The Relationship between Internet Use and Psychological Health Status among University Students

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As internet use has become popular, its advantages and disadvantages of social, psychological and occupational health consequences have increased. The aim of this work was to investigate the relationship between internet use and psychological health status among university students. A cross-sectional study was conducted in different universities in Tehran. The random stratified sampling was employed to select a sample of 1,237 students from different universities in Tehran, Iran. Two questionnaires were used to obtain information related to the students' demographic characteristics and the time they spent on the Internet. Their psychological health status was investigated by means of a symptoms checklist questionnaire (SCL90-R). Fifty participants were identified as heavy Internet users (over 25 hours per week). They were matched by socio-demographic characteristics with 50 participants categorized as light Internet users (less than 10 hours a week) who served as the control group. The light Internet users were psychologically healthier than the heavy users. The heavy Internet users suffered from psychological problems such as somatization, compulsive obsession, interpersonal sensitivity, anxiety, depression and aggression. These results are suggestive of a decline in psychological health status of students who overuse the internet.

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Internet has become the fastest, widespread, efficient and suitable technology of our time. It attracts an ever-increasing number of users from all around the world.

If used for educational and scientific tasks, this technology helps to improve the knowledge and skills of university students by easily providing information and scientific resources (Brown, 2002).

As Internet use becomes more and more popular, the advantages and disadvantages of social, psychological and occupational health consequences of heavy

In a study by Zhang (2004) on 302 university students' internet users, it was found that students who used internet on a daily basis during the week were more functional than those who used internet only one day during the week. Also, the students' enjoyment, feeling of internet usefulness, and self-efficacy had a significant effect on their anxiety level while using internet. Well-known researchers like Brenner (1997), Egger and Routerberg (2009), Thompson (2009) and Young (1997) have methodically studied whether there is any issue due to heavy Internet use or not. They concluded that internet use might be a cause of future problems.

Bai, Lin & Chen (2001) and Van Gelder (2009) carried out an experiment in a virtual clinic of internet-induced disturbances in which in 60% of cases, internet overusing and psychological disorders especially anxiety, depression and drug abuse overlapped each other. Orzack (2002) reported that those with Internet use had at least one of disorders such as depression, social phobia, impulsive control disorder and attention deficiency disorder. Furthermore some of them had either an addiction record or drug dependency, some were bi-polar; others had committed suicide or had severe violence record, mood and anxiety disorders, hyperactivity, insomnia and paraphilia have been observed as well (Mitchell, 2000; Christensen, Orzack, Babington & Patsdaughter, 2001). Simon (1998) added schizoid personality disorder to this list. In his opinion, psychic patients prefer to be separated from people and avoid interaction with others so the Internet provides such an opportunity for

them. Catalano, Catalano, Embi & Frankel (1999) reported two patients who suffered from Internet-related delirium.

Caplan (2002) showed that internet addicts are more prone to depression, loneliness, shyness, and have lower self-esteem. Also, internet addicts showed lower social interaction than non-internet dependent individuals. In several studies, the overlapping of internet heavy usage and depression has been investigated. Young and Rodgers (1998) investigated the correlation between internet use and depression showing that internet heavy users suffered from mild- to moderate depression. In a longitudinal study, Kraut, Patterson & Lundmark (1998) stated that internet use might increase depression. Two other studies also reported a positive correlation between internet use and deep depression (Yang & Tung, 2004; Kim, Ryu, Chon, Yeun, Choi, Seo, et al, 2005). Black, Bel Sare & Schlosser (1999) observed mood disorders, drug abuse, anxiety disorders, impulsive control disorder and personality disorders in 16 men and women who were heavy Internet users.

However, these effects should be judged with some caution according to other studies such as Bessiere, Kiesler, Kraut & Boneva (2008) who have shown that personal variables such as the user's social support, resources and the type of activities the user engages online could indicate that causation might be in fact reversed so that depressed users would tend to stay online longer and in consequence Internet use may be due to depression and not the other way around.

In sum some of the consequences of heavy internet use include changes of lifestyle in order to spend more time online, a decline of physical activities or disregarding activities that might be important, neglecting friends, family, financial and health issues and a general decline of social skills (Suler, 1996; Young, 1999).

Given the negative potential of these consequences, the present study was undertaken to investigate the relationship between internet use and psychological health status of university students in Tehran.

Methods

The study population was composed of 1,237 young men and women students from different universities in Tehran, Iran (University of Tehran, Shehid Beheshti university, Teacher Training University, Sharif University Islamic Azad University, Allameh Tabatabaee University and Amir kabir University). They were selected by random stratified sampling and were asked to complete two questionnaires. One questionnaire elicited the demographic characteristics of the participants and gave information about the duration of their internet usage. The participants were also asked about the purpose of internet usage such as scientific activity, fun, sexual activity, chatting purpose and social communications (emailing). Students, who used the Internet for 5 – 10 hours per week, were classified as light users and mainly use the internet for their scientific activity and emailing. Those who spent 25 – 40 hours of their time per week on the Internet were considered as heavy users who use the internet mainly for sexual activity chatting purpose. Fifty individuals from each group (light and heavy users) were matched for demographic characteristics and selected for comparison. The second questionnaire was taken from Deragotis, Lipman & Covey (1973) based on the revision of a list of pathologic symptoms. A revised questionnaire from the same authors (Deragotis, Morrow, Fetthing, Fetting & Hallad, 1984) named Symptoms Classified List-Reconsidered (SCL90-R) was composed of 90 questions with five grades that classify the degree of loss of psychological health: never, rarely, sometimes, less frequently, frequently. The symptoms covered by Deragotis et al (1984) questionnaire have 9 distinguishing features: physical complaints, compulsive obsession, depression, interpersonal sensitivity, anxiety, hostility, phobic anxiety, paranoid ideation and psychosis. Deragotis et al., (1984) have reported the reliability coefficients of all these features with MMPI questionnaire in the range of 0.36 to 0.73.

Mirzaie (1990) and Jaberi (1993) investigated the validity and reliability of the SCL90-R. Another study in the United States confirmed high validity (0.8) of this questionnaire.

In the present study, the response rate was 100% but some participants had to be excluded from the study due to incomplete filling of the

questionnaires. At the end, a total of 1,127 subjects were included. After evaluation of their questionnaires, 50 were diagnosed as heavy internet users and were considered as the case group. From the remaining 1077 subjects who where classified as light internet users, fifty were matched by age, sex and marital status and selected as the controls.

The differences in psychological health factors between the two groups were established by the independent t-test using the SPSS v.15 software.

Results

The demographic characteristics of the two study groups are shown in Table 1.

Table 1
Sociologic characteristics of light users and over users

Variable		Light user	Heavy user
Gender	female	25	25
	Male	25	25
Marital Status	Single	39	39
	Married	11	11
Age (years)		19-24	19-24
The location of internet use	University	12 (24%)	23 (46%)
	Home	31 (62%)	22 (44%)
	Internet cafés	7(14%)	5 (10%)
Living place	Family Home	21 (42%)	11(22%)
	University hostel	22 (44%)	34 (68%)
	Rental home	7 (14%)	5(10%)
Purpose of internet usage			
	scientific	(53%)	(6%)
	fun	(10%)2	(17%)
	chatting	(12%)	(27%)
	sexual activity	(8%)	(37%)
	emailing	(17%)	(10%)

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In order to find out how psychological health variables differed across the, heavy and light Internet users. the data was analyzed using the multivariate analysis of variance (MANOVA).

The first step in the multivariate analysis of variance is the omnibus F-test to see if the dependent variables differ for different categories of the factor. This multivariate test was conducted using Wilk's Lambda, as this the most suited test there are two categories of factor variable. In the present study there were two such categories of heavy and light Internet users.

The results obtained showed that two, heavy and light Internet users differed significantly on their scores on the nine factors of psychological health, Wilk's Lambda= 0.79, $p<0.0001$. Thus, noting this significance, the null hypothesis was rejected and it was concluded that there were differences in the psychological health variables across the heavy and light Internet users.

The second step of the analysis was the analysis of variance, which gave F values for each psychological health variables, the results of which are below in Table 3.

After carrying out the analysis of variance, in order to further find out how each , heavy and light Internet users differed from the immediated next (or previous) , heavy and light Internet users, trend analysis was carried out. The investigator's interest here was to see the trend of scores across the different, heavy and light Internet users. In order to find out whether scores on a particular psychological health variables or decrease across the, heavy and light Internet users, polynomial contrast analysis was carried out. Here, the number of groups being two, Linear as well as quadrilateral trends was possible.

Thus, these trends were examined for those factors for which a significant F was obtained. The results for each psychological health variables are described below.

Table 2
The results of the multivariate Analysis (Wilk's lambda) for psychological health variables

source	value	F	df1	df2	P	Eta2
Groups	0/937	6/59	13	189	0/001	0/073

The results of analysis of multivariate (Wilk's lambda) with controlling variables are given showing that groups have a significant multiple effects on total score psychological health variables and its components (0/001). The Eta square of 0/073 shows that the size is desirable.

Table 3
The results of Manova Analysis for psychological health variables

source	Dependent Variables	Sum of squares	Mean squares	df	F	Sig
	Somatization	33.1	5.42	1	5.21	0.001
	Obsessive Compulsive	27.3	3.57	1	9.87	0.001
	Inter personal Sensitivity	31.9	6.23	1	6.38	0.001
	Depression	32.7	4.81	1	8.91	0.0 01
Heavy users Light users	Anxiety	28.4	5.23	1	7.37	0.001
	Hostility	14.5	3.93	1	0.925	0.028
	Phobic Anxiety	11.8	2.79	1	0.528	0.083
	Paranoid Ideation	32.6	4.99	1	0.321	0.036
	Psychoticism	45.8	9.86	1	0/071	0.041

The heavy and light Internet users differed significantly on somatization, $F = 5.21$ $p<0.01$. The trend analysis using polynomial contrasts showed a significant linear trend ($p<0.001$).

The heavy and light Internet users differed significantly on obsessive-compulsive, $F= 9.87$ $p<0.001$. The trend analysis using polynomial contrasts showed a significant liner trend ($p<0.001$).

The heavy and light Internet users differed significantly on inter personal sensitivity, $F= 6.38$ $p<0.01$. The polynomial contrast showed significant linear trend ($P<0.001$).

The heavy and light Internet users differed significantly on depression, $F=8.91$ $p<0.001$. The trend analysis using polynomial contrasts showed a significant liner trend ($p<0.001$).

The heavy and light Internet users differed significantly on anxiety, $F=7.37$ $p<0.001$. The trend analysis using polynomial contrasts showed a significant liner trend ($p<0.001$).

It was noted that the overall psychological health did show a significant difference among the heavy and light Internet users. To comment on specific psychological health variables, there were significant differences on somatization, obsessive – compulsive, inter personal sensitivity, depression and anxiety across the heavy and light Internet users. Whereas, hostility, phobic anxiety, paranoid ideation, and psychoticism did not differ significantly across the heavy and light Internet users.

Discussion

The present study reveals that the light internet users were psychologically healthier than the heavy users. This may be due to the fact that the light internet users spending more time with their families, friends and relatives or on sports, hobbies, entertainment, study and other interests that lead to a more balanced psychological state.

Putnam (1995) has pointed to a considerable reduction in social interactions and willingness to work with others in the United States during the last 35 years. Working with the internet prevents people from going to church, socializing with their neighbors and sharing their ideas about national issues and, in general, gathering for social reasons. From a personal aspect, they are not concerned with socializing because of low quality of life style and so there is a decline of their physical and mental

health. On the contrary, cooperative behavior improves happiness and physical and mental health.

Different studies have concluded that there are challenging problems between parents and teenagers about how, when and for how long to use the internet as well as the content of what is seen while online. These studies revealed that young individuals overusing Internet become progressively unconcerned with communicating with the factual world and eventually isolate from it (Mitchell, 2000; Christensen et al., 2001).

Research carried out by Martin and Schumacher (1996), based on the relation between extreme use of the internet and depression and seclusion proved that internet heavy users were more depressed and lonely and they used this technology as their primary form of entertainment.

Greenfield (1999) conducted one of the most detailed studies on the undesirable consequences of internet use. Nearly six percent of his sample had compulsive obsessive behavior.

"We use the internet to avoid factual world and change our psychological situations," said about one third of patients dependent on the internet. Eighty-five percent of them also reported that they could not perform their job properly and face the prospects of their responsibility.

Researches point out that spending too much time on internet causes physical, mental, social, learning, occupational and family problems. Furthermore, therapists who have worked with addicts reported other psychological disorders (Bai et al., 2001; Siomos et al., 2008)

Whang, Lim & Boucsein (2003) reported that use of the Internet increased fourfold among heavy internet users compared to light users when they were anxious about their job or were unhappy and twofold when they were depressed. They claimed that using Internet allowed them to avoid facing reality.

Considering the close relation between depression and feeling lonely, heavy use of the Internet can be associated with depression. This claim by Whang et al (2003) is in agreement with the study by Tsau and Lin (2003) on school students that were hooked on the net, who claimed that they used the internet when they were depressed.

Chou (2001) also concluded from his thorough interview of 83 users who have become dependent on the Internet that they have found this technology as a good way to avoid facing various problems, including depression.

In a study about interpersonal sensitivity, Joiner & Jones (2004) reported that when the risk of interaction is high: e.g. dating opposite gender, Internet addicts prefer to contact others by E-mail. Our findings are in agreement with these observations.

The result of the present study is also in agreement with those of Young (1997) and McKenna and Bargh (2000), which showed that the virtual world provides greater anonymity and greatly reduces the importance of physical appearance and distance making it easier to respond in the worst possible way when angry and then quickly calm down. It is also easier to keep calm after being involved in a dispute or not getting angry at all because antagonists are physically away from the subject (Vels, 1998). Arguing with someone out of sight and physical closeness is easier. In this situation, the face of the antagonist subject side is not seen, so there is greater sense of security.

An experiment by Dubrovsky, Kiesler& Sethna (1991) proved that verbal arguments are more common among people while online in comparison with those that do so in real life. Parks and Floyd (1996) also reported cases of online rage not only in experimental environments but also in occupational, governmental, educational and social networks.

Our results about somatization are consistent with those reported by Christensen et al (2001). Heavy Internet users are more susceptible to suffer from eye pain, eye dryness, a decrease in sight, back-, and headaches and psychosomatic restlessness. Pain in hands, wrist, neck, shoulder, legs, muscle stiffness, fatigue, cardiovascular diseases, gastrointestinal disorders and insomnia are also common due to inappropriate body posture for a long time. Dell (2001) believes that overusing the internet leads to physical and social indolence and inactivity and to a decrease interaction with others in the real world.

Our results point out that light internet users had a better psychological health than those who spend most of their time on the internet. The later

presented mental and physical abnormalities. This study shows an association between heavy internet uses with low mental health. However, this association cannot rule out a reverse causal association because heavy internet use may not be a problem of internet use and individuals with mental and psychological problems may tend to stay online longer and their internet use may be a consequence and not the cause of their problems. Limitations such as a relatively small sample size and not assessing the effects of demographic background on mental problems might have influence the results here presented.

In order to decrease internet use we propose that students be well informed about proper ways of administering the time spent using computers and the internet. It would be advisable to include such training in their curricula.

Future case-control and prospective studies with a larger sample size will be conducted to fine-tune the results of the present study, including the causality of the relationship between heavy internet use and psychological problems, including the effects of demographic background.

One of the limitations of this study is the lack of cooperation of the students who were possibly addicted to the internet in completing the questionnaires.

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