

Internet Addiction Based on Personality Characteristics in Medical Students

Ali Sahraian,^{1,2} Seyyed Bozorgmehr Hedayati,³ Arash Mani,⁴ and Arvin Hedayati^{5,6,*}

¹Full Professor, Psychiatrist, Research Center for Psychiatry and Behavioral Sciences, Department of Psychiatry, Shiraz University of Medical Sciences, School of Medicine, Shiraz, Iran

²Psychiatrist Substance Abuse Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

³General Physician, Shiraz University of Medical Sciences, School of Medicine, Shiraz, Iran

⁴Assistant Professor, Cognitive Neuroscientist, Research Center for Psychiatry and Behavioral Sciences, Department of Psychiatry, Shiraz University of Medical Sciences, School of Medicine, Shiraz, Iran

⁵Assistant Professor, Department of Psychiatry, Fasa University Of Medical Sciences, School of Medicine, Fasa, Iran

⁶Psychiatrist, Research Center for Psychiatry and Behavioral Sciences, Department of Psychiatry, Shiraz, Iran

*Corresponding author: Arvin Hedayati, Assistant Professor, Department of Psychiatry, Fasa University of Medical Sciences, School of Medicine, Fasa, Iran. Tel: +98-9381079746, Fax: +98-7136411723, E-mail: hedayatia@razi.tums.ac.ir

Received 2016 August 09; Revised 2016 September 11; Accepted 2016 October 17.

Abstract

Background: The Internet has become a fundamental part of modern life, it has given rise to various problematic behaviors. Some of these behaviors, such as prolific use of social media, frequent email checking, excessive online gaming, online buying and gambling, and viewing pornography cause significant impairment in everyday functioning of some individuals. Different researchers studied psychological aspects like impulsive compulsive spectrum, anxiety and depression in internet addicts.

Objectives: The aim of this study is to examine the relationship between internet addictions and different aspects of personality in medical students.

Methods: In this cross, sectional study the purpose was to assess all 687 medical students of medical faculty of Shiraz University of Medical Sciences. 364 students showed their contention for participating in the study by filling the consent form. Finally 278 valid questionnaires were collected. They responded to the demographic questions in the questionnaire such as age, sex, marital status, student accommodation, entrance year to university, student residence place and also internet addiction test was performed and NEO five-factor inventory short form (NEO-FFI) was filled.

Results: 55% of participants show internet addiction, with distribution of 51.4% mild, 2.9% moderate and 0.4% severe addiction. Internet addiction and personality traits of extraversion (The correlation coefficient = -0.118, P = 0.05), agreeableness (The correlation coefficient = -0.379, P = 0.001) and conscientiousness (The correlation coefficient = -0.21, P = 0.001), showed significant negative correlation, but its correlation with neuroticism (The correlation coefficient = +0.2, P = 0.001) was significantly positive. Internet addiction scores among students in semester five and eleven prior to the comprehensive basic science test (26.52 ± 9.8) and comprehensive pre-internship test (28.57 ± 19.2) were higher than the other academic years.

Conclusions: The prevalence of Internet addiction in this study was higher compared to similar studies in other fields which led to the concerns regarding the extent of the problem. More internet addiction among students in 4th and 10th semester reveals the need for being efficiently trained in order to deal with stress in critical condition and also to maintain positive academic performance. Correlation of some aspects of personality traits with internet addiction, suggested initial assessment of medical students' personality by screening tools and identification of populations at risk. This may prove a need for favorable methods for initiation of prevention.

Keywords: Addictive Behavior, Personality, Personality Inventory

1. Background

The internet as a huge network that contains millions of private, public, academic, business, and government channels from local to global scope, with dramatic effects on human life plays a significant role on people's behavior and mentality (1). Adolescents are the most frequent users of the internet, which among them university students are

a group at significant risk of internet addiction (2).

University students are exposed to a new life like inevitable academic use and access to internet, portable mini-computers and cell phones. Additionally, less parental control, feeling of loneliness and isolation which lead to depression and anxiety. On the other hand, some characteristics such as seeking for novelty, competition with peers and the peers pressure, threat them as well as

internet addiction (3-7).

Definition of internet addiction is the inability to control one's internet usage that results in the serious impairment of various aspects of life (8). This term is reported in the appendix of the last version of the diagnostic and statistical manual for mental disorders (DSM-5) as the new phrase, internet gaming disorder (9).

Internet addiction prevalence in college students has been reported to be 16.3% in Italian college students, 4% in the United States, 5.9% and 17.9% in Taiwan, 10.6% in China and 34.7% in Greece (2, 10-13). In university students, there is direct relationship between perceived poor social support and the feeling of social-emotional loneliness with internet addiction (14, 15). Internet addiction is related to mental health state (16). Prevalence of internet addiction in university students in Iran was reported 10 - 43% (2, 17-19).

As personality trait is an important factor for substance dependency, it seems as a significant risk factor for internet addiction (20-23). In this study, our aim is to assess the personality traits in students affected with internet addiction. This can prove the importance of need for a screening tools and help the high risk individual, especially in an academic environment

2. Objectives

Exploration of the prevalence of internet addiction and discerning the role of personality traits as a risk factor of internet addiction, were the main aims of this study. The hypothesis were: 1, demographic characteristics such as sexuality would be positive risk factors for internet addiction; and 2, specific personality traits such as low extraversion, low agreeableness, and low emotional stability would influence the risk of internet addiction. The current research aimed to investigate the scope of effect of three factors including: personality, socio-demographic and Internet usages on internet addiction among medical students.

3. Methods

3.1. Participants

In the current cross sectional research, the statistical sample consisted of all medical students of Shiraz University of Medical Science, Shiraz, Iran. At the time of study, 687 medical students were studied in Shiraz University of Medical Sciences. Among them 364 students was intended to participate in the study. Finally, 278 valid questionnaires were collected. The research was done at second semester of the academic year 1393 - 1394.

The inclusion criteria: All of the medical students studied in 1393 - 1394.

The exclusion criteria: everyone who refused from participating in the study.

3.2. Instruments

Demographic questionnaire consist of questions about age, sex, marital status, student accommodation, year of admission, student residence place.

The internet addiction test (IAT) developed by Kimberly Young is a reliable and valid measure of addictive use of internet. It consists of 20 items ranked on a six options Likert format from never = 0 to always = 5. The minimum and maximum score are zero and 100, respectively. The total score of each participant was categorized into one of these classes: healthy (score 0 - 19), at risk (score 20 - 49), moderate dependence (score 50 - 79) and severe dependence (score 80 - 100) (24). The Persian version of this questionnaire was used in this study (25).

The different causes of internet usage evaluated in a separate questionnaire that contains 10 items.

The 60-item NEO Five-Factor Inventory (NEO-FFI) can define the five basic personality factors. The instrument containing 60 items ranked on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) that assessed the five-factor model of personality including: neuroticism (N), agreeableness (A), and conscientiousness (C), extraversion (E) and openness (O) factors (26). The Iranian version of this questionnaire was used in this study (26).

3.3. Procedure

All the participants voluntarily participated in this study. The researcher met participants in their classes. After the preliminary introduction about the aims of this study and the confidentiality of disclosure agreement, participants were asked to complete the questionnaires including demographic questionnaire, the ITA questionnaire and immediately afterwards the NEO-FFI.

4. Results

4.1. Descriptive Analysis

Raw data of 278 valid questionnaires were imported into the SPSS version 20 and prepared for the statistical analysis. Mean age of participants was 21.48 ± 2.59 .

39% (n = 108) of participants were male and 61% (n = 170) were female. In assessing place of residence, 66% (n = 184) of them lived with family and 34% (n = 94) were living in student residence (Table 1).

Table 1. Demographic Factors Which Affect the Internet Usage

	Prevalence	Internet Usage, %
Sex		
Male	108	38.8
Marital status		
Single	255	91.7
Married	23	8.3
Location of residence		
With parent or spouse	184	66.2
Student residence	94	33.8
Year-admission		
1385	33	11.9
1386	43	15.5
1387	34	12.2
1388	32	11.5
1389	33	11.9
1390	33	11.9
1391	35	12.6
1392	35	12.6
Internet usage		
Scientific research	178	64
Non -scientific research	159	57
chat	84	30.2
Social web	176	63.3
Email checking	164	59
Daily news	109	39.2
Download		
Film	114	41
Music	148	53.2
Software	114	41
Online games	49	17.6

4.2. Internet Use

Mean time of Internet usage was 3.81 ± 3.14 hours.

The different causes of internet usage evaluated in a separate questionnaire that contains 10 items. Results are shown in Table 1. The most common usage of internet was scientific search and social network usage; and the least cause was online game and chat.

4.3. Analysis of IAT Score

To analyze the students' IAT answers, Young's standard scale was applied. Distribution of severity of internet addiction was as: 45.3% (n = 125) which is in normal range,

51.4% (n = 143) mild internet addiction, 2.9% (n = 8) moderate internet addiction and 0.4% (n = 1) severe addiction.

The assessment of sexuality factor indicated that the males' scores were higher (M = 27.67, SD = 14.57) than females (M = 20.34, SD = 13.12). Independent t-test analysis indicated IAT scores vary according to gender (P = 0.001). IAT score was significantly higher in students who live with family (M = 24.34) compared to the students who live in student residence (M = 20.92) (P = 0.001). Evaluation of marital status show single students' IAT mean scores were significantly higher compared to the married students (P = 0.043).

Table 2 show mean and SD of ITA score due to demographic factors in addicted group. There is positive correlation between hours of internet usage and IAT score.

Comparison of IAT mean score between different year of attendance show that students who attended the university at 2012 (1391 Hijri) and 2008 (1387 Hijri) who must participate in university comprehensive tests, respectively show Comprehensive Basic Science Test and comprehensive Pre-Internship test (P = 0.02).

4.4. Personality Traits and Internet Addiction

The Pearson's correlation analysis and multiple linear regressions were used to assess the relationship between

Table 2. Mean of IAT Score and Demographic Factors

	Mean $\pm$ SD	P Value
Sex		0.001
Male	27.67 $\pm$ 14.57	
Female	20.34 $\pm$ 13.12	
Marital status		0.043
Single	24.34 $\pm$ 14.89	
Married	20.92 $\pm$ 12.29	
Location of residence		0.001
With parent or spouse	24.1 $\pm$ 14.08	
dormitory	14.4 $\pm$ 11.45	
Year of admission		0.02
1385	17.66 $\pm$ 12.79	
1386	19.13 $\pm$ 14.80	
1387	26.52 $\pm$ 9.8	
1388	23.78 $\pm$ 15.46	
1389	22.18 $\pm$ 10.88	
1390	24.96 $\pm$ 10.41	
1391	28.57 $\pm$ 19.2	
1392	23.48 $\pm$ 14.66	

student personality traits and IAT total scores. The results are shown in Table 3. There is positive correlation between IAT score and neuroticism (N), and negative correlation between IAT score and, agreeableness (A), and conscientiousness (C), extraversion (E). No significant relationship was found between IAT total scores and openness personality traits. The investigation of the potential role of personality traits in explaining problematic Internet usage, was done by multiple regression analysis. The IAT total scores were set as dependent variables. The results of the multiple linear regressions analyses shows that the only domain that could predict internet addiction was agreeableness (A) which could predict 0.1% of internet addiction variable regression is calculated by: $y = ax + b$, so predictive formula for internet addiction can be: $Y = 46.21 \pm 0.762$ (Agreeableness). Raw score of agreeableness can be put in this formula and internet addiction can be predicted.

Comparison of personality traits between addicted and non-addicted groups is reported in Table 4. Non-addicted group show significant higher mean score in agreeableness (A), and conscientiousness (C), extraversion (E), neuroticism score was significantly higher in addicted group.

5. Discussion

The main purpose of this study was to investigate the risk of internet addiction in medical students by consideration of the interplay between demographic data, student

Table 3. The Correlation Coefficient Between the Personality Traits and IAT Scores

Personality traits	
Neuroticism (N)	
The correlation coefficient	+0.2**
The significance level	0.001
Extraversion (E)	
The correlation coefficient	-0.118*
The significance level	0.05
Openness (O)	
The correlation coefficient	0.043
The significance level	0.478
Agreeableness (A)	
The correlation coefficient	-0.379**
The significance level	0.001
Conscientiousness (C)	
The correlation coefficient	-0.21**
The significance level	0.001

Table 4. Mean of Personality Traits of Internet Addicted and Non-Addicted Populations

Personality Traits	Fill Out This	Fill Out This	Fill Out This
Neuroticism (N)			
Non-addict	19.30 ± 7.87	3.94	0.001
Addict	22.83 ± 7.03		
Extraversion (E)			
Non-addict	29.0 ± 6.84	2.53	0.01
Addict	26.95 ± 6.61		
Openness (O)			
Non-addict	25.38 ± 5.89	0.386	0.7
Addict	25.63 ± 5.2		
Agreeableness (A)			
Non-addict	32.27 ± 5.91	5.54	0.001
Addict	28.51 ± 5.4		
Conscientiousness (C)			
Non-addict	33.32 ± 7.49	2.83	0.005
Addict	30.90 ± 6.70		

Internet usage and personality traits. The prevalence was higher compared to the other similar research in university students in Iran and other countries. Internet addiction prevalence in college students has been reported to be 4% in the United States, 5.9% and 17.9% in Taiwan, 10.6% in China and 34.7% in Greece. In other Iranian medical university prevalence was between 5.2 to 22% (2, 10-13, 17-19, 27). Although this difference can be related to increasing rate of accessibility of technology. This high rate of internet addiction is worrying. In our study, the most common internet usage among medical student was intended to search for the scientific articles. This was confirmed in the study of medical students (17) although the most common purpose of excessive internet usage in other studies is social cyber connection such as chatting (10, 27).

In this study similar to other researches male students achieved higher means IAT scores than females (17, 26, 28). A few studies indicate that internet addiction rate was higher in female students (10, 29). This can be explained by the men's interest and motivation for information technology. Culture can also have a significant role in such an outcome.

Our research show that the mean IA score was higher in those who lived with family in comparison with the students who lived at student residence. This finding is similar to the other studies (26). This can be due to more sense of responsibility in students who live at student residence as they have to manage everything in their own life.

Well known risk factor which is defined in this research for IA, is being single. In other similar studies being single, having impaired family relationships and being divorced were risk factors for internet addiction (28). This can be explained by cognitive behavioral model that justify this finding. Being online give individuals the sense of competence and socialization that consequently influence the internet usage (13). Beyrami et al. studied the effect of perceived social support and the feeling of social-emotional loneliness on internet addiction in university students (15). This was also approved in shaw's study (14).

In this research, initial hypothesis of influence of personality traits as a predictor for internet addiction was partially accepted. In our study, there was positive correlation between IAT score and neuroticism (N), and Negative correlation between IAT score and, agreeableness (A), conscientiousness (C), and extraversion (E). No significant relationship was found between IAT total scores and Openness personality traits. Different studies use various type of personality assessment tools. Among those the one that use five factors model and three factors model confirmed the effect of neuroticism (N) on internet addiction (29-34). Negative correlation of agreeableness (A), conscientiousness (C), extraversion (E) are similar with findings in the other studies assessing personality role in internet addiction (20, 30, 31). Three independent British samples on the NEO-FFI indicate that agreeableness, neuroticism and conscientiousness are more reliable sub-scales than extraversion and openness to experience and extraversion (35).

Neuroticism is the susceptibility to experience negative feelings, such as depression, anxiety, anger with low tolerance for stress or unpleasant stimuli. Those with high score in neuroticism interpret usual situations as alarming and threatening. These problems in emotional regulation can influence the ability of thinking clearly, making decisions, and coping effectively with stress (36). These can be the reason that these individuals use substitute methods like internet usage in dealing with stressful situations. This can be an explanation for increasing rate of internet addiction in periods before comprehensive tests during academic year.

The agreeableness trait was a dramatic negative predictor of internet addiction. Persons with low agreeableness have some problems in establishing real interpersonal relationships, or sharing team-work experiences, thus they prefer to spend their free time to surf the Internet (37, 38) and this is a mean to satisfy their personal needs.

Another personality trait that showed a significant negative effect in predicting internet addiction was extraversion. Extraversion is characterized by attention seeking, being talkative, having high positive affect and sociability in real life whereas introverts are over-aroused and

nervous. They are therefore in need of peace and calm environment to be in the optimal level of performance; so they may prefer interacting online with others (39).

Conscientiousness personality trait was also a significant negative predictor of internet addiction. So students with a methodical and structured behavior in comparison to disorganized persons have a lower risk of Internet addiction (40).

Another interesting finding in this research was the effect of stressors such as comprehensive basic science test and comprehensive pre-internship test on increasing internet usage. It seems that students use this maladaptive behavior as a defense mechanism to escape from these stressors. Students in 4th and 10th semester need to be trained correctly and efficiently in order to deal with stress in critical condition and also to maintain positive academic performance. no similar study was found to assess this effect.

These data were a good identifier of medical students of Medical faculty of Shiraz University of Medical Sciences. Several limitations in this study should be underlined. The data are related to students from one specific Iranian medical university; hence, this can limit its generalization. However, the same opportunities in using information and communication technologies in all medical students in Iran can explain the minimal homogeneity among students in internet usage. It is recommended that initial assessment of medical students' personality by screening tools and identification of populations at risk, may prove the need for favorable methods for initiation of prevention.

Acknowledgments

The writers would like to express their utmost gratitude to the vice president of research at Shiraz University of Medical Sciences as well as the centre for psychiatric research for the assistance in conducting this project.

Footnotes

Authors' Contribution: Ali Sahraian designed the study; Seyyed Bozorgmehr Hedayati collected the data and prepared the article; Arash Mani analyzed the data; Arvin Hedayati prepared and edited the English version of the article.

Conflict of Interest: None declared.

Funding/Support: This study was supported by Shiraz University of Medical Science under student grant number 4768/01/01/91.

References

- Young KS. Internet addiction a new clinical phenomenon and its consequences. *American Behav Sci.* 2004;**48**(4):402-15. doi: [10.1177/0002764204270278](https://doi.org/10.1177/0002764204270278).
- Mazhari S. The prevalence of problematic internet use and the related factors in medical students, Kerman, Iran. *Addict Health.* 2012;**4**(3-4):87-94. [PubMed: [24494141](https://pubmed.ncbi.nlm.nih.gov/24494141/)].
- Koyuncu T, Unsal A, Arslantas D. Assessment of internet addiction and loneliness in secondary and high school students. *J Pak Med Assoc.* 2014;**64**(9):998-1002. [PubMed: [25823176](https://pubmed.ncbi.nlm.nih.gov/25823176/)].
- Wu CY, Lee MB, Liao SC, Chang LR. Risk Factors of Internet Addiction among Internet Users: An Online Questionnaire Survey. *PLoS One.* 2015;**10**(10):0137506. doi: [10.1371/journal.pone.0137506](https://doi.org/10.1371/journal.pone.0137506). [PubMed: [26462196](https://pubmed.ncbi.nlm.nih.gov/26462196/)].
- Chang FC, Chiu CH, Lee CM, Chen PH, Miao NF. Predictors of the initiation and persistence of internet addiction among adolescents in Taiwan. *Addict Behav.* 2014;**39**(10):1434-40. doi: [10.1016/j.addbeh.2014.05.010](https://doi.org/10.1016/j.addbeh.2014.05.010). [PubMed: [24930050](https://pubmed.ncbi.nlm.nih.gov/24930050/)].
- Huan VS, Ang RP, Chong WH, Chye S. The impact of shyness on problematic internet use: the role of loneliness. *J Psychol.* 2014;**148**(6):699-715. doi: [10.1080/00223980.2013.825229](https://doi.org/10.1080/00223980.2013.825229). [PubMed: [25175891](https://pubmed.ncbi.nlm.nih.gov/25175891/)].
- Bozoglan B, Demirev V, Sahin I. Loneliness, self-esteem, and life satisfaction as predictors of Internet addiction: a cross-sectional study among Turkish university students. *Scand J Psychol.* 2013;**54**(4):313-9. doi: [10.1111/sjop.12049](https://doi.org/10.1111/sjop.12049). [PubMed: [23577670](https://pubmed.ncbi.nlm.nih.gov/23577670/)].
- Young KS. Internet addiction: The emergence of a new clinical disorder. *Cyber Psychol Behav.* 1998;**3**(3):237-44.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM). ;1994.
- Chou C, Hsiao M. Internet addiction, usage, gratification, and pleasure experience: the Taiwan college students case. *Comp Edu.* 2000;**35**(1):65-80.
- Servidio R. Exploring the effects of demographic factors, Internet usage and personality traits on Internet addiction in a sample of Italian university students. *Com Hum Behav.* 2014;**35**:85-92.
- Christakis DA, Moreno MM, Jelenchick L, Myaing MT, Zhou C. Problematic internet usage in US college students: a pilot study. *BMC Med.* 2011;**9**:77. doi: [10.1186/1741-7015-9-77](https://doi.org/10.1186/1741-7015-9-77). [PubMed: [21696582](https://pubmed.ncbi.nlm.nih.gov/21696582/)].
- Frangos CC, Frangos CC, Sotiropoulos I. Problematic Internet Use among Greek university students: an ordinal logistic regression with risk factors of negative psychological beliefs, pornographic sites, and online games. *Cyberpsychol Behav Soc Netw.* 2011;**14**(1-2):51-8. doi: [10.1089/cyber.2009.0306](https://doi.org/10.1089/cyber.2009.0306). [PubMed: [21329443](https://pubmed.ncbi.nlm.nih.gov/21329443/)].
- Shaw LH, Gant LM. In defense of the internet: the relationship between Internet communication and depression, loneliness, self-esteem, and perceived social support. *Cyberpsychol Behav.* 2002;**5**(2):157-71. doi: [10.1089/109493102753770552](https://doi.org/10.1089/109493102753770552). [PubMed: [12025883](https://pubmed.ncbi.nlm.nih.gov/12025883/)].
- Beyrami M., Movahedi M. The relationship between perceived social support and the feeling of social-emotional loneliness with internet addiction in university students. *Social Cogn.* 2015;**3**(6):109-22.
- Salahian A, Gharibi H, Malekpour N, Salahian N. Examining the role of predictor variables of mental health and personality subscales in internet addiction of students in medical and non-medical universities of sanandaj in 2014. *forjani.* 2015;**3**(2):46-56.
- Ghamari F, Mohammadbeigi A, Mohammadalehi N, Hashiani AA. Internet addiction and modeling its risk factors in medical students, Iran. *Indian J Psychol Med.* 2011;**33**(2):158-62. doi: [10.4103/0253-7176.92068](https://doi.org/10.4103/0253-7176.92068). [PubMed: [22345841](https://pubmed.ncbi.nlm.nih.gov/22345841/)].
- Hashemian A, Direkvand-Moghadam A, Delpisheh A, Direkvand-Moghadam A. Prevalence of internet addiction among university students in Ilam: a cross-sectional study. *International Journal of Epidemiologic Research.* 2014;**1**(1):9-15.
- Ansari H, Ansari-Moghadam A, Mohammadi M, Peyvand M, Amani Z, Arbabisarjou A. Internet addiction and happiness among medical sciences students in southeastern Iran. *Health Scope.* 2016;**5**(2).
- Boogar IR, Tabatabaee SM, Tosi J. Attitude to substance abuse: do personality and socio-demographic factors matter?. *Int J High Risk Behav Addict.* 2014;**3**(3) doi: [10.5812/ijhrba.16712](https://doi.org/10.5812/ijhrba.16712). [PubMed: [25593892](https://pubmed.ncbi.nlm.nih.gov/25593892/)].
- Ozturk C, Bektas M, Ayar D, Ozguven Oztornaci B, Yagci D. Association of Personality Traits and Risk of Internet Addiction in Adolescents. *Asian Nurs Res (Korean Soc Nurs Sci).* 2015;**9**(2):120-4. doi: [10.1016/j.anr.2015.01.001](https://doi.org/10.1016/j.anr.2015.01.001). [PubMed: [26160240](https://pubmed.ncbi.nlm.nih.gov/26160240/)].
- Xu J, Shen LX, Yan CH, Hu H, Yang F, Wang L, et al. Personal characteristics related to the risk of adolescent internet addiction: a survey in Shanghai, China. *BMC Public Health.* 2012;**12**:1106. doi: [10.1186/1471-2458-12-1106](https://doi.org/10.1186/1471-2458-12-1106). [PubMed: [23259906](https://pubmed.ncbi.nlm.nih.gov/23259906/)].
- Chen Q, Quan X, Lu H, Fei P, Li M. Comparison of the personality and other psychological factors of students with internet addiction who do and do not have associated social dysfunction. *Shanghai Arch Psychiatry.* 2015;**27**(1):36-41. doi: [10.11919/j.issn.1002-0829.214129](https://doi.org/10.11919/j.issn.1002-0829.214129). [PubMed: [25852254](https://pubmed.ncbi.nlm.nih.gov/25852254/)].
- Alavi SS, Eslami M, Meracy MR, Najafi M, Jannatifard F, Rezapour H. Psychometric properties of Young internet addiction test. *Int J Behav Sci.* 2010;**4**(3):183-9.
- Mohammadsalehi N, Mohammadbeigi A, Jadidi R, Anbari Z, Ghaderi E, Akbari M. Psychometric Properties of the Persian Language Version of Yang Internet Addiction Questionnaire: An Explanatory Factor Analysis. *Int J High Risk Behav Addict.* 2015;**4**(3):21560. doi: [10.5812/ijhrba.21560](https://doi.org/10.5812/ijhrba.21560). [PubMed: [26495253](https://pubmed.ncbi.nlm.nih.gov/26495253/)].
- Anisi J, Majdiyan M, Joshanloo M, Ghoharikamel Z. Validity and reliability of NEO five-factor inventory (NEO-FFI) on university students. *Int J Behav Sci.* 2011;**5**(4):351-5.
- Salehi M, Khalili MN, Hojjat SK, Salehi M, Danesh A. Prevalence of internet addiction and associated factors among medical students from Mashhad, Iran in 2013. *Iran Red Cres Med J.* 2014;**16**(5) doi: [10.5812/ircmj.17256](https://doi.org/10.5812/ircmj.17256). [PubMed: [25031856](https://pubmed.ncbi.nlm.nih.gov/25031856/)].
- Senormanci O, Saracli O, Atasoy N, Senormanci G, Kokturk F, Atik L. Relationship of Internet addiction with cognitive style, personality, and depression in university students. *Compr Psychiatry.* 2014;**55**(6):1385-90. doi: [10.1016/j.comppsy.2014.04.025](https://doi.org/10.1016/j.comppsy.2014.04.025). [PubMed: [24889340](https://pubmed.ncbi.nlm.nih.gov/24889340/)].
- Mok JY, Choi SW, Kim DJ, Choi JS, Lee J, Ahn H, et al. Latent class analysis on internet and smartphone addiction in college students. *Neuropsychiatr Dis Treat.* 2014;**10**:817-28. doi: [10.2147/NDT.S59293](https://doi.org/10.2147/NDT.S59293). [PubMed: [24899806](https://pubmed.ncbi.nlm.nih.gov/24899806/)].
- Wang CW, Ho RT, Chan CL, Tse S. Exploring personality characteristics of Chinese adolescents with internet-related addictive behaviors: trait differences for gaming addiction and social networking addiction. *Addict Behav.* 2015;**42**:32-5. doi: [10.1016/j.addbeh.2014.10.039](https://doi.org/10.1016/j.addbeh.2014.10.039). [PubMed: [25462651](https://pubmed.ncbi.nlm.nih.gov/25462651/)].
- Kuss DJ, Shorter GW, Van Rooij AJ, van de Mheen D, Griffiths MD. The Internet addiction components model and personality: establishing construct validity via a nomological network. *Com Hum Behav.* 2014;**39**:312-21.
- Ying Ge JS, Zhang J. Research on relationship among internet-addiction, personality traits and mental health of urban left-behind children. *Global J Health Sci.* 2015;**7**(4):60.
- Dalbudak E, Evren C. The relationship of Internet addiction severity with Attention Deficit Hyperactivity Disorder symptoms in Turkish University students; impact of personality traits, depression and anxiety. *Compr Psychiatry.* 2014;**55**(3):497-503. doi: [10.1016/j.comppsy.2013.11.018](https://doi.org/10.1016/j.comppsy.2013.11.018). [PubMed: [24374171](https://pubmed.ncbi.nlm.nih.gov/24374171/)].
- Zamani BE, Abedini Y, Kheradmand A. Internet addiction based on personality characteristics of high school students in Kerman, Iran. *Addiction Health.* 2012;**3**(3-4):85-91.
- Egan V, Deary I, Austin E. The NEO-FFI: Emerging British norms and an item-level analysis suggest N, A and C are more reliable than O and E. *Pers Individ Dif.* 2000;**29**(5):907-20.
- Goldberg LR. The structure of phenotypic personality traits. *Am Psychol.* 1993;**48**(1):26-34. [PubMed: [8427480](https://pubmed.ncbi.nlm.nih.gov/8427480/)].

37. Landers RN, Lounsbury JW. An investigation of Big Five and narrow personality traits in relation to Internet usage. *Com Hum Behav.* 2006;**22**(2):283-93.
38. Buckner JE, Castille C, Sheets TL. The Five Factor Model of personality and employees' excessive use of technology. *Com Hum Behav.* 2012;**28**(5):1947-53.
39. Yan W, Li Y, Sui N. The relationship between recent stressful life events, personality traits, perceived family functioning and internet addiction among college students. *Stress Health.* 2014;**30**(1):3-11.
40. Muller KW, Beutel ME, Egloff B, Wölfling K. Investigating risk factors for internet gaming disorder: a comparison of patients with addictive gaming, pathological gamblers and healthy controls regarding the big five personality traits. *Euro Addict Res.* 2013;**20**(3):129-36. doi: [10.1159/000355832](https://doi.org/10.1159/000355832). [PubMed: [24247280](https://pubmed.ncbi.nlm.nih.gov/24247280/)].