

## Prevalence of Internet Addiction and its Association with General Health Status among High School Students in Isfahan, Iran

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### Abstract

**Background:** Internet has played an increasingly important role in people's lives; however, there is a global concern that it may cause negative effects on health. The purpose of this study was to assess the prevalence of Internet addiction (IA), and its relationship with general health status among high school students.

**Materials and Methods:** A cross-sectional study using a multistage proportionate sampling technique conducted among 10-15 year-old students in Isfahan, Iran. Data were collected from 721 students in 5 educational areas of Isfahan. A total of 721 students filled out a self-report questionnaire consisted of two parts; the first was Young Internet Addiction Test and the second was General Health Questionnaire (GHQ28). Data was analyzed using SPSS software version 16.0.

**Results:** Of the 721 students, 52% (375 students) were male. The average age of students was 15.75±1.5 years old. The prevalence rate of Internet addiction among adolescents was 41.2% non-addicts, 53.7% exposed to IA, and 5.1% Internet addicts. Whereas there was a significant difference between boys and girls in IA (P=0.004). In this study, Internet addiction was found to have an independent relationship with parent education and household income but it had a significant negative relationship with the general health aspect including physical health (r=0.3, P<0.001), depression (r=0.4, P<0.001), sleep (r=0.4, P<0.001), and social function (r=0.25, P<0.001).

**Conclusion:** Based on the results, the prevalence of Internet addiction was high among high school students and overuse of the Internet by students may cause depression, decreased mental health and academic performance. Therefore, education about the proper use of the Internet is necessary for high school students.

**Key Words:** Internet addiction, General health, Student, Prevalence, Iran.

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## 1- INTRODUCTION

Today, the Internet has become an essential part of many people's daily lives. With the Internet, individuals are allowed great flexibility and convenience in communication, entertainment, information search and exchange, as well as working time and location (1). Despite its usefulness in accessing a wide range of information, there is a great deal of concern about the improper use of the Internet which has led to the phenomenon described as Internet addiction (2). IA can be defined as an inability to control one's use of the internet despite negative consequences (3) which persists over a significant period (4).

Internet addition is a heterogeneous and complex process. The adolescents due to entertainment, educational needs, information, and so on, have more tendency to internet, and since they have more free time to use the Internet, are more disposed to the phenomenon of Internet addiction (5). It affects every sphere of an adolescence's life destructively, expressing itself in various pathological behaviors and emotional states, which can be grouped into negative outcomes, such as academic dysfunction, depression, anxiety, peer relations, deteriorating family and substance use (6-8). Students who are addicted to the Internet also usually suffer from problems in their daily routine, school performance, family relationships, and mood (9).

According to studies conducted in Italy, China, South Korea, and Taiwan, the prevalence of IA among adolescents ranges from 10.7 to 36.7 % (10). The prevalence of Internet addiction among high school students has been reported 13.8% in Taiwan, 2.4% in China, and 30% in Korea. These statistics should alert us to the fact that IA has become an international health issue that cannot be ignored (11). In Iran, a nationwide study among 4,500 students of high school or

pre-college schools recruited from 13/31 provinces of Iran revealed that 22.2% of the study participants were labeled as having "Internet addiction" and males were significantly more likely to be an internet addict (12). Both national and international studies suggest that Internet addiction is an important public health problem in adolescents. Due to the increasing prevalence of Internet addiction in students (13-15), we aimed to investigate the prevalence and risk factors of Internet addiction in high school students and its relation with general health among students aged 14-18 year-old

## 2- MATERIALS AND METHODS

### 2-1. Study design and population

This study is a cross-sectional and analytical description. The study population included all male and female students 14 to 18 year-old (second year of high school), that in the first semester of school year 2017-2018 are studying in Isfahan city.

### 2-2. Methods

Sample selection of students has been stratified and clustered proportional to volume. In this way, firstly, educational areas (5 areas) are considered as class, and from each class, according to the student population, the number of schools required is specified and in each school, students were randomly selected and the questionnaires were completed by the students themselves. The time required to complete the questionnaire is 15-20 minutes. Data collection is done using the Goldberg General Health Questionnaire and Internet addiction. The number of samples was calculated according to the following equation and at least 778 samples were obtained.

$$n = \frac{(z_1 + z_2)^2(1 - r^2)}{r^2} + 2$$

Where, ( $z_1$  is the confidence coefficient of 95%, ( $z_2$  is the test power factor of 80%), and  $r$  is an estimate of the correlation coefficient between the amount of internet used and the general health score, which is at least 0.1.

### 2-3. Inclusion and exclusion criteria

#### 2-3-1. Inclusion criteria

- Students age ranged from 14-18 year-old from second year of high school.
- Would like to participate in the study and completed the questionnaire.

#### 2-3-2. Exclusion criteria

- Failure to complete the questionnaire.
- Unwillingness to continue the completion of the questionnaire.

### 2-4. Measuring tool

1. To assess Internet addiction, the Young Internet Addiction test was used; the validity and reliability was investigated by Alavi et al. (2012). The questionnaire contained 20 items which were classified in three groups, including normal users (20-49), users who are suspected of Internet addiction (50-79), and addicts (80-100), and if the total score is between 20-49, the individual will be divided into the normal user group, but if the total score is greater than 50, it will be in the group of addicted users (16).

2. General Health Assessment Questionnaire (GHQ28) was used to assess the general health of the students (17). The reliability and validity of the Persian version was approved by Nazifi et al. (2014) (18). The questionnaire included sub-scale, which included 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

item 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. Alpha-Cronbach's Yang questionnaire was 0.88, and Alpha-Cronbach's General Health Questionnaire was 0.90.

### 2-5. Ethical consideration

The Ethics Committee of Isfahan University of Medical Sciences approved the ethical considerations of the present study (IR.MUI.REC.1396.1.105).

### 2-6. Data Analyses

The collected data were analyzed by SPSS software version 16.0. The quantitative data were expressed as mean and standard deviation, and the qualitative data were assessed as numbers and percentages. Kolmogorov-Smirnov Test was used to analyze the normality of the data. Chi-square, t- test, Pearson Correlation Coefficient and Analysis of variance method with Tukey's post hoc were performed to compare means of different general health aspects in Internet addiction levels. The significance level for this study was  $p\text{-value} < 0.05$ .

## 3- RESULTS

Of the 721 students, 52% (375 students) were male and 48% (346 students) were female. The average age of students is  $15.75 \pm 1.5$  year-old. Out of 721 participants in the study, 665 students completed the Internet addiction questionnaire (response rate: 92.2 %), of which 41.2% (274 students) were non-addict, 53.7% (357 students) were exposed to Internet addiction and 5.1% (34 students) of students were considered to have Internet addiction. The average score of Internet addiction was  $52.87 \pm 16.09$  (ranged from 21 to 100), and the average general health score was  $71.68 \pm 14.23$  (ranged from 2 to 109). The mean score of physical health  $19.9 \pm 4.3$  (ranged from 7 to 28), sleep  $18.06 \pm 5.3$  (ranged from 7 to

28), social functioning:  $14.6 \pm 4.1$  (ranged from 7 to 28), and depression were  $20.5 \pm 6.5$  (ranged from 2 to 29), respectively. The results showed that Internet addiction among the boys was significantly higher than girls ( $P < 0.05$ ), and there was no significant relationship between Internet addiction and parents' education ( $P > 0.05$ ) (**Table.1**). **Table.2** shows the association between the dimensions of public health aspects (physical health, sleep, social functioning and depression), and Internet

addiction, including no Internet addiction, exposure to Internet addiction and Internet addiction. According to the results, as the level of Internet addiction increased, the level of general health among students was decreased significantly ( $P < 0.05$ ) (**Table.2**). The results showed that internet addiction has a significant negative correlation with sleep and physical health and a significant positive correlation with social function and depression (**Table.3**).

**Table-1:** Relationship between Internet addiction and Descriptive characteristics.

Characteristics		Number (%)	Addiction score Mean $\pm$ SD	P-value
* Gender	Female	322(48%)	51.01 $\pm$ 16.3	0.004
	Male	343(52%)	54.61 $\pm$ 15.6	
** Father's Education	illiterate	23(3%)	52.3 $\pm$ 15.7	0.66
	Elementary and Diploma	376(56%)	53.47 $\pm$ 15.9	
	Bachelor's Degree	216(33%)	51.77 $\pm$ 16.7	
	Master's and Ph.D.	49(8%)	53.24 $\pm$ 14.9	
** Mother's Education	illiterate	24(3%)	53.75 $\pm$ 13.3	0.45
	Elementary and Diploma	383(59%)	52.77 $\pm$ 15.6	
	Bachelor's Degree	234(36%)	52.36 $\pm$ 16.9	
	Master's and Ph.D	22(2%)	58.09 $\pm$ 16.9	
Income	Very high	18(2%)	55.05 $\pm$ 16.1	0.76
	High	331(50%)	52.36 $\pm$ 16.9	
	Low	279(42%)	53.55 $\pm$ 15.04	
	Very low	29(6%)	52.62 $\pm$ 15	

\*Due to the normal distribution of data, independent t-test was used. \*\* Due to the normal distribution of data and homogeneity of variance, ANOVA was used. SD=standard Error.

**Table-2:** Association between Internet addiction and general health dimensions in students.

Variables	Levels of Internet Addiction				P-value
	Numbers (%)	No IA (mean $\pm$ SD)	Exposure to IA (mean $\pm$ SD)	Internet addiction (mean $\pm$ SD)	
Physical health	626(86%)	20.09 $\pm$ 4.07	18.1 $\pm$ 4.2	16.86 $\pm$ 4.5	<0.001
Sleep	603(84%)	20.57 $\pm$ 5.01	17.29 $\pm$ 4.8	13.8 $\pm$ 4.9	<0.001
Social functioning	616(85%)	13.7 $\pm$ 4.04	15.41 $\pm$ 3.89	16.06 $\pm$ 4.8	<0.001
Depression	616(85%)	19.72 $\pm$ 7.1	20.53 $\pm$ 6.1	25.83 $\pm$ 2.08	<0.001

Due to the normal distribution of data and homogeneity of variance, ANOVA and Tukey post hoc test were used. The numbers with the same letters in each row indicate no significant difference at the 0.05 level. SD: standard deviation; IA: Internet addiction.

**Table-3:** Correlation coefficient between Internet addiction and General health dimensions and total general health in students.

Variables	General health dimensions					
	Physical Health	Sleep	Social Functioning	Depression	General health	
Internet addiction	Correlation coefficient of Pearson	-0.29	-0.43	0.25	0.40	-0.35
	P-value	<0.001	<0.001	<0.001	<0.001	<0.001

#### 4- DISCUSSION

This cross-sectional study aimed to evaluate the level of Internet addiction and its relation with general health among students aged 14-18 year-old in Isfahan, Iran. The results showed that 41.2% of students were normal internet user, 53.7% (357 students) were exposed to Internet addiction and 5.1%, were internet addicts. According to research, 5 to 10 percent of Internet users experience Internet addiction (1), and international prevalence of Internet addiction has been reported 1.5% to 8.2% (18). Gholamian et al. revealed that among 417 high school students, 69.5% were normal users, 27.6% were mild Internet addict and 2.9% were severe Internet addict (13). In some studies, the prevalence of IA was stated 25 to 30% (2). The statistical report shows that the number of Internet users in Iran has grown up to 25 times in recent years (3). The number of Internet users in Iran was over 36 million people in 2015, which has increased to nearly 39 million in 2016 (19). Furthermore, the lower level of IA in this study might be related to the cultural and social characteristics of the Isfahan society. The Isfahan families are conservative and still have some control, supervision, and guidance over their children's cyber behaviors. This study showed that internet addiction prevalence among boys was significantly higher than girls. According to Barate Dastgerdi et al.'s study (20), there was a significant difference among males and females in internet use. But Mohammadkhani et al.'s

study (3) showed that Internet addiction is not significantly different between two sexes. In the another study, boys were more addicted to the Internet (21). But, in the study of Rücker et al. (5), and Malak et al. (6) Internet addiction was higher in girls. The most plausible interpretation of the present study findings is that male students are more concerned than female students about seeking companionship is that male students, more than females, are concerned by using different applications of the Internet, building social networking and relationships, developing close friends in a confidential way. It has shown that male students are vulnerable to becoming addicted and experiencing negative consequences in terms of their academic performance and social life, and inability to restrict their time online (22). The results showed that there is a significant relationship between the dimensions of public health aspects (physical health, sleep, social functioning and depression), and Internet addiction. Internet addiction has a significant negative correlation with sleep and physical health and also has a significant positive correlation with social function and depression. According to the results, with the increasing level of Internet addiction, the level of general health among students decreases significantly. Several studies confirm the current results that Internet addiction score increased in the same direction with all general health aspects (8, 23). In this study, the mean of physical dimension of health was significantly correlated with Internet addiction, which was consistent

with the study of Bahri et al. (24), and Pashaei et al. (25), but was inconsistent with the study of Nastiezaie (27). It could be explained by the fact that the use of the Internet without any limitation or control reduces the physical activity and physical mobility of the person, and also deprives him/ her of social communication. In general, people's lifestyles such as sleep, nutrition and daily activities are affected by Internet addiction (28). In the present study, the mean score of post-anxiety disorder and online addiction were significantly correlated that is consistent with previous studies (29, 30). Nastiezaie indicated that general health of addicted Internet users, especially in subscales of anxiety and depression, is at higher risk as compared with normal users (27). In explaining this relationship, it suggested that there is a lot of anxiety before the onset of Internet addiction, and people use the Internet to avoid their anxiety. But after that, when the person does not have access to the internet, the anxiety is created as a result of the person's addiction to the Internet (31). Young and Rogers showed that withdrawal from significant real-life relationships is a consequence of pathological Internet use (PIU). Therefore, the possibility exists that increased levels of social isolation consequent to excessive time spent in front of a computer may result in increased depression rather than be a cause of such Internet overuse (32). Our findings suggest that increased levels of depression are associated with those who become addicted to the Internet. In general, the general health of Internet addict users is at a higher risk than ordinary users; which coincided with the study of Abolhassani et al. (33) and Farhadini et al. (34). But in the Nodoushan et al.'s study (35), there was no significant relationship between Internet addiction and general health. The possible reason was that in the study of Nodoushan et al., most of the samples had a mild Internet addiction.

#### **4-1. Study Limitations**

The limitations of the study can be noted that, the participants themselves completed the questionnaire and this could be a mistake. One of the limitations of this study is that the participants were selected from public schools in Isfahan city, which might not be not representative of all students in Isfahan province, Iran.

#### **5- CONCLUSION**

According to our study results, the prevalence of Internet addiction was high among high school students. The results indicate that there is a relationship between Internet addiction and general health. It is suggested that a comprehensive information program should be designed to emphasize the impact of the Internet on health and lifestyle. Moreover, counseling sessions and mental health clinics should be required to provide IA monitoring and management of it among high-risk students. Further studies are needed to focus on other factors affecting this problem such as cognitive and environmental factors.

**6- CONFLICT OF INTEREST:** None.

#### **7- ACKNOWLEDGMENTS**

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