

## Evaluation of Internet Addiction and Digital Game Addiction in Adolescents with Anxiety Disorder

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### Introduction:

Anxiety disorders (AD) are quite common disorders which associated with severe loss of function, causing high economic cost in children (1). AD, which manifest as separation anxiety disorder and specific phobia in childhood, appear as social phobia as the age progresses. The prevalence of AD is reported to be between 15-20% for children and adolescents (2).

Today, the Internet is increasingly being used as a means of information sharing, access to information, rapid communication and interaction among all age groups. In our country, Turkey Statistical Institute, according to data from 2016, where nearly eight of ten households have internet access opportunity and the proportion of individuals using the Internet was reported to be 61.2%. In addition to the advantages of increasing internet usage in our country along with the world, the negative effects on the life of some users were pointed out. In DSM-5, "internet gaming disorder" is located under the title of 'Conditions for Further Study' (1, 3). In the literature, terms such as online addiction, cyber addiction, pathological internet use, excessive internet use, internet addiction disorder, net addiction, cyber domain addiction, problematic internet use, technological addiction, compulsive internet use, internet behavior addiction are included (4). In a study conducted in seven different provinces in Turkey in 2009 internet addiction rate in the sample aged 14-20 was 10.1% (5). Internet addiction has been shown to have harmful effects on neurobiological, psychological and emotional development of adolescents in general (6). In a systematic review, internet addiction can have serious mental and emotional effects, but may also occur as a result of ongoing mental health problems, and there is a potential correlation between impulsivity, depression, anxiety, psychosis, obsessive compulsive symptoms, and internet addiction (7). In the literature, there are studies investigating the relationship between social anxiety disorder and internet use (8). However, it is reported that almost all ADs can be comorbid to internet addiction (9). In this study, it was aimed to share the results of a clinical sample by comparing internet addiction and digital game addiction to adolescents diagnosed with AD with healthy adolescents. According to our knowledge; this is the first study in the literature evaluating internet and digital game addiction in adolescent patients diagnosed with AD after a formal process.

### Materials and Methods:

The study included 28 adolescents diagnosed with anxiety disorder after a semi-structured diagnostic interview among adolescents who applied to the Child and Adolescent Psychiatry Outpatient Clinic of Selçuk University. The control group consisted of volunteers who agreed to come to our outpatient clinic as a result of the announcement made in the schools of Konya Provincial Directorate of National Education. As a result of the organic and psychiatric evaluations of these volunteers, 39 were found suitable for inclusion in the study. Consent was obtained from all participants and their parents that they agreed to participate in the study. All participants included in the study completed the sociodemographic data form. Afterwards, a semi-structured interview was conducted using Turkish Version of Schedule

for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL). Revised Children's Anxiety and Depression Scale (RCADS) were used to assess anxiety levels of the patients, Internet addiction levels were assessed using the Internet Addiction Scale (IAS) and digital game addiction levels were evaluated using the Digital Game Addiction Scale (DGAS-7).

For statistical analysis; the data of the study were evaluated using IBM SPSS v.22 statistical software program. In descriptive statistical evaluation, mean  $\pm$  standard deviation values are presented for continuous data. Chi-square test was used to compare categorical data. Student's t-test was used for the data that fit the normal distribution and Mann-Whitney U Test was used for the data that did not fit the normal distribution. Pearson correlation analysis was performed to evaluate the correlation between IAS and RCADS scores. Statistical significance was accepted as p value  $<0.05$ .

### Results:

The mean age of AD group ( $14.46 \pm 1.37$ ) and control group ( $14.41 \pm 0.49$ ) was similar and no statistically significant difference was found. 67.9% (n = 19) of the AD group and 48.7% (n = 19) of the control group were girls, and there was no significant difference in gender distribution between the groups. Similarly, no significant difference was found between the two groups in terms of educational level and working status of the parents and socioeconomic level.

Sixteen of the adolescents with anxiety disorder were diagnosed with GAD and 12 with SF. As a comorbidity, it was found that 10 adolescents had a diagnosis of SF.

In the context of clinical evaluation scales, RCADS anxiety and depression scores were found to be significantly higher in the AD group compared to the control group. In addition, there was a significant difference between the AD and control groups in terms of IAS and DGAS-7 scores. The scale scores of the AD group and the control group are shown in Table 1.

Table 1. Scale scores of the AD and control groups

	AD Group		Control Group		p	t/z
	Mean	SD	Mean	SD		
RCADS anxiety scores	48,64	19,98	21,61	9,40	$<0,001^*$	6,448
RCADS depression scores	12,42	6,56	4,51	3,10	$<0,001^*$	5,920
IAS scores	35,64	22,54	18,51	19,75	$0,003^{**}$	-2,944
DGAS-7 scores	15,03	6,64	11,12	4,61	$0,010^*$	2,681

AD: Anxiety disorder. SD: Standard deviation \* Student's t test p value, \*\* Mann-Whitney U test p value

Internet usage time of the AD group was also significantly higher than the control group. In the AD group, there were 15 adolescents with more than 4 hours of internet usage per day, whereas in the control group only 1 adolescent had more than 4 hours of internet usage per day. ( $p < 0,001$ ,  $\chi^2$ : 25,720). In addition, a moderate correlation was found between RCADS anxiety scores and IAS scores. ( $p$ : 0,016,  $r$ : 0,451).

### Discussion:

The aim of this study was to investigate the levels of internet and digital game addiction in adolescents with AD and to compare the data with the control group. Internet and digital game addiction scores of adolescents with AD were higher than control group. To our knowledge; our study is the first study in the literature on this issue.

Today's adolescents were born into the Internet age, and therefore Maslow's hierarchy of needs could be redefined to include the existence of the Internet in the pyramid. In addition more than 90% of adolescents have internet access (10, 11). The prevalence of internet addiction is between 4% and 18% in screening studies conducted in adolescents and young



adults in different cultures (12, 13). Internet addiction is often associated with psychiatric disorders. Mood disorders, AD, substance abuse and attention deficit hyperactivity disorder; comorbid conditions commonly seen in internet addiction. In a study which included 60 Internet addicts aged between 10-18 years, anxiety disorder comorbidity was found 71.7%. (9). In another study involving 300 university students, a positive relationship was found between internet addiction and anxiety levels. In addition; Internet addiction was found to be associated with decreased social interaction. (14). At the same time, the Internet provides a non-face-to-face communication environment for individuals with low social skills. In this context, internet is defined as “Prozac of social communication” by some authors. (15). As a result, internet addiction and anxiety disorders appear in a reciprocal relationship. In our study, a correlation was found between anxiety scores and internet addiction scores, consistent with the literature. In addition, the duration of internet usage time was significantly higher in the AD group compared to the control group.

The most important limitation of the present study is that it is a cross-sectional study, so a causal relationship could not be established. Other limitations of the study are the clinical sample and the small sample size. All these factors prevent the generalization of the results to the larger society. One of the strengths of our study is that it includes a control group. Other strengths; the study is the first study in the literature on the subject.

### **Conclusion:**

In conclusion, this study demonstrates the importance of evaluating problems related to internet and digital game addiction in adolescents with AD. Internet and digital game addiction are important factors in both treatment selection and treatment follow-up. In this context, holistic evaluation of adolescents diagnosed with AD is required.

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