

Prevalence of the Pathological Internet Use in a Sample of Turkish School Adolescents

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Abstract

Background: The Internet addiction, also described as pathological Internet use (PIU), is conceptualized by an individual's inability to control his or her use of the Internet, which eventually causes marked distress and/or functional impairment. The aim of the present study was to investigate the prevalence of the PIU among adolescence, in relation to different Internet activities, and to excessive use of the Internet in Samsun, Turkey.

Methods: A cross-sectional study was conducted between October 1 and 31, 2005 in Samsun, Turkey. In total, 1315 high school students (760 male, 555 female; mean age, 15.2±1.1 years) were recruited. A self-administered questionnaire and Young's Internet Addiction Scale (IAS) was applied to the participants.

Results: Although only 506 (38.5%) of the participants have a computer at their home, total 1054 (80.2%) used a computer at home or public, such as an internet cafe. Eight hundred and ten (76.9%) of the participants, used a computer, to access to the Internet. Of the internet users, 10(1.2%), 161 (19.9%) and 639 (78.9%) were Internet addicts (IAs), possible Internet addicts (PAs), and nonaddicts (NAs), respectively. It is found that males were more likely than females to be pathological users in this study ($P < 0.05$).

Conclusion: Our results still demonstrate that the Internet plays an important role in the lives of Turkish adolescents.

Keywords: *Pathological internet use, Prevalence, Adolescence, Turkey*

Introduction

The Internet has been touted as a revolutionary technology among politicians, academicians, and businessmen (1, 2). The use of the Internet has increased rapidly over the last few years. At the end of the 2007, it is declared that 6.6 billion people are living in the world, 20.0% of them use internet and between 2000 and 2007, the usage rate has increased 265.6%. However, in Turkey that has 70.6 billion populations, 22.5% use internet and the usage rate increased 700.0% between same years (3, 4).

The computer and the Internet are becoming major influences in the lives of adolescent. Because of increasing in the Internet usage has led to various psychological changes in adolescents, some warning voices have been raised on the possible problematic consequences of pathological Internet use (PIU) in recent years (5, 6).

The PIU is conceptualized by an individual's inability to control his or her use of the Internet, which eventually causes marked distress and/or functional impairment (7-12). The term "PIU" usually encompasses alcoholism, drug addiction, and smoking. All include the use and abuse of chemical substances, and the drugs' effects may also confound the disorders. The general DSM-IV diagnostic criteria for substance abuse include function disturbances, use in hazardous situations, legal problems, and continuous use despite serious problems. It shares characteristics of substance dependence such as preoccupation, changes of mood, tolerance, withdrawal, distress, and functional impairment (13).

Studies generally agree that full-time students are more likely to be addicted to the Internet, and they are considered to be at high-risk for problems because of free and unlimited access and flexible

time schedules (2, 14, 15). Other studies find that feelings of loneliness and lack of social support may lead students to become addicted to the Internet (7, 16). This special vulnerability of college students to Internet addiction has been characterized by: an increasing investment of resources on Internet-related activities; unpleasant feelings when off-line, including anxiety, depression, and emptiness; an increasing tolerance to the effects of being on-line and denial of the problematic behaviours (17). Additional negative consequence of heavier Internet use in college students is impaired academic performance (18, 19), although there is no agreement in the literature (16). In Spain, a study carried out with college students has found that only a small percentage of the participants came near to psychopathology use or Internet addiction (20). Prevalence of PIU found between 1.5% and 27.0% at some studies in adolescence (7-10, 14, 21, 22).

There is no an epidemiological study on PIU neither in general nor in adolescence in Turkey. The aim of the present study was to determine the prevalence of the PIU among adolescence, in relation to different Internet activities, and the excessive use of Internet in Turkey.

Materials and Methods

Subjects and Method of Data Collection

A cross-sectional study was conducted between October 1 and 31, 2005 in Samsun, Turkey. Samsun is one of the metropolises in Turkey with an average population of 364 000. There are 9100 high school students at 35 high schools in the city centre. Ten high schools were selected among these schools according to randomly sampled for analysis. The schools were selected from the different districts of Samsun those have different socio-economic levels to prevent bias. A power of 0.80, an alpha of 0.05, and small effect size determined that a sample size of 1315 participants was necessary in this study.

Researchers explained the purpose of the study to the principle and class teachers and asked for their cooperation. When their cooperation was con-

firmed, the researchers went to the classroom where they introduced the purpose of the study and explained how to respond to the questionnaire to potential subjects. The participants filled the questionnaire and Young's Internet Addiction Scale (IAS) by themselves.

Questionnaire

A questionnaire, prepared by the researchers, was designed in a self-administered format. Demographic variables as gender, age, where they used the computer and internet, average weekly internet use, the most activities on computer and internet were assessed.

IAS examines the degree of preoccupation, compulsive use, behavioural problems, emotional changes, and impact on life related to Internet usage (5). It is comprised of 20 multiple-choice questions written at a 5-point Likert scale, classified as rarely, occasionally, frequently, often, and always. It was given a total score ranging from 20 to 100 points, with higher scores reflecting a greater tendency toward addiction. Three types of Internet user groups were identified in accordance with the original scheme of Young: IAs, PAs, and non-addicts (NAs), whose scores on the IAS were higher than 80, 50-79, and below, respectively (10). The internal consistency (Cronbach's alpha) of the IAS was found 0.81, in this study.

Analyses

Descriptive analyses were performed on all data. Data were given as mean \pm standard deviation (SD), median (minimum-maximum) and percentage. Analyses of data were performed by using ANOVA (post hoc Bonferroni test) and Two Sample Kolmogorov-Smirnov Test. The level of significance was set at p less than 0.05.

Results

The mean age of the participants was 15.2 \pm 1.1 yr old. Of the participants, 555 (42.2%) were female. Although only 506 (38.5%) of the participants have a computer at their home, total 1054 (80.2%) used a computer at home or public, such as internet cafe. The median computer usage was

12.0 (3.0-72.0) h per a week. Eight hundred and ten (76.9%) of the participants, used a computer to access to the Internet. There were overlapping percentages of the Internet access at home (50.8%) and in public places such as internet cafe (49.9%).

There were different activities on computer and the internet, which were shown in Table 1.

The internet addiction status of the participants was determined by evaluating the answers given to the questions of IAS and calculating an internet addiction score for each of them. The distribution of the answers was given in Table 2.

The means of IAS scores and Internet experience according to internet addiction were shown in Table 3.

Of the internet users, 10(1.2%), 161(19.9%) and 639(78.9%) were IAs, PAs and NAs, respectively.

It is shown in Table 4 that males were more likely than females to be pathological users.

Table 1: Different activities on computer and the Internet

Computer (n=1054)		
Use internet	810	76.9
Playing games	481	45.6
Listening music	303	28.7
Doing homework	218	20.7
Making computer programme	85	8.1
Internet (n=810)		
Chatting	346	42.7
Information searching	269	33.2
Playing interactive games	181	22.3
Reading/sending e-mail	162	20.0
Surfing	148	18.3

Table 2: The distribution of the questions of IAS (n, %)

Questions	rarely		occasionally		frequently		often		always	
	n	%	n	%	n	%	n	%	n	%
1. How often do you find that you stay on-line longer than you intended?	234	28.9	364	44.9	104	12.8	66	8.1	42	5.2
2. How often do you neglect household chores to spend more time on-line?	529	65.3	208	25.7	35	4.3	23	2.8	15	1.9
3. How often do you prefer the excitement of the Internet to intimacy with your partner?	330	40.7	262	32.3	99	12.2	74	9.1	45	5.6
4. How often do you form new relationships with fellow on-line users?	344	42.5	212	26.2	107	13.2	85	10.5	62	7.7
5. How often do others in your life complain to you about the amount of time you spend on-line?	446	55.1	210	25.9	60	7.4	54	6.7	40	4.9
6. How often do your grades or school work suffer because of the amount of time you spend on-line?	593	73.2	152	18.8	29	3.6	18	2.2	18	2.2
7. How often do you check your e-mail before something else that you need to do?	403	49.8	193	23.8	78	9.6	55	6.8	81	10.0
8. How often does your job performance or productivity suffer because of the Internet?	552	68.1	176	21.7	35	4.3	30	3.7	17	2.1
9. How often do you become defensive or secretive when anyone asks you what you do on-line?	265	32.7	196	24.2	67	8.3	123	15.2	159	19.6
10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?	215	26.5	227	28.0	111	13.7	145	17.9	112	13.8
11. How often do you find yourself anticipating when you will go on-line again?	110	13.6	108	13.3	88	10.9	146	18.0	358	44.2
12. How often do you fear that life without the Internet would be boring, empty, and joyless?	342	42.2	205	25.3	91	11.2	81	10.0	91	11.2
13. How often do you snap, yell, or act annoyed if someone bothers you while you are on-line?	339	41.9	198	24.2	78	9.6	110	13.6	85	10.5
14. How often do you lose sleep due to late-night log-ins?	565	69.8	126	15.6	50	6.2	38	4.7	31	3.8
15. How often do you feel preoccupied with the Internet when off-line, or fantasize about being on-line?	482	59.5	193	23.8	53	6.5	45	5.6	37	4.6

Table 2: Continued....

16. How often do you find yourself saying "just a few more minutes" when on-line?	279	34.4	223	27.5	109	13.5	91	11.2	108	13.3
17. How often do you try to cut down the amount of time you spend on-line and fail?	454	56.0	191	23.6	66	8.1	63	7.8	36	4.4
18. How often do you try to hide how long you've been on-line?	453	55.9	191	23.6	81	10.0	46	5.7	39	4.8
19. How often do you choose to spend more time on-line over going out with others?	395	48.8	213	26.3	70	8.6	77	9.5	55	6.8
20. How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back on-line?	512	63.2	166	20.5	52	6.4	43	5.3	37	4.6

Table 3: The means of IAS scores and Internet experience according to internet addiction

Variables	NAs	PAs	IAs
IAS scores			
Male	37.0 ± 7.4	57.7 ± 6.0	85.6 ± 1.7
Female	35.2 ± 7.1	57.3 ± 5.8	82.7 ± 1.2
<i>p</i>	t=3.22, <0.01	>0.05	t=2.6, <0.05
Internet experience (hour/week)			
Male	12.8 ± 3.1	16.3 ± 1.0	30.3 ± 4.0
Female	12.3 ± 2.2	15.9 ± 2.2	30.6 ± 3.9
<i>P</i>	>0.05	>0.05	>0.05

Table 4: The distribution of gender according to internet addiction groups

	Male (n=476)		Female (n=334)		TOTAL (n=810)		<i>P</i>
	n	%*	n	%*	n	%**	
NAs	342	55.2	278	44.8	620	76.6	<0.05
PAs	127	70.6	53	29.4	180	22.2	
IAs	7	70.0	3	30.0	10	1.2	

* Percentage of line

** Percentage of column

Discussion

A dramatic change did take place in the mid-late 1990s and early 2000s. It is revolution in Information and Communication Technologies. Probably the most notable component of this was the dramatic growth of the Internet in world: about the number of the Internet hosts soared from 17 per 1000 people in 1994 to 200 in 2007 (3). The Internet usage prevalence is increasing in Turkey, too (4). The Internet was used for the first time in 1993 in Turkey and while the prevalence of internet usage was 3.1% in 2000, this had increased to 22.5% by 2007 in Turkey (3, 4). In order that the group is consist of adolescence in present study, the prevalence of internet usage found as a higher percentage than adults.

The rapid growth of the Internet has been accompanied by questions about its impact, both positive and negative, on society and users. The Internet provides a new communication medium that enables access to vast amounts of information across a wide variety of topics. On the other hand, one recurring concern involves 'Internet addicts', whose the Internet usage has become excessive, out of control, and severely disrupts their lives (1, 2, 7). The concept of addiction has been very broadly extended into so-called "excessive appetite disorders" such as pathological gambling and other behaviours, including "love, sex, food, dieting, jogging, television-even religion" and video game play (17, 18), as well as computers (23). The Internet addiction, also described as PIU, is

conceptualized by an individual's inability to control his or her use of the Internet, which eventually causes marked distress and/or functional impairment (7-10).

The interest in the study of new addictions related to new technologies is very recent, with the earliest studies in the 1990s (21). Prevalence of PIU found between 1.5% and 27.0% at some studies (7-10, 14, 21, 22). Although this condition is not seems to be a problem now, it is thought that PIU will be an important problem among adolescence in future in the world (7). On the other hand there is no an epidemiological study on PIU neither in general nor in adolescence in Turkey. In light of these findings, the aim of the present study was to determine the prevalence of the PIU among adolescence, in relation to different Internet activities, and the excessive use of the Internet in Turkey.

There were different activities on computer and the Internet in this study group. While the most intensive activity on computer was the Internet usage, the most intensive activities in the Internet were chatting (47.2%), information searching (33.2%) and playing interactive games (22.3%), similar to the previous studies (7,9). Home (50.8%) and internet cafe (49.9%) were the common places where the participants had accessed the Internet, in this study. Griffiths (24) was found that, the Internet addicted students tended to surf the Internet at internet cafes rather than at school. On the other hand online activities or applications (such as chat rooms or online games) are also an important factor used in determining Internet addiction, in Young's study, dependents used predominately two-way communication functions such as chat rooms, role-playing games, newsgroups, or email, whereas non-dependents most likely used information-gathering functions available on the Internet such as Information Protocols and the World Wide Web (1). The prevalence of the Internet usage of Korean adolescents between 6 and 19 yr old was around 50.0% in 1999, and by 2002 this had increased to 90.6%, almost reaching the market saturation point (14).

In this study, three types of Internet-addiction groups were identified in accordance with the original scheme of Young (10). Of the Internet users, 1.2%, 19.9% and 78.9% were IAs, PAs and NAs, respectively. Some warning voices have been raised on the possible problematic consequences of PIU in adolescence (6). Ryu EJ et al. (7) found that 1.5% had been diagnosed as possible addicts (PAs). Oh WO (9) stated that Internet addicts (IAs) among middle school students were relatively low (average users). In the overall ratio distribution, however, students who were classified as either addicted or at risk of addiction accounted for a high percentage, 27.0% (9). According to another study conducted by the Information Culture Center of Korea, using a self reporting questionnaire, 11.0% of Korean adolescents who use the Internet exhibit addiction symptoms (14). Other recent researches on the Internet addiction have reported prevalence rates of 5.7–14.0% (7, 8, 10, 14, 21, 22). The much lower prevalence found in our study may be attributable to the previous studies collecting data from online samples, whereas we used offline samples that ranged from light to heavy users. Furthermore this lower prevalence may be occupied with low percentage of using computer and the Internet in Turkey.

It is found that males were more likely than females to be pathological users in this study (Table 4). Findings regarding the relationship between gender and the Internet addiction were mixed in some studies worldwide. Some studies found no relationships (1, 25), while a number of studies found that males were more likely to be pathological Internet users (9, 12, 19, 26) or a higher incidence of addiction among females (27, 28). This is consistent with other off-line studies of undergraduates (23, 28). Online recruitment of participants for the online studies may have biased participation in favor of females, as females are more likely than males to seek help (29). Males, especially adolescent and young adults, use the Internet more than females (12, 13). Males may be more prone to pathological use because they are more likely to use applications such as Internet

games, netsex, and Internet gambling which are associated with more compulsive use (27, 30). The terms “overuse” and “excessive use,” which appear in many Internet addiction studies, usually indicate that time online is an important factor or index for determining Internet addiction. For example, in Young’s study, the Internet dependents reported a striking average of 39.0 h per week spent online, compared to the 5.0 h of non-dependents (1). In other words, dependents spent the equivalent of a “full-time job” on the Internet and spent nearly 8 times the number of hours per week online than did nondependent. The finding indicated that the hours spent on the Internet were increased towards NAs to IAs in both female and male gender in this study. The hours spent on the Internet by IAs were greater than those of NAs (12). The IAs adolescents spent long online about 18.0 h/wk that resembles the problem of Taiwanese young adults and college students (26). Owing to the different sampling method and research conducted in the States, the comparisons of Internet usage are difficult and inadequate. Nonetheless, the weekly Internet usage reported by American IAs was extremely varied: 38.5 h in Young (1), 19.0 h in Brenner (25), and 8.5 h in Morahan-Martin and Schumacher (13). The above Internet addiction-related research conducted in the USA was accomplished through on-line surveys. The self-selected samples obtained from on-line research limit the orientation and capacity of investigations. For example, the investigator cannot select the participants to ensure the representativeness and generalizability. Although some researchers may contend that the most effective means of approaching a true IAs is through on-line survey (because IAs must spend an enormous amount of time on-line), on-line research may draw only a proportion of people or addicts. More research on this topic is needed to understand the full scope of the Internet addiction and its solutions in Turkey. Our results still demonstrate that the Internet plays an important role in the lives of Turkish adolescents. With the rapid change and development of the Internet technology and the trend of on-line

learning, the figures reported here need to be updated by new research, but the incidence comparison made here can still provide a snap shot of the IAs status in Turkey.

Limitations

This study is limited by its use of a convenience sample, but it is the only study on Internet addiction with psychological variables in Turkish adolescents. Future studies should attempt to determine the predictive factors by identifying the causal relations between Internet addiction and the psychological characteristics in a large group in Turkish adolescents.

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References

1. Young KS, Rodgers RC (1998). *Internet addiction: personality traits associated with its development*. 69th annual meeting of the Eastern Psychological Association.
2. Johansson A, Gotestam KG (2004). Internet addiction: characteristics of a questionnaire and prevalence in Norwegian youth (12-18 yr). *Scandinavian Journal of Psychology*, 45(3): 223-29.
3. Internet Usage World Stats- The Big Picture- Population Statistics (2007). Available from: <http://www.internetworldstats.com/>.
4. Internet Usage World Stats (2008). Available from:

- <http://www.internetworldstats.com/stats4.htm#europe>.
5. Young KS (1996). Psychology of computer use: XL. Addictive use of the Internet: a case that breaks the stereotype. *Psychol Report*, 79: 899-902.
 6. Armstrong L, Phillips JG, Saling LL (2000). Potential determinants of heavier Internet usage. *Int J Human Computer Studies*, 53: 537-50.
 7. Ryu EJ, Choi KS, Seo JS, Nam BW (2004). The relationship of Internet addiction, depression, and suicidal ideation in adolescents. *Taehan Kanho Hakhoe Chi*, 34(1): 102-10.
 8. Beard KW, Wolf EM (2001). Modification in the proposed diagnostic criteria for Internet addiction. *Cyberpsychol Behav*, 4: 377-83.
 9. Oh WO (2003). Factors influencing Internet addiction tendency among middle school students in Gyeongbuk area. *Taehan Kanho Hakhoe Chi*, 33(8):1135-44.
 10. Young KS (2005). Internet addiction test. Available from: http://www.netaddiction.com/resources/internet_addiction_test.htm.
 11. O'Reilly M (1996). Internet addiction: a new disorder enters the medical lexicon. *CMAJ*, 154: 1882-83.
 12. Young KS, Rodgers RC (1998). The relationship between depression and internet addiction. *Cyberpsychol Behav*, 1: 25-8.
 13. Morahan-Martina J, Schumacherb P (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, 16:13-29.
 14. Kim K, Ryu E, Chon M, Yeun E, Choi S, Seo J, Nam B (2006). Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: A questionnaire survey. *Int J Nurs Stud*, 43(2): 185-92.
 15. Chak K, Leung L (2004). Shyness and locus of control as predictors of Internet addiction and Internet use. *Cyber Psychology and Behavior*, 7: 559-70.
 16. Pawlak C (2002). Correlates of Internet use and addiction in adolescents. Dissertation Abstracts International Section A: *Humanities and Social Sciences*, 63(5-A): 1727.
 17. Kandell JJ (1998). Internet addiction on campus: The vulnerability of college students. *CyberPsychology and Behavior*, 1(1): 11-17.
 18. Kubey RW, Lavin MJ, Barrows JR (2001). Internet use and collegiate academic performance decrements: Early findings. *Journal of Communication*, 51(2):366-82.
 19. Lee MS, Oh EY, Cho SM., Hong MJ, Moon JS (2001). An assessment of adolescent Internet addiction problems related to depression, social anxiety and peer relationship. *Journal of the Korean Neuropsychiatry Association*, 40 (4): 616-26.
 20. Mun˜oz Rivas MJ, Perales ME, DePablo N (2003). Patronos de uso de Internet en poblaci3n universitaria espan˜ola. *Adicciones*, 15(2):137-44.
 21. Nichols LA, Nicki R (2004). Development of a psychometrically sound Internet addiction scale: A preliminary step. *Psychology of Addictive Behaviors*, 18(4):381-84.
 22. Greenfield DN (1999). Psychological characteristics of compulsive Internet use: A preliminary analysis. *Cyber Psychology and Behavior*, 2(5): 403-12.
 23. Anderson K (1998). *Internet dependency among college students: should we be concerned?* Paper presented at the meeting of the American College Personnel Association, St. Louis, MO, USA, pp.: 3-7.
 24. Griffiths M. (1998). Internet addiction: does it really exist? In: *Psychology and the Internet: intrapersonal, interpersonal, and traspersonal implications*. Ed, Gackenbach J., Academic Pres, 1st ed, San Diego, CA, pp. 61-75.

25. Brenner V (1997). Pathology of computer use: XLVII. Parameters of Internet use, abuse and addiction: the first 90 days of the Internet Usage Survey. *Psychological Reports*, 80(3):879-82.
26. Lin SSJ, Tsai CC (2002). Sensation seeking and internet dependence of Taiwanese high school adolescents. *Computers in Human Behavior*, 18:411-26.
27. Curtis P (1992). Mudding: social phenomena in text-based virtual realities. Proceedings of Directions in Advanced Computing Conference (DIAC '92). Available from: www.parcftp.xerox.com/pub/MOO/papers/DIAC92.
28. Scherer K (1997). College life on-line: healthy and unhealthy Internet use. *The Journal of College Student Development*, 38: 655-64.
29. Weissman M, Payle E (1974). *The depressed woman: a study of social relationships*. Evanston IL, University of Chicago Press, USA, pp.:17-21.
30. Kraut R, Patterson M, Landmark V, Kiesler S, Mukophadhyay T, Scherlis W (1998). Internet paradox: a social technology that reduces social involvement and psychological well being? *American Psychologist*, 53: 1017-31.