



# The Relationship Between Internet Addiction and General Health in Students of Hamadan University of Medical Sciences-Iran, 2015: A Cross Sectional Study

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## Abstract

**Objectives:** The Internet is a global system that is increasingly used by the public, especially university students, as a useful tool to access information sources. The aim of this study was to investigate the relationship between Internet addiction and general health in students of Hamadan University of Medical Sciences, during year 2015.

**Methods:** This cross-sectional study was conducted on 650 students of Hamadan University of Medical Sciences, west of Iran, during year 2015. The participants were volunteers and were selected by stratified sampling. The data collection tool was the Young internet addiction test and general health questionnaire (GHQ28). Data was analyzed by logistic regression and analysis of variance methods.

**Results:** Mean age of students was  $22 \pm 4.01$  years old. The mean score of Internet addiction was  $77.08 \pm 17.24$  and mean score of general health was  $59.38 \pm 9.54$ . Analysis of variance method showed that the score of all general health aspects (except social functioning) was increased significantly in the addicted group in comparison with normal and suspected groups (all  $P_s < 0.001$ ). In addition, risk of internet addiction in females was 1.81 (95% CI: 1.3 - 2.5) times more than males. Pearson correlation coefficients showed that internet addiction score increased in the same direction as all general health aspects (all  $P < 0.001$ ).

**Conclusions:** Results showed that overuse of the Internet is causing serious problems for general health in students of medical universities.

**Keywords:** Internet Addiction, General Health, Medical Students

## 1. Background

The Internet is the most advanced new communication technology, which involves multiple links and access to a variety of data sources (1). The number of Internet users in Iran was over 36 million people in 2015, which has increased to nearly 39 million in 2016 (2). There is no doubt that every new development, which may have many benefits, could also cause problems; one of the main problems of the Internet is addiction (3). Social pathologists and psychologists believe that excessive use of the Internet could cause physical and mental problems (4-6). General health is defined as physical, mental, and social health that are subscales of the Goldberg general health questionnaire (7). The study of Saraji and Sheikhi Fini showed that Internet addiction and general health, specially mental health, have a significant relationship in high school students, and

addiction to the internet effects academic achievement (8).

Addiction is a disease, in which the patient's continually repeat behaviors that have bad effects. American psychological association defines Internet addiction as a pattern of Internet use that could impair performance and lead to unpleasant moods over a period of two months; they offered seven criteria (at least three criteria during two months) in this regard including, withdrawal symptoms, extra time of Internet use more than expected, persistent desire to control the behavior, considerable time spent on the Internet; reduced social activities, employment and recreational use of the Internet, and continued use despite awareness of its negative effects (9). Young believes that Internet addicted is a person, who has lost control of his/her daily activity and is generally being online more than 38 hours a week (6).

In a cross-sectional study, performed by Ko et al., it was shown that addicted adults showed aggressive behaviors for one year after addiction and seniors had worse conditions in comparison to juniors (10). The study of Jafary et al., which evaluated the correlation between Internet addiction and public health, conducted on students of the Qom University of Medical Sciences in 2010 to 2011, revealed no significant relationship between Internet addiction and public health. The desired level of general health status was observed in users, who had mild level of addiction to the Internet (11). In addition, in the study of Kawabe et al. in 2016 on 12- to 15-year-old high school students in Japan, Internet addicted students had high general health scores (12). Another study on Internet addiction and its psychological effects performed on nursing students in Gaza and Palestine in 2014 showed a positive and significant relationship between Internet addiction and psychological effects (13). Gholamian conducted a study on high school students in Shahrekord and showed that the mean score of anxiety, depression, and stress among users of Internet addiction was significantly higher than ordinary Internet users (14).

The aim of this study was to investigate the relationship between Internet addiction and general health among students of Hamadan University of Medical Sciences during year 2015.

## 2. Methods

This cross-sectional study was conducted on 650 students of Hamadan University of Medical Sciences, located in the west of Iran, during year 2015. The participants were volunteers that were selected by stratified sampling. Initially, 30 questionnaires were randomly assigned to students to calculate reliability, which was 0.86. Stratified sampling method with proportional allocation was performed according to the total number of students in each faculty. Sample size was calculated as 704 subjects based on Lashgarara et al.'s study (15) with prevalence of 0.34 and type I error equal to 0.05. At the beginning of the study, 704 people were identified as samples, yet after collecting information and excluding incomplete questionnaires, 650 questionnaires (92%) remained with the least missing information for proper analysis.

After obtaining permission from the research council of Hamadan University of Medical Science, written consent was obtained from all students. The data collection tool was a questionnaire including demographic information, such as gender, education level, age, status of residence, and marital status. General Health Assessment Questionnaire (GHQ28) was used to assess the general health of the students (7). The reliability and validity

of the Persian version was approved by Nazifi et al. (2014) (16). The questionnaire included sub-scales, including the somatic symptoms scale (items 1 to 7), anxiety and sleep disturbance symptoms scale (items 8 to 14), the scale of social functioning (items 15 to 21), and symptoms of depression scale (items 22 to 28). Each question was scored on a Likert scale from 0 to 3; in each subscale scores above 6 and a total score of above 22 indicated a disorder. To assess Internet addiction, the Young Internet Addiction Test was used; the reliability and validity of the Persian version of this scale was investigated by Alavi et al. (2012) (17). The questionnaire contains 20 items with minimum and maximum scores of 20 and 100, respectively. Scores are classified in three groups, including normal users (scores between 20 and 49), users who are suspected of Internet addiction (scores between 50 and 79), and addicts (scores between 80 and 100).

The data were analyzed using SPSS statistical software version 24. Means (SD), frequencies, and percentages were used to report descriptive characteristics. Kolmogorov-Smirnov test and homogeneity of variances were checked and confirmed for each aspect. Analysis of variance method with Tukey's post hoc was performed to compare means of different general health aspects in Internet addiction levels. Moreover, binary logistic regression model (0 normal or suspected, 1 addiction) was used to determine the effect of each variable on the risk of internet addiction. P values of < 0.05 were considered significant. The Ethics Committee of Hamadan University of Medical Sciences approved the ethical considerations of the present study under No B/16/35/9/241.

## 3. Results

In this study mean  $\pm$  SD of age of students was  $22 \pm 4.01$  years old. The mean score of Internet addiction was  $77.08 \pm 17.24$  and mean score of general health was  $59.38 \pm 9.54$ . Table 1 shows baseline characteristics of the study population by level of addiction.

Analysis of variance method followed by Tukey's post hoc showed that the score of all general health aspects (except social functioning) increased significantly in the addicted group in comparison with normal and suspected groups ( $P < 0.001$ ) (Table 2).

Table 3 shows binary logistic regression, which determines the effect of each qualitative and quantitative variable on the risk of Internet addiction. The results showed that risk of Internet addiction in females was 1.81 (95% CI: 1.3 to 2.5,  $P < 0.001$ ) times more than males. Pearson correlation coefficients showed that Internet addiction score increased in the same direction with all general health aspects ( $P < 0.001$ ) (Table 4).

**Table 1.** Frequency and Percentage of Demographic Variables in Different Internet Addiction Categories

Variables	Group	Normal	At Risk	Addicted	Total
<b>Case of addiction, No. (%)</b>		52 (8.0)	244 (37.5)	336 (51.7)	632
<b>Gender</b>	Male	28 (54.9)	109 (46.4)	111 (33.6)	248 (40.3)
	Female	23 (45.1)	126 (53.6)	219 (66.4)	368 (59.7)
<b>Age groups</b>	20 ≥	15 (30.6)	76 (32.6)	115 (35.5)	206 (34)
	25 - 21	32 (65.3)	131 (56.2)	170 (52.5)	333 (55.0)
	26 ≤	2 (4.1)	26 (11.2)	39 (12)	67 (11.1)
<b>Marital status</b>	Single	44 (88)	215 (91.1)	291 (88.4)	550 (89.4)
	Married	6 (12)	21 (8.9)	38 (11.6)	65 (10.6)
<b>Education level</b>	Bsc	24 (44)	100 (42.3)	190 (57.4)	314 (50.8)
	Msc and Medical Student	17 (34)	110 (46.6)	123 (37.2)	250 (40.5)
	PhD	9 (18.0)	26 (11)	18 (5.4)	53 (8.6)
<b>Status of residence</b>	Native	21 (42)	69 (29.4)	109 (33.1)	199 (32.4)
	dormitory	23 (46)	152 (64.7)	195 (59.3)	370 (60.3)
	Rented home	6 (12)	14 (6)	25 (7.6)	45 (7.3)

**Table 2.** Mean General Health Aspects in Different Internet Addiction Categories

Aspect	Internet Addiction			ANOVA Test	
	Normal	Suspected	Addicted	F	P Value
<b>Somatic symptoms</b>	14.34 (3.5)	14.27 (3.3)	15.6 (2.6) <sup>a,b</sup>	14.85	< 0.001
<b>Anxiety and sleep disturbance</b>	13.7 (4.1)	13.4 (4.1)	15.3 (3.8) <sup>a,b</sup>	17.16	< 0.001
<b>Social functioning</b>	12.1 (4.0)	12.7 (3.7)	12.9 (3.8)	1.19	0.356
<b>Symptoms of depression</b>	15.3 (4.0)	16.0 (4.4)	17.7 (3.8) <sup>a,b</sup>	22.65	< 0.001
<b>General health</b>	55.6 (1.4)	56.5 (9.8)	62.0 (8.3) <sup>a,b</sup>	31.10	< 0.001

<sup>a</sup>Significant difference from normal group.

<sup>b</sup>Significantly different from suspected group.

#### 4. Discussion

The majority of Internet users are university students. This cross-sectional study aimed at determining the relationship between Internet addiction and general health in students of Hamadan University of Medical, during year 2015. This study was performed on 650 university students from various faculties of University of Medical Sciences.

The results showed that 7.4% of students were normal users and most of the students, 49.8%, were addicted users. Gholamian et al. revealed that among 417 high school students, 69.5% were normal, 27.6% had mild addition and 2.9% were addicted (14). Moreover, Internet addiction in females was more than males and the risk of developing Internet addiction in females was 1.81 times that of males. In other studies, there were significant differences between genders in terms of Internet addiction. Hosseini et al.'s

study, which aimed at assessing the rate of Internet addiction among 1500 male and female students at 6 public universities of Tehran during year 2011, including Tehran, Al-lameh, Amir Kabir, Sharif, Science and Technology, and Al Zahra University, showed that from 9.8% of students had severe addiction; 5.9% were females and 3.8% males (18). In contrast, Alhajjar studied Internet addiction and psychological morbidity among nursing students in Gaza-Palestine and showed that male students had higher Internet addiction scores than females (13).

In this study, academic level, residency, marital status, and age had no significant effect on Internet addiction. Bakhshayesh et al.'s study indicated similar results among female students living in Yazd University dormitories (19). Fayazbakhsh et al. (20) showed that more than half of the students (55%) believed that the use of the Internet reduced

**Table 3.** Binary Logistic Regression Indicating the Effect of Each Variable on the Risk of Internet Addiction

Variable	Group	Coefficient	SE	OR (95% CI)	Wald	P Value
Gender	Male	Ref	Ref	1	Ref	Ref
	Female	0.59	0.16	1.81 (1.3 - 2.5)	12.8	< 0.001
Age groups	20 ≥	Ref	Ref	1	Ref	Ref
	25 - 21	-0.19	0.17	0.82 (0.5 - 1.1)	1.1	0.281
	26 ≤	0.10	0.28	1.1 (0.6 - 1.9)	0.1	0.733
Marital status	Single	Ref	Ref	1	Ref	Ref
	Married	-0.22	0.2	0.80	0.7	0.397
Education level	BSc	Ref	Ref	1	Ref	Ref
	MSc	1.54	1.1	4.6 (0.4 - 45.5)	1.7	0.183
	Medical Student	1.06	1.1	2.9 (0.3 - 28.3)	0.8	0.359
	PhD	0.43	1.2	1.5 (0.1 - 15.9)	0.1	0.716
Status of residence	Native	Ref	Ref	1	Ref	Ref
	dormitory	-0.08	0.1	0.9 (0.6 - 1.3)	0.2	0.637
	Rented home	0.03	0.3	1.0 (0.5 - 1.9)	0.01	0.924

**Table 4.** correlation Among General Health Aspects and Internet Addiction

Variables	Addiction	General Health	Somatic Symptoms	Anxiety and Sleep Disturbance	Social Functioning	Symptoms of Depression
Addiction	1	-	-	-	-	-
General health	0.35 (< 0.001)	1	-	-	-	-
Somatic symptoms	0.25 (< 0.001)	0.71 (< 0.001)	1	-	-	-
Anxiety and sleep disturbance	0.25 (< 0.001)	0.78 (< 0.001)	0.50 (< 0.001)	1	-	-
Social functioning	0.05 (0.164)	0.22 (< 0.001)	-0.02 (0.531)	-0.20 (< 0.001)	1	-
Symptoms of depression	0.31 (< 0.001)	0.77 (< 0.001)	0.43 (< 0.001)	0.61 (< 0.001)	-0.18 (< 0.001)	1

their physical activity, 33% developed inappropriate eating habits, 31% felt tired and bored. Also, results showed that Internet addiction score increased in the same direction with all general health aspects. Several studies confirm the current results (12-14). Gholamian et al.'s study showed that anxiety, depression, and stress were significantly higher in Internet addicted users (14). Nasti Zaii's study showed similar results in students of Sistan and Baluchestan University (21). However, Jahanian et al. indicated that internet addiction have inverse significant relationships with students' mental health in Alborz province, Iran (22).

One other alarming result of this study is the high frequency of medical sciences university students, who are addicted to the Internet. The results of this study indicate the relationship between Internet addiction and public health. This relationship is an alarm to cultural authori-

ties of the university to provide necessary measures in use of Internet and awareness of Internet addiction dangers in their executive programs.

Limitations of study were the cross-sectional design and weakness in determining the extent of influence of other related factors on general health risk factors because of the unavailability of information.

#### 4.1. Conclusion

According to the findings, it is suggested that a comprehensive information program should be designed, which focuses on the impact of the Internet on health and lifestyle, in addition to raising awareness. Also, planning educational programs is required to promote awareness of the adverse effects of the Internet, to monitor and control Internet use among university students, as well as raise

awareness of the damaging effects of incorrect use of the Internet.

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## Footnote

**Conflict of Interests:** None declared.

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