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## Evaluation of Internet Addiction and Depression Among University Students

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### Abstract

This descriptive study was conducted to evaluate internet addiction and depression among university students. The scores of the students on the Internet Addiction Scale were  $08.28 \pm 21.89$ , and the scores on the Depression Scale were  $14.72 \pm 10.58$ . Internet addiction among students was significantly higher ( $p < 0.05$  for each) among students in the Faculty of Economics and Administrative Sciences, students with high family income, students with large families, students whose parents were university graduates and were employed, students with chronic diseases and students who used the internet more than 13 hours each day. A significant positive correlation was found between the level of depression and the level of internet addiction ( $r_s = 0.804$ ;  $p = 0.000$ ).

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*Keywords:* University Student, Internet Addiction, Depression.

### 1. Introduction

Healthy use of the internet is defined as the use of the internet to achieve a desired goal within an appropriate period of time without intellectual or behavioral discomfort (Davis, 2001). Some individuals limit their use of the internet to only what they need, whereas others cannot limit their use. Excessive internet use, which is also called uncontrolled use of the internet, pathological internet use, net addiction or internet addiction, causes problems in work and social life (Whang, Lee, & Chang, 2003a; Widyanto, 2007). Internet addiction is generally defined as an uncontrollable desire for excessive use of the internet, devaluation of time spent without connecting to the internet, intense nervousness and aggression in the case of deprivation and progressive deterioration of social and family life (Young, 1999; Young, 2004).

The internet allows people to establish social connections that cannot be achieved easily in modern urban life, to be in easy and risk-free relationships with strangers, to express their thoughts and feelings freely without restraint and to exaggerate aspects that the individual wants to feature. Other factors that may increase internet

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use are the availability of the internet, opportunities to access prohibited content and the ability to play games and take risks (Buckingham, 2002; Teo & Lim, 2000; Young, 1999) .

The prevalence of internet addiction is high among young people due to their unsettled personalities and has been reported to vary from 1.5% to 24.2% (Petersen, Weymann, Schelb, Thiel, & Thomasius, 2009; Tsai et al., 2009; Üneri & Tanıdır, 2011; Whang, Lee, & Chang, 2003b). In Turkey, the prevalence of internet addiction among young people ranges from 1.1% to 18.9% (Aksu & İrgil, 2003; Batıgün & Hasta, 2010; Batıgün & Kılıç, 2011; Bayraktar & Gün, 2007; Ceylan, 2008; Vaizoğlu et al., 2004) .

Even young people without mental health problems report addiction to the internet and mental health problems as a result of spending hours on porn sites, online shopping sites, luck and computer games, hobby sites and chat rooms (Young, 1996) . Internet addiction has been reported to be associated with anxiety disorders (Kratzer & Hegerl, 2008; Robin-Marie Shepherd, & Edelman, 2005), shyness, (Saunders & Chester, 2008), introversion (Ebeling-Witte, Frank, & Lester, 2007), personality disorders (Bernardi & Pallanti, 2009), and mental health problems, such as paraphilia, pathological gambling and game-playing, bipolar disorder, social phobia, attention deficit hyperactivity disorder and depression in young people (Yen, Ko, & Yen, 2007).

There is a similar incidence of depression among individuals addicted to the internet and of internet addiction among depressive patients (Yen et al., 2007) . Depression manifests as deep sorrow or grief, insomnia, loss of appetite, unpleasant mood, hopelessness, irritability, self-dislike, and suicidal tendencies (DSM-IV-TR, 2000). Low self-esteem, low motivation, fear of rejection and the need for confirmation from others, all of which are commonly observed in depressive people, may result in frequent use of the internet, and the interactive functions of the internet may lead to internet addiction in individuals with these characteristics (Yang, Choe, Baity, Lee, & Cho, 2005). It has also been found that depression may occur due to the social isolation caused by internet addiction (Tsai & Lin, 2003). The literature debates whether the primary disease in this case is internet addiction or depression. The purpose of this study is to evaluate the levels of internet addiction and depression among students from Eskisehir Osmangazi University.

## 2. Materials and methods

### 2.1. Participants

This descriptive study was conducted among first-year students from Eskisehir Osmangazi University (ESOGU) between February 20 and June 20, 2012. Eskisehir is a city located in the west of Turkey with two large state universities (Türkiye İstatistik Kurumu, 2009). Eskisehir Osmangazi University consists of 7 faculties (Faculty of Medicine, Faculty of Engineering and Architecture, Faculty of Science and Letters, Faculty of Economics and Administrative Sciences, Faculty of Education, Faculty of Agriculture and Faculty of Theology), 2 colleges (Eskisehir School of Health Sciences and the School of Tourism and Hotel Management) and 3 vocational colleges. The University has three campuses. The study was conducted at only one campus and included 5 faculties and 1 college located on the campus of Meselik.

After permission to collect the data was received from the school administrations, the students were gathered in classrooms and informed about the subject and purpose of the study. Prepared survey forms were completed by the students under supervision. This procedure took approximately 30-40 minutes. In total, 190/215 students (88.37%) from the Faculty of Medicine, 1093/1749 students (62.49%) from the Faculty of Engineering and Architecture, 909/1254 students (72.49%) from the Faculty of Science and Letters, 595/600 students (99.16%) from the Faculty of Education, 515/577 students (89.25%) from the Faculty of Economics and Administrative Sciences, and 140/190 students (73.68%) from Eskisehir School of Health Sciences participated in the study. Of the 4585 students on this campus during the study period, the 3442 (75.1%) students who were in school and agreed to participate in the study constituted the study group (Eskişehir Osmangazi Üniversitesi. Öğrenci Sayılarına ilişkin istatistikler, 2012).

### 2.1.1. Instruments

A questionnaire was prepared in line with the purposes of the study based on the literature (Batıgün & Kılıç, 2011; Bayraktar & Hasta, 2010, Ceylan, 2008; Bernardi & Pallanti, 2009; Douglas et al., 2008). The questionnaire consisted of items related to students' sociodemographic characteristics (gender, age, faculty, high school, family type, family income level, maternal education status, paternal education status, maternal employment status, paternal employment status, residence, presence of chronic diseases and disability status), students' habits related to internet use (the student's age when he or she first used the internet, the ability to access the internet anywhere, the frequency of the use of the internet, time spent on the Internet in one day), Young's Internet Addiction Scale and the Beck Depression Inventory.

Young's Internet Addiction Scale was used to assess internet addiction in the study group. Young's Internet Addiction Scale was developed in 1996 by Young and colleagues (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), and the validity and reliability of the scale for Turkey were verified in 2001 by Bayraktar (Bayraktar, & Gün, 2007). The scale consists of 20 Likert-type questions. Each question contains six options that are scored from 0 (never) to 5 (always). Higher scores on the scale indicate higher levels of internet addiction.

The Beck Depression Inventory was used to assess depression in the study group. This scale was developed in 1961 by Beck and colleagues (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961)<sup>34</sup>, and the validity and reliability of the scale for Turkey were verified in 1989 by Hisli and colleagues (Hisli, 1998). The scale consists of 21 Likert-type questions. Each question contains four options that are scored from 0 (none) to 3 (severe). The total score ranges from 0 to 63 points. Students with scores of 17 points or more were suspected of having depression. Family income level was classified as low, moderate or high according to the students' perceptions. Students whose parents were actively working in any revenue-generating job were classified as "employed".

#### 2.1.1.1. Statistical analyses

The data were analyzed using SPSS version 20.0. The Mann-Whitney U test, Kruskal-Wallis test and Spearman's correlation analysis were used for statistical analysis. The statistical significance value was set at  $p < 0.05$ .

#### 2.1.1.1.1. Limitation

The limitations of this study include its cross-sectional design of the study and the fact that it was conducted in a single university with only first-year students. Furthermore, the legal system does not recognize internet addiction.

## 3. Results

Of the students comprising the study group, 1850 (53.7%) were female and 1592 (46.3%) were male. Their ages ranged from 17 to 19 years, with a mean age of  $17.61 \pm 0.87$  years. More than half of the students (64.9%) were 17 years old, and 53.0% had graduated from a non-specific high school. The number of students from a nuclear-type family was 3021 (87.8%). Family income level was reported to be moderate by 48% of the students. Maternal and paternal education levels were primary school or below for 1270 (36.9%) and 460 (13.4%) students, respectively. The mothers of 1379 students (40.1%) and the fathers of 2564 students (81.4%) were employed. Nearly half of the study group (52.1%) lived at home. The scores of the students on the Internet Addiction Scale ranged from 0 to 81, with a mean score of  $28.08 \pm 21.89$ . The distribution of the mean scores on the Internet Addiction Scale by socio-demographic characteristics is shown in Table 1.

Table 1. The distribution of the mean scores on the Internet Addiction Scale by socio-demographic characteristics

Socio-demographics	n (%)	Scale Score Median (min-max)	Statistical Analyses z / $\chi^2$ ; p	Multiple Comparison	p
<b>Gender</b>					
Female	1850 (53.7)	28.21 (0-81)		-	-
Male	1592 (46.3)	27.94 (0-81)	0.176; 0.861	-	-
<b>Age</b>					
17 (1)	2234 (64.9)	20.0 (0-56)		2-3	<b>0.000</b>
18 (2)	313 (9.1)	11.0 (0-54)	99.361; <b>0.000</b>	2-1	<b>0.000</b>
19 (3)	895 (26.0)	19.0 (0-54)		3-1	<b>0.000</b>
<b>Faculty</b>					
Faculty of Engineering and Architecture (1)	1093 (31.8)	27.02 (0-81)		2-1	<b>0.000</b>
Faculty of Science and Letters (2)	909 (26.4)	17.81 (0-81)		2-3	<b>0.000</b>
Faculty of Education (3)	595 (17.3)	33.43 (1-72)		2-6	<b>0.000</b>
Faculty of Economics and Administrative Sciences (4)	515 (15.0)	37.81 (2-79)	443.912; <b>0.000</b>	2-5	<b>0.000</b>
Faculty of Medicine (5)	190 (5.5)	35.33 (1-81)		2-4	<b>0.000</b>
Eskisehir School of Health Sciences (6)	140 (4.0)	34.80 (1-64)		1-3	<b>0.000</b>
-	-	-		1-6	<b>0.000</b>
-	-	-		1-5	<b>0.000</b>
-	-	-		1-4	<b>0.000</b>
<b>Student's high school</b>					
Non-specific high school (1)	1832 (53.2)	21.0 (0-56)		3-2	<b>0.000</b>
Anatolian high school (2)	1169 (34.0)	19.0 (1-54)	389.121; <b>0.000</b>	3-1	<b>0.000</b>
Vocational high school (3)	441 (12.8)	2.0 (0-51)		2-1	<b>0.001</b>
<b>Family type</b>					
Nuclear family (1)	3021 (87.8)	18.0 (0-56)		1-3	1.000
Patriarchal family (2)	280 (8.1)	24.0 (1-56)	45.744; <b>0.000</b>	1-2	<b>0.000</b>
Divided family (3)	141 (4.1)	18.0 (1-54)		3-2	<b>0.000</b>
<b>Family income level</b>					
High (1)	456 (13.3)	2.0 (0-54)		1-2	<b>0.000</b>
Moderate (2)	1652 (48.0)	14.0 (1-56)	1218.667; <b>0.000</b>	1-3	<b>0.000</b>
Low (3)	1334 (38.7)	33.0 (0-56)		2-3	<b>0.000</b>
<b>Maternal education level</b>					
Primary school or below (1)	1270 (36.9)	13.0 (0-56)		1-2	<b>0.000</b>
Middle or high school (2)	1166 (33.9)	14.0 (1-56)	626.593; <b>0.000</b>	1-3	<b>0.000</b>
University (3)	1007 (29.2)	30.0 (2-56)		2-3	<b>0.000</b>
<b>Paternal education level</b>					
Primary school or below (1)	460 (13.4)	28.67 (1-80)		2-1	<b>0.000</b>
Middle or high school (2)	1628 (47.3)	18.48 (0-81)	839.752; <b>0.000</b>	2-3	<b>0.000</b>
University (3)	1355 (39.4)	39.43 (2-81)		1-3	<b>0.000</b>
<b>Employment status of the mother</b>					
Unemployed	2063 (59.9)	14.0 (0-56)		-	-
Employed	1379 (40.1)	24.0 (1-56)	15.228; <b>0.000</b>	-	-
<b>Employment status of the father</b>					
Unemployed	878(18.6)	18.83 (0-80)		-	-
Employed	2564(81.4)	31.25 (1-81)	17.818; <b>0.000</b>	-	-
<b>Residence</b>					
Home (0)	1792 (52.1)	29.75 (0-81)		2-1	<b>0.000</b>
Dorm (1)	1240 (36.0)	26.54 (0-54)	39.916; <b>0.000</b>	2-0	<b>0.000</b>
Apartment/Hotel (2)	410 (11.9)	25.46 (1-80)		1-0	<b>0.000</b>
<b>Total</b>	<b>3442 (100.0)</b>	<b>28.08 (0-81)</b>		-	-

We found that 1245 students (36.2%) began to use the internet by the age of 10-12. Of the students, 3295 (95.7%) reported that they had access to the internet at their residence. Internet use a few times per day was reported by 2354 students (68.4%), and 1136 students (33.0%) used the internet 4-6 hours each day. Among the students in the study group, 2485 (72.2%) students reported that they used the internet for social friendships, 1582 (46%) used the internet because of loneliness, 1516 (44%) used the internet for their lessons, and 1314 (38.2%) used the internet for entertainment. The distribution of the mean scores of the students on the Internet Addiction Scale according to some of the characteristics of their internet usage is shown in Table 2.

Table 2. Distribution of the mean scores of the students on the Internet Addiction Scale according to some of the characteristics of their internet usage

Characteristics of Internet Usage	n(%)	Scale Score Median (min-max)	Statistical Analyses z / $\chi^2$ ; p	Multiple Comparison	p
<b>Age at first internet use (years)</b>					
≤9 (1)	1214 (35.3)	34.57 (0-81)	190.870; <b>0.000</b>	2-1	<b>0.000</b>
10-12 (2)	1245 (36.2)	25.53 (0-81)		3-1	<b>0.000</b>
≥13 (3)	983 (28.6)	23.31 (0-81)		3-2	<b>0.01</b>
<b>Accessibility of the internet at the residence</b>					
Available	3295 (95.7)	28.19 (0-81)	0.408; 0.684	-	-
Unavailable	147 (4.3)	25.79 (0-70)		-	-
<b>Frequency of internet usage</b>					
A few times a day (1)	2354 (68.4)	37.43 (9-81)	1764.278; <b>0.000</b>	3-2	0.172
A few times a week (2)	748 (21.7)	8.04 (1-75)		3-1	<b>0.000</b>
A few times a month (3)	340 (9.9)	7.49 (0-67)		2-1	<b>0.000</b>
<b>Time spent on the internet daily (hours)</b>					
≤ 3 (1)	779 (22.6)	3.54 (0-8)	3174.495; <b>0.000</b>	1-2	<b>0.000</b>
4 – 6 (2)	1136 (33.0)	16.50 (8-27)		1-3	<b>0.000</b>
7 – 12 (3)	1036 (30.1)	41.11 (28-54)		1-4	<b>0.000</b>
≥ 13 (4)	491 (14.3)	66.35 (55-81)		2-3	<b>0.000</b>
-	-	-		2-4	<b>0.000</b>
-	-	-	3-4	<b>0.000</b>	
<b>Total</b>	<b>3442 (100.0)</b>	28.08 (0-81)		-	-

Of the students in this study, 942 (27.4%) had a history of chronic disease, 359 (10.4%) had physical disabilities, and 1082 (31.4%) had a suspected diagnosis of depression. The distribution of the mean scores of the students on the Internet Addiction Scale according to their health problems is shown in Table 3.

Table 3. Distribution of the mean scores of the students on the Internet Addiction Scale according to health problems

Health problems	n (%)	Scale Score Median (min-max)	Statistical Analyses z; p
<b>History of chronic disease</b>			
Yes	2726 (79.2)	16.00 (0-81)	31.573; <b>0.000</b>
No	716 (20.8)	52.00 (20-81)	
<b>Presence of a physical disability</b>			
No	3385 (98.3)	22.20 (0-80)	3.998; <b>0.000</b>
Yes	57 (1.7)	39.00 (9-81)	
<b>Suspicion of depression</b>			
Yes	1082 (31.4)	53.00 (40-81)	47.181; <b>0.000</b>
No	2360 (68.6)	13.00 (0-39)	
<b>Total</b>	<b>3442 (100.0)</b>	28.08 (0-81)	

## Figures

The students' scores on the Beck Depression Inventory ranged from 0 to 46, with a mean score of  $14.72 \pm 10.58$ . There was a significant positive correlation between the scores on the Internet Addiction Scale and the scores on the Beck Depression Scale ( $r_s=0.804$ ;  $p=0.000$ ). The distribution of the scores of the students on the Internet Addiction Scale and the Beck Depression Scale is shown in Figure 1.

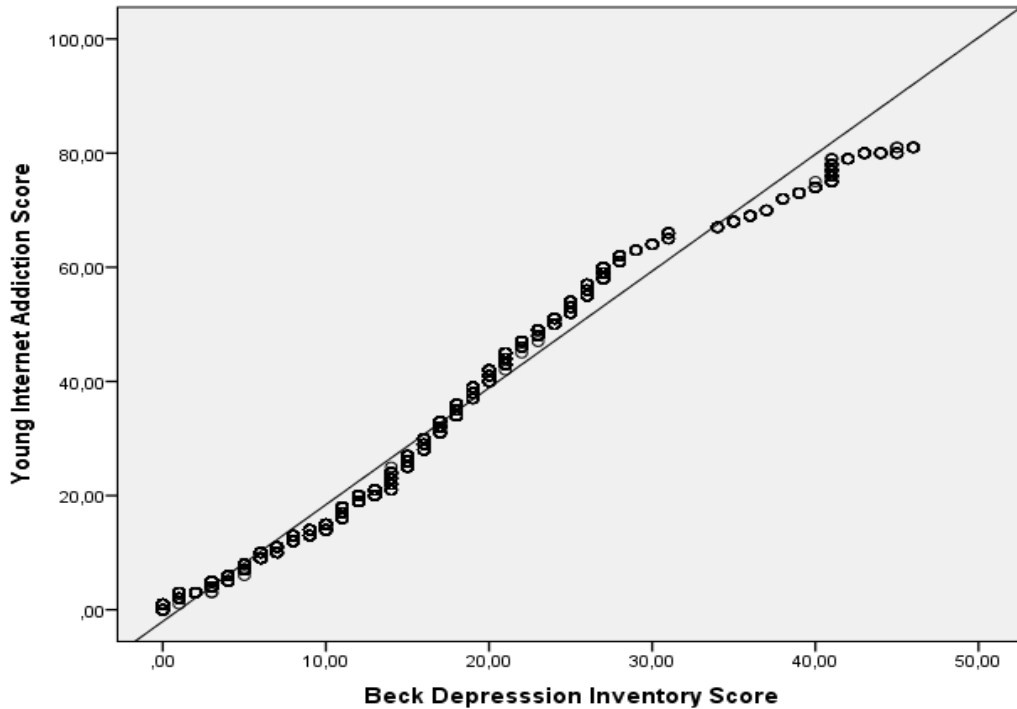


Figure 1. Distribution of the scores of the students on the Internet Addiction Scale and the Beck Depression Scale

## 4. Discussion

Because of the widespread use of the internet for following up on lessons, conducting research and writing papers, it is not surprising that internet addiction is common among university students. In this study, the mean score of the students on the Internet Addiction Scale was 8.28. Several studies have reported different results for the level of internet addiction (Üneri & Tanıdır, 2011). The differences in reported results may be explained by the different methods used in the diagnosis of internet addiction and by the fact that studies have been conducted in different populations and in different time periods.

It has been reported that, for social and cultural reasons, internet addiction is more common among men than women because of the lack of social control on the internet over activities such as reading the news, gaming and gambling, virtual sex, chatting and meeting new people (Batıgün & Kılıç, 2011; Morahan-Martin & Schumacher, 2000; Wang, 2001; Kim et al., 2006; Yang & Tung, 2007; Ko, Yen, Chen, Chen, & Yen, 2008). However, no differences were observed between women and men in terms of the level of internet addiction in our study group ( $p > 0.05$ ). Similar results have been reported in other studies (Kim et al., 2006; Lam, Peng, Mai, & Jing, 2009; Doğan, Işıklar, & Eroğlu, 2008; Chou & Hsiao, 2000; Fortson, Scotti, Cihen, Malone, & Kevin, 2007; Miller, 2001). The lack of a significant association in our study between gender and the level of internet addiction may



be related to similarities between the genders with respect to the family and peer pressure, academic structure, and economic situation experienced by students.

Internet addiction is considered a mental disorder that can be found in all age groups. However, internet addiction has been reported to occur more frequently among young people (Wang, 2001). In this study, the level of internet addiction was higher among students who were 17 years old than among other age groups ( $p < 0.05$ ). Yen et al. reported similar results (Yen, Ko, & Yen, 2007). The results obtained in our study may be explained by the fact that students can use technology (such as Twitter) more cheaply and more easily in their early life (Treuer, Fa'bia'n, & Füredi, 2001).

Because of the differences in the content and density of education and in the field of application, the level of internet addiction is expected to differ among students in various faculties. In our study, a high level of internet addiction was found in students at the Faculty of Economics and Administrative Sciences ( $p < 0.05$ ). In contrast, Niemz and colleagues found a higher level of internet addiction among students in the Faculty of Sciences (Niemz, Griffiths, & Banyard, 2005).

In this study, the level of internet addiction was found to be higher among students who had graduated from a non-specific high school ( $p < 0.05$ ). In contrast, Yang and Tung reported that students at a vocational high school were more addicted to the internet than those studying at a non-specific high school (Yang & Tung, 2007).

Because of greater opportunities to access the internet and a lack of control over their internet usage, the level of internet addiction may be high among students whose mothers and fathers are employed and among those with a high family income level. Accordingly, in our study, the level of internet addiction was found to be higher among students whose mothers and fathers were employed and among those with a high family income level ( $p < 0.05$  for each). Several other researchers have reported similar results (Batıgün & Kılıç, 2011; Jackson, Alexander, Biocca, Barbatsis, Fitzgerald, & Zhao, 2003).

It is well known that although individuals may have "real social support" from their families and society, they may also have "virtual social support" from the internet (Yeh, Ko, Wu, & Cheng, 2008). Individuals who are not supported by their family use the internet frequently to satisfy the need for interpersonal relationships and to create alternative social channels. Levels of internet addiction have been reported to increase in parallel with increased use of the internet (Papacharissi, 2000). In our study group, the level of internet addiction was higher among students from patriarchal families ( $p < 0.05$ ).

It is well established that there is a positive relationship between internet addiction and socio-economic status and that parental education status is an indicator of socio-economic level. In our study group, the level of internet addiction was higher among students whose mothers or fathers were university graduates ( $p < 0.05$  for each). Several studies have reported a similar relationship between internet addiction and parental education level (Balci & Ayhan, 2007).

Due to easier access to the internet, a high level of internet addiction is likely among individuals residing at home or in dorms that have internet access (Young, 1999; Douglas et al., 2008). In our study, the level of internet addiction was found to be higher among students residing at home and in dorms ( $p < 0.05$ ). Similar results have been reported by Douglas and colleagues and by Young (Young, 1999; Douglas et al., 2008).

The time spent on the internet is an important factor in addiction. Using the internet for 40-80 hours weekly or up to 20 hours at one time may be the criterion for hospitalization for internet addiction (Young, 2004; Brenner, 1997). The level of internet addiction was higher among students who used the internet 13 or more hours daily ( $p < 0.05$ ). Several studies have reported that the level of internet addiction increases with increasing duration of internet use (Beard & Wolf, 2001; Ceyhan, Ceyhan, & Gürcan, 2007; Chou & Hsiao, 2000; Davis, Flett, & Besser, 2002; Keser Özcan & Buzlu, 2005; Morahan-Martin & Schumacher, 2000; Treuer, Fa'bia'n, & Füredi, 2001; Üneri & Tanıdır, 2011).

In patients with chronic diseases, feelings of desperation, physical symptoms caused by disease, and side effects of treatment may lead to the feeling of being unable to control their body. The decreased self-esteem resulting from this loss of control may facilitate the emergence of internet addiction (Saba, Somnath, Emese, Ajay, Vikram, & Bedirhan, 2007; Sharp & S, 2002; Chuang, 2006; Fasano, Elia, Soleti, Guidubaldi, & Bentivoglio, 2006; Jacobs & Baker, 2002). Among the students in the study group, the level of internet addiction was found to be higher among students with a chronic disease than among those without a chronic disease

( $p < 0.05$ ). Previous studies have reported a higher level of internet addiction among individuals with a history of chronic disease (Saba, Somnath, Emese, Ajay, Vikram, & Bedirhan, 2007; Sharp, 2002; Chuang, 2006; Fasano, Elia, Soleti, Guidubaldi, & Bentivoglio, 2006; Jacobs & Baker, 2002).

A difficult and stressful educational process, the burden of studying, uncertainty due to living away from one's family and financial and emotional problems may lead to depression or internet addiction among students. Problems with school, health, family and time management may aggravate the level of internet addiction and/or depression. The internet can emerge as a savior to combat stress caused by these problems. Students can establish risk-free, positive communications with other people by using the internet. However, excessive use of this positive communication tool may lead to internet addiction, which is a step toward depression. Internet addiction is found in individuals with depression and those predisposed to depression, and depression and internet addiction may interact to aggravate both clinical situations (Facer, Sutherland, Furlong, & Furlong, 2001 b; Tsai & Lin, 2003; Wang, 2001). Levels of depression and internet addiction were significantly positively correlated in our study ( $p < 0.05$ ). Several studies have reported a similar correlation between levels of depression and internet addiction (Davis et al., 2002; Ha et al., 2006; Keser Özcan & Buzlu, 2005; Kim et al., 2006; Ko, Yen, Chen, Chen, & Yen, 2008; Kraut et al., 2002; Teo & Lim, 2000; Üneri & Tanıdır, 2011; Whang, Lee, & Chang, 2003b; Yang & Tung, 2007; Young & Rodgers, 1998). In contrast, studies by Niemz and colleagues and Sanders and colleagues found no correlation between levels of depression and internet addiction (Niemz, Griffiths, & Banyard, 2005; Sanders, Field, Diego, & Kaplan, 2000).

## 5. Conclusions and suggestions

Internet addiction is a major health problem among first-year students studying at ESOGU. There is a significant positive correlation between levels of depression and internet addiction. It would be beneficial to refer individuals who are suspected of having depression and internet addiction to advanced centers for accurate diagnosis and treatment and to inform students about the controlled use of the internet. Further comprehensive studies are warranted to identify the relationship between internet addiction and depression.

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