

Original Article**The effect of psychiatric symptoms on the Internet addiction disorder in Isfahan's university students**

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Abstract

BACKGROUND: Internet addiction disorder is an interdisciplinary phenomenon and it has been studied from different viewpoints in terms of various sciences such as medicine, computer, sociology, law, ethics, and psychology. The aim of this study was to determine the association of psychiatric symptoms with Internet addiction while controlling for the effects of age, gender, marital status, and educational levels. It is hypothesized, that high levels of Internet addiction are associated with psychiatric symptoms and are specially correlated with obsessive-compulsive disorder symptoms.

METHODS: In a cross-sectional study, a total number of 250 students from Isfahan's universities were randomly selected. Subjects completed the demographic questionnaire, the Young Diagnostic Questionnaire (YDQ) and the Symptom Checklist-90-Revision (SCL-90-R). Data was analyzed using the multiple logistic regression method.

RESULTS: There was an association between psychiatric symptoms such as somatization, sensitivity, depression, anxiety, aggression, phobias, and psychosis with exception of paranoia; and diagnosis of Internet addiction controlling for age, sex, education level, marital status, and type of universities.

CONCLUSIONS: A great percentage of youths in the population suffer from the adverse effects of Internet addiction. It is necessary for psychiatrists and psychologists to be aware of the mental problems caused by Internet addiction.

KEYWORDS: Internet Addiction, Internet Users, Psychiatric Symptoms.

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In the past decade, most countries were faced with an increasing number of Internet users. In 2009, the Iranian Internet Network Information Center showed that 32 million people had gone online.¹ This number is an indication of the importance of this issue in the lives of Iranians today. With easier access, the Internet has become an integral part of our lives.

Social pathologists, psychologists and education experts are aware of the potential negative impacts of excessive Internet usage and the related physical and psychological prob-

lems.²⁻⁵ People who lose control over their actions in life, and in general, spend more than 38 hours a week online, are considered to have an Internet addiction. Internet addiction usually is described as an impulse control disorder that does not involve the use of an intoxicating drug and is very similar to pathological gambling.⁴

Internet addiction is a problem of modern societies and many studies have considered this issue. The prevalent use of Internet is increasing markedly during these years. Along with all the benefits Internet brings, problems

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of excessive Internet use are becoming apparent. Internet addiction disorder is an interdisciplinary phenomenon and various sciences such as medicine, computer, sociology, law, ethics and psychology have surveyed it from different viewpoints.⁶

The growing number of researches on Internet addiction indicates that Internet addiction is a psychosocial disorder and its characteristics are as follows: tolerance, withdrawal symptoms, affective disorders, and problems in social relations. Internet usage creates psychological, social, school and/or work difficulties in a person's life.⁷ Eighteen percent of a study participants were considered to be pathological Internet users, whose excessive use of the Internet was causing academic, social, and interpersonal problems.⁸ Excessive Internet use may create a heightened level of psychological arousal, resulting in little sleep, failure to eat for long periods, and limited physical activity, possibly leading to the user experiencing physical and mental health problems such as depression, OCD, low family relationships and anxiety.⁴

Problematic Internet use may be associated with subjective distress, functional impairment and Axis I psychiatric disorders.⁹ In addition, many studies have reported associations between Internet addiction and psychiatric symptoms, such as depression, anxiety, loneliness, self efficacy, etc among adolescents.¹⁰⁻¹²

Depression is the most frequently reported psychiatric symptom associated with Internet overuse.^{10,13-15} However, high Internet-addiction score was not significantly correlated with the depression score.¹⁶

An Iranian research found that excessive Internet users feel less responsibility toward the society and their environment, and suffer more from social isolation. They usually feel unsuccessful in their education and work, and they have less social support and low self-esteem.⁶

In spite of the fact that many researchers investigated the relation of Internet addiction and psychiatric symptoms such as depression, there are very few studies which focused on

the association between psychiatric symptoms such as somatization, psychosis and Internet addiction. The past researches were contradictory and their noted findings were quite limited.¹⁷

It is necessary to identify the Internet usage pattern, examine the association between Internet addiction and psychiatric symptoms and explore the psychological features of Internet addiction. The aim of this study was to determine the association of psychiatric symptoms with Internet addiction by controlling for the effects of demographic variables such as age, gender, marital status, and educational levels. It is hypothesized that high levels of Internet addiction are associated with psychiatric symptoms and are specially correlated with obsessive-compulsive disorder (OCD) symptoms.

Methods

A cross-sectional design was used in this study. Based on stratified sampling, a total number of 250 students were randomly selected from four universities including Isfahan University, Isfahan University of Medical Sciences, Islamic Azad University and Isfahan University of Technology. The participants were students who had used the Internet at least once a week for the past 6 months at their home, school, library, coffee net, or any other relative place.

To measure the level of Internet addiction, we used a valid and reliable Persian version of Young Diagnostic Questionnaire (YDQ), Young Internet Addiction test (IAT), and also conducted an interview based on DSM-IV-TR criteria for an impulse control disorder (ICD) and not otherwise specified (NOS).

YDQ which consisted of eight 'yes' or 'no' questions was translated into Farsi. It comprised the questions that incorporated the following aspects of addiction: preoccupation with the Internet, tolerance (a need to spend increasing amounts of time on the Internet to achieve satisfaction), inability to cut back or stop Internet use, spending more time online than intended, adverse consequences in inter-

personal, educational or vocational spheres of life, lying to conceal the true extent of Internet use, or using of the Internet as an attempt to escape from problems. Subjects were considered 'addicted' when answering "yes" to five or more of the questions over a 6-months period. Respondents who answered 'yes' to questions 1 through 5 and at least any one of the remaining three questions were classified as suffering from Internet addiction. The split-half reliability of YDQ was 0.729 and the Cronbach's alpha was 0.713.¹⁸ We chose the modified YDQ by Beard as the eight clinical symptoms of YDQ to assess Internet addiction.⁷ In our study, it had a Cronbach's alpha reliability of 0.71 and P-value of test-retest after 2 weeks was 0.82.¹⁹

IAT is a 20-item self-report with a 5-point scale, based on the DSM-IV diagnostic criteria for compulsive gambling and alcoholism. It includes questions that reflect typical behaviors of addiction. IAT comprises the following components: obsessive behavior related to Internet or chatting, withdrawal symptoms, tolerance, slump in school performance, negligence of family and school life, personal relationship problems, behavioral problems, health trouble, and emotional problems. The severity of addiction was then classified according to the suggested 20-49, 50-79, and 80-100 scores as normal, moderate, and severe, respectively.²⁰ In the present study, we used a Persian version of IAT which had a Cronbach's alpha reliability of 0.89 and the P-value of test-retest after 2 weeks was 0.68.²¹

Symptom Checklist-90-Revision (SCL-90-R) is a multidimensional self-report symptom inventory, developed by Derogatis et al., and its derived Iranian standard version²² was used in this study. The SCL-90-R consisted of 90 questions in total, which were divided into nine symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. Each question contains one of the psychological symptoms in which include Likert spectrum from '1 = no problem' to '5 = very serious' to

describe the extent of the symptoms they had experienced during the last 2 weeks. The nine symptom dimensions were divided into three global indexes such as "global severity index" representing the extent or depth of the present psychiatric disturbance, "positive symptom total" representing the number of questions rated above 1 point, and "positive symptom distress index" representing the intensity of the symptoms. In this study, the Iranian version of SCL-90-R had a Cronbach's alpha reliability of 0.95 and the split-half reliability was 0.88.

Interviews were based on DSM-IV-TR criteria for an impulse control disorder (ICD) not otherwise specified (NOS). They were performed by a psychiatrist who had educated in ICD (diagnosis and treatment) especially in Internet addiction disorder.

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 18.0. Descriptive statistics were used to demonstrate demographics and properties of psychiatric symptoms based on the data. The effective factors on Internet addiction were determined using multiple logistic regression analysis.

Results

Two hundred and fifty students participated in this cross-sectional study. Their age ranged from 19 to 30 years with average of 22.5 ± 2.6 years (mean \pm SD). Out of them 155(62%) were male; 223(89.2%) were unmarried and 202(80.8%) were undergraduates. The average numbers of days and times using Internet per week were 2.1 ± 1.1 and 2.2 ± 1.1 , respectively. Table 1 summarizes some characteristics of students based on their diagnosis of Internet addiction.

Psychiatric symptoms such as somatization, sensitivity, depression, anxiety, aggression, phobias, psychosis except paranoia with associated with diagnosis of Internet addiction controlling for age, sex, education level, marital status, and type of universities. Table 2 summarises the effect size of the relationship between all of nine psychiatric symptoms based on OR (95% CI).

Table 1. Some characteristics of students based on diagnosis of Internet addiction

Demographic Properties		Diagnosis of Internet Addiction		
		Yes n(%)	No n(%)	P
University	Isfahan University of Technology	18(50%)	65(30.4%)	0.145
	Isfahan University	8(22.2%)	68(31.8%)	
	Isfahan University of Medical Sciences	4(11.1)	35(16.4%)	
	Islamic Azad University of Khorasgan	6(16.7%)	46(21.5%)	
Sex	Male	22(61.1%)	73(34.1%)	0.020
	Female	14(38.9%)	141(65.9%)	
Education	Undergraduate& Bachelor	26(72.2)	176(82.2)	0.158
	MSc or PhD	10(27.8)	38(17.8)	
Marital status	Married	4(11.1)	23(10.7)	0.948
	Single	32(88.9)	191(89.3)	
Age (year)	Mean±SD	22.8±3.1	22.5±2.5	0.613

Table 2. Association of psychiatric symptoms with of Internet Addiction (results of multiple logistic regression)

psychiatric symptoms		Diagnosis of Internet Addiction		
		Yes n(%)	No n(%)	Adjusted OR(95%CI)*
Somatization	Normal	22(11.7)	166(88.3)	2.47(1.12-5.47)
	Abnormal	14(22.6)	48(77.4)	
OCD	Normal	12(6.7)	166(93.3)	9.31(3.92-22.1)
	Abnormal	24(33.3)	48(66.7)	
Sensitivity	Normal	24(10.9)	197(89.1)	11.6(4.01-33.7)
	Abnormal	12(44.4)	15(55.6)	
Depression	Normal	20(10.3)	174(89.7)	5.79(2.40-13.8)
	Abnormal	16(29.6)	38(70.4)	
Anxiety	Normal	18(9.6)	170(90.4)	5.47(2.39-12.5)
	Abnormal	18(30.0)	42(70.0)	
Aggression	Normal	22(10.9)	180(89.1)	4.02(1.75-9.25)
	Abnormal	14(30.4)	32(69.6)	
Phobias	Normal	32(13.2)	210(86.8)	11.2(1.57-80.5)
	Abnormal	4(66.7)	2(33.3)	
Paranoia	Normal	32(13.6)	204(86.4)	3.02(0.75-12.1)
	Abnormal	4(33.3)	8(66.7)	
Psychosis	Normal	12(8.4)	131(91.6)	3.06(1.41-6.64)
	Abnormal	24(22.9)	81(77.1)	

*: OR adjusted by age, sex, marital status, education level, and type of university

Discussion

According to our findings, male students tend to use Internet more frequently than females. The risk of Internet addiction in men was about 3 times more than women. However there was not a statistically significant effect of marital status on Internet addiction. Some other studies reported that unmarried male adolescents had a higher tendency toward Internet usage and were at more risk of Internet addiction.^{14,23-27}

In despite of these findings, some studies found no relationships between gender and Internet addiction,²⁸⁻²⁹ but Young found a higher number of females to be dependent on Internet.⁴ These differences in findings might be the result of cultural differences in use of Internet.

We found that Internet addicts had various co-morbid psychiatric disorders. It means that Internet addiction brings with it various dimensions of psychiatric symptoms, which suggests that the addiction could have a negative effect on the mental health status of youth. These findings are consistent with other studies and support previous findings.³⁰⁻³¹

Many studies concluded that preoccupation with Internet use might cause psychiatric problems; Internet addicts had psychological and psychiatric problems, such as depression, anxiety and low self-esteem. Nathan et al. mentioned that problematic Internet use might be associated with subjective distress, functional impairment and Axis I psychiatric disorders, and about 86% of IAD cases were also presented with some other DSM-IV diagnosis.^{9,32} Obsessive-compulsive symptoms are the most related symptoms in both genders in Internet addicts.³³

Whang et al. found a significant correlation between the degree of Internet addiction and negative psychological states such as loneliness, depression, and compulsive behavior.¹⁶ Ha et al. showed that Internet addiction was significantly associated with depressive and obsessive-compulsive symptoms.¹² van den Eijnden et al. reported that instant messenger

use and chatting in chat rooms are positively related to compulsive Internet use after 6 months.³⁴

Yen et al. reported that Internet addiction was associated with symptoms of ADHD and depressive disorders. However, hostility was associated with Internet addiction only in males, and only higher ADHD and depressive symptoms were associated with Internet addiction in female students. An association between Internet addiction and depression was shown in both genders.¹³ Other studies reported a significant positive correlation between the excessive use of the Internet and negative emotions (such as anxiety, depression and fatigue).³⁵⁻³⁶

These findings suggest that Internet usage may provide an environment for individuals to escape from stress in the real world. It also suggests that these individuals tend to become more vulnerable to aggressive behaviors and interpersonal dangers than others. But the causal relationship between hostility (aggression) and Internet addiction needs to be further evaluated in prospective and longitudinal studies. Despite these findings, some researches did not relate Internet addiction to depression, social anxiety, and frustration.^{17,37-38}

Based on the aforementioned studies, it is difficult to draw the conclusion that excessive Internet usage results in an overall negative impact on addicts' lives; only one negative impact can be conclusively leading to interference with academic work, professional performance, daily routines, and mental health and so on. In addition, it is not clear whether excessive use of Internet is the cause or the consequence of mental problems.

Findings on the impacts of excessive Internet usage on addict's mental health are inconclusive. But altogether, the general health of Internet addicts is more at risk than that of normal users.

It is needed to explore the various demographic criteria to enhance the comparative ability of the results. Future research should focus on the role that compulsive Internet use

plays in the development of psychiatric illnesses such as depression or obsessive-compulsive disorder. Since it has yet to be established whether psychiatric symptoms are the cause or the outcome of Internet addiction, researchers need to conduct longitudinal research on the Internet and its users.

Limitations

First, our results did not clearly indicate whether the psychological characteristics in this study preceded the development of Internet addiction behavior or were the outcome of Internet use. Second, the data was collected over a very short period of time and the questionnaires YDQ, IAT and S-CL-90 had their restrictions. The procedure for selecting the sample did not allow us to generalize the results to the non-college population.

Most importantly, we were unable to control or measure the period of time in which individuals had been excessively using the Internet, so it is not known how excessive Internet usage over an extended period of time will affect a person's psychological and physical well-being.

Conflict of Interests

Authors have no conflict of interests.

Authors' Contributions

SSA contributed to the design, literature review, method, and discussion of the paper. MRM contributed to the design, method, results, and discussion of the paper. FJ contributed to the distribution and collection of the questionnaires. ME contributed to the semi structured interview with the students. All the authors have read and approved the content of the manuscript.

References

1. Ministry of Information and Communication Technology, Islamic Republic of Iran. internet branch. 2009. [Online]; [cited 2011 November 15]. Available from: URL:<http://www.ict.gov.ir/>.
2. Griffiths MD. Does Internet and computer addiction exist? Some case study evidence. *Cyber Psychology and Behavior* 2000; 3(2): 211-8.
3. Young KS. Internet addiction: The emergence of a new clinical disorder. *CyberPsychology and Behavior* 1998; 1(3): 237-44.
4. Young KS. *Caught in the Net: How to Recognize the Signs of Internet Addiction and a Winning Strategy for Recovery*. New York: Wiley; 1998.
5. Greenfield DN. Psychological characteristics of compulsive internet use: a preliminary analysis. *Cyberpsychol Behav* 1999; 2(5): 403-12.

Conclusion

With regard to the results of this study, this phenomenon should be considered as a psychological problem that affected the younger generation who are expected to develop the future society. The correct use of Internet should be taught and eventually substituted for miss-uses through appropriate education at home, school and university.

Furthermore, it is necessary for psychiatrists and psychologists who act in the field of mental health, to be aware of mental problems caused by Internet addiction such as anxiety, depression, aggression, job and educational dissatisfaction. They should also be aware of this growing phenomenon and the role that psychology can take in addressing Internet use and abuse.

The problems caused by the use of Internet show that it is necessary to improve the culture of effective Internet usage in the society and families using appropriate education.

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6. Moeedfar S, Habbibpour Getabi K, Ganjee A. Study of Internet addiction between adolescent & young 15-25 years in Tehran University. *Global Media Journal of Tehran University* 2007; 2(4): 55-79.
7. Beard KW, Wolf EM. Modification in the proposed diagnostic criteria for Internet addiction. *Cyberpsychol Behav* 2001; 4(3): 377-83.
8. 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(6): 562-70.
9. Shapira NA, Goldsmith TD, Keck PE, Jr., Khosla UM, McElroy SL. Psychiatric features of individuals with problematic internet use. *J Affect Disord* 2000; 57(1-3): 267-72.
10. Jang KS, Hwang SY, Choi JY. Internet addiction and psychiatric symptoms among Korean adolescents. *J Sch Health* 2008; 78(3): 165-71.
11. Young KS, Rogers RC. The relationships between depression and Internet addiction. *CyberPsychology and Behavior* 1998; 1(1): 25-8.
12. Ha JH, Kim SY, Bae SC, Bae S, Kim H, Sim M, et al. Depression and Internet addiction in adolescents. *Psychopathology* 2007; 40(6): 424-30.
13. Yen JY, Ko CH, Yen CF, Wu HY, Yang MJ. The comorbid psychiatric symptoms of Internet addiction: attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. *J Adolesc Health* 2007; 41(1): 93-8.
14. Ha JH, Yoo HJ, Cho IH, Chin B, Shin D, Kim JH. Psychiatric comorbidity assessed in Korean children and adolescents who screen positive for Internet addiction. *J Clin Psychiatry* 2006; 67(5): 821-6.
15. Whang LS, Lee S, Chang G. Internet over-users' psychological profiles: a behavior sampling analysis on Internet addiction. *Cyberpsychol Behav* 2003; 6(2): 143-50.
16. Kim K, Ryu E, Chon MY, Yeun EJ, Choi SY, Seo JS, et al. Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: a questionnaire survey. *Int J Nurs Stud* 2006; 43(2): 185-92.
17. Alavi SS, Maracy MR, Jannatifard F, Eslami M, Haghghi M. A survey Relationship between Psychiatric symptoms and Internet addiction disorder in students of Isfahan universities. *Scientific Journal of Hamadan University of Medical Sciences and Health Services* 2010; 17(2): 57-65.
18. Johansson A, Gotestam KG. Internet addiction: characteristics of a questionnaire and prevalence in Norwegian youth (12-18 years). *Scand J Psychol* 2004; 45(3): 223-9.
19. Alavi SS, Jannatifard F, Bornamanesh A, Maracy M. The psychometric properties of young diagnostic questionnaire(YDQ) in students Internet users of Isfahan universities. *Proceeding of the 9th consecutive annual meeting of the Iranian psychiatric association*; 2009 November 24-27; Tehran, Iran; 2009.
20. Chang MK, Manlaw SP. Factor structure for Young Internet Addiction Test: A confirmatory study. *Computer in Human Behavior* 2011; 24(6): 2597-619.
21. Alavi SS, Eslami M, Maracy MR, Najafi M, Jannatifard F, Rezapour H. Psychometric properties of Young Internet Addiction test. *Journal of Behavioral Sciences* 2010; 4(3): 185-9.
22. Seiiedhashemi H. Standardization of diagnostic questionnaire mental status (SCL-90-R)in high school students of Zarrinshahr city. Isfahan: University of Isfahan; 2001.
23. Dargahi H, Razavi M. Internet addiction and factors related with it in Tehran city. *Quarterly Journal of Payesh* 2007; 6(3): 265-72.
24. Omidvar A, Saremy A. Description, Ethiology, Prevention, Treatment and Scales of Assessment Internet Addiction Test. Mashhad: Tamrin Publication; 2002.
25. Deangelis T. Is Internet addiction real? *Monitor on Psychology* 2000; 31(4): 4.
26. Ko CH, Yen JY, Yen CF, Lin HC, Yang MJ. Factors predictive for incidence and remission of internet addiction in young adolescents: a prospective study. *Cyberpsychol Behav* 2007; 10(4): 545-51.
27. Yen JY, Yen CF, Chen CC, Chen SH, Ko CH. Family factors of internet addiction and substance use experience in Taiwanese adolescents. *Cyberpsychol Behav* 2007; 10(3): 323-9.
28. Egger O, Rauterberg M. Internet behavior and addiction. Zurich: Work & Organizational Psychology Unit (IFAP), Swiss Federal Institute of Technology (ETH); 1996.
29. Hall AS, Parsons J. Internet addiction: College student case study using best practices in cognitive behavior therapy. *Journal of Mental Health Counseling* 2001; 23(4): 312-27.
30. Yang CK. Sociopsychiatric characteristics of adolescents who use computers to excess. *Acta Psychiatr Scand* 2001; 104(3): 217-22.
31. Kim JS, Chun BC. [Association of Internet addiction with health promotion lifestyle profile and perceived health status in adolescents]. *J Prev Med Public Health* 2005; 38(1): 53-60.
32. Ahn DH. Korean policy on treatment and rehabilitation for adolescents' Internet addiction. *International Symposium on the Counseling and Treatment of Youth Internet Addiction*. Seoul, Korea: National Youth Commission; 2007.

33. Chou C, Condrón L, Belland JC. A Review of the research on Internet addiction. *Educational Psychology Review* 2005; 17(4): 363-88.
34. van den Eijnden RJ, Meerkerk GJ, Vermulst AA, Spijkerman R, Engels RC. Online communication, compulsive Internet use, and psychosocial well-being among adolescents: a longitudinal study. *Dev Psychol* 2008; 44(3): 655-65.
35. Spada MM, Langston B, Nikčević AV, Moneta GB. The role of metacognitions in problematic Internet use. *Computers in Human Behavior* 2008; 24(5): 2325-35.
36. Jenaro C, Flores N, Gomez-Vela M, Caballo C. Problematic Internet and cell-phone use: Psychological, behavioral and health correlates. *Addiction Research and Therapy* 2007; 15(3): 309-20.
37. Sammis J. Video game addiction & depression rates among online video game players. Berkeley: The Wright Institute; 2008.
38. Campbell AJ, Cumming SR, Hughes I. Internet use by the socially fearful: addiction or therapy? *Cyberpsychol Behav* 2006; 9(1): 69-81.