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Relationship between internet addiction, psychopathology and self-esteem among university students

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ABSTRACT

Objectives: Internet addiction is closely associated with general psychopathology and interpersonal relationships. The aim of our study is to investigate the relationship between internet addiction, psychopathology and self-esteem among university students. *Methods*: One hundred and eighty-five volunteer university students were involved in this study. The participants are evaluated with socio-demographic data form, Internet Addiction Scale (IAS), Symptom Check List (SCL-90), Rosenberg Self-Esteem Scale (RSES). *Results*: In order to evaluate the internet addiction, the participants were divided into three internet addiction (IA) groups as "none", "low" and "moderate/high" according to their addiction status. The addiction status was assessed as risk of low level in 59 (31.89 %) participants, high level in 27 (14.59 %) participants and none in 99 (53.51%) participants. A high positive correlation was found between IAS and SCL-90 subscales and RSES ($p<0.001$). In three different IA groups it was found out that all SCL-90 subscale averages increase ($p<0.001$), and RSES subscale averages decrease ($p=0.001$) as internet addiction severity increases. According to regression analysis it is seen that, all SCL-90 subscale scores explain 19.4% of IAS scores and, all SCL-90 subscales and RSES subscale scores explain 25% of IAS scores. *Conclusions*: Significant relationship was found between internet addiction and general psychopathology and self-esteem. This result shows that psychopathology and self-esteem must be taken into consideration as important parameters in approach to internet addiction.

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Introduction

Despite the simplicity it brings to our daily lives, one of the most important problems that we face with internet is the internet addiction (IA) that is associated with loose of control of the user on internet usage [1, 2]. It is thought that among reasons of IA there may be psychological, neurobiological and cultural factors [3]. In studies about IA; it was found out that addiction scores are positively correlated with depression and anxiety scores, and individuals with IA are more affected by depression and anxiety. At the same time, it was observed that there are depressive symptoms in more than half of the ones who seek for IA treatment, and depressive symptoms diminish in treated individuals with IA [4-8].

It is evaluated that, personality traits of the young people with IA are different, in addition to depression and anxiety symptoms, introversion, neurotic personality traits, hyperactivity and impulsivity signs are much more in people with IA; second axis clinical diagnosis of the young people with IA may be borderline personality disorder, obsessive compulsive personality disorder [9-12]. It is seen that, paranoid ideation, hostility, anxiety, depression, interpersonal sensitivity, obsessive compulsive average scores are higher in individuals with high IA scores than the ones without IA [13, 14]. It is reported that in the individuals with IA, attention deficit hyperactivity disorder (ADHD) incidence and ADHD scores are higher, and obsessive compulsive symptoms, attention and motor impulsivity may raise internet addiction [15-17]. Beside this, it is shown that overuse of internet may cause deprivation as in the substance usage disorder, and internet addicted people have difficulty in inhibition of inappropriate behavior [18, 19].

Another important topic in IA is self-esteem. Especially, it is evaluated that there is a significant relationship between low self-esteem and IA; and self-esteem of people with IA increases significantly after treatment [20-22]. It is assessed that self-esteem mediates positive parental behavior which is important for IA [23]. It is reported that, self-esteem explains 38% of IA with life satisfaction and isolation, and it may explain time management problems, interpersonal relationships and health problems in IA [24]. In another study, it is considered that, self-esteem may be an important factor in relationship between childhood abuse and internet addiction, and self-esteem may predict internet addiction in these individuals and it may be a factor to be considered

in treatment process of these individuals [25]. It is reported that there is a significant relationship between severity of IA and depressive symptoms, somatic symptoms and low self-esteem, ant it is suggested that anxiety, depression and self-esteem must be taken into consideration in IA prevention and intervention programs for adolescents with attention deficit and hyperactivity diagnosis [26].

The severity of internet addiction and several psychopathological features and self-esteem may be closely related to each other. Beside this, self-esteem may have an important role as well as psychopathological features in prediction of IA. The aim of this study: is to analyze the relationship between internet addiction, psychopathology and self-esteem among university students.

Methods

In this study, students of Bursa Orhangazi University were evaluated in April 2014. We have obtained permission from the university administration and the students were informed about the study before participation.

Participation was determined on a voluntary basis and participation approval permission was taken from each student. 200 students were evaluated in our study who declares to use internet. Exclusivity criteria of the study were determined as incorrect or incomplete measurement and 15 students' data were excluded from the study as they were incorrect or incomplete. In our study exclusion criterias are schizophrenia, manic phase of bipolar disorder and psychosis are determined. But with these exclusion criteria of the subjects it did not appear to be any person.

The students were evaluated as groups in a quiet classroom. Following the briefing the participants were assessed with socio-demographical data form and scales of paper and pencil tests.

Internet Addiction Scale (IAS)

Validity of the Internet Addiction Scale (IAS) [27] which was developed by Nicolas and Nichi in 2004 in order to evaluate the internet addiction(IA) was made by Kayri and Gunuc (2009) in Turkey on

university students [28]. The Crombach α value of the scale was found as 0.93 in this study. Scale is composed of 31 articles andthere is no reverse scored article. The attitudes in likert form are scored as; "1-never, 2-rarely, 3-sometimes, 4-frequently and 5-always" and the scores of the scale ranges between 31 and 155. In the validity study made by Kayri and Gunuc (2009) addiction scores are evaluated in 5 groups as 30-60, 61-70, 71-80, 81-89 and 90-over. However, in the study of Dalbudak and friends on the university students in our country, it is seen that cut-off point of the scale in terms of addiction is 81, and IA is assessed in three groups in IAS as 30-60 (no addiction), 61-80 (light addiction) and 81 and over (risk in terms of addiction/addicted) [9]. Therefore we also evaluated the severity of total IAS scores of the participants in 3 groups as determined by Dalbudak and friends.

Symptom Check List (SCL-90)

Symptom Check List is an evaluation tool which was developed by Derogatis (1983) and that evaluates psychiatric symptoms composed of 90 articles and 9 subscales [29]. Validity and reliability of the scale was made by Dag (1991) and its reliability co-efficient according to subscales were as follows; Somatization (SOM) 0.82; Obsessive-Compulsive (O-C) 0.84; Interpersonal Sensitivity (INT) 0.79; Depression (DEP) 0.78; Anxiety (ANX) 0.73; Anger-Hostility (HOS) 0.79; Phobic Anxiety (PA) 0.78; Paranoid Ideation (PAR) 0.63; Psychoticism (PSY) 0.73; Additional Scale (AS) 0.77 [30].

Rosenberg Self Esteem Scale (RSES)

The inventory developed by Rosenberg is used for the purpose of self-esteem evaluation of the individuals [31]. The validity of the inventory was made by Cuhadaroglu in our country and the test retest reliability of the inventory was found as 0.89 [32]. The sub dimensions of the inventory composed of 63 multiple choice articles are as follows: Self-esteem, Continuity of self-concept, Relying on people, Sensitivity to criticism, Depressive mood, Visionary, Psychosomatic symptoms, Feeling threatened in interpersonal relationships, Degree of participating in discussions, Interest of parents, Relationship with father, Psychic isolation. Increase of scores obtained from these subscales (except relationship with father) is evaluated as a negative situation in terms of self-esteem. Increase of the score obtained from Relationship with father subscale shows that relation with father increases. All subscales of the inventory are used in our study.

Statistical Analysis

In this study, the data has evaluated with SPSS 22.0 program. For all analyzes, a level of significance α=0.05 was determined. We have used the independent groupst test to evaluate socio-demographic data; Kruskal Wallis analysis to compare psychopathology and self-esteem in three different internet addiction (IA) groups (without IA, mild IA, moderate/high IA); and Pearson correlation coefficient and hierarchical linear regression analysis to analyze the relationship between internet addiction and self-esteem.

Table 1. Correlations between the scale scores.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1-IAS	-												
2-SE	0.25*	-											
3-S	0.34*	0.34*	-										
4-O-C	0.40*	0.40*	0.68*	-									
5-INT	0.41*	0.38*	0.56*	0.67*	-								
6-DEP	0.42*	0.48*	0.71*	0.75*	0.79*	-							
7-ANX	0.45*	0.42*	0.79*	0.77*	0.73*	0.84*	-						
8-HOS	0.37*	0.33*	0.57*	0.62*	0.59*	0.65*	0.77*	-					
9-PA	0.35*	0.36*	0.63*	0.60*	0.69*	0.74*	0.77*	0.62*	-				
10-PI	0.33*	0.35*	0.61*	0.63*	0.74*	0.70*	0.76*	0.69*	0.68*	-			
11-PSY	0.41*	0.38*	0.63*	0.70*	0.72*	0.73*	0.80*	0.61*	0.76*	0.71*	-		
12-AS	0.32*	0.33*	0.60*	0.60*	0.62*	0.72*	0.71*	0.58*	0.66*	0.66*	0.69*	-	
13-GP	0.45*	0.45*	0.81*	0.84*	0.84*	0.91*	0.94*	0.78*	0.83*	0.83*	0.86*	0.79*	-

IAS=Internet Addiction Scale, SE=Self Esteem S=Somatization, O-C=Obsessive-Compulsive, INT=Interpersonal Sensitivity, DEP=Depression ANX=Anxiety, HOS=Anger-Hostility, PA= Phobic Anxiety, PI=Paranoid Ideation, PSY=Psychoticism, AS= Additional Scale GP= General Psychopathology, *p<0.001.

Table 2. Comparing subscale scores according to severity of internet addiction (IA)

	without IA n=99		mild IA n=59		moderate/high IA n=27		Chi-Square	p
	mean	SD	mean	SD	mean	SD		
Somatization[b]	0.48	0.46	0.66	0.44	1.02	0.71	17.70	<0.001
Obsessive-Compulsive[b]	0.98	0.61	1.32	0.73	1.64	0.84	16.20	<0.001
Interpersonal Sensitivity[a]	0.71	0.64	1.06	0.63	1.46	0.96	21.83	<0.001
Depression[b]	0.65	0.60	0.85	0.57	1.46	0.96	20.40	<0.001
Anxiety[a]	0.58	0.60	0.91	0.69	1.50	1.02	26.10	<0.001
Anger-Hostility[b]	0.64	0.73	0.88	0.75	1.41	0.97	18.64	<0.001
Phobic Anxiety[b]	0.31	0.46	0.41	0.51	0.84	0.88	11.40	0.003
Paranoid Ideation[b]	0.78	0.66	1.02	0.61	1.24	0.75	13.23	0.001
Psychoticism[a]	0.37	0.42	0.59	0.49	0.90	0.76	19.00	<0.001
Additional Scale[b]	0.71	0.60	0.91	0.53	1.17	0.91	10.04	0.007
General Psychopathology[b]	0.62	0.47	0.86	0.48	1.29	0.81	22.06	<0.001
Continuity of self-concept[c]	3.17	1.30	3.66	1.16	3.85	1.26	10.23	0.006
Relying on people[d]	2.56	1.12	3.00	0.98	2.74	1.12	6.64	0.036
Sensitivity to criticism[e]	1.49	1.06	1.89	1.09	1.88	1.05	6.20	0.045
Depressive mood[e]	1.52	1.14	1.69	1.00	2.07	1.07	4.63	0.099
Visionary[a]	1.13	1.20	1.67	1.41	2.51	1.34	18.08	<0.001
Psychosomatic symptoms[b]	2.26	2.16	2.88	2.48	4.66	2.61	16.36	<0.001
Feeling threatened in interpersonal relationships[d]	0.81	0.92	1.05	0.91	1.29	0.91	7.69	0.021
Degree of participating in discussions[e]	1.08	0.88	0.81	0.86	0.92	0.91	3.92	0.141
Interest of parents[e]	1.18	1.38	1.20	1.04	1.51	1.76	0.90	0.630
Relationship with father[b]	1.19	1.11	1.22	1.13	2.14	1.76	9.78	0.007
Psychic isolation[e]	0.66	0.76	0.79	0.86	1.03	0.89	3.72	0.156
Self-esteem[c]	0.81	0.60	0.90	0.61	1.25	0.89	7.41	0.025

[a]Moderate/high>mild>no. [b]Moderate/high>mild, no. [c]Moderate/high>no. [d]Moderate/high, mild>no. [e]Moderate/high, mild, no.

Results

The participants of our study were composed of 81 men (43.78%), and 104 women (56.21%). The internet addiction scores obtained show that, 99 of the individuals with an age average of 19.51±1.04 (53.51%) have no addiction, 59 of them (31.89%) have light addiction and 27 of them (14.59%) have high risk of addiction/addicted. As we assess the socio-demographic properties, we have not found significant variety in IAS score averages in terms of independent groups t-test results that is applied according to sex (p=0.471, F=0.487, t=-0.723), usage of tablet (p=0.502, F=0.02, t=-0.672), android

telephone (p=0.644, F=1.219, t=0.463), loss of education year (p=0.655, F=0.704, t=-0.448), smoking situation (p=0.122, F=0.097, t=1.556). We have found out a high level of positive correlation (p<0.001) among IAS scores and self-esteem subscale scores and SCL-90 total and some subscale scores (Table 1).

When we compare the SCL-90 subscale grades of IAS scores of three groups with no addiction, light and high internet addiction levels with Kruskal Wallis analysis, we found out that somatization, obsession, interpersonal sensitivity, depression,

Table 3. Linear regression analysis model when IAS score was taken as a dependent variable.

	Unstandardized coefficients		t	*p*
	B	**Standard error**		
(Constant)	40.964	5.248	7.806	<0,001
Somatization	0.084	3.718	0.023	0.982
Obsession	2.093	2.712	0.772	0.441
Interpersonal Sensitivity	1.413	3.114	0.454	0.651
Anger-Hostility	4.441	2.304	1.927	0.056
Phobic Anxiety	-1.199	3.605	-0.332	0.740
Paranoid Ideation	-1.837	3.012	-0.610	0.543
Psychoticism	4.787	4.253	1.126	0.262
Additional Scale	-1.913	2.778	-0.689	0.492
Depression	-2.007	3.971	-0.505	0.614
Anxiety	3.216	4.281	0.751	0.454
Continuity of self-concept	2.028	0.965	2.101	0.037
Relying on people	-0.042	1.106	-0.038	0.970
Sensitivity to criticism	-0.395	1.206	-0.327	0.744
Depressive mood	-0.194	1.242	-0.156	0.876
Visionary	2.256	0.955	2.361	0.019
Psychosomatic symptoms	-0.291	0.662	-0.439	0.661
Feeling threatened in interpersonal	1.901	1.378	1.380	0.170
Degree of participating in discussions	-1.296	1.419	-0.914	0.362
Interest of parents	0.990	0.892	1.110	0.269
Relationship with father	2.216	0.979	2.264	0.025
Psychic isolation	1.435	1.591	0.902	0.369
Self-esteem	-0.315	1.991	-0.158	0.874

IAS= Internet Addiction Scale, Variables entered SCL-90 subscales and Rosenberg Self-Esteem Inventory Subscales; F= 3.724, *p*<0.001 adjusted R2 =0.250 R2 change =0.103.

anxiety, anger-hostility, additional, psychoticism SCL-90 subscales and SCL-90 total score averages vary in a level of *p*<0.001, whereas SCL-90's paranoid ideation and phobic-anxiety subscale score averages vary in a level of *p*<0.003. We also found out that, Rosenberg self-esteem inventory subscales such as depressive mood, ability to participate in discussions and psychic isolation subscale score averages in 3 different internet addiction groups do not vary as a result of Kruskal Wallis analysis, visionary and psychosomatic symptoms sub scales vary in a level of *p*<0.001, self-esteem vary in a level of *p*<0.05 and other scale averages vary in a level of *p*<0.05 (Table 2).

In the linear regression analysis; it is reported that all SCL-90 subscales explain 19.4% (F=5.329, *p*<0.001, adjusted R2=0.194 R2 change=0.239) of

IAS scores. It is determined that, all SCL-90 subscales and all Rosenberg Self-Esteem Inventory subscale scores explain 25% (*p*<0.001) of IAS scores (Table 3).

Discussion

In our study, the rate of the individuals carrying risk in terms of IA and with a risk of high internet addiction was determined as 14.59%. When the other studies made on university students are evaluated, it is assessed that the ratio that we obtain in terms of addiction is lower 19.9 % [9], 17.9% [33] than some studies, 6,4% [34], 7,2% [35], 12,2% [36], 14,4% [37] while higher than some other.

We stated a high positive correlation ($p<0.001$) between IAS scores and SCL-90 all subscale scores (somatization, obsession, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety, paranoid ideation, psychoticism, additional scales). It is reported in the literature that IA and anxiety and depression are highly positively associated, the designs about psychopathologic features in internet addicts vary and SCL-90 subscale scores are highly positively ($p<0.001$) associated with IA scores [13, 14]. It is shown in many studies that SCL-90 subscale averages increase significantly as severity of IA group increases. [9, 13, 14, 38-40]. We also evaluated in our study that, average of general psychopathologic features in three internet addiction groups differentiate, and general psychopathologic features averages increase as internet addiction severity increases. In the clinical assessments on internet addicts, it is found out that several additional psychiatric disorders accompany internet addiction in these people [7, 9, 12].

We stated in our study that IAS scores have the highest correlation with anxiety and depression subscales. Beside this, it is found out in results of Kruskal Wallis analysis that anxiety and depression scores increase as IAS scores increase. In many studies in the literature it is declared that; depression and anxiety assessed among leading psychopathologic features in internet addiction not only frequently accompany internet addiction in the clinical picture, but also presents high positive correlation with internet addiction in correlative studies [4-8]. High presence of isolation, depressive mood and impulsivity in the groups assessed as internet addicts and unusual sympathy of these people towards strangers and their rather vulnerable situation in interpersonal relationships may explain these psychopathologic processes in IA addiction [41].

It is found out that self-esteem in the internet addicts is lower than healthy individuals, and self-esteem of internet addicts increases after treatment [42, 22]. Similarly, we determined in our study that there is a decrease in self-esteem as IAS scores increase. It is also stated in the literature that self-esteem is associated with IA severity, it acts as intermediary for psychological factors that may be associated with IA and it is an important factor that explains the time management problems, interpersonal relationships and health problems in internet addicts [23-25]. Nonetheless, it is also put forward that, not only self-

esteem of the person himself but also his self-esteem regarding social and family concept is effective in explaining IA scores and self-esteem may decrease with decreasing control regarding addiction in addicted adolescents [43].

In our study we concluded that, visionary and psychosomatic symptom subscale score averages increase significantly as IA severity increases; and that depressive mood, ability to participate in discussions and psychic isolation subscale averages do not differentiate significantly. Differentiation of psychosomatic symptoms subscale averages associated with psychopathologic features in IA groups supports the results that we obtain from SCL-90 subscales. However, it may be assumed that the same situation is not valid for depressive symptoms subscale averages. At the same time, it is determined that relationship with the father increases and interest of parents subscale averages do not change as internet addiction severity increases. The fact that the interest of parents subscale score averages do not change and the increase of relationship with father as IA severity increases is not compatible with the results of other studies in the literature. It is put forward that, self-esteem is associated with mother and father education status, mother's job, family's level of income and direct interest of the family and parental attitudes, family communication and family atmosphere are important factors in internet addiction. [44-48]. Despite this, it is discussed in the literature that overprotective family attitudes, especially overprotective behavior of the fathers may be associated with internet addiction [23].

It is evaluated that IA is associated with social inhibition and social maladjustment [42, 49]. In our study, differentiation of averages of continuity of self-concept, sensitivity to criticism, relying on people and feeling threatened in interpersonal relationships subscales in three IA groups may be related to socialization problems of internet addicts. A suggestion of a family based protective approach may be profitable in internet addiction treatment which is similar to the risk factors of substance addiction [50]. According to linear regression analysis results, psychopathologic features explain 19.3% of IA scores, psychopathologic features and self-esteem explain 25% of IA scores in our study. In the study made by Khoshakhlagh and Faramarzi, SCL-90 subscales are proves to explain 49% of internet addiction [51]. In

the study of Bahrainian and Khazaee depression and self-esteem explain 11% of internet addiction [52]. In another study, it is seen that temperament and character properties, alexithymia, depression and anxiety explain 21% of IA scores [36]. In a study made by Dalbudak and Evren it is found out that neuroticism, psychoticism, extraversion, lie sub-personality features and hyperactivity/impulsivity, anxiety and depression explain 35.2% of IA scores [9]. At this point when we evaluate the results we have obtained, we may assume that primarily psychopathologic features and self-esteem are important while explaining IA scores.

Some limitations of our study are; small number of subjects, lack of clinical examination, and our results are only generalizable to university students. As a result; realization by the clinicians of family dissatisfaction of the internet addicted adolescents, increasing self-esteem in internet addiction, explanation of psychopathologic elements involved in addiction and preparation of a systematic treatment plan in which addicted individual and the family are included is suggested [53-54]. With the results we obtained we similarly observe that, general psychopathologic features and self-esteem and self-esteem related factors (continuity of self-concept, relying on people, sensitivity to criticism, depressive mood, visionary, psychosomatic symptoms, feeling threatened in interpersonal relationships, ability to participate in discussions, interest of parents, relationship with father, psychic isolation) present risk in university students in terms of internet addiction. That's why, in the conclusion of our study, we may suggest considering all psychopathologic features, self-esteem and self-esteem related factors as well as anxiety and depression in internet addiction treatment and in internet abuse prevention programs.

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