

## ORIGINAL ARTICLE

# Evaluation of Internet Addiction and Mental Health Status among Medical Sciences Students in Bushehr, Southwest of Iran

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**ABSTRACT**

**Introduction:** Overuse of the Internet has significant impact on human life by causing psychological and social problems. This study is an attempt to describe the prevalence of addictive Internet use and mental health status among students in a public university in Iran. The relationship between Internet use and socio-demographic as well as mental health dimensions was explored. **Methods:** The present study relied on a cross-sectional design and 400 students were selected through proportional stratified random sampling. The data were collected using validated and reliable scales, Young Internet Addiction Test (YIAT) and Goldberg General Health Questionnaire (GHQ-28). Descriptive statistics, Independent Sample t-test, Chi-square test, and Binary Logistic Regression were conducted for data analysis. **Results:** The mean age of participants was 22.06. The overall prevalence of Internet addiction among the students was 34.5%. Logistic regression analysis indicated that the age of starting Internet use [OR: 0.92, 95% CI: 0.87,0.99; p=0.028], daily time spent on the Internet [OR: 1.12, 95% CI: 1.05,1.21; p <0.0001], purpose of Internet use [OR: 3.32, 95% CI: 2.08,5.48; p <0.0001] and anxiety/insomnia [OR: 1.20, 95% CI: 1.07,1.28; p <0.0001] are the significant predictors of Internet addiction. **Conclusion:** The Internet addiction among the students was high. The purpose of Internet use, experiencing a higher level of anxiety/insomnia, surfing on the Internet for long time are related to the Internet addiction. Organizing cognitive behavioral intervention programs may be effective in developing self-regulation skills of students in order to control their Internet use.

**Keywords:** Internet Addiction, Mental Health, Students**Corresponding Author:**

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**INTRODUCTION**

Currently the Internet is regarded an indispensable part of human life, allowing sharing of information, social interactions, entertainment, and shopping (1, 2). Since 1990s scholars have widely used the term Internet addiction and accordingly numerous scales have been designed to examine the level of Internet addiction (3-5). Unhealthy Internet use is often regarded as Internet addiction, excessive Internet use, and pathological Internet use (1, 2). Young defined Internet addiction as the lack of ability to resist the impelling desire for the Internet overuse, depreciate the significance of time even when one is not using the Internet, being unduly aggressive and irritable as deprived from Internet use, and increasingly putting a person's social and family life and work (6). Various Internet addiction ratios have been found in different studies which relied on a variety of scales (7-9).

A Meta-Analysis of 31 communities around the world indicated a universal prevalence estimate of 6%. The Middle East possess the greatest prevalence with 10.9%

while Northern and Western Europe had the lowest with 2.6% (10). A systematic review of literatures during the years 2007-2016 in Iran indicated the overall prevalence of Internet addiction among school and university students was 20% (11).

Various studies have shown the Internet overuse has a significant impact on human life by causing psychological disturbances, neurological complications, and social problems. Social withdrawal, poor diet, repetitive strain injury, backache, self-neglect, family problems are consequences of Internet addiction (IA) (12). The excessive use of the Internet influences sedentary lifestyle and can increase obesity and associated complications. IA also may have a significant impact on sleep (sleep deprivation), poor academic or work performance, and job loss (12-14). Since young users widely make use of the Internet, the students of universities are more subject to Internet addiction and physical and mental disorders. This condition can also affect their academic performance and social interactions. It seems studying medicine is stressful and complicated for medical students. They are more at risk of internet addiction than non- medical students. On the other hand, the medical students' mental and physical health as future professionals can affect public health, indirectly (15, 16). Accordingly, it seems essential to explore the main problem and risk groups. This study aimed to describe

the prevalence of addictive Internet use and mental health status among students in Bushehr University of Medical Sciences (BUMS). The relationship between the Internet use and socio-demographic as well as mental health dimensions were also examined.

## **MATERIALS AND METHODS**

### **Design of the study**

We used a cross-sectional design in our study which lasted from January to March 2018 amongst the students of medical sciences at BUMS, the southwest of Iran.

### **Criteria of exclusion and inclusion**

We only included the participants that met the following criteria: Being a full time student at BUMS, showing consent to take a part in the research, and to fill out the surveys. Exclusion Criteria was no access to the Internet.

### **Sample size**

Single proportion formula was used to reach an estimated sample size. The reference prevalence of Internet addiction among the students was based on a previous study in the southeast of Iran which was 27.5% (17). The least sample size needed for the present study was 306 based on 0.05 precision with 95% confidence. As non-response rate was found to be 20%, the acceptable sample size was roughly 360.

### **Sampling method**

This study was carried out among undergraduate students. There are five faculties in Bushehr University of Medical Sciences, namely medical, dentistry, nursing and midwifery, health and nutrition, and paramedical faculty. The subjects were selected using stratified random sampling method. In the first step, we identified the total number of students in the university. As the numbers of students are unequal in different faculties, a list of students was obtained from the registrar's office of each faculty and served as the sampling frame. Then we divided the numbers of students of each stratum (faculty) by the total number of the students to get the percentage. After that we multiplied the percentage of each stratum by the desired sample size to get the required sample for each faculty. In the final step, from each stratum, students were selected by a simple random sampling method based on the sample frame.

### **Ethics**

The ethical Committee gave us research ethical clearance for using human subject of BUMS with the reference number of IR.BPUMS.REC.1395.171. All the students gave us a verbal consent before they were asked to participate in the research and their names were not recorded to assure confidentiality.

### **Research tools and scoring**

The data collection was done using a validated, reliable self-administered questionnaire which has 3 phases:

In the first phase, there are demographic information, and variables associated with Internet use including age, marital status, gender, residence, time spent on the Internet, age of starting Internet use, the purpose of Internet use. The second section was related to Internet overuse questions. We used Young Internet Addiction Test (YIAT) 1998 with 20 items to examine the Internet addiction and its impacts on disparate aspects of the Internet users' lives. The scale has a 5-point Likert scale: rarely (1), occasionally (2), frequently (3), often (4) always (5). The potential scores have the highest and lowest range of 20 and 100, respectively (18). According to the research on the psychometric features YIAT in Iran, the most acceptable cut-off point the study of Internet addiction is 46. It means the sum score higher than 46 is considered as IA (19).

Persian version of the translated YIAT is a valid instrument for assessing Internet addiction in Iranian university students. In previous Iranian studies face validity of the scale was tested among medical students and the content validity also was approved by 10 experts including 5 psychiatrists and 5 psychologists. The instrument showed good internal consistency (Cronbach's  $\alpha = 0.88$ ), and concurrent validity with the Young Diagnostic Questionnaire ( $r = 0.50$ ,  $P < 0.05$ ), test-retest reliability ( $r=0.82$ ) and bisection ( $r=0.72$ ). Also, best cut off point for the questionnaire was 46 to discriminate students with and without Internet addiction (19,20). In current study Cronbach's alpha coefficient for internal consistency reliability for YIAT was 0.95. In the third section of the questionnaire, the participants' mental health status was measured through Goldberg's General Health Questionnaire (GHQ-28). This scale is valid and reliable in numerous countries with 38 different translations. Goldberg GHQ has 28 items in four subsets: somatic symptoms (items of 1 to 7), anxiety/insomnia (items of 8 to14), and social dysfunction (items of 15 to 21), severe depression (items of 22 to 28) ((21). Each subset contains seven questions concerning with different aspects of mental health. Each item is based on a 4-point Likert scale: 'much more than usual' (3), 'rather more than usual' (2), 'no more than usual' (1), and not at all' (0). The overall potential score on the GHQ 28 has a range from zero to 84. The higher the scores are, the lower the mental health is. The validity and reliability of the Persian version of GHQ was confirmed by the previous studies in Iran. The instrument showed good internal consistency (Cronbach's  $\alpha = .93$ ), test-retest reliability ( $r=0.87$ ) and concurrent validity with the Symptom Checklist-90-Revised ( $r = 0.84$ ,  $P < 0.05$ ) (22,23). In addition, many studies approved the reliability and validity of GHQ-28 (23-25). In current study Cronbach's alpha coefficient for internal consistency reliability for GHQ-28 was 0.87

### **Statistical analysis**

We used IBM SPSS Statistics version 16 to analyze the data with the significance level of  $P < 0.05$ . The descriptive

analysis included frequencies and percentages, means, and standard deviations. The relationships among the categorical variables were determined using the chi-square test. The means of the two groups of an interval or the ratio variables were determined via independent sample t-test. Concerning quantitative variables, Kolmogorov-Smirnov test was used to assess the normality of data. The variables that were significant in the bivariate analysis were re-examined in the multivariate analysis. Binary logistic regression was also conducted to identify factors associated with Internet addiction after controlling other variables.

## RESULTS

### Participants' Characteristics

Of 410 students, four students refused to participate. We had to exclude six students due to their incomplete questionnaire, creating the response rate of 97.5%. The participants' mean age was 22.06 (standard deviation, SD= 3.78) in the range of 18 to 28. The most of the participants were female (65.5%), single (85.5%), live at the dormitory (90%), study at level of bachelor (64.8%). The overall prevalence of Internet addiction was 34.5%. The mean Internet addiction score was 42.63 (standard deviation, SD=17.11) in the entire study group. The average daily time spent on the Internet was  $5.85 \pm 4.18$ . The most common device used to access the Internet was smartphones (92.5%), followed by laptops (5%) and iPads or tablets (2.5%).

### Association between Internet Addiction with Study's Variables

There were significant differences in the mean score of somatic syndrome ( $p < 0.0001$ ), anxiety/insomnia ( $p < 0.0001$ ), and severe depression ( $p < 0.0001$ ) among Internet addicts and non-addicts. No significant difference was observed in the mean GPA score between non-addicts and Internet addicts ( $p = 0.486$ ). Table I provides more information on association between Internet addiction with socio demographic and Internet use variables.

Table II summarizes the results of the logistic regression analysis of the factors related to Internet addiction among the students. Hosmer-Lemeshow chi-square test gave a p-value of 0.463, indicating that the model adequately fits the data. The whole model explained between 26.1% (Cox and Snell R square) and 35.6% (Nagelkerke R squared) of the variance of Internet addiction, and appropriately categorized 75.9% of cases. As can be seen from Table II, variables such as age of starting Internet use [OR: 0.92, 95% CI: 0.87, 0.99;  $p = 0.028$ ], daily time spent on the Internet [OR: 1.12, 95% CI: 1.05, 1.21;  $p < 0.0001$ ], purpose of Internet use [OR: 3.32, 95% CI: 2.08, 5.48;  $p < 0.0001$ ] and anxiety/insomnia [OR: 1.20, 95% CI: 1.07, 1.28;  $p < 0.0001$ ] significantly predicted the Internet addiction.

**Table I: Association between Internet addiction and study's variables**

Characteristics	Internet users		Test value	p-value
	Addicts	Non-addicts		
<b>Age (Year)</b>				
M± SD	22.07±3.53	22.05±3.91	t= -0.056	0.955
<b>Age of starting Internet use</b>				
M± SD	15.52±3.84	16.66±4.62	t= 2.49	0.013*
<b>Daily time spent on Internet (hours)</b>				
M± SD	7.71±4.34	4.87±3.75	t= -6.82	<0.0001*
<b>Marital Status</b>				
Single	113(32.9)	230(67.1)	$\chi^2 = 1.422$	0.108
Married	25(43.9)	32(56.1)		
<b>Gender</b>				
Male	53(38.4)	85(61.6)	$\chi^2 = 2.57$	0.233
Female	177(67.6)	85(32.4)		
<b>Residence</b>				
Home	22(55)	18(45)	$\chi^2 = 2.161$	0.141
Dorm	120(33.3)	240(66.7)		
<b>Internet use purpose</b>				
Academic	37(18.1)	167(81.9)	$\chi^2 = 49.32$	<0.0001*
Non academic	101(51.5)	95(48.5)		
<b>General Health dimensions</b>				
<b>M ± SD</b>				
Somatic symptom	12.74	15.10	t= -6.192	<0.0001*
Anxiety/Insomnia	12.32	15.80	t= -8.347	<0.0001*
Social Dysfunction	15.31	15.58	t= 0.703	0.483
Severe Depression	12.10	9.85	t= -4.093	<0.0001*
Total GH	58.32	50.51	t= -6.823	<0.0001*

\*Significant level at  $p < 0.05$

For each year increase in the age of starting Internet use, the respondents were 1.09 times less likely to be Internet addict. Also, for every additional hour spent on the Internet, the respondents were 1.12 times more likely to be Internet addicts. The strongest predictor of Internet addiction was the purpose of Internet use. The students that surf on the Internet for non-academic purposes such as chatting or gaming were 3.2 times more likely to be Internet addicts. From mental health dimension, only anxiety/insomnia was significantly associated with Internet addiction, implying that for each unit increase in anxiety/insomnia score, the respondents were 1.2 times more likely to be Internet addicts.

## DISCUSSION

Literatures have indicated quite different rates of Internet addiction. Some studies in Jordan have shown rates as low as 0.9% (21), whereas others studies have indicated a high rate approximately 80% in Turkey (27), 34.7% in Greece (28), and 21% in Philippines (29).

Studies among different parts of Iran had different results. Study by Salarvad et al among 160 students of Lorestan university of medical sciences in Iran indicated

**Table II: Factors associated with Internet addiction among students**

Characteristics	B	S.E	Wald	Sig	OR	95% C.I. for EXP(B)	
						Lower	Upper
Age of starting Internet use (Continuous)	-0.075	0.034	4.847	0.028*	0.928	0.868	0.992
Time spent on Internet (hours) (Continuous)	0.114	0.034	11.314	0.001*	1.121	1.049	1.198
<b>Purpose of Internet use</b>							
Academic purpose (Ref)							
Non-academic purpose	-1.180	0.257	21.146	<0.0001*	3.32	2.08	5.48
<b>General Health Dimensions</b>							
Somatic(Continuous)	0.031	0.046	0.452	0.501	1.031	0.943	1.127
Anxiety/ Insomnia (Continuous)	0.161	0.044	13.629	<0.0001*	1.205	1.078	1.298
Depression (Continuous)	0.010	0.030	0.122	0.727	1.011	0.953	1.072
<b>Constant</b>	-2.656	0.826	10.346	0.001	0.070		

\* Significant level at p < 0.05, \*\*Ref= reference, B= coefficient, S.E=standard error, CI= confidence interval, OR=odds ratio, Cox & Snell R<sup>2</sup> =0. 261; Nagelkerke R<sup>2</sup> = 0.356.

that prevalence of internet addiction was 10%, and this problem was more prevalent in male students (P<0.05). Moreover, there was a significant and adverse relation between internet addiction score and self-esteem (P=0.015), and life satisfaction (P=0.012) (30).

A cross-sectional study in Ilam, west region of Iran among 1066 university students in both public and private sectors revealed 43.7% of students were Internet addicts. Prevalence of internet addiction among the medical students was higher than non-medical students (P< 0.0001) (16). Salehi et al. showed that 2.1% of the medical sciences students of Mashhad University are more likely to suffer from Internet addiction and 5.2% had Internet addiction (31). In another study in Iran, Pirzadeh et al. showed that 19.5% of medical sciences students of Isfahan University were moderately internet addicts (32). Moreover, a study in Zahedan University showed that the students have 27.5% of prevalence of IA (17). Our study showed the prevalence of IA among students was 34.5% which was higher than studies among other Iranian universities of Zahedan(17), Lorestan (30), Mashhad (31), Isfahan (32) and lower than Ilam University (16). This difference in IA may be related to availability and speed of internet which can motivate internet using. Of course, it also can be related to socio cultural factors and family relationships (30, 33).

Studies among universities and college students revealed the prevalence of 7.8% addictive Internet use in Malaysia (34), 2.9% in Jordan (35), and 6.4% in China (36). Study among nursing students in king Saud Bin Abdul-Aziz University in Saudi Arabia revealed that 38.4% and 2.1% of subjects were categorized as moderate to severe Internet addicts respectively (37). Moreover, study among students at Gaza strip in Palestine showed that 30.1% were at risk for Internet addiction (38). The diversity in the findings could be explained in the light of the various scales in the many study groups, the definition of Internet addiction, and time diversity of conducting studies (39).

Several studies have shown men are more vulnerable to Internet addiction than women because they cannot socially regulate their Internet use over such activities as gambling and gaming, reading the news, having virtual sex, meeting and chatting with new people (17, 31, 39, 40). However, like many other studies (42, 43), the present findings showed no significant differences between male and female participants concerning the level of Internet addiction.

The insignificant difference between female and male in relation to Internet addiction could be attributed to their similarities with respect to the culture, academic structure, peer and family pressure, and students' economic status (42). Further, the widespread use of the Internet is supposed to narrow the gap of Internet use among males and females. This can reduce differences in Internet addiction (44). Young (1998) notes that the addicted users form online relationships in chat rooms and play interactive games while the non-addicted Internet users spend time on the Internet, surfing on the Web and checking e-mail (18).

Our study suggests that Internet users with non-academic purposes such as gaming or chatting are 3.4 times are more prone to Internet addicts than those participants who surf on the Internet for academic purposes. This could be attributed to the lack of ability in managing time and self-control of students as they get involved in online or game chatting. Internet addiction occurs as students get away from real worlds to get online in virtual worlds. They prefer to spend their loneliness using the Internet specially when they are far from home, and are more eager to build a social relation online. Low psychological support could result in overuse of the Internet (17, 44). Indeed, virtual social support based on the Internet could not change into a permanent relation in reality, which causes social difficulties. The unhappiness and dissatisfaction in social relationships in the virtual worlds cause a vicious cycle (45). Time spent on the Internet is an essential element in Internet

addiction. Surfing on the Internet is used for 40-80 hours weekly or over 20 hours at one time could symptomize Internet addiction and requires hospitalization (6,46). If students spend 13 or more hours on the Internet each day, they will probably show a great amount of Internet addiction (42).

In consistent with our study, some researches have shown that as the duration of Internet use increases, the level of Internet addiction is more likely to increase (42,47). In this study, Internet addiction was not significantly different among students who reside at dorm and home. Due to ready and quick access to the Internet at dorm and home, the gap of Internet access decreases. In the present study, the Internet addicted users experienced a higher level of anxiety and sleep disorders compared to the non-addicted. Studies have shown that behavioral, social, and psychological disorders could happen following an increase in time spent on Internet and the growth of addiction (13). Numerous studies have reported interplay between Internet addiction and mental and behavioral disorders such as anxiety, depression, social phobia, substance abuse, and attention deficit hyperactivity disorder (48, 49). Moreover, Carli et al. systematically reviewed 20 published articles and showed a significant relationship between depression and Internet addiction (14).

The burden of studying, difficult and stressful educational process, financial and emotional problems, and uncertainty because of being far from family may contribute to depression and Internet addiction. Health, family, and school problems as well as time management could increase the level of depression and Internet addiction. In other words, the Internet is viewed as an alternative to reduce stress created by these problems (42).

The limitations of this include self- report questionnaire was used to collect the data about Internet; this could cause the actuality. Second, since the study relied on a cross sectional design, it was quite impossible to find a causal relationship between dimensions of general health and Internet addiction. Third, this study was carried out among the students of university; hence, the findings cannot be readily generalized to the whole population

## CONCLUSION

Internet addiction among the BUMS students was high. Internet use purpose, experiencing a higher level of anxiety/insomnia, spending more hours on the Internet, starting Internet use at younger age are significantly associated with Internet addiction. It is therefore suggested that students suspected of Internet addiction or psychological problem visit advanced centers in order to receive accurate diagnosis and appropriate treatment and that they need to be educated about the

regulated use of the Internet. In light of these results, organizing cognitive behavioral intervention programs may be effective in developing self-regulation skills. Panel discussions and seminars are also recommended in order to inform students about negative effects of Internet use.

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