



Original Article

The association between Internet addiction and personality traits in medical students

Seyedeh Azam Pourhoseini¹; *Ali Akbary²; Zohre Ahmadi³

¹Department of Obstetrics and Gynecology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

²Associate professor of psychiatry, Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.

³School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran.

Abstract

Introduction: Regarding the prevalence of Internet Addiction (IA) in university students and the relationship between IA and personality traits, the present study aims to assess Internet addiction and its relationship with personality traits in medical students.

Materials and Methods: The population of this correlational study consisted of all medical students of Gonabad University of Medical Sciences-Iran in 2020 (n= 350). Among them, 196 students (124 female and 72 male) were selected using simple random sampling based on gender and educational level. They fulfilled the Internet Addiction Test (IAT) and NEO Personality Inventory-Revised (NEO-PI-R). The data were analyzed through the descriptive tests and inferential statistics, including standard error of proportions, Chi-square, Fisher's-test, Pearson's correlation coefficient, and the regression model through SPSS v.23.

Results: The findings revealed that 16.84% of the students had severe IA, while 63.78% had moderate IA. The demographic variables indicated that gender was not related to IA significantly, while the relationship between IA and marital status was significant. In personality traits, the highest correlation was seen between IA and neuroticism ($r= 0.33, P= 0.001$). Also, there is a significant and negative relationship between conscientiousness and the level of internet addiction (moderate correlation level) ($r= -0.29, P= 0.001$). At the same time, there were not any significant relationships between IA and other personality traits.

Conclusion: Based on the findings, the prevalence rate of Internet addiction among medical students was high, especially in single students—also, personality traits of neuroticism, and conscientiousness significantly correlated with Internet addiction.

Keywords: Internet addiction, Medical students, Personality traits

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Introduction

The Internet is useful for transferring information and data worldwide, but its problematic and uncontrolled use is a global health issue, especially among youth (1,2). Overuse of the Internet affects physical health

(3), sleep quality (4), social functions (5), psychological conditions (6), and quality of life (7). Internet Addiction (IA) is an addiction without dependency on any chemical agent, but a person with IA cannot control him/herself to discontinue Internet problematic use despite

*Corresponding Author:

Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
akbaria@mums.ac.ir

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negative consequences (8). Internet addiction in university students, especially medical students, is more harmful because it threatens their academic progress and occupational life in addition to social and individualized adverse effects. Based on the conducted studies, medical students with IA receive lower exam scores than non-addicted students (9-11). On the other hand, there is a relationship between IA and personality traits (12,13). Based on the evidence, there were relationships between personality traits such as neuroticism, extraversion, and low level of consciousness with IA (14,15).

So, the present study aims to assess the association between Internet addiction and personality traits in medical students.

Materials and Methods

The statistical population of this correlational study consisted of all medical students of Gonabad University of Medical Sciences in 2020 (n= 350). Among them, 196 students (124 female and 72 male) were selected using simple random sampling based on gender and educational level. The inclusion criteria included being medical students, having access to the Internet, willingness to participate in this research, not having a major psychological illness or not having psychiatric medication, and lack of having a history of substance abuse. The exclusion criteria included unwillingness to continue the study and incomplete questionnaires. The ethical committee of Gonabad University of Medical Sciences approved this study. All medical students participated voluntarily, and the researchers ensured the students that they kept personal information confidential.

Research instruments

A) *Demographic Checklist*: This checklist included demographic variables such as age, gender, and marital status.

B) *The Internet Addiction Test (IAT)*: This test was developed by Kimberly Young to assess

problematic Internet use. It is a self-report instrument with 20 items that score in a five-degree Likert system. Based on the scores of this test, Internet users are divided into four groups: normal (0-30), mild internet addiction (31-49), moderate internet addiction (50-79), and severe internet addiction (80-100) (16). This test was applied in different countries (17), and the previous studies indicated a good internal consistency of this test using the Cronbach alpha ($\alpha > 0.85$) (18,19). In Iran, 233 university students fulfilled the Persian version of this test. The Cronbach alpha was calculated equal to 0.88 (20).

C) *NEO Personality Inventory-Revised (NEO-PI-R)*: Costa and McCrae developed this instrument in 1992. This 60-item inventory evaluates the big five personality dimensions (Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness).

They reported its reliability of 0.63 to 0.83 in three-year intervals and 0.68 to 0.83 in six-year intervals (21,22). Haghshenas in Iran has normalized this inventory (1999) on 502 individuals without any psychiatric history. The Cronbach's alpha coefficients of big five personality factors in sixth- and seventh-month intervals for internal consistency were 0.81, 0.71, 0.57, 0.71, 0.83, and for test-retest stability, were 0.53, 0.74, 0.76, 0.60, and 0.64 respectively (23). The data were analyzed through descriptive and inferential statistical tests, including standard error of proportions, Chi-square, Fisher's-test, Pearson's correlation coefficient, and the regression model through SPSS software (version 23).

Results

Regarding demographic variables, 125 female and 71 male students participated in this study, and 43 students were married. Also, the mean age of the students was 22.17 ± 2.39 years. The descriptive statistics of the variables are presented in Table 1.

Table 1. The descriptive statistics related to internet addiction

Participants		Lack of internet addiction (normal use and mild addiction; IAT score: 20-49)	At risk of internet addiction (moderate addiction; IAT score: 50-79)	Internet addiction (severe addiction; IAT score: 80-100)	P (X ² test)
Gender	Male (n (%))	15 (21.12)	43 (60.56)	13 (18.30)	0.963
	Female (n (%))	23 (18.40)	82 (65.60)	20 (16.00)	
Marital status	Married (n (%))	12 (27.90)	27 (62.79)	4 (9.30)	0.041
	Single (n (%))	26 (17.00)	98 (64.05)	29 (18.95)	
Total (n (%))		38 (19.39)	125 (63.78)	33 (16.84)	

Based on the results, 16.84% of the medical students had severe IA, while 63.78% had moderate IA. These findings revealed a high prevalence of IA in medical students. The demographic variables indicated that gender was not related to IA significantly. At the same

time, the relationship between IA and marital status was significant, and the prevalence of IA was significantly lower in married students compared to singles. Table 2 displays the correlation matrix of variables.

Table 2. The correlation matrix of internet addiction and personality traits

	1	2	3	4	5	6	7
Internet addiction	1						
Personality traits (five factors)	-0.21**	1					
Neuroticism	0.33**	-0.29**	1				
Extraversion	-0.90	0.39**	-0.37**	1			
Openness	-0.80	0.36**	-0.29**	0.57**	1		
Agreeableness	-0.60	0.27**	-0.19**	0.62**	0.67**	1	
Conscientiousness	-0.29**	0.35**	-0.26**	0.56**	0.72**	0.70**	1

** $P=0.001$

The correlation matrix of all research variables shows that the highest correlation was seen between internet addiction and neuroticism ($r= 0.33$, $P= 0.001$), which is a significant and positive correlation. Also, there is a significant and negative relationship between conscientiousness and the level of internet addiction (moderate correlation level) ($r= -0.29$, $P= 0.001$). At the same time, there were no significant relationships between IA and other personality traits of openness, agreeableness, and extraversion.

Discussion

Based on the findings, the prevalence rate of Internet addiction (IA) among medical students of Gonabad University of Medical Sciences was high, especially among single students. Among the five personality traits, neuroticism and conscientiousness significantly correlated with Internet addiction.

In this line, Miskulin et al. studied 1051 university students (mean age: 22 years) in Eastern Croatia through the Young Internet Addiction Test and Big Five Inventory. They concluded that 1.0% of the participants had severe Internet addiction, and 24.6% had moderate IA. However, they reported IA in 80.0% of the students who use the Internet in social networks, 78.9% in individuals involved in online games, and 52.2% in students who use it for educational tasks (24).

However, in the present study, we did not investigate the issues medical students follow on the Internet, such as social networks, games, or scientific sources. So, we cannot compare two studies in this field. Regarding personality traits, Miskulin et al. concluded that higher

neuroticism, extraversion, and openness scores were associated with higher addictive behaviors in Croatian university students. Also, all three traits were higher in students who spend more time on social networks. Higher scores in openness and extraversion were associated with students who had IA in using the Internet for university assignments. There was no significant relationship between special personality traits and IA in online games (24). These findings are consistent with our results about the significant relationship between personality traits and IA, in general, and between neuroticism traits and IA. However, the rate of IA in the Miskulin et al. study was lower than in our study. Also, Miskulin et al. did not report a significant relationship between conscientiousness and IA, which may be related to the different cultures.

Also, Eapen and Sundaramoorthy investigated personality traits and Internet addiction in 421 college students (mean age: 20.09 years) of South India using NEO-FFI-3 and Internet Addiction Test. The findings indicated that IA was more prevalent in male students than females. In personality traits, neuroticism had a strong positive correlation with IA, while personality traits such as agreeableness and conscientiousness were higher in non-addicted students (15). These findings support our findings about the positive correlation of neuroticism and the negative correlation of conscientiousness with IA in medical students. Although, we did not find any significant relationship between gender and IA.

In another study, Haramain and Afiah assessed the effects of personal traits and IA on learning motivation in 337 Indonesian students.

They found that personality traits, including extraversion, agreeableness, and neuroticism (most effect) impact IA. Also, these three personality traits influence learning motivation (25). Their findings align with our results about the positive correlation between neuroticism and IA. However, we did not report any significant relationships between extraversion and agreeableness with IA, which may be related to different samples (students vs. medical students).

The findings related to the meta-analysis on 37 studies (34438 participants) conducted by Kei Mak et al. in 2021 indicated that personality traits of neuroticism and psychoticism were associated positively with IA, while extraversion, agreeableness, and conscientiousness were associated negatively with IA (26). These findings support the present study and highlight the significance of personality traits in internet addiction.

Also, Shi and Du investigated the association of IA and personality traits in 1264 Chinese medical students using the Big Five Inventory, Internet Addiction Test, and Adult ADHD Self-Report Scale V1-1. They concluded that 44.7% of the medical students had an IAT score higher than 30, while 9.2% reported moderate to severe IA (IAT score > 50).

In addition, agreeableness and conscientiousness were negatively associated with IA, while neuroticism was associated positively with IA, and ADHD symptoms mediated these associations (27). These findings are consistent with our study. However, we did not assess the ADHD symptoms among medical students, and

the prevalence of IA was higher than in Shi and Du's study, which shows the high prevalence of overusing smartphones and social networks in our youth populations.

Regarding the high prevalence rate of Internet addiction among medical students in our country (11) and the role of personality traits in preventing and maintaining Internet addictive behaviors (28), it seems that educational programs and necessary interventions can reduce the rate of Internet addiction in medical students and improve their academic and social performance.

The present study has limitations, such as limited sampling to one university and one geographical region in Iran and a need to assess psychological conditions, educational courses, and living in homes or dormitories. Also, we should have investigated the main reasons for Internet usage, such as academic searching, sharing in social networks, or online gaming in medical students.

Conclusion

Based on the findings, the prevalence rate of Internet addiction among medical students of Gonabad University of Medical Sciences was high, especially among single students. In addition, personality traits of neuroticism and conscientiousness significantly correlated with Internet addiction.

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