

The Relationship between Depression and Internet Addiction among University Students in Jordan

Laith Rabadi*, Maram Ajlouni, Saleem Masannat, Shaimaa Bataineh, Ghaith Batarseh, Ahmad Yessin, Katreen Haddad, Moh'd Kareem Nazer, Saba Al Hmoud and Ghaith Rabadi

JUST Medical School, Jordan University of Science and Technology, Jordan

*Corresponding author: Laith Rabadi, JUST Medical School, Jordan University of Science and Technology, Jordan, Tel: 009620776603417; E-mail: laithrabadi21@gmail.com

Received date: August 31, 2017; Accepted date: November 04, 2017; Published date: November 11, 2017

Copyright: © 2017 Rabadi L, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

This study examined the effects and the connection between Internet addiction and developing depression, stress, anxiety, and psychological symptoms among university students. Participants were 4388 university students from JUST University in Jordan. In this study, the English version of Davis's OCS and the DASS; to isolate and identify aspects of emotional disturbance, were used. By measuring correlation analysis, internet addiction was found completely associated with depression, stress, and anxiety. The analysis of the study results suggests that the association of the two conditions is multifaceted, and shows the effect of Internet addiction in developing other psychological symptoms. All the studies agreed that Internet addiction or the depression increases the risk of both complications whether they were mental disorders or addictive disorders. In view of the negative implications of the co-morbidity of depression and Internet addiction, the suggestion that all clinically relevant cases of depression related to addition on websites and other types of social media networks found in the community should be treated seems logical. However, new studies seem mandatory to document the safety of antidepressant use and the efficacy of treatment of depression in cases of co-morbidity.

Keywords: Depression; Internet addiction; Stress; Anxiety

Introduction

Internet addiction and depression occur together approximately twice as frequently as would be predicted by chance alone. Comorbid social media addiction and depression are a major clinical challenge as the outcomes of both conditions are worsened by the other. Notwithstanding the psychological burden of Internet addiction may contribute to depression. Both conditions may be driven by shared underlying psychological and behavioral mechanisms, such as anxiety axis activation, sleep disturbance, inactive lifestyle, poor dietary habits, and environmental and cultural risk factors. Depression is frequently spread among people with Internet addiction despite effective screening tools being available and awareness campaign. Clear care pathways involving a multidisciplinary team are required to get best Medical and psychiatrically outcomes for individuals with comorbid Internet addiction and depression. To review the support for two hypotheses concerning the interrelationship between psychological depression scale and Internet Addiction, and to identify areas in which more research is needed.

Participants were 4388 university students from JUST University in Jordan. In this study, the English version of Davis's OCS and the DASS; to isolate and identify aspects of emotional disturbance, were used. By measuring correlation analysis, internet addiction was found completely associated with depression, stress, and anxiety.

Purpose of the Study

The purpose of this study is to examine the effects and the connection between Internet addiction and developing depression, stress, anxiety, and psychological symptoms among university students.

Participants were 4388 university students from JUST University in Jordan. In this study, the English version of Davis's OCS and the DASS; to isolate and identify aspects of emotional disturbance, were used. By measuring correlation analysis, internet addiction was found completely associated with depression, stress, and anxiety. This review according to analysis results suggests that the association of the two conditions is multifaceted, and shows the effect of Internet addiction in developing other psychological symptoms. All the studies agreed that Internet addiction or the depression increases the risk of both complications whether they were mental disorders or addictive disorders.

With the growth of social media users worldwide, Internet addiction has become a pandemic in the new era. A study by Kot et al reported that the prevalence of Internet addiction ranged from 1% to 36.7%. Meanwhile the variability in prevalence rates across several studies that were reviewed before this one may be attributed to variations inaccessibility of the internet in different countries, with definitions of Internet addiction and diagnostic instruments. A study focusing on adolescents in 6 different countries by Mak et al. [1] reported that the prevalence of IA ranged from 1% in South Korea to 5% in the Philippines, and the prevalence of problematic Internet use ranged from 13% in South Korea to 46% in the Philippines [1]. Among university students nowadays with the development of online learning, communication, and entertainment, the Internet has become an indispensable tool for university students. In 2017, Zhang et al. reported that the global prevalence of IA and problematic internet use among medical students was 30.1% [2]. Internet addiction and psychiatric co-morbidity may co-occur as a dual diagnosis and engender significant impact on patients and existing treatment services. Internet addiction is a new problem of modern societies nowadays and many studies have considered this issue. The prevalent

use of the Internet is increasing markedly during these years, but with all the benefits Internet brings, problems of excessive Internet use and addiction are becoming apparent.

The growing number of researchers on this topic indicates that Internet addiction is a psychosocial disorder and its characteristics are as follows: affective disorders and problems in social relations tolerance, withdrawal symptoms. Internet usage creates social, psychological, school and/or work difficulties in a person's life. Seventy-nine percent of study participants were pathological Internet users, whose excessive use of the Internet was causing, social, academic, and interpersonal problems. Excessive Internet use may create a heightened level of psychological arousal, resulting in failure to eat for long periods, little sleep, and limited physical activity, possibly leading to the user experiencing physical and mental health problems such as Obsessive-Compulsive Disorder, low family relationships, psychological depression, and general anxiety.

The fact that Internet addiction and depression relationship is the aim of this study to know the prevalence of internet addiction and associated existing psychopathology in adolescent age group, and to determine the association of psychiatric symptoms with Internet addiction by controlling for the effects of demographic variables such as gender, marital status, age, and educational levels.

Internet addiction and depression

Many studies have been conducted to test whether there is any relationship between internet addiction and depression; in August 1995, scientist Young from University of Pittsburgh, conducted a research about her new theory that the internet is becoming an addiction to people, she used 396 people who are dependent on the internet and another 100 as a control group of non-dependents, by doing a survey of 8 questions the people who answered 5 or more as yes were labelled as addicted to the internet usage, as a result, she found out that people who are addicted to the internet are more prone to develop depression or other disease conditions like bipolar disorders, finding out that the dependents are usually newly introduced to the internet.

In 2000 a research was conducted about loneliness and the usage of internet they found out that people with loneliness tend to use the internet more often than normal people although both normal and lonely been using the internet for the same amount of time which is 6 months using the MANOVA method. In the evaluation of internet addiction and depression among university students a research was conducted by Orsala et al. [3] from the University of Medico Socio in Turkey at 2012, the typical students score on the scale of addiction were 08.28 ± 21.89 , while the depression scale score was 14.72 ± 10.58 , an alarming correlation appeared on the internet addiction and the level of depression, the research was conducted among first-year students from the University of Eskisehir Osmangazi, a total of 4585 students participated in this survey, the survey had 20 questions with 6 answers ranging from 0 (never) to 5 (always), any student with a test score of 17+ was considered to be depressed, the data were analyzed by SPSS version 20 at a significance value of $p < 0.05$, 31.4% were found to be suspected of depression [3].

In 2011 a study was made by looking at the correlations between internet usage in college students and depression, loneliness, stress in those students, in the preliminary analysis they found that most forms of Internet use were weakly to moderately correlated with one another. Controlling for age and gender, some of the strongest correlations were

between personal use and times used on the previous day ($r=0.56$, $p < 0.001$), ending the day on the internet ($r=0.41$, $p < 0.001$), and the average Internet use per week was correlated with age ($r=-0.17$, $p < 0.05$, $N=200$), gender ($r=-0.24$, $p < 0.001$, $N=203$), in the end, the internet usage was high among those students, the depression was negative in starting the day with the usage of internet while it was high at ending the day with the internet usage. In 2014, Ho et al. [4] published a meta-analysis and found that the global prevalence of depression among people with IA was 26.3% (95% CI: 17.6-37.4%) and the risk to develop depression was 2.77 times higher than general population worldwide.

The study conducted from Cyprus International University, Faculty of Education, Nicosia and North Cyprus was published in 2012 by International Journal of Global Education. The research was conducted on university students in North Cyprus which consisted of 46 females and 80 males; they were chosen per criterion sampling method, the results showed a significant correlation between internet addiction and psychological symptoms, proofing the relation between depression, loneliness, self-esteem, and internet addiction [5-11].

Another study was conducted by researchers from Sakarya University Education Faculty, TR.; The sample consisted of 294 students who continued their education in the first term of 2009-2010 academic years in Trabzon and who were chosen with simple random sampling method. In this group, there were 54.1% were females and 45.9% were males. 25.3% of the students were in 9th grade, 27.4% were in 10th grade, and 24.7% were in 11th grade 22.6% were in 12th grade. A positive oriented and mid-level relation had been found in the study between internet addiction and depression, as well as a positive oriented and low-level relation between internet addiction and loneliness had been found. On the contrary, it had been found that there is an insignificant negative oriented and low-level relation between internet addiction and self-esteem [12-14].

The study conducted from Cyprus International University, Faculty of Education, Nicosia, and North Cyprus was published in 2012 by International Journal of Global Education. The research was conducted on university students in North Cyprus which consisted of 46 females and 80 males; they were chosen per criterion sampling method, the results showed a significant correlation between internet addiction and psychological symptoms. The relation between depression and internet addiction were inconclusive in this study regarding the small number of participants [15,16].

In 2012 a research under the title of Differential Psychological Impact of Internet Exposure on Internet Addicts was submitted and accepted, and published in 2013 done by Romano and Tripoli [17] from Università Degli Studi di Milano, Milan, Italy and Lisa A. Osborne, Phil Reed from Swansea University, Swansea, United Kingdom. Sixty people volunteered (without receiving any payment for their participation) as a response to a request, which was advertised on and around Swansea University campus for participation in a psychology study; 45% of which were males and 55% were females, with a mean age of 24.0 ± 2.5 years. The group with chronic depression and anxiety, along with social isolation, and anxiety deficient may be at risk of too much internet usage. On the other hand, the group of people who later on experience a negative impact on good mood post to internet exposure may then be triggered by additional escape-motivated internet use, suggesting a likely mechanism preserving internet use in internet addicts.

Regarding depression and anxiety a research was done to associate between social media usage and depression among young adults.

Primack from the medical center of the University of Pittsburgh, a group of 1787 participated in the questionnaire, about (36.0%) of who participated had no higher education, while (25.8%) had a B.A. or higher, about 26.3% were classified as highly depressed people while 29.2% of participants were put in the moderately depressed zone, all in all, the survey gave us a strong indication of presence in a relationship between social media usage and depression, and showing us that cyber-bullying might be a cause.

Internet over-users' psychological profiles: a behavior sampling analysis on internet addiction. A study was published in 2003; the aim of this study is to examine internet's implications on individual's psychology and behavior. The approach to collecting data is "survey on the internet use". Advertisement for research participation was published on popular Korean website "Daum" for 1 week. A reward was granted to each participant after completing the survey. The survey's questionnaire examined internet use behaviors (e.g. Hours spent, services most used) and measures of psychological well-being (e.g. loneliness, depressive moods, and compulsiveness). Thus, three types of internet users were identified; Internet Addicts (IA), possible internet addicts (PA) and non-Addicts (NA). IA was reported to be lonelier and more depressed compared to the other groups. They also expressed unusual close feeling to strangers. Accordingly, IA behavior patterns were quite like those of lonely people in real life. However, it is still controversial to imply directionality relationship between psychological well-being and internet dependency.

Insomnia is one of the core symptoms of the depressive disorder [5]. Zhang et al. reported that 26.7% of young people with IA also reported that they have had sleep-related difficulties [2] which might contribute to depression. Quality of Life (QOL) was reported to be lower for patients with depression than the general population [6]. Tran et al. found that young people IA were more likely to have problems with self-care, difficulty in performing daily routine, suffer from pain and discomfort, anxiety and depression. IA was significantly associated with poor health-related QOL in young Vietnamese [7]. Most importantly, depressive disorder is the main psychiatric disorder which precipitates suicide attempts [8] which may increase the suicide risk of young people suffering from IA.

International Online Journal of Educational Sciences, a recent study was published by Chaudhari et al. on the psychological correlates of internet addiction [9]. The results of this study suggested that every student having internet addiction should be screened for depression and anxiety and vice versa as it will affect the treatment plan immensely. Surprisingly, the negative impact of Facebook use in everyday life has been widely publicized over the world, but a recent study named Facebook Use and Depressive Symptoms. Simoncic at the University of Michigan contradicting most popular belief stated that there is no association between Facebook use and depression in college students. What's more for females suffering from high level of neuroticism, the Facebook activity can be protective against the symptoms [10,11].

Kraut et al. [12,13] found that communication through computers weakens social influence since the absence of nonverbal behavior as talking in the headset, speaking loudly, staring, touching, and gesturing. The disappearance of facial expression, voice inflection, and eye contact makes electronic communication less threatening, thereby helping the depressive to overcome the initial intimidation in meeting and awkwardness and speaking with others. This anonymous two-way talk also helps depressives feel comfortable while sharing ideas with others thanks to the personal control over the level of their

communication, as they have time to contemplate, plan and edit comments before sending an electronic message. Therefore, the treatment protocol should assert the primary psychiatric condition, if related to a subsequent impulse control problem, as addictive Internet use. Effective management of such psychiatric symptoms may indirectly correct PIU.

Internet addiction is defined as an impulse control disorder that does not involve the use of an intoxicating drug and that is very similar to pathological gambling. Individuals who lose control over their own actions in life, and spend over 38 h a week online, are considered to have an Internet addiction. The growing number of researchers on Internet addiction indicates that Internet addiction is a psychosocial disorder and its characteristics are as follows: tolerance, withdrawal symptoms, affective disorders, and problems in social relations. Internet usage creates psychological, social, school and/or work difficulties in a person's life. On the other hand, Problematic Internet use may be associated with subjective distress, functional impairment and Axis I psychiatric disorders. In addition, many studies have reported associations between Internet addiction and psychiatric symptoms, such as depression, anxiety, loneliness, self-efficacy, etc. among adolescents. An Iranian research found that excessive Internet users feel less responsibility toward the society and their environment, and suffer more from social isolation. They usually feel unsuccessful in their education and work, and they have less social support and low self-esteem. Wherefore, using the Internet correctly should be taught through appropriate education at home, schools, and universities. Psychiatrists and psychologists who work in the field of mental health should be aware of mental problems that are caused by Internet addiction such as depression, anxiety, aggression, job, and educational dissatisfaction. The role of psychology should be considered when dealing with this phenomenon and addressing the use and abuse of internet.

Materials and Method

Participants

Subjects were self-selected active Internet users who responded to postings on Facebook support groups and those who searched for the keywords Internet or addiction on popular Web search engines (e.g. Yahoo), University students ranging in age from 17 to 26 and who are receiving education in different faculties at Jordan University of Science & Technology participated in the study. Jordan University of Science & Technology consists of 8 faculties. (Faculty of Agriculture, Faculty of Applied Medical Sciences, Faculty of Computer and Information Technology, Faculty of Dentistry, Faculty of Engineering, Faculty of Medicine, Faculty of Nursing, Faculty of Pharmacy, Faculty of Science and Arts, Faculty of Veterinary Medicine) UCLA Loneliness Scale, Young Internet Addiction Test Short Form, Depression test from Health Promotion Agency, and Indication Scanning List applied to the participants

This research was conducted by an online survey over one of the most popular websites sites in the world, "Facebook." Not only because of the size but also because of the nature of the site, the visitors of this site are a representative population of internet users in the University. The participants were recruited by a banner advertisement, which was posted for about 8 days. Participants in the research had clicked on the banner and then consented to join the questioner survey. The responses of each participant were collected through the linked survey site, and responses were automatically recorded by Google surveys

tool. An advertisement for research participation was posted to the Facebook site (<http://www.facebook.com>) for 1 week. As a reward, the participant was eligible for a prize when he or she completed the survey. Accordingly, the survey was conducted at one of the most popular and largest internet portal sites in the world, the participants could be regarded as a representative sample of internet users in Jordan and other countries. After 1 week, we disconnected the link. We then examined group differences in internet use behaviors (e.g., hours spent, services most used on the internet) and measures of psychological well-being (e.g. depressive moods, loneliness, and compulsiveness).

After permission to collect the data in the university was received from the school administrations of each faculty, the preparation for the survey forms was completed by the students under the supervision of statistics department in the university. This procedure took approximately 30-40 min. In total, 189/214 students (88.37%) from the Faculty of Applied Medical Sciences, 1095/1751 students (62.49%) Faculty of Computer and Information Technology, 910/1255 students (72.49%) from the Faculty of Dentistry, 594/599 students (99.16%) Faculty of Engineering, 415/477 students (89.25%) Faculty of Medicine and 130/180 students (73.68%) from Faculty of Nursing participated in the study.

Instruments and measures

We used the "Survey on Internet Use," which was composed of four sections: the pattern of the Internet use, demographic information, psychological well-being and the degree of internet dependence. The sociodemographic characteristics collected was (age, gender, employment status, educational level, and income, paternal occupational and residential province.)

Internet use: The section of the survey on patterns of Internet used Young's Internet Addiction Scale to confirm and assess the addiction on the internet and other social media types; the new version of this scale was developed in 2015 asked 22 Likert-type questions. The options in this scale for each question contains six options that are scored from 0 (never) to 5 (always). Young's scale asked about the overall amount of time spent on the Internet per day, Do they spend more time than they thought should be surfing the 'Net, Do they find it annoying or uncomfortable to stay away from the 'Net for several days at a time, Have their work out been worsened as a result of spending too much time on the 'Net, Have their personal relationships suffered as a result of spending too much time on the 'Net If tried, unsuccessfully, to curtail your use of the 'Net, If they have a trouble controlling impulses to purchase items, products or there are particular areas of the 'Net and the types of files, they find hard to resist or If they have a problem limiting the time you spend on the 'Net . The higher scores on the scale of Young's indicate higher levels of internet addiction [14]. The Internet Addiction Scale has evidence of being a valid and reliable scale for screening IA due to strong internal consistency (Cronbach's $\alpha=0.93$) [10].

For Internet usage patterns and Internet dependency, Internet services were not the same for all internet users. The three groups showed distinctive usage patterns. For those who were classified as Internet Addicted, online shopping, or online community activities, online games, were much higher than those of the other two groups. By contrast, non-Addicted reported a higher rate of doing information

searches and using e-mail or chatting than did the Internet Addicted and Partially Addicted.

The online cognition scale (OCS): This scale contains thirty-six items on a 7-point Likert-type scale. It had been developed by Davis, Flett, and Besser to assess web addiction and its four sub-dimensions: Loneliness/depression, diminished impulse management, distraction, and social comfort. The interior consistency constant of Jordanian kind was 0.93 and also the test-retest responsiveness constant was 0.87. Jordanian adaptation of this scale had been done in. The interior consistency constant of Jordanian kind was 0.94 and also the test-retest responsiveness constant was 0.92.

The depression anxiety stress scale (DASS): The Depression Anxiety Stress Scales is formed of forty-two self-report items to be completed over 5 to 10 min, every reflective a negative emotional symptom. Every of those are rated on a four-point Likert scale of frequency or severity of the participants' experiences over the last week with the intention of action states over traits. These scores ranged from zero, which means that the consumer believed the item "did not apply to them at all", to three which means that the consumer thought about the item to "apply to them noticeably or most of the time". It's additionally stressed within the directions that there aren't any right or wrong answers.

The total of the relevant fourteen items for every scale represent the participants' scores for each of Depression, Anxiety, and Stress, as well as things like "I could not appear to expertise any positive feeling at all", "I was awake to the status of my mouth" and "I found it exhausting to wind down" within the various order of the scales. The order of the forty-two things has been randomized in order that items of an equivalent scale aren't clustered along. Every one of the scales is then counteracted into subscales comprising 2 to 5 items each.

Limitation

However, several limitations of the study should be noted, diagnosis of depression and internet addiction were established based on self-administrated questionnaires. Neither personal interviews nor a specialist opinion was conducted to confirm the diagnosis. 2. Representation of the population. As the data was collected by online survey, the participants of the study don't necessarily represent the population.

Results

The total number of participants was 4388, composed of 1786 were male (40.7%) and 2588 were female (59.3%). However, those who failed to complete the questionnaire were excluded from the analyses. Their ages ranged from 17 to 22 years with a mean age of 21.53 ± 0.82 years. The paternal economic level was found to be moderate by 47% of the participant. Maternal and paternal education levels were primary school or below for 1370 (36.9%) and 560 (13.4%) students, respectively. The moms of 1479 students (40.1%) and the dads of 2564 students (81.4%) were found to be employed. Nearly about half of the study group (52.1%) lived at home. Considering a large number of participants in the survey, SPSS version 21.0. The program was used to analyze the data. The Statistical significant value (p) was set as $p \leq 0.01$ (Table 1).

Socio-demographics	n (%)	Scale Score Median (min-max)	Statistical Analyses z/x ² ; p	Multiple Comparison	p
Gender					
Female	1850 (53.7)	28.21 (0-81)	0.176; 0.861	-	-
Male	1592 (46.3)	27.94 (0-81)		-	-
Age					
17 (1)	2234 (64.9)	20.0 (0-56)	99.361; 0.000	2-3	0.000
18 (2)	313 (9.1)	11.0 (0-54)		2-1	0.000
19 (3)	895 (26.0)	19.0 (0-54)		3-1	0.000
Faculty					
Faculty of Engineering and Architecture (1) Faculty of Science and Letters (2)	1093 (31.8)	27.02 (0-81)	443.912; 0.000	2-1	0.000
Faculty of Education (3)	909 (26.4)	17.81 (0-81)		2-3	0.000
Faculty of Economics and Administrative Sciences (4)	595 (17.3)	33.43 (1-72)		2-6	0.000
Faculty of Medicine (5)	515 (15.0)	37.81 (2-79)		2-5	0.000
Eskisehir School of Health Sciences (6)	190 (5.5)	35.33 (1-81)		2-4	0.000
-	140 (4.0)	34.80 (1-64)		1-3	0.000
-	-	-		1-6	0.000
-	-	-		1-5	0.000
-	-	-		1-4	0.000
-	-	-			
Student's high School					
Non-specific high school (1)	1832 (53.2)	21.0 (0-56)	389.121; 0.000	3-2	0.000
Anatolian high school (2)	1169 (34.0)	19.0 (1-54)		3-1	0.000
Vocational high school (3)	441 (12.8)	2.0 (0-51)		2-1	0.001
Family type					
Nuclear family (1)	3021 (87.8)	18.0 (0-56)	45.744; 0.000	1-3	1.000
Patriarchal family (2)	280 (8.1)	24.0 (1-56)		1-2	0.000
Divided family (3)	141 (4.1)	18.0 (1-54)		3-2	0.000
Family income level					
High (1)	456 (13.3)	2.0 (0-54)	1218.667; 0.000	1-2	0.000
Moderate (2)	1652 (48.0)	14.0 (1-56)		1-3	0.000
Low (3)	1334 (38.7)	33.0 (0-56)		2-3	0.000
Maternal education level					
Primary school or below (1)	1270 (36.9)	13.0 (0-56)	626.593; 0.000	1-2	0.000
Middle or high school (2)	1166 (33.9)	14.0 (1-56)		1-3	0.000
University (3)	1007 (29.2)	30.0 (2-56)		2-3	0.000
Paternal education level					

Primary school or below (1)	460 (13.4)	28.67 (1-80)	839.752; 0.000	2-1	0.000
Middle or high school (2)	1628 (47.3)	18.48 (0-81)		2-3	0.000
University (3)	1355 (39.4)	39.43 (2-81)		1-3	0.000
Employment status of the mother					
Unemployed	2063 (59.9)	14.0 (0-56)	15.228; 0.000	-	-
Employed	1379 (40.1)	24.0 (1-56)		-	-
Employment status of the father					
Unemployed	878(18.6)	18.83 (0-80)	17.818; 0.000	-	-
Employed	2564(81.4)	31.25 (1-81)		-	-
Residence					
Home (0)	1792 (52.1)	29.75 (0-81)	39.916; 0.000	2-1	0.000
Dorm (1)	1240 (36.0)	26.54 (0-54)		2-0	0.000
Apartment/Hotel (2)	410 (11.9)	25.46 (1-80)		1-0	0.000
Total	3442 (100.0)	28.08 (0-81)		-	-

Table 1: The distribution of the mean scores on the internet addiction scale by socio-demographic characteristics.

For those who responded to this survey, gender was not correlated with depression state, $r=0.0750637027047903$, which can't be considered as a large effect. No correlation between gender and Internet addiction state, $r=0.0775485393551834$, which can't also be considered as a large effect.

However, several limitations of the study should be noted, diagnosis of depression and internet addiction were established based on self-administrated questionnaires. Neither personal interviews nor a specialist opinion was conducted to confirm the diagnosis. 2. Representation of the population. As the data was collected by online survey, the participants of the study don't necessarily represent the population. In conclusion, this investigation reports that internet addiction affects anxiety, depression, and stress directly. Students high in internet addiction are more likely to vulnerability to anxiety,

depression, and stress. So, the current findings increase our understanding of the relationships between internet addiction and anxiety, stress, and depression. It is seen that there are significant correlations between internet addiction and depression, anxiety, and stress. Internet addiction-related positively to depression ($r=0.66$, $p<0.01$), stress ($r=0.65$, $p<0.01$) and anxiety ($r=0.62$, $p<0.01$).

Structural equation modeling

Assumed sample was studied by structural equation modeling (SEM). The following figure shows the results of SEM analysis. After collecting data the pattern adapted well. ($\chi^2=1.23$, $DF=1$, $p=0.26745$, $AGFI=0.98$, $GFI=1.00$, $NFI=1.00$, $RFI=0.99$, $RMSEA=0.028$, $CFI=1.00$, and $IFI=1.00$) and also accounted for 41% of the anxiety, 42% of the stress and 46% of the depression variances (Table 2).

Characteristics of Internet usage	N (%)	Scale Score Median (min-max)	Statistical Analysis $Z/\chi^2:p$	Multiple Comparision	p
Age at first internet use (years)					
≤ 9 (1)	1214 (35.3)	34.57 (0.81)	190.870; 0.000	2-1	0.000
10-12 (2)	1245 (36.2)	25.53 (0.81)		3-1	0.000
≥ 13 (3)	983 (28.6)	23.31 (0.81)		3-2	0.01
Accessibility of internetat the residence					
Available	3295 (95.7)	28.19 (0-81)	0.408; 0.684	-	-
Unavailable	147 (4.3)	25.79 (0-70)		-	-
Frequency of internet usage					
A few times a day (1)	2354 (68.4)	37.34 (9-81)	1764.278; 0.000	3-2	0.172
A few times a week (2)	748 (21.7)	8.04 (1-75)		3-1	0.000

A few times a month (3)	340 (9.9)	7.49 (0-67)		2-1	0.000
Time spent on the internet daily (h)					
≤ 3 (1)	779 (22.6)	3.54 (0-8)	3174.495; 0.000	1-2	1
4-6 (2)	1136 (33.0)	16.50 (8-27)		1-3	
7-12 (3)	1036 (30.1)	41.11 (28-54)		1-4	
13 (4)	491 (14.3)	66.35 (55-81)		2-3	
-	-	-		2-4	
-	-	-		3-4	
Total	3442 (100.0)	28.02 (0-81)		-	-

Table 2: Distribution of mean scores of the students on the internet addiction scale according to some of the characteristics of their internet usage.

The statistics show that the ratio of people who spend more than 6 h on the internet among those who are severe to people who use the internet the same amount of time among those who are not depressed is 3.78 which means severely depressed people are approximately 4 times more likely to be addicted to the internet. It seems that the more depressed people get the more they get addicted to the internet, as we move the data the ratio of people spending the most time on the internet increases as the severity of depression increases. So, in severely depressed patient 64.7% of them use the Internet more than 6 h. On the other hand, we can see a decline in this percentage as the severity of depression decreased. In moderately severe patients the percentage was 50% among all of them, 25% in moderate depression patients, 25% among the mildly depressed patient, and 17% in non- depressed. And that's doing the same for other results.

Discussion

The main target for this study was to examine the relationship between IA and other psychological problems. Among investigations and after results came out findings have shown that there was an important and noticeable relationship among these variables. As expected, those psychological variables were predicted positively IA. Some studies on IA showed that: IA related to participating in the decline of social interactions, feeling of sadness and loss of interest [11,12]. The finding of this study corresponds with other studies that have found a relationship between psychological disorders (i.e. depression, anxiety) and IA. [12-14]. Furthermore, propping findings can be found in studies of depressed individuals who had shown to be magnetized for IA [14,15]. So, it appears that the minimizing of IA may decrease depression and anxiety scales. In this study, there was no significant difference in the number of male and female participants with IA and without IA. Tran et al. found that gender may not play a key role in IA. This can be an emerging trend when both genders have equal access to the internet [16] (Table 3).

Concerning of the connection between stress, internet addiction, and anxiety, there is no research proof to elucidate this link. Nevertheless, since Internet addiction (IA) has been connected with some psychosomatic and social marked by poor or inadequate adaptation variables such as, loneliness, declines in the size of social circle lower self-esteem and life satisfaction [11], poor mental health [14], low family function, and sensation seeking the IA may promote stress and anxiety. In agreement with this suggestion in our study, IA was linked positively to stress and anxiety. These results indicate that the more IA is, the more anxiety and stress would people have. Cognitive behavior therapy is an evidence-based treatment for IA. Behavior therapy can restrict usage of internet. Besides cognitive behavior therapy, immersive virtual reality therapy is beneficial for IA [2] and substitute's addictive activity online.

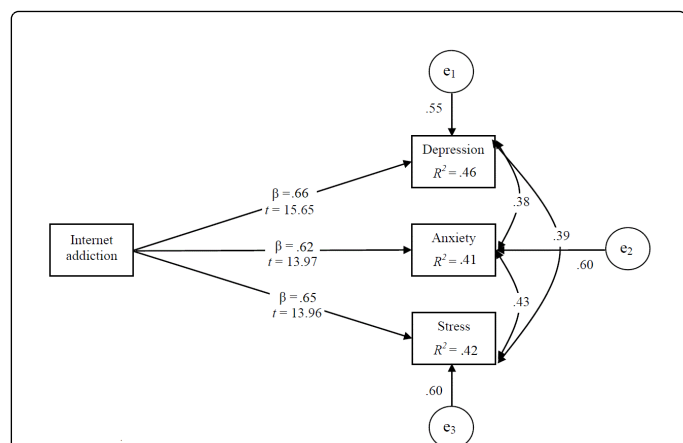


Figure 1: Path analysis between internet addiction, depression, anxiety and stress.

Variables	Internet Addiction	Depression	Anxiety	Stress
Internet Addiction	1.00			
Depression	0.662	1.00		

Anxiety	0.619**	0.806	1.00	0
Stress	0.647	0.810	0.826**	1.00
Mean	85.15	10.48	11.83	15.07
Standard deviation	41.01	9.01	8.90	9.60
Alpha	0.95	0.91	0.88	0.90

Table 3: Significant correlations between internet addiction and depression, anxiety and stress.

Conclusion

In conclusion, this investigation reports that IA affects stress, anxiety, and depression directly. Students high in IA are more likely to emotionally, or mentally attack to stress, anxiety, and depression. So, these results and findings increase our understanding of the relationships between IA and stress, anxiety, and depression.

References

- Mak KK, Lai CM, Watanabe H, Kim DI, Bahar N, et al. (2014) Epidemiology of internet behaviors and addiction among adolescents in six Asian countries. *Cyberpsychol Behav Soc Netw* 17:720-728.
- Zhang MWB, Lim RBC, Lee C, Ho RCM (2017) Prevalence of internet addiction in medical students: A meta-analysis. *Acad Psychiatry*: 1-6.
- Orsala O, Orsal O, Unsal A, Ozalpd S (2013) Evaluation of internet addiction and depression among university students. *Proc Soc Behav Sci* 82: 445-454.
- Ho RC, Zhang MWB, Tsang TY, Toh AH, Pan F (2014) The association between internet addiction and psychiatric co-morbidity: A meta-analysis. *BMC Psychiatry* 14: 183.
- Puri B, Hall A, Ho RC (2014) Revision notes in psychiatry. 3rd edn. CRC Press: New York: 384.
- Tan SH, Tang C, Ng WW, Ho CS, Ho RC (2015) Determining the quality of life of depressed patients in Singapore through a multiple mediation framework. *Asian J Psychiatr* 18: 22-30.
- Tran BX, Huong LT, Hinh ND, Nguyen LH, Le BN, et al. (2017) A study on the influence of internet addiction and online interpersonal influences on health-related quality of life in young Vietnamese. *BMC Public Health* 1: 138.
- Ho CSH, Ong YL, Gabriel HJT, Yeo SN, Ho RCM (2016) Profile differences between overdose and non-overdose suicide attempts in a multi-ethnic Asian society. *BMC Psychiatry* 16:379.
- Chaudhari BL, Menon P, Saldanha D, Tewari A, Bhattacharya L (2015) Psychological correlates of internet addiction: Association with depression and anxiety. *Int J Curr Med Appl Sci* 8:33-38.
- Lai CM, Mak KK, Watanabe H, Ang RP, Pang JS, et al. (2013) Psychometric properties of the internet addiction test in Chinese adolescents. *J Pediatr Psychol* 38: 794-807.
- Ko CH, Yen JY, Chen CC (2005) Gender differences and related factors affecting online gaming addiction among Taiwanese adolescents. *J Nerv Ment Dis* 193: 273-277.
- Kraut R, Lundmark V, Patterson M, Kiesler S, Mukopadhyahy T, et al. (1998) Internet paradox: A social technology that reduces social involvement and psychological well-being? *Am Psychol* 53: 1017-1031.
- Kraut R, Kiesler S, Boneva B, Cummings J, Helgeson V, et al. (2002) Internet paradox revisited. *J Soc Issues* 58: 49-74.
- Young KS, Rodgers RC (1998) The relationship between depression and internet addiction. *Cyberpsychol Behav* 1: 25-28.
- Caplan SE (2003) Preference for online social interaction: A theory of problematic internet use and psychosocial well-being. *Communication Res* 30: 625-648.
- Zhang MWB, Tran BX, Huong LT, Hinh ND, Nguyen HLT, et al. (2017) Internet addiction and sleep quality among Vietnamese youths. *Asian J Psychiatr* 28: 15-20.
- Romano M, Osborne LA, Truzoli R, Reed P (2013) Differential psychological impact of internet exposure on internet addicts. *PLoS One* 8: e55162.