The Role of Psychological Disorders' Symptoms and Emotion Regulation Strategies in Predicting Internet Addiction among Students of Lorestan University of Medical Sciences

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Abstract

Introduction: Although the Internet is a very important tool for new information in today's life, it is largely addictive. The present study aims to investigate the role of psychological disorders and emotion regulation strategies in predicting Internet addiction among students.
Method: This descriptive-correlational study is performed on 254 students of Lorestan University of Medical Sciences, who are selected through multistage cluster sampling method. Participants respond to the Demographic Information Questionnaire, Young Internet Addiction Test (IAT), Derogatis & et al., Symptom Checklist-90-Revised (SCL-90-R) and Garnefski & Kraaij Cognitive Emotion Regulation Questionnaire (CERQ). The obtained data are analyzed using Pearson correlation coefficient and multiple regression.
Results: The results of correlation analysis show that there is a significant relationship between the symptoms of psychological disorders and emotion regulation strategies with internet addiction (p<0.001). The results of multiple regression analysis indicate that the symptoms of psychological disorders and emotion regulation strategies significantly predict 39.7% of the variance of Internet addiction (p<0.001).
Conclusion: Therefore, paying attention to the symptoms of psychological disorders and difficulty in regulating emotion in preventive and therapeutic program can be effective in reducing pathological use of the Internet.

Keywords: Internet Addiction, Psychological Disorders, Emotional Regulation

Introduction

Innovations in the field of information and communication technology, especially the Internet, have led to widespread social changes [1-3]. Internet is a tool for access to new information that allows communication with various social groups and expands individual communication. However, people's awareness of the complications of inappropriate use of the Internet is low because the Internet is largely addictive [4-5]. The increasing growth and more harmful complications of Internet addiction have led to addiction to the Internet to be considered as the culmination of all behavioral addictions [6]. Internet addiction is defined as overuse of the Internet or illicit use of the Internet. Internet addiction, like any other addiction, is associated with physical dependence, tolerance, withdrawal symptoms, and interference with everyday life of the individual. Internet addiction is also associated with vulnerability to psychological, familial and social pressures [7]. According to the Diagnostic and Statistical Manual of Psychiatric Disorders, the fifth edition, in order to detect Internet addiction, there should be at least three of the following symptoms over a

2-month period: 1. Tolerance: Increased Internet usage to obtain prior consent, 2. Withdrawal Symptoms: Restlessness, distress and anger when trying to cut or slow down the use of the Internet, 3. Using the Internet more than what the person had already planned, 4. Lying about Internet usage to friends and family members, 5. Reducing social, occupational and recreational activities due to the use of the Internet, 6. Continued use of the Internet despite awareness of its negative effects, and 7. Inability to manage and control self in the use of the Internet [8]. A study of 600 students in the age group of 18-28 years found that 16.8 percent of students had Internet addiction [9]. Studies have shown that Iran has ranked 87 in terms of Internet access among 178 countries, which is in the middle based on the classification of the Global Telecommunications Union, and 35% of these users are youth. The average time spent on the Internet is 52 minutes a week [10].

Based on research evidence, Internet addiction is associated with low self-esteem [11], impulsiveness [12], low sleep quality [13], mood disorder [14], and suicide [15]. A study of 2114 students showed that people who were addicted to the Internet had symptoms of ADHD, depression and social phobia [8]. Another study on 600 students showed that anxiety, stress and depression are correlated with Internet addiction [16]. Milani et al., [17] also found that depression, anxiety and isolation were associated with Internet addiction, and a significant number of people with Internet addiction had low self-esteem. In this regard, research evidence [18-19] also suggests a meaningful positive relationship between depression and Internet addiction. Also, the study of Akin and Iskender [20] showed a significant positive correlation between stress, depression and anxiety with Internet addiction. Kim et al. [15] have also reported depression and suicide among Internet addicts.

On the other hand, research has shown that the difficulty in regulating emotion plays an important role in the Internet's troublesome use [21-23] and the pathological use of social networks. Emotional adjustment strategies are cognitive responses to excitement-eliciting events that are consciously or unconsciously aimed at modifying the severity, type of emotional experience of individuals and the event itself [24-25]. Garnefski et al. [26] presented nine emotional adjustment strategies and categorized them into two broad categories of adaptive strategies and maladaptive strategies. Positive refocusing, positive reappraisal, putting into perspective, refocus on planning and acceptance are related to an adaptive strategy of emotion regulation and self-blame, other-blame, focus on thought/rumination and catastrophizing are among the maladaptive strategy of emotion regulation [27]. In a study on 525 high school students, Yu et al. [28] reported that difficulty in emotion regulation had a significant relationship with the troublesome Internet use. Another study [29] was conducted on a sample of 380 Italian students who confirmed that emotion regulation had a negative relationship with inefficient use of the Internet. Also, Romano et al. [30] showed that the main factor that has a positive relationship with addiction and pathological Internet use is the inability to adopt an appropriate and positive emotion regulation strategy.

Internet addiction is considered as one of the most important social injuries due to the widespread injuries and consequences for the general population, especially the younger generation. In addition, the increasing use of the Internet in the Iranian society, especially vulnerable groups, including youth, can affect their mental and physical health. The significance of the study indicated that identifying the factors and their role in Internet addiction not only increases knowledge in this field, but also increases the possibility of applying more appropriate preventive strategies and necessary interventions in Internet addiction. Considering the importance of controlling and managing Internet addiction and the importance of paying attention to psychological disorders that are also associated with Internet addiction, which can be effective in identifying the nature of the Internet, it is important to study in this regard. On the other hand, although the general correlation between emotion regulation and Internet addiction has been investigated, the role of adaptive and maladaptive regulation of emotion in Internet addiction has not been investigated. Therefore, the purpose of this study was to determine the role of psychological disorders symptoms and emotion regulation strategies in predicting Internet addiction.

Method

The research method was descriptive correlational. The statistical population of this study included all students of Lorestan University of Medical Sciences who studied in the academic year of 2018-2019. The sample consisted of 254 students (136 males and 118 females) who were selected through multistage cluster sampling method. The inclusion criterions were being university students at the time of research and the willingness of the student to participate in the research. The exclusion criterion was not completing the research questionnaires. Data collection tools consisted of four self-reporting questionnaires.

Demographic Information Questionnaire: This questionnaire contained information about the age, gender, discipline, daily and weekly Internet usage, and the reason why students used the Internet.

Internet Addiction Test (IAT): The Young Internet Addiction Test consists of 20 items and is scored by Likert method [31]. The users' status in the Internet addiction index is 0-19 (normal), 20-49 (mild addiction), 50-79 (moderate addiction), and 80-100 (severe addiction) [32]. Widyanto reported the reliability of the Young Internet addiction test as .89. In addition, he has investigated two types of content and divergent validity and three types of retest reliability (r = .74), internal consistency (a = .88) and split-half (r = .82). Asgari and Marashian determined the reliability of the questionnaire using Cronbach's alpha and split-half methods and reported coefficients of .97 and .97, respectively [31]. In the present study, the Cronbach's Alpha of the Internet addiction test was .89.

Symptom Checklist-90-Revised (SCL-90-R): The SCL-90-

R test was presented by Derogatis et al. [33] based on clinical experience and previous psychometric analyses. This tool examines nine dimensions of psychiatric symptoms (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism) [33]. In a research by Derogatis et al., the reliability coefficients of each of the nine dimensions of this test have been reported to be desirable. The range of these coefficients varied from .77 to .90. Also, they have reported the coefficients of the concurrent validity of the nine dimensions of this test with the Minnesota Multiphasic Personality Inventory (MMPI) [34]. In the present study, Cronbach's alpha for the nine dimensions of psychological symptoms was found to be between .77 and .85.

Cognitive Emotion Regulation Questionnaire (CERQ): This 18-item questionnaire is designed by Garnefski and Kraaij and measures the emotion regulation strategies in terms of nine subscales. Emotion adjustment strategies can be divided into two types of adaptive and maladaptive strategies. Positive refocusing, positive reappraisal, putting into perspective, refocus on planning and acceptance are related to an adaptive strategy of emotion regulation and self-blame, other-blame, focus on thought/rumination and catastrophizing are among the maladaptive strategy of emotion regulation. The results of the factor analysis by the principal components method determined the nine predicted factors. The test-retest reliability showed that it had a relative stability and the internal consistency of the dominant factors was confirmed by Cronbach's alpha coefficient of .80 [27]. In the present study, Cronbach's alpha for adaptive strategies and maladaptive emotion regulation strategies was .74 and .79, respectively.

In this research, Pearson correlation and multiple regression analysis were used to test the relationship between Internet addiction, psychological symptoms and emotion regulation. Data were analyzed using SPSS software version 22. For having respected ethical principles, before the beginning of the study, all the participants were informed of the procedure of this study.

Results

In this study, 254 students (136 males and 118 females) from Lorestan University of Medical Sciences in the academic year of 2018-2019 were studied. The mean and standard deviation of students' age were 20.96 and 1.73, respectively. About 26.9% of students had mild addiction, 8.5% had moderate addiction, and 3.6% had severe internet addiction. In the context of the reasons for use of the Internet, students mentioned various reasons such as entertainment, social networking and communication with others, especially friends (47.24%), science and knowledge (33.07%), and culture (7.87%). Also, 11.82% of students did not report the reason for the use of the Internet. Descriptive findings of the research components are presented in Table 1.

According to Table 1, the scores of subjects in the research components indicate that the Skewness of the distribution of scores is in the domain (2 and -2) and the kurtosis of distribution of scores is in the domain (3 and -3), which shows normal distribution of data.

Table 1. Average, Standard Deviation, Skewness and Kurtosis of Research Components

	Mean	SD	Skewness	Kurtosis
Internet addiction	45.32	16.91	.62	-.52
Somatization	13.42	10.36	.51	-.69
Obsessive-compulsive	14.07	8.47	.01	-.49
Interpersonal sensitivity	12.43	8.37	.40	-.64
Depression	16.43	12.12	.26	-.69
Anxiety	10.92	6.95	.64	-.63
Hostility	7.92	6.02	.33	-.89
Phobic anxiety	6.35	2.14	.63	-.04
Paranoid ideation	9.21	5.70	.04	-.46
Psychoticism	12.51	8.34	.41	-.64
Adaptive emotion regulation strategies	37.55	11.21	.59	-.51
Maladaptive emotion regulation strategies	42.34	11.01	.61	-.58

Table 2. Internal Correlation Matrix of Internet Addiction, Symptoms of Psychological Disorders and Emotion Regulation Strategies

Components	1	2	3	4	5	6	7	8	9	10	11	12
Internet addiction	1	.35**	.46**	.50**	.47**	.40**	.45**	.17	.44**	.44**	-.59**	.67**
Somatization		1	.73**	.65**	.76**	.79**	.67**	.69**	.65**	.75**	-.04	.39**
Obsessive-compulsive			1	.72**	.77**	.74**	.66**	.59**	.72**	.75**	-.11	.38**
Interpersonal sensitivity				1	.74**	.73**	.71**	.54**	.73**	.76**	-.05	.38**
Depression					1	.77**	.67**	.61**	.69**	.75**	-.34**	.44**
Anxiety						1	.73**	.69**	.69**	.78**	-.39**	.41**
Hostility							1	.52**	.75**	.70**	-.04	.37**
Phobic anxiety								1	.49**	.65**	-.14**	.34**
Paranoid ideation									1	.72**	-.09	.37**
Psychoticism										1	-.04	.45**
Adaptive strategies											1	-.34**
Maladaptive strategies												1

P <0.01**

As it can be seen, the results of the correlation coefficient in Table 2 show that the symptoms of psychological disorders have a positive relationship with Internet addiction (P<0.01). Also, the results indicate a significant negative relationship between adaptive emotion regulation strategy and Internet addiction and a positive correlation between maladaptive emotion regulation strategy and Internet addiction (P<0.01).

Before running this test, it should be ensured that the basic assumptions of regression are established. The normal distribution of data in Table 1 was studied based on skewness and kurtosis. The Durbin-Watson coefficients for the five regression models ranged from 1.43 to 1.67, which, according to the presence in the range of 1.5-2.5, expresses the establishment of assumption of the independence of the errors [35]. On the other hand, the coefficients of variance inflation in the symptoms of psychological disorders and emotion regulation strategies were 1.24 to 1.78, which indicated that there was no strong co-linear correlation between the sums of independent variables. The absence of a co-linear

relationship shows the absence of a very high correlation between the sum of independent variables, and its basis is the coefficient of variance inflation of less than 10 [36]. It is possible to perform this test by confirming the provision of the assumptions.

Based on the results of Table 3, the incidence of psychological disorders and adapted and maladaptive strategies of emotion regulation predict 39.7% of Internet addiction changes. Also, the results indicate that regression models are significant, meaning that the calculated f value is larger than the critical value and the significance level is smaller than p < 0.001. Considering the beta coefficients, the positive relationship between interpersonal sensitivity, depression, anxiety and maladaptive emotion regulation strategy with Internet addiction is statistically significant (p<0.05); and the negative relationship between adaptive emotion regulation strategy with Internet addiction is statistically significant (p < 0.01). Therefore, it can be stated that each of these components have the power to predict Internet addiction.

Table 3. The Results of Regression Analysis to Predict Internet Addiction by Symptoms of Psychological Disorders and Emotion Regulation Strategies

Prediction components	B	β	p-value	R	R2	F	p-value
Somatization	.20	.12	.22				
Obsessive-compulsive	.26	.12	.21				
Interpersonal sensitivity	.53	.17	.04				
Depression	.54	.17	.04				
Anxiety	.51	.17	.04				
Hostility	.42	.15	.13	.63	.397	6.534	.001
Phobic anxiety	.38	.13	.22				
Paranoid ideation	.36	.12	.25				
Psychoticism	.36	.11	.25				
Adaptive strategies	-.97	-.25	.003				
Maladaptive strategies	.74	.20	.03				

Discussion

The purpose of this study was to predict Internet addiction based on symptoms of psychological disorders and emotion regulation strategies in Lorestan University of Medical Sciences.

The findings of the study showed that there was a positive relationship between interpersonal sensitivity, depression and anxiety with Internet addiction using regression analysis. Accordingly, it can be said that each of these symptoms of psychological disorders has the power to predict Internet addiction. This finding is consistent with the results of previous research [9, 11-20]. The study of Akin and Iskender [20] showed a significant positive correlation between stress, depression and anxiety with Internet addiction. In this regard, Kim et al. [15] have reported depression and suicide among Internet addicts. Another study showed that depression, anxiety and isolation are related to Internet addiction, and a significant number of people with Internet addiction have low self-esteem [17]. People who drop out and avoid social calls use the Internet as a means of escaping reality [18]. Because of the lack of social skills necessary to establish and maintain social relationships, such as high sensitivity to the behavior and sayings of others, they

usually fall out of social relationships and prefer social relationships that are virtual in nature, where their personal nature and identity is not clear to others. This leads to their greater distancing from social relationships in the real world and their more drown in the virtual world. On the other hand, people who have pathological Internet use are alone most of the time, spend less time with others, and are often considered socially isolated. In addition, they try to hide the amount of time spent on the Internet, which leads to mistrust and disturbance in the quality of their durable communication with others [37].

People who are anxious and depressed may go to the internet and cyber space to escape these negative states and seek alternative lives for their joyless life, which provides grounds for their dependence to the Internet [18]. Accordingly, in the event of depression and anxiety, the use of the Internet can lead to a reduction in their attention and concentration on negative emotions and can also play a strengthening role for them. As a result, when it comes to negative emotional states, one of the quick options that comes to mind is the use of the Internet and the use of cyberspace to alleviate anxiety and depression. Continued use of the Internet, as the only way to reduce negative emotional states, can pave the way for

their continued dependence on the Internet. Also, low self-esteem and self-confidence, reduced motivation, fear of rejection and the need to be confirmed in depressed and anxious people are among the reasons that lead depressed and anxious people towards increased Internet use [38].

Other findings of the study indicated a positive relationship between maladaptive emotion regulation strategies and the negative relationship of adaptive emotion regulation strategy with Internet addiction. However, the existing research report supports the relationship between the emotion regulation and Internet addiction in general [21-23, 25-26, 28-29]. However, the important issue to be mentioned is that in the review of the research background, there was no study investigating the predictive role of emotion regulation strategies for Internet addiction. Research evidence suggests that the difficulty in regulating emotion not only is seen in alcohol abuse [39], cocaine dependency [40], and gambling [21], but is also connected with the troublesome use of Internet [22, 41]. In a research by Hormes et al. [23], people who use social networking sites in an over-morbid and maladaptive way, have more difficulty regulating their emotions. Based on the general model of emotion regulation strategies, we will be able to explain the association of emotion regulation strategies with Internet addiction. According to this model, adaptive strategy can be a protective factor and has positive effects on mental health. Adaptive emotion regulation strategy plays an important role in our adaptation to stressful life events and increases the control and adjustment of emotions, self-control, and the ability to manage the mood, and increases the ability to solve problems, and exploit the emotions. This is while the maladaptive strategy of emotion regulation provides the context for the formation, emergence and continuation of various types of mental harms. Research evidence in this area suggests that those who are addicted to virtual domains and the Internet are more likely to think about negative life events, experience more negative feelings, and focus more on negative events of their own lives [30]. Accordingly, the excessive use of the Internet seems to be an attempt by the individual to avoid painful excitement through instant emotional pleasure or avoidance and distraction [42, 23]. Spada et al. [43] also argued that the high consumption of the Internet may be a form of maladaptive self-regulation strategy. Insufficient emotional growth, difficulty in organizing behavior and excitement, and having negative emotions are the characteristics of people who have Internet addiction. Lower emotion regulation and more negative emotion control strategies can prevent the use of the Internet, which is somehow a tendency-avoidant conflict [44].

Given the role and importance of the Internet in today's life, especially in adolescence and young age, due to the greater vulnerability of these age groups to inefficient and pathological Internet use, it is necessary to pay more attention to the risk and protective factors of internet consumption. Accordingly, the practical and theoretical implications of this research can be pointed out. At the practical level, the provision of educational and interventional programs for the treatment of psychological disorders and the correction of inefficient and maladaptive emotion regulation strategies will create the appropriate skills and abilities for young people to reduce the use of Internet. At the theoretical level, the findings of this study will help increase knowledge about the pathological use of the Internet and also raise new questions and hypotheses within the context of research on Internet addiction in young people. Examples of questions are: Is training adaptive emotion regulation strategies based on cognitive therapy associated with a reduced likelihood of pathological Internet use among young people? The answer to this question and its hypotheses requires an independent research that is suggested to enthusiasts. In general, according to the findings of the present study, psychologists and counselors are advised to pay more attention to the prevention and treatment of maladaptive strategies for the regulation of emotion and psychological disorders in youth and the risk factors and protective factors affecting it.

In this study, due to the use of self-report questionnaires, subjects' responses may be affected by deliberate false distortions and responses. Accordingly, participants were assured that the research data were confidential and would be analyzed in groups. Finally, the present study had a demographic limit in such a way that its participants were all students from Lorestan University of Medical Sciences. Therefore, there should be caution in generalizing the findings of this study to other statistical communities. Accordingly, it is suggested to carry out similar studies on other statistical societies. Also, considering that adolescents and young people as high-risk groups have a high degree of vulnerability to internet addiction, it is suggested to investigate other cognitive, emotional and social variables and their predictive role in the occurrence of pathological Internet use.

Conclusion

Based on the results of this study, symptoms of psychological disorders and emotion regulation strategies have an effective role in the Internet addiction of students. Therefore, considering these factors (psychological disorders and emotion regulation strategies) for formulating effective preventive and therapeutic programs for students' Internet addiction will increase the effectiveness of these programs.

Conflict of Interest

The author declares no conflict of interest.

Ethical Approval

All ethical criteria were met in this paper. The participants were informed about the purpose of the research and its implementation stages. They were also assured of confidentiality. Moreover, they were allowed to be excluded from the study as they wish, and if desired, the results of the research would be available to them.

Acknowledgement

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