.
  15. Greenberg JL, Lewis SE, Dodd DK. Overlapping addictions and self-esteem among college men and women. *Addict Behav.* 1999;24:565–571.