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The relationship between Internet addiction with depression and anxiety among Iranian adolescents

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Original Article

Abstract

BACKGROUND: Currently, the Internet has become an indispensable part of individuals' lives. Given the increasing use of the Internet, especially among students, it is essential to analyze its impacts on the psychological characteristics of individuals. The present study was carried out aiming to determine the relationship between Internet addiction with depression and anxiety among the adolescents.

METHODS: This descriptive cross-sectional study was conducted on all high school students of the city of Sanandaj, Iran. The study subjects included 595 students (285 girls and 310 boys) which were selected through cluster random sampling. The data collection tools in this study included Internet Addiction Test (IAT) by Young, Beck Anxiety Inventory (BAI), and Beck Depression Inventory (BDI). Data were analyzed using SPSS software, regression analysis, and chi-square test.

RESULTS: It has been found that 28.7% of the students had Internet addiction. There was a significant correlation between Internet addiction and depression ($P < 0.001$), anxiety ($P < 0.001$) and school grade ($P = 0.002$). However, no significant relationship was reported between Internet addiction and sex ($P = 0.560$), parental separation ($P = 0.860$) and parents' death ($P = 0.722$). Moreover, the results of regression analysis showed that these variables altogether could predict 36% of Internet addiction among these subjects.

CONCLUSION: The increasing Internet addiction in the Iranian society is associated with depression and anxiety. Therefore, providing educational programs for students and parents to use the Internet properly and diagnosis and treatment of Internet addiction among students are recommended.

KEYWORDS: Internet, Addiction, Depression, Anxiety, Adolescents, Students, High School

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Introduction

Currently, Internet addiction is on the rise among different communities and teenagers are the most vulnerable group.[1-3] The China Internet Network Information Centre (CNNIC) has announced four main incentives for the use of the Internet among the teenagers, including searching for information (news), interaction with others (sending Emails and chatting), entertainment (games and movies) and commercial activities (online shopping).[4]

Numerous applications of the Internet along with its attractions have resulted in the emergence of a phenomenon called Internet dependency.[5] Internet addiction is a compulsive-impulsive disorder that involves using online and offline computers for at least

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three activities, including extreme games, sexual preoccupation, and emailing and text messages. Internet addiction comprises four parts, including overuse of the Internet which is accompanied by losing track of time and neglecting other stimulants, withdrawal symptoms like feelings of anger, tension and depression in the lack of a computer, tolerance which includes the need for better computer equipment, more software packages and more hours of Internet use, and negative reactions like arguments, lying, social isolation, and fatigue.[6-9]

The number of Internet users in Iran increased to 36% during 2000-2006, growing to more than 11.5 million individuals by 2012.[10] However, other studies have shown the estimated incidence of Internet addiction to be 15.1%, 16.2%, and 0.8% in Taiwan,[11] Poland,[12] and Italy,[13] respectively. Some countries including South Korea have considered internet addiction as one of the most serious public health issues.[14] In this country, high school students use the Internet 23 hours per week, and 2.1 million students are at risk of internet addiction.[15]

Internet addiction can have several consequences including waste of time and money, reduced social and educational performance, psychological damage, loneliness, depression, and anxiety.[2,16-19] Moreover, excessive dependence on the virtual world can lead to decreased happiness and social interaction, shyness, embarrassment, withdrawal from the community, inefficient fantasies and loneliness, which consequently result in depression.[20-22] Approximately 30% of individuals addicted to the Internet have varying degrees of social aversion and abnormal behavior.[23] Accordingly, there is a positive correlation between internet addiction and depression.[2,20,24]

Anxiety is more persistent and is characterized by concerns about the occurrence of bad things in the future. Internet users may have anxiety and feel guilty for wasting their time on surfing the web or chatting.[25] Moreover, some studies have indicated that anxiety can be a predictor of internet addiction, so that anxious students use the internet excessively to decrease their negative attitude and to eliminate anxiety and stress. In a study by Bahri et al., a significant negative correlation between the Internet addiction and anxiety was reported.[26] However, in another study, teenagers addicted to the Internet had lower levels of anxiety.[2] Furthermore, Kajbaf et al. found a significant relationship between the Internet and anxiety.[25]

Depression consists of a group of symptoms including low mood, depression-based thoughts and in extreme cases, biological symptoms. Depression and anxiety are related to the Internet indecency.[2,16,18,19,25] In some cases, it has been shown that the Internet addiction is resistant to treatment since it is associated with other disorders like depression and anxiety. Therefore, psychiatric disorders like depression and anxiety should be taken into account in order to develop a program to prevent the Internet addiction among teenagers.[7,27]

The present study was performed with the aim to determine the relationship between the Internet addiction with depression and anxiety with respect to sex, school grade, and separation and death of parents. We also investigated whether depression and anxiety disorders could predict the Internet addiction among the respondents.

Materials and Methods

This cross-sectional study was performed on all high school students of Sanandaj, Iran. The study population comprised 595 students (285 girls and 310 boys) aged 14-20 years which were selected through the cluster random sampling. Data collection began after obtaining the legal permission from the regional departments of education in Sanandaj city (regions 1 and 2). All schools in the city

were divided into two clusters, and therefore, the number of schools in each region was calculated in proportion to all schools. Ultimately, 16 schools (four boys' schools and four girls' schools from each region) were randomly selected among all schools in the two regions (regions 1 and 2 included 31 and 28 schools, respectively, Figure 1). The sample size was determined in proportion to the number of students in each school. Then, the number of subjects in each school was determined based on the ratio of the students in different grades, then, the subjects were selected through stratified random sampling. Individuals with a history of psychiatric disorders other than depression and anxiety were excluded from the study. Written informed consent was obtained from the participants in the study.

Data collection was performed in several stages. First, the researchers had to officially apply to the Education Organization of Kurdistan Province, Iran, for the required permission to carry out the study and a letter of permission from the Education Administration of Sanandaj to enter the selected high schools. Then, they performed the required coordination with the principals of these high schools for distributing the questionnaires. In addition, a brief explanation about the study and its objectives was given to the officials. Then, as discussed earlier, sample selection was performed using the stratified randomized sampling method. In the next step, a clear description of the main purpose of the study and its expected findings, applications and implications of these findings were discussed to encourage the respondents.

Data were collected during July-November 2015 using the demographic information checklist, Internet Addiction Test (IAT), Beck Anxiety Inventory (BAI), and Beck Depression Inventory (BDI). A brief explanation of the study and how to complete the questionnaires were given to the students. Then the researchers distributed the questionnaires BAI and BDI among the participants. The tools used in this study included: IAT, BDI, and BAI.

IAT: The IAT consisted of 21 items with choices ranked from never to very much with a score range of 0 to 4, respectively, yielding a total score of to 84. Scores over 44 indicated the Internet addiction. The reliability and validity of this questionnaire has been previously confirmed by Alavi et al.[28] The reliability of this test according to the data of the present study was $\alpha = 94\%$.

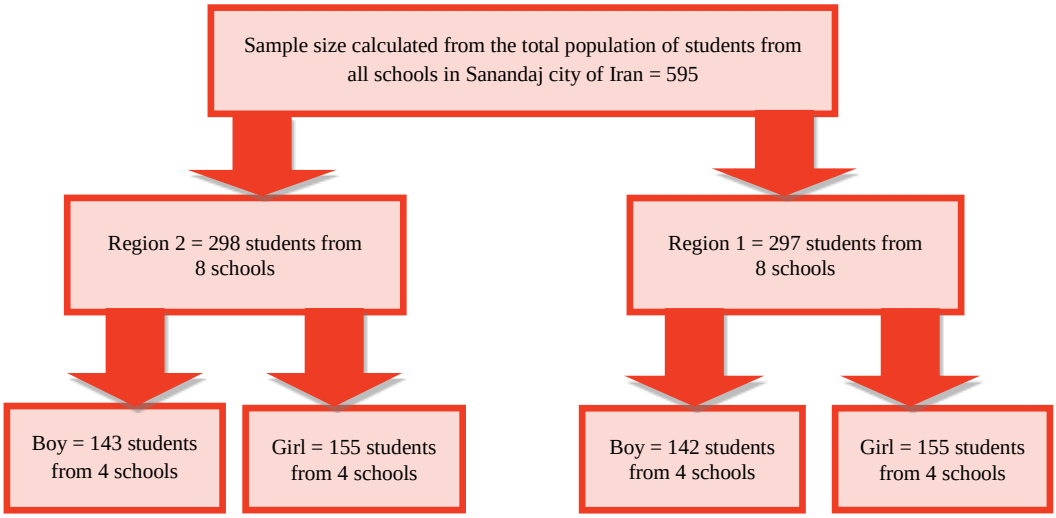

Figure 1. Sampling process

BDI: This 21-item questionnaire was first introduced by Beck, Mendelson, and Mockand Arbaf in 1961 and was later revised in 1971 and published in 1978. The items have been modified in the current version and there was a high correlation between the two versions of 1971 and 1978. The popularity of this questionnaire comes from the fact that more than 1000 studies have been conducted on it or have used it since its introduction about 30 years ago. The 21 items of BDI have been originally obtained from the observation and summary of the attitudes and symptoms of depressed psychiatric patients.[29] This test consisted of 21questions and its cutoff point was the score of ≥ 17. Hence, scores ≥ 17 and < 17 indicated depression and lack of depression, respectively. The reliability and validity of this questionnaire have been measured by different psychologists and scholars. Stefan-Dobson et al. reported a reliability and internal consistency coefficient of 94% and 92% for this questionnaire, respectively.[29] In addition, a reliability of 93% is reported for this questionnaire.[30] The reliability of the items of this questionnaire according to the data obtained in this study was reported to be α = 85%. The reliability of this questionnaire has also been evaluated by Stefan-Dobson et al. for the Persian population.[29]

BAI: BAI was a self-report questionnaire which has been used to measure the level of anxiety among teenagers and adults.[31] This questionnaire included 21 items and its cutoff point was determined based on the normal curve mean ± standard deviation (SD) and the study subjects in three different forms as follows: Mean – SD = 3.829, Mean + SD = 23.95, and Mean + SD – (Mean – SD) = 23.95 – 3.829 indicating low anxiety, high anxiety, and moderate anxiety, respectively. The internal consistency (alpha coefficient) of the questionnaire and the test-retest reliability with one week interval were 75% and 92%, respectively, in addition, the correlation of its components varied from 30-76%. Five types of validity including content, concurrent, construct, diagnostic and factor validities have been measured for this test, all of which reflected the high efficacy of this inventory to measure the severity of anxiety.[32] The reliability of the items of this questionnaire according to the data of the present study was reported to be α = 80%. Beck et al. reported an alpha of 92% and a test re-tests validity of 75%, showing desirable reliability and validity.[32] The participants who were diagnosed with depression and anxiety using BAI, were referred to school counselors and were interviewed using the Structured Clinical Interview (SCID-1).

SCID-1: The SCID-1 is a semi-structured interview which provides diagnoses based on the diagnostic and statistical manual of mental disorders (DSM-IV). SCID-1 is called a semi-structured interview as performing the interview requires clinical judgment of the interviewer about the interviewee's responses. It should be noted that the interviewer should have sufficient clinical knowledge and experience in this regard.[33] Moreover, several studies have indicated acceptable validity and reliability for this questionnaire.[34-37] The reliability of the Persian version of this interview is reported to be 84.6% for all depression disorders.[38] Data were analyzed using SPSS software (version 21, IBM Corporation, Armonk, NY, USA) software. Descriptive statistics were used to calculate the mean and percentage. In addition, the multiple regression analysis (MRA) was applied to analyze the relationship between the Internet addiction with depression, anxiety, sex, school grade, parental separation and parents' death.

Results

285 (47.9%) and 310 (52.1%) of the study participants were respectively girls and boys aged 14-20 years. In terms of educational grade, 121 (20.3%), 166 (27.9%), 154 (25.9%), and 154

(25.9%) of the subjects were the first grade, second grade, third grade, and fourth grade students, respectively. According to the results of the study, 28.7% of the students had the Internet addiction. Distribution of age group, grade, depression, anxiety, and internet dependence rates between the boys and girls are shown in table 1.

MRA was conducted to predict the Internet addiction from predictors' variables. As shown in table 2, 13% accounted for a significant amount of the Internet indication. In addition, it has been found that sex, age, grade, father or mothers' job, and anxiety were significantly related to the Internet addiction ($P \leq 0.050$), while there was no significant relationship between depression and the Internet addiction ($P \geq 0.050$).

Discussion

This study was conducted to determine the incidence of the Internet addiction and its relationship with depression and anxiety among high school students. It was hypothesized that the Internet addiction could be a good predictor for the increased depression and anxiety disorders among students in particular.

Table 1. Frequency distribution of depression, anxiety, and the Internet dependency by sex, age group, and school grade

Variables	Internet dependence [n (%)]		Anxiety [n (%)]	Depression [n (%)]		Mother's death [n (%)]		
	Yes	No	Low Average High	Yes	No	Yes	No	Yes
Sex								
Boy	74 (26.0)	211 (74.0)	18 (6.3) 195 (68.4) 72 (25.3)	144 (50.5)	141 (49.5)	2 (0.7)	283 (99.3)	6 (2.1)
Girl	213 (68.7)	97 (31.3)	58 (18.7) 219 (70.6) 33 (10.6)	135 (43.5)	175 (56.5)	1 (0.3)	309 (99.7)	6 (1.9)
Age group								
14-17	141 (31.1)	313 (68.9)	60 (13.2) 317 (69.8) 77 (17.0)	208 (45.8)	246 (54.2)	3 (0.7)	451 (99.3)	9 (2.0)
18-20	30 (21.3)	111 (78.7)	16 (11.3) 97 (68.8) 28 (19.9)	71 (50.4)	70 (49.6)	0 (0)	592 (100)	3 (2.1)
Grade								
First year	38 (31.4)	83 (68.6)	22 (18.2) 75 (62.9) 24 (19.8)	45 (13.2)	76 (62.8)	1 (0.8)	120 (99.2)	39 (2.6)
Second year	54 (32.5)	112 (67.5)	21 (12.7) 112 (67.5) 33 (19.9)	80 (48.2)	86 (51.6)	1 (0.6)	165 (99.2)	3 (1.8)
Third year	53 (34.4)	101 (65.6)	12 (7.8) 122 (79.2) 20 (13.0)	79 (51.3)	75 (48.3)	1 (0.6)	153 (99.4)	3 (1.9)
Fourth year	26 (16.9)	128 (83.1)	21 (13.6) 105 (68.2) 28 (18.2)	75 (48.7)	79 (51.3)	0 (0)	154 (100)	3 (1.9)

Table 2. Multiple regression analysis (MRA) on the Internet addiction (n = 594)

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	P
	B	Standard Error	Beta		
Constant	-32.07	16.86		-1.90	0.058**
Sex	3.82	1.57	0.090	2.42	0.010***
Age	3.31	1.12	0.190	2.95	0.003***
Grade	-5.29	1.15	-0.290	-4.57	P < 0.001***
Father's job	1.53	0.72	0.080	2.12	0.030**
Mather's job	3.07	0.70	0.170	4.39	P < 0.001***
Depression	0.14	0.08	0.079	1.74	0.082
Anxiety	0.29	0.08	0.155	3.38	0.001***

Dependent Variable: Internet addiction; $R^2 = 0.13$
(P ≤ 0.050);*(P ≤ 0.001),

The obtained results showed an incidence rate of 28.7% for the Internet addiction among high school students of Sanandaj city. The Internet addiction rates for other populations in Turkey,[39] Birjand city, Iran,[24] and United Kingdom (UK)[39] have been reported as 9.7%, 40.7%, and 3.2%, respectively. Compared with the results obtained in the present study, it can be argued that the incidence of the Internet addiction is relatively higher in the Iranian society. Therefore, the increasing rate of Iranian users of the Internet may be attributed to the lack of easy access to physical activities, lack of family support and a proper role model in the families for their children's sports activities, which cause reduced physical activity.[40] Therefore, teenagers turn to cyber space to spend their leisure time to release their energy during adolescence.

In addition, studies have shown that shy, depressed, bored and lonely individuals are more at the risk of the Internet addiction compared to other individuals.[41] Moreover, according to the present study, these was a significant relationship between depression and anxiety and the Internet addiction. This finding indicates that these variables along with other demographic variables including age, sex, school grade, and parental separation, and parents' death and job could predict the Internet addiction by 36%. Several studies, including a study by Jafari and Fatehizadeh[20] have found a similar significant correlation between the Internet addiction and their predictive effects. Moreover in this study, it was acknowledged that these variables could predict the Internet addiction by 39%. Moreover, Beranuy et al.[16] showed a significant correlation between the amount of the Internet use and depression. Furthermore, Bahrainian and Khazaee[24] indicated that depression was associated with the Internet addiction, and could partly predict its rate and could be used for its diagnosis and treatment. To sum up the findings of other studies, it can be argued that the Internet addiction and depression[42-46] and anxiety [42,46-48] are significantly correlated.

Furthermore, the results obtained in this study showed a significant relationship between the Internet addiction and school grade, indicating the higher rate of the Internet addiction among the second and third grade students. In addition, studies have shown a significant relationship between behavioral disorders and the school grade.[49,50] Considering the educational conditions in Iran, this may be attributed to further research load, further restrictions imposed on the fourth grade students by parents to prepare the students for university entrance examination, and the low knowledge and less access of first grade students to the Internet.

Based on the findings of the present study, there was no significant relationship between the Internet addiction and parents' separation

and death. Shayegan and Jebelli reported a significant relationship between the parents' separation and death and drug addiction, which was caused due to the loss of parental affection among the children.[51] Tsitsika et al. found that the rate of the Internet use was significantly higher among the adolescents whose parents had been separated.[52] Moreover, studies have shown that single parenthood can influence the Internet dependency.[53] Inconsistencies between the results of the present study and the abovementioned studies can be due to difference in the type and conditions causing the addiction.

Furthermore, there was no relationship between sex and the Internet addiction in this study, which was in line with the results of the studies by Kajbaf et al.[25] However, many studies are in contrast with this result, claiming that sex is correlated with the Internet addiction among different societies. Some studies have reported a significantly higher level of the Internet use among men compared to women.[38,54-56] Other studies have shown that the excessive use of the Internet.[57,58] This may be indicative of the cultural differences in different societies and different ways of upbringing of the children. A study showed that Korean students who were at the risk of the Internet addiction needed consultation.[59] Therefore, counselors were trained and the subsequent preventive measures were taken in the schools.[14]

Limitations: The present study faced several limitations. One of the limitations was the small sample size. The study population consisted of the high school students of two regions of the Sanandaj city, hence the results could not be generalized to other populations since the study subjects were selected from a limited community. Finally, data were collected by questionnaires and interviews and the students might not have answered accurately. Clinical interview by psychiatrists and mental health experts should be conducted in order to obtain the correct and certain results.

Conclusion

The increasing Internet addiction in the Iranian society is associated with depression and anxiety. Therefore, providing educational programs on the proper use of the Internet for students and parents and diagnosis and treatment of the Internet addiction among students are recommended.

Conflict of Interests

Authors have no conflict of interests.

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