

Research Paper: Predicting Internet Addiction in Medical Students by General Self-efficacy, Difficulty in Emotion Regulation, and Resilience



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Citation: Salek Ebrahimi, L., Ahmadi, Gh., Masjedi Arani, A., & Mousavi, S. E. (2019). Predicting Internet Addiction in Medical Students by General Self-efficacy, Difficulty in Emotion Regulation, and Resilience. *Journal of Practice in Clinical Psychology*, 7(3), 167-174. <http://dx.doi.org/10.32598/jpcp.7.3.167>

doi <http://dx.doi.org/10.32598/jpcp.7.3.167>



Article info:

Received: 10 Dec 2018

Accepted: 05 Apr 2019

Available Online: 01 Jul 2019

Keywords:

Internet, Emotion, Social control, Self-efficacy

ABSTRACT

Objective: The present study aimed to predict internet addiction based on general self-efficacy, difficulty in emotion regulation, and resilience in medical students.

Methods: This was a cross-sectional study. The statistical population included all medical students of Shahid Beheshti University of Medical Sciences. The research sample consisted of 96 medical students selected by random sampling method in 2018. Data collection was performed by Sherer General Self-Efficacy Scale, Gramat's and Roemer's Difficulties in Emotion Regulation Scale, Connor-Davidson Resilience Scale, and Young's Internet Addiction test.

Results: To analyze the obtained data, Pearson's correlation coefficient and the stepwise regression model were used. The obtained results suggested a significant relationship between internet addiction and general self-efficacy, difficulty in emotion regulation, and resiliency ($P < 0.05$). Additionally, general self-efficacy, difficulty in emotion regulation, and resilience are able to predict 27% of internet addiction variance in medical students.

Conclusion: To prevent and reduce the harm of internet addiction in students in stressful events, they should be trained to improve their resilience, self-efficacy, and emotion regulation skills.

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Highlights

- The obtained results indicate a significant relationship between internet addiction and general self-efficacy, difficulty in emotion regulation, and resilience.
- General self-efficacy, difficulty in emotion regulation, and resilience can predict internet addiction in medical students.

Plain Language Summary

Official reports indicate that more than 56700000 internet users exist in Iran. The youth, especially the students, spend a lot of hours on the Internet. The excessive use of the Internet may lead to internet addiction, resulting in serious problems. It is necessary to recognize the associated factors with internet addiction. We found a significant relationship between internet addiction and general self-efficacy, difficulty in emotion regulation, and resilience so that these factors can predict internet addiction. Identifying at-risk students and training them with the necessary skills can reduce the prevalence of internet addiction.

1. Introduction

Recently, internet use has become an integral part of everyday life, especially among the youth. However, the excessive use of internet generates major public health problems, called “Internet Addiction” (IA) (cited by Jorgenson, Chih-Jui Hsiao, Yen, 2016). IA, as a mental and behavioral disorder, is characterized by the extreme use of internet by an individual. It manifests as a strong desire or craving to reuse the internet; moreover, withdrawal reactions are observable when the internet use is discontinued or reduced, which are accompanied by other biopsychological symptoms (American Psychiatric Association, 2013).

Based on previous research, the prevalence rate of IA has been assessed as 9.8-15.2% in the United States, 1.5-19.4% in Greece, 15.3% in Taiwan, and 2.6-14.9% in South Korea (Lee, Shin, Cho, & Shin, 2014). Furthermore, surveys in Iran revealed that almost more than half of the samples were afflicted with the IA or were at-risk for it (Ghaderi Rammazi, Askarizadeh, Ahmadi, and Divsalar, 2017).

Young (1998) believed it is necessary to observe at least 4 of the following symptoms for the diagnosis of IA: preoccupation with the internet; they need to use the internet by increasing the amount of time to obtain satisfaction; inability to restrain the use of internet; having a sense of irritability when trying to stop using the internet; using the internet as a way to escape from difficulties or to elevate the mood, and lying to family mem-

bers or friends to hide the amount of internet penetration. According to various studies, there is a significant relationship between IA and pathological factors, such as anxiety, Obsessive-Compulsive Disorder (OCD), depression, substance, alcohol and tobacco use, Attention-Deficit/Hyperactivity Disorder (ADHD), sleeping problems, and high-risk sexual behaviors (Koukia, Mangoulia, & Alexiou, 2014; Sung, Lee, Noh, Park, & Ahn, 2013; Ghanbari, Amani, Namdari Pezhman, Bidi, Kareshki, 2012; Mazhari, 2012; Alavi, Maracy, Jannatifard, Eslami, & Haghighi, 2010; Jafari & Fatehizadeh, 2012; Khoshakhlagh & Faramarzi, 2012; Ko, Yen, Yen, Chen, & Chen, 2012).

Emotion regulation influences psychological well-being (Aldao, Jazaieri, Goldin, & Gross, 2014). In addition, recent studies have reported difficulties in emotion regulation are associated with a tendency toward addiction and its predictability (EsmaliNasab, Andamikhoshk, Azarmi, samarrokhi, 2014). Furthermore, people with severe deficits in emotion regulation are more likely to use different substances (Wilens, Martelon, Anderson, Shelley-Abrahamson, Biederman, 2013). There are some common features between substance use disorders and IA. Studies revealed the odds of difficulties in emotion regulation or dysfunctional emotion regulation strategies are greater in students with severe IA (Mo, Chan, Chan, Lau, 2018; Spade & Marino, 2017).

Mahapatraa & Sharmab (2018) reported that people with alexithymia (i.e. characterized by the inability to recognize, express, and communicate emotions) might overuse internet as a strategy to regulate their emotions. Self-efficacy concept was defined by Bandura as the

“beliefs of people about their ability” with a significant influence on the “cognitive, affective, motivational, and selection processes” (Bandura, 1993). Moreover, it is associated with life satisfaction, emotional health, decision making, as well as coping with stress and depression (Craparo et al., 2014). Despite the claims of prior research (Odaci, 2013), studies suggested no strong relationship between IA and self-efficacy (Craparo et al., 2014). However, others (İskender & Akin, 2010) revealed a negative relationship between social self-efficacy and IA.

Resilience is also associated with IA as a protective factor (Robertson, Yan & Rapoza, 2018). Resilience is defined as “a dynamic process wherein individuals display positive adaptation despite experiencing significant adversity or trauma” (Luthar & Cicchetti, 2000). In addition to the relationship between resilience and IA (Zhou, Zhang, Liu, & Wang, 2017), reports indicated an association between resilience and emotion regulation (Andamikhoshk, Golzar, & Esmailinasab, 2013), and self-efficacy (Craparo et al., 2014).

As previously stated, IA is highly prevalent among students; thus, that has unpleasant consequences on their health. It was also reported from several research findings that emotion regulation, resilience, and self-efficacy majorly impact the pathology of a wide range of disorders, including IA. However, there are conflicting findings regarding the relationship between self-efficacy and IA. Furthermore, despite the importance of students' health as a decisive strata of society, few studies have been conducted in this area. Most existing studies have investigated a single variable, while most human behaviors are affected by several factors. Therefore, the present study aimed to explore whether resilience, self-efficacy, and emotion regulation can predict IA in students.

2. Methods

This was a descriptive study. The statistical population comprised all medical students affiliated to Shahid Beheshti University of Medical Sciences. The research sample consisted of 96 students, selected by random multistage cluster sampling method. In the first step of sampling, some classes were randomly selected. Also, all subjects received an explanation about the research purposes.

Difficulties in Emotion Regulation Scale: (Grazt & Roemer, 2004). This 36-item tool is a multidimensional self-reporting tool with 6 subscales. In addition to assessing emotion regulation, it assesses the difficulty in

emotion regulation. Higher scores indicate more serious difficulties in emotion regulation (Aminian, 2009). Questions 1, 2, 6, 7, 8, 10, 17, 20, 22, 24, and 34 have a reverse scorecard. The results of the reliability test (Grazt & Roemer, 2004) revealed that this scale has a high internal consistency. Khanzadeh, Saidiyan, Hosseinchary, & Edrissi (2012) investigated the psychometric properties of this scale in an Iranian sample; the internal consistency for all of its subscales was reported from 0.86 to 0.88 by the Cronbach's alpha coefficient. Furthermore, its subscales' test-retest coefficient ranged from 0.79 to 0.91. In the present study, the internal consistency was obtained as 0.81 by the Cronbach's alpha coefficient. We used the whole scale.

Self-Efficacy Scale: This scale was developed by Sherer and Adams (1983). It contains 17 items, each of which is answered on a five-point Likert-type scale, including (completely disagree: 1), (disagree: 2), (no idea: 3), (agree: 4), and (completely agree: 5). Items 2, 4, 5, 6, 7, 10, 11, 12, and 14 are scored in a reverse order. The maximum obtainable score is 85 and the minimum one is 17. The reliability of this questionnaire was calculated as 0.82 (Saki, Nemati, & Rezaei, 2015); in this study, this rate was obtained equal to 0.88. Therefore, it can be applied in the Iranian population. Connor-Davidson Resilience Scale: This 25-item tool was developed by Connor and Davidson (2003). This scale has been standardized in Iran by Mohammadi (2005). The validity of this scale demonstrated coefficients ranging from 0.41 to 0.64 (Jowkar, 2007). The obtained Cronbach's alpha coefficient in this study was equal to 0.76.

Young's Internet Addiction Test (IAT): This scale was developed by Young (1988). The respondents answer to each of the 20 items on a five-point Likert-type scale. The test scores range from 0 to 100; higher scores indicate greater dependency on the internet. In an earlier study, Young et al., reported the internal reliability of the scale as 0.92 (Young, 1988; cited by Alavi Jannatifard, Maracy, & Rezapour, 2010). In Iran, the Cronbach's alpha coefficient of this scale was assessed as 0.71 for its reliability. The discriminant and concurrent validities of the scale were assessed as 0.62 and 0.50, respectively (Masoudnia, 2012). In this study, the Cronbach's alpha coefficient for the internal consistency of it was equal to 0.78.

3. Results

Based on the results, from 96 students with the age of 19.73(1.11), 50(52.1%) subjects were male, and 46(47.9%) were female. According to the study partici-

pants, more than half of them (64.8) had a 4-member family and their mother’s educational level was under diploma 7(7.3), diploma 19(19.8), post-diploma 7(7.3), BS 31(32.3), MA. 22(22.9), and PhD. 10(10.4). The IA scores of 79(82.9%) of the students were normal (below 50), 15(15.6%) were at risk for IA (50-79), and 2(2.1%) were dependent on the internet (80-100). The mentioned cut-off points have been suggested by previous researches (e.g. Alavi et al., 2010). It indicates that only 17.7% of the students were either at the risk of addiction or dependence on the internet.

According to the obtained results, as shown in Table 1, there was a positive and significant relationship between the difficulties in emotion regulation and IA ($r=0.321$). That is, with increasing difficulty in the emotion regulation, the prevalence rates of addiction increase, and vice versa. There is a significant negative relationship between self-efficacy and resilience ($r=-0.424$, $r=-0.222$). That is, with increasing difficulty in the emotion regulation, the rates of IA decrease. To predict IA, the independent variables (DER, GSE, Resilience) were introduced to stepwise regression analysis (for all questionnaires, the whole scale was used). By examining the matrix of correlation between the predicting variables, we can claim that the Collinearity assumption was observed; i.e. in line with other indices. The same was true for the other indicators like tolerance and variance inflation factor.

As per Table 2, Self-Efficacy (GSE) and difficulty in emotion regulation could predict 0.276 of the variance

of IA in the samples. This rate is 25% if adjusting that to the real community ($R^2=0.276$, $R^2_{adj}=0.257$, $P<0.01$). However, resilience poorly anticipates IA. Considering the standardized beta coefficients, under the control of other variables, per each unit of variation in standard coefficients, the dependent variable coefficient changes one standard deviation. According to the beta coefficients in Table 3, among independent variables, self-efficacy ($B=-0.37$; $t=-3.81$) had a higher predictive value than difficulties in emotion regulation ($B=0.27$; $t=2.80$).

4. Discussion

The obtained results suggested a significant multi-correlation between IA and self-efficacy and difficulty in emotion regulation. This finding is in line with the results of some studies (İskender & Akin, 2010). However, the relationship between resilience and IA was not very strong. Its relationship with self-efficacy was strong and in line with the study of Sagonea & Carolia (2013). Such finding might be due to the impact of resilience on IA which is more indirect, and this relation may be through self-efficacy.

In explaining the relationship between IA and self-efficacy, we could claim that those with high self-efficacy were more likely to be able to manage their tendencies; e.g. extensive internet use. The relationship between self-efficacy and emotion regulation may demonstrate such explanation (Jalali & ahadi, 2016). Regarding the relationship between IA and difficulties with emotional reg-

Table 1. Statistical description and the matrix correlation of the research variables

Variables	Mean±SD	IA	DER	GSE
1. IA	43.14±12.32	1		
2. Difficult in Emotion Regulation (DER)	95.49±13	0.321*	1	
3. General Self-Efficacy (GSE)	61.14±7.1	-0.424*	-0.173	1
4. Resilience	67.00±12.06	-0.222**	-0.267*	0.570*

*Correlation is significant at the 0.01 level (2-tailed); **Correlation is significant at the 0.05 level (2-tailed)

Table 2. Model summary of stepwise regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig F Change
GSE	0.451	0.203	0.193	11.07426	0.203	20.410	1	80	0.000
DER	0.525	0.276	0.257	10.62694	0.072	7.877	1	79	0.006

Table 3. The analysis of IA regression based on GSE, DER, and resilience

Step	Predicting Variables	B			t	Sig.	Tolerance	VIF
		USC	SE	SC				
1	GSE	-0.654	0.171	-0.379	-3.817	0.000	0.932	1.072
2	DER	0.264	0.094	0.278	2.807	0.006	0.932	1.072

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ulation, we can refer to [Kober \(2014\)](#). Kober suggested that emotion regulation is a causal factor in substance use disorders of adolescence. Moreover, more considerable difficulties in emotion regulation are related to excessive drug use as a means of emotion regulation ([Bonn-Miller, Vujanovic, & Zvolensky, 2008](#)). Therefore, the strong desire to reuse internet is a type of emotion regulation. This explanation is consistent with [Akbari \(2017\)](#), [Mo et al., \(2018\)](#), [Spade & Marino \(2017\)](#), and [Mahapatraa & Sharmab \(2018\)](#) investigations.

There was also a negative relationship between the resiliency and IA. Studies have suggested that individuals with limited ability to understand their own and others' emotions were less able to cope with stress and crises; thus, they demonstrate more behavioral problems ([Zarei & Asadi, 2011](#)). Moreover, the study findings revealed a positive association between suppression and depressive symptoms ([Larsen et al., 2013](#)). Therefore, emotional regulation strategies can directly affect IA; moreover, they indirectly impact maladaptive emotional regulation strategies associated with mental disorders that may negatively influence behavioral management. Furthermore, IA is highly related to depression, anxiety, ADHD, and substance use disorders ([Jorgenson et al., 2016](#); [Li, Hou, Yang, Jian, & Wang, 2019](#)). Another finding of this study was the severity of medical students' dependence on the internet.

Data analysis indicated a low prevalence of IA in medical students, compared to other medical sciences students ([Ghaderi Rammazi et al., 2017](#); [Doošti Irani, Bagheri Amiri, Khajehkazemi, Moštafavi, 2017](#)). This might be because medical students may not have much time for internet use; or because they have enough information about health problems and self-care to be aware of the proper use of it.

Internet use is increasing and recognized among the most essential means of accessing information. Furthermore, young people, especially students, have to spend many hours on the internet; thus, it is possible to

improve emotion regulation caused by education. As a result, it may prevent the destructive effects of this new communication technology. Prior research on emotion regulation training in terms of substance use disorders has suggested the effectiveness of this intervention ([Ahmadi, Sohrabi, & Borjali, 2018](#); [Choopan, et al., 2016](#)); therefore, emotion regulation could be beneficial in IA.

The limitations of the present study included the following: this research was limited to Shahid Beheshti University of Medical Sciences and conducted on medical students only; therefore, caution should be taken in the generalization of the findings. Moreover, we applied self-reporting tools for data collection. As a result, there might be possible biases; e.g. some subjects might have not had a proper insight into what the self-assessment tool measures. Internet use is increasing, and it is recognized among the most important means of accessing information; therefore, young people, and especially the student population, have to spend hours on the internet.

The obtained results suggested that although IA is less prevalent among medical students, it can be influenced by factors like emotion regulation strategies and self-efficacy. Therefore, emotion regulation skills training is suggested for this group. Such measures may prevent the destructive effects of this new communication technology and reduce the level of IA.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article. The study participants were informed about the purpose of the research and its implementation stages. They were also assured about the confidentiality of their information. Moreover, they were allowed to discontinue participation in the study whenever they wish. Eventually, if desired, the results of the research would be available to them.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

All authors contributed in preparing this article.

Conflict of interest

All authors certify that this manuscript has neither been published in whole, nor in part, or being considered for publication elsewhere. The authors have no conflicts of interests to declare.

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