Original article / *Araştırma*

Internet addiction prevalence in youths and its relation with depressive symptoms, self-esteem, and bullying

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ABSTRACT

Objective: This study aims to investigate the prevalence of internet addiction (IA), the predictors of IA, and its relation with depressive symptoms, self-esteem, and peer bullying. *Methods:* The sample of this study were selected from high school students in the city center of Mus, Turkey, by using a multistage sampling method. Students completed the Internet Addiction Scale, Peer Bullying Questionnaire, Beck Depression Inventory, and Coopersmith Self-Esteem Inventory. Data obtained from 1150 students were analyzed. *Results:* The prevalence of internet addiction was 11.7%. IA scores correlated negatively with self-esteem scores and positively with depression scores. Students involved in the bullying cycle had a statistically significantly higher mean internet addiction score than those who were not involved in the cycle. Results of binary logistic regression analysis show that students who are both bully and victim are more likely to be addicted to the internet (odds ratio=1.68) than students who are not in the bullying cycle. Every unit increase in the depression score is associated with a 3.8% increase in the odds of being addicted to the internet. For every unit increase in the self-esteem score, the odds of internet addiction decreases by 1.7%. *Conclusion:* Results show that involvement in bullying, depression, and low self-esteem are predictors of internet addiction. Depression and low self-esteem should be the concurrent predictors for both bullying and internet addiction. Clinical interventions for internet addiction or bullying should include depression and low self-esteem. *(Anatolian Journal of Psychiatry 2020; 21(5):483-490)*

Keywords: adolescent, aggression, bullying, depression, internet addiction, self-esteem

Gençler arasında internet bağımlılığının yaygınlığı ve depresif belirtiler, benlik saygısı ve akran zorbalığı ile ilişkisi

ÖZ

Amaç: Bu çalışmanın amacı, internet bağımlılığının yaygınlığı ve belirleyicilerinin incelenmesi, depresif belirtiler, benlik saygısı ve akran zorbalığı ile ilişkisinin araştırılmasıdır. Yöntem: Bu çalışmanın örneklemi, Muş şehir merkezinde bulunan lise öğrencilerinden çok aşamalı bir örnekleme yöntemi kullanılarak seçilmiştir. İnternet Bağımlılığı Ölçeği, Akran Zorbalığı Anketi, Beck Depresyon Ölçeği ve Coopersmith Benlik Saygısı Envanterini dolduran 1150 öğrenciden elde edilen veriler analiz edilmiştir. Sonuçlar: İnternet bağımlılığının yaygınlığı %11.7 idi. İnternet bağımlılığı puanları benlik saygısı puanları ile negatif, depresyon puanları ile pozitif yönde ilişkilidir. Zorbalık döngüsüne katılan öğrenciler, döngü içinde bulunmayanlara göre istatistiksel olarak anlamlı derecede yüksek bir ortalama internet bağımlılığı puanına sahipti. Binary lojistik regresyon analizinin sonuçları hem zorba, hem de mağdur olan öğrencilerin zorbalık döngüsünde olmayan öğrencilere göre internete bağımlı olma olasılıklarının daha yüksek (Odds ratio=1.68) olduğunu göstermektedir. Depresyon puanındaki her birim artış, internet bağımlılığı olma olasılığında %3.8'lik bir artışla ilişkilidir. Benlik saygısı puanındaki her birim artışta internet bağımlılığı olasılığı %1.7

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oranında azalmaktadır. **Tartışma:** *Sonuçlar, zorbalık döngüsüne girmenin, depresif belirtilerin ve düşük özgüvenin, internet bağımlılığının belirleyicileri olduğunu göstermektedir. Depresyon ve düşük özgüven, hem internet bağımlılığının, hem de zorbalığa karışmanın risk etkenleridir. İnternet bağımlılığı ve zorbalığa yönelik klinik müdahaleler, depresyon ve düşük özgüven içermelidir.* **(Anadolu Psikiyatri Derg 2020; 21(5):483-490)**

Anahtar sözcükler: *Benlik saygısı, depresyon, ergen, internet bağımlılığı, saldırganlık, zorbalık*

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INTRODUCTION

Internet addiction is a new struggle domain for mental health professionals. In DSM-5, internet gaming disorder has found a place under the title 'conditions for further studies'.[1] Internet addiction (IA), as studied in some earlier studies, is a broader concept that does not only include playing games but also all other on-line activities on the internet. Different diagnostic criteria have been proposed in the literature for IA[2], and more experimental data are needed for its identification and classification.[3]

IA is characterized by spending hours for non-business activities such as computer/internet/ video game playing[4] and yet there is an on-going debate about its classification. It is characterized by mood swings, a preoccupation with the Internet and digital media, an inability to control time spent online, a perceived need for more time or games to achieve the desired mood, withdrawal symptoms, continued use despite intra-familial conflict, a reduction in social engagement, and adverse effects on work and academic achievement.[5-7]

A random-effects meta-analysis estimated the global prevalence of IA as 6.0%.[8] It was estimated to be 13.8% in Taiwan,[9] and the range between 1.5% and 8.2% in the United States and Europe.[10,11] Prevalence differences may be attributed to methodological, cultural or measurement tool differences.[12]

Young individuals show more symptoms of IA than older,[13] and psychiatric comorbidity is more common in young people with IA.[14] Depression,[15,16] social anxiety, attention deficit, and hyperactivity disorder,[3,17] impulsivity,[18] dysfunctional social behaviors, loneliness,[19] self-injurious behaviors[20,21] are reported with IA. However, it is still being debated whether IA is a primary dependency disorder or occurs secondary to other psychiatric disorders.[22]

It is observed that adolescents with depression use the Internet to alleviate their symptoms, and they are more likely to become addicted to the internet later than their undepressed peers.[3,17,23] Pathological internet users have significantly higher rates of depression, thoughts of self-harm

than regular users.[24] The Internet provides social support to adolescents and opportunities to express their feelings,[25,26] and it helps them to escape from the emotional rigors of offline life.[27]

Internet addiction and bullying are now defined as two of the four most pressing problems confronting young people, along with substance abuse and adolescent sexuality.[28] Exposure to bullying during adolescence was associated with psychological distress and psychiatric disorders.[29,30] The relationship between aggression and Internet addiction has been noted in the previous research.[31] Ko et al.[23] found that hostility was one of the most significant predictors of IA in male and female adolescents in their two years follow up study.

Jung et al.[32] demonstrated a relationship between problematic Internet use and cyber-bullying and/or cyber-victimization. Recently, it was shown that traditional bullying, a form of non-virtual aggression, often accompany to cyberbullying.[33] But, still we know less about the relationship between traditional bullying and IA.

In this study, the aim is to examine the prevalence of Internet addiction among high school students and its relation between depressive symptoms, self-esteem, and bullying.

METHODS

Participants

Before work commenced, the necessary permissions were received from the Provincial Directorate of National Education through Muş Alparslan University. Due to the lack of a local ethics committee in Muş province, the study was presented to Karadeniz Technical University's Ethics Committee. According to the Pro-vincial Directorate of National Education, the total number of high school students in Mus center was as 10,207. To estimate the prevalence of internet addiction in Muş within ±2% (margin of error) with a 95% confidence interval, we calculated the sample size required for our study. Based on the previous studies, we expected the prevalence of IA as 15%; we concluded that a sample size of at least 1094 is needed.

The scales were administered to a total of 1175

students from ninth-, tenth-, eleventh-, and twelfth-grade students. The answers were examined, and the scales containing three or more unanswered items were discarded. The data obtained from 1150 students were analyzed.

Data collection tools

Internet Addiction Scale (IAS): Nichols and Nicky developed the scale,[34] and Canan et al.[35] carried out Turkish validity and reliability study on Turkish adolescents. There are 27 items in the scale. The cut-off point of the scale is 81; those scoring 81 points and above are considered possible cases of Internet addiction.

Beck Depression Inventory (BDI): Developed by Beck,[36] Turkish validity and reliability study was carried out by Hisli et al.[37] It is a 21-item scale; each item is scored 0-4. Twenty points or more, indicate the presence of moderate or severe depression.

Coopersmith Self-Esteem Inventory (CSI): Each of the 25 items has two possible answers. It is a self-rating scale developed by Coopersmith.[38] Points range 0-100, and those who obtain higher scores display higher self-esteem. Turan and Tufan[39] conducted the Turkish validity and reliability study.

Peer Bullying Questionnaire: The questionnaire developed by Pişkin,[40] can be administered to fourth- to twelfth-grade students. This questionnaire categorizes each student as a non-victim bully, non-bully victim, bully-victim, and non-involved in the bullying cycle.

At the beginning of the questionnaire, students are given the definitions of bullying and related terms (for example, the different types of bullying). In the questionnaire, bullying is defined as 'the intentional, repeated aggressive acts of a student or a group of students on other weaker student(s).' The questionnaire then asks about the grade level, age, and gender of the participant. Pişkin[41] examined the Turkish validity and reliability of the questionnaire. Piskin and Ayas have defined bullying in six categories as sexual, physical, verbal bullying, spreading rumors or lies about the victim, damaging properties of the victim and social exclusion.[42]

Procedure

The information about the study was sent via the Provincial Directorate of National Education of Muş to the schools. Before the beginning of the study, the schools sent the informed con-sents to 1180 families from selected schools and got back. Only five parents did not send back the signed forms. The authors went to the selected schools in the hours allocated to them, presented information about the research and scales, and gave the scales to the students who signed the informed consent forms. The participants filled in the scales for 30-60 minutes. The child and adolescent psychiatrist author conducted face-to-face interviews according to the criterion that had suggested by Young[6,7] to confirm Internet addiction in the students whose Internet Addiction Scale scores were 81 or higher. The impairment of functionality was asked to the students, and all of those students reported functional impairment. Depressive symptoms are assessed due to their high correlation with IA. The data were entered into IBM SPSS 20.0, and analyses were performed.

Statistical analysis

The demographics of the sample were analyzed using descriptive statistics. Pearson's correlation analyses were used to determine the relationship between the students' IAS scores, BDI, and CSI scores and their ages. IA rates, according to bullying and victimization types, were presented by percentages. A chi-square test examined the relationship between bullying status and IA. The students' BDI and CSI scores are compared according to their bullying cycle involvement and internet addiction situations by Student's t-test. The factors that predict Internet addiction were investigated by logistic regression analyses enter method used. Age, gender, non-involvement in bullying, victimization, being a bully-victim, BDI total score, and CSI total score were the variables in the model.

RESULTS

Of the sample group, 395 (34.3%) were female, and 755 (65.7%) were male. The mean age was 16.32±1.31.

Prevalence of internet addiction

The range of the IAS scores was 27-135, with a mean of 54.5±21.3. The percentage of the IAS score equaled to 81 or higher was 11.7%. A relationship between the ages of the subjects and IAS scores was not observed (p=0.58; r=0.56). Internet addiction criteria were met by 10.4% of the females and 12.3% of the males. Male students' scores were significantly higher (t=-5339, df=1148, sigma≈0, p<0.001).

The relationship between IA and bullying

Students in the bullying cycle were divided into four groups: a) not-involved in bullying, b) bully,

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Table 1. The relationship between internet addiction and bullying

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| | Internet addiction | | | | | | |
| | No | | Yes | | Total number | | |
	n	%	n	%	of students	χ^2	p
Not-involved	639	90.5	67	9.5	706	8.30	**0.004**
Involved in the bullying cycle	377	84.9	67	15.1	444		
Non-victim	788	89.4	93	10.6	881	0.62	**0.036**
Victim	228	84.8	41	15.2	269		
Non-bully	743	90.5	78	9.5	821	12.91	**<0.001**
Bully	273	83.0	56	17.0	329		
Not-involved	639	90.5	67	9.5	706	12.72	**0.002**
Only bully or only victim	253	87.1	37	12.8	290		
Bully-victim	124	80.5	30	19.5	154		

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Table 2. Internet addictions according to type of bullying

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| | Internet addiction | | | |
	Yes	No	Total	Percent
Sexual bullying	34	89	123	27.6
Spreading rumors or lies	33	88	121	27.2
Damaging property	37	102	139	26.6
Social exclusion	43	132	175	24.5
Physical bullying	50	209	259	19.3
Verbal bullying	56	239	295	18.9

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Table 3. Internet addictions according to type of victimization

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| | Internet addiction | | | |
	Yes	No	Total	Percent
Sexual victimization	25	98	123	20.3
Being gossiped about	33	147	180	18.3
Property damaged	28	130	158	17.7
Social exclusion	29	141	170	17.0
Physical victimization	35	175	210	16.6
Verbal victimization	40	210	250	16.0

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c) victim, d) bully-victim. These four bullying status and meeting the IA criterion were shown to be dependent variables (χ^2=14.61, df=3, p=0.002). The IA ratio of the students not-involved in bullying and of those who were only victims was 9.5% and 15.2%, respectively. This rises to 17.0% for bullies and 19.5% for bully-victims. IA was more frequent between the individuals in the bullying cycle (Table 1).

The relationship of IA with self-esteem and depression

The students were divided into groups accord-ing to their IA status and compared by BDI and CSI scores. The BDI scores of the IA students not involved in the bullying cycle were higher than the non-addicted students outside of the cycle (Table 4) while their CSI scores were lower (Table 5). There was no statistical difference between BDI and CSI scores (Table 4, 5) of the IA students that were in the bullying cycle.

There was a negative relationship between IAS scores and CSI scores (r=-0.241; p<0.001). A positive relationship was found between IAS scores and BDI scores (r=0.239; p<0.001).

Table 4. Analyzing the BDI scores of the adolescent in and out of bullying cycle in terms of internet addiction

| | | Internet addiction | | |
	Being in bullying cycle	No	Yes	p
Beck Depression	Not involved in bullying	13.2±8.6	19.1±9.6	**<0.001*****
Inventory scores	Involved in bullying	16.9±10.3	21.7±11.6	**0.002******
	p	**<0.001***	0.16**	

Student's t test performed. BDI: Beck depression inventory,
*: The comparison of BDI scores of the <u>not internet addicted</u> students in terms of involving in bullying cycle.
**: The comparison of BDI scores of the <u>internet addicted</u> students in terms of involving in bullying cycle.
***: The comparison of BDI scores of the students that are <u>not involved to bullying cycle</u> in terms of being internet addicted or not.
****: The comparison of BDI scores of the students that are <u>involved to bullying cycle</u> in terms of being internet addicted or not.

Table 5. Analyzing the CSI scores of the adolescent in and out of bullying cycle in terms of internet addiction

| | | Internet addiction | | |
	Being in bullying cycle	No	Yes	p
Coopersmith Self-esteem	Not involved in bullying	64.7±18.5	54.7±15.4	**<0.001*****
Inventory scores	Involved in bullying	58.7±18.1	49.9±17.9	**<0.001******
	p	**<0.001***	0.09**	

Student's t test performed.
*: The comparison of CSI scores of the <u>not internet addicted students</u> in terms of involving in bullying cycle.
**: The comparison of CSI scores of the <u>internet addicted</u> students in terms of involving in bullying cycle.
***: The comparison of CSI scores of the students that are <u>not involved to bullying cycle</u> in terms of being internet addicted or not.
****: The comparison of CSI scores of the students that are <u>involved to bullying cycle</u> in terms of being internet addicted or not.

The correlates of internet addiction

When examining the predictive factors of IA, being a bully-victim increase 1.6 folds the risk of becoming an addict. Each point increase in the BDI total score increases 1.03 fold the risk of Internet addiction, while each unit increase in the self-esteem scores 1.01 fold reduces the risk of becoming addicted (Table 6) (Nagelkerke R Square=0.094).

DISCUSSION

This study aimed to examine the prevalence of IA among high school students, the relationship between IA and depressive symptoms, self-esteem, and bullying.

The prevalence of IA among students was 11.7%. When previous surveys conducted in different countries examined different prevalence rates are observed.[43-45] In a study conducted in Turkey using the same IAS, the rate of

Table 6. The predictive factors of internet addiction

	B	OR	%95 CI	p
Age	0.053	1.054	0.91-1.21	0.470
Gender	0.144	1.155	0.75-1.76	0.507
Bullying	0.355	1.426	0.86-2.36	0.168
Victimization	-0.385	0.681	0.33-1.36	0.281
Being a bully-victim	0.518	1.679	1.02-2.75	**0.041**
BDI total score	0.037	1.038	1.01-1.06	**0.001**
CSI total score	-0.017	0.983	0.97-0.99	**0.005**

BDI: Beck Depression Inventory; CSI: Coopersmith Self-esteem Inventory

IA was 11.6% in a city in the northeast of Turkey,[35] 15% in a study from the south of Turkey.[46] The IA rate was 6% in a study conducted in China, but they used Young's Internet Addiction Test.[43] In another study from Turkey, which was used Young's IAS, 1.6% of the students had addictive internet use, 16.2% had borderline internet use.[47] So, we can interpret that different ratios can be obtained with different measurements. But still, these percentages cannot be underestimated for Turkey, demonstrate that IA among Turkish students is a growing concern.[34]

In this study, the prevalence of IA in male students (12.3%) was significantly higher than in female students (10.4%). In the Sasmaz et al.'s study,[46] from the south of Turkey, the addiction rate was 9.3% in girls, and 20.4% in boys (p<0.001). Heo et al.[48] reported a higher prevalence of IA for boys in their large sampled study either. Our study agrees with the literature that IA is more common among male adolescents, maybe due to the socialization characteristics of the different genders.

In this study, IA was found to be more common among bullies than non-bullies, among victims than non-victims, and students involved in the bullying cycle than in those who were not involved. Being bully-victim 1.6 fold increases the risk of Internet addiction. Research has shown a linear association between aggression and IA such that one could be predicted by the other.[45,49,50] Lim et al.[31] observed the mediating effect of depression, anxiety, and the Conners-Wells Adolescent Self-Report Scale (CASS) scores for cases of IA that were predicted by aggression by path analysis. The same was not observed in cases of Internet addiction that were not predicted by aggression. They interpreted that aggressive adolescents with depression, anxiety, or ADHD were more prone to Internet addiction. In our study, the aggression that has turned into action has been examined. Our results demonstrate a relationship between violence among teenagers and IA; however, they cannot demonstrate a causal relationship, as was proposed by Lim et al.,[31] or a common etiologic factor of aggression and IA.

In our study, the IA students involved in the bullying cycle had higher BDI scores and lower CSI scores than their non-addicted peers. A similar difference existed among students not involved in the bullying cycle. When only the Internet-addicted students were examined, BDI and CSI scores did not differ between those in the bullying cycle and those who were not involved in it. Depression and self-esteem, therefore, appear to be concurrent predictors of IA and bullying, and both may be the cause of the aggression. There was a positive correlation between IAS and BDI, and a negative correlation between IAS and CSI in our study, which is consistent with Wu et al.[44] and Younes et al.'s[45] studies. Each point increase in the BDI total score, 1.3 fold increased the risk of Internet addiction, while each unit increase in the CSI score reduced the risk of becoming addicted to the internet by 1.7%. Depressive symptoms and low self-esteem may affect the adolescent's involvement in the bullying cycle and may make the youth more susceptible to IA. The absence of depressive symptoms and a high level of self-esteem may protect against IA in adolescents in the bullying cycle.

Only traditional bullying was examined in this study; cyberbullying was excluded because the aim was to investigate the aggression that had occurred in daily life. These results indicate that the same etiologic factors may be shared by IA and bullying.

High self-esteem may be a protective factor preventing individuals from engaging in uncontrolled internet use. Depression destroys the individual's resiliency and increases vulnerability to other psychopathologies. A depressive individual may use the Internet as a form of self-medication or as an escape from everyday problems. Nevertheless, recently we know excessive use of the internet is an important risk factor for aggression.[31] According to these results, clinical interventions should focus not only on IA and bullying but also on depression and low self-esteem.

Limitations

This is a cross-sectional study, so we cannot conclude a causal relationship. The sample size allows us to examine the predictors. The data obtained by self-report scales except for IA, and this is one of the limitations of this study. The sociodemographic characteristics of the cases and their parents, medical history, duration of internet use were not evaluated in this study. The depressive symptoms and self-esteem are assessed in this study, and the lack of assessment of other psychiatric symptoms is another limitation of this study.

Authors' contributions: *S.T.H.: design, collected the data, analysis, writing and revised manuscript; H.Y.: design, collected the data, analysis, revised manuscript.*

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