

## INTERNET ADDICTION IN HIGH SCHOOL STUDENTS, AFFECTING FACTORS AND RELATIONSHIP BETWEEN INTERNET ADDICTION AND DEPRESSION RISK

Kamile Öner<sup>1</sup>, Hülya Arslantaş<sup>2</sup>,

<sup>1</sup>Eldivan Health Services Vocational College, Çankırı Karatekin University, Çankırı, Turkey

<sup>2</sup>Nursing Faculty, Adnan Menderes University, Aydın, Turkey,

Correspondent author: Hülya Arslantaş, hulyaars@yahoo.com

### Abstract:

This is a cross sectional study conducted to determine internet addiction in high school students, affecting factors and relationship between internet addiction and depression risk. 690 students were included in this study, a Personal Information Form, Internet Addiction Scale and Beck Depression Scale were used to collect data. Descriptive statistics, Student's t test and Kruskal Wallis test were used to evaluate data.

It was determined that 2.1% of the adolescents had limited symptoms of internet addiction and 0.4% was pathological internet user.

The study found that the internet addiction increased in the students in the 9th class and as their ages decreased. It was observed that 21.1% of the adolescents had depression risk and adolescents with depression risk had a higher level of internet addiction ( $t(667)=7.497$ ;  $p<0.05$ ).

It is concluded that internet addiction and depression risk in high school adolescents were influenced especially by interpersonal relationships and adolescents with depression risk had higher level of internet addiction.

**Key-words:** Adolescent, internet addiction, depression risk

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### Introduction

Every stage in a human's life has a unique importance; however the stage where fast and significant biological, psychological and social changes occur is undoubtedly adolescence which is the last stage of childhood and the first stage of adulthood [4]. Adolescence is defined as a risky period in many aspects. Adolescents can demonstrate emotions, thoughts, attitudes and behavior specific to this period such as emotional outbursts and excitement, being easily offended and destructive behavior in relationships, defiant behavior toward authority figures such as parents, teachers, showing resistance to follow rules, attention seeking and role seeking [20].

Especially in this period adolescents can experience certain psychological problems since they go through a developmental stage such as trying to separate themselves from their families and prove their individuality, fit in to their social environment and group of friends, find a role in the society as well as developing anxiety and worry about being accepting by the society and their circle of friends, choosing the right occupation, about their appearance and relations

with the opposite sex [39] and dissatisfaction in their relations with their friends. Especially depression, various addictions, anxiety disorders, suicide and suicidal thoughts are among such mental disorders [26].

Accepted as the core icon of information society and globalization, internet is an indispensable tool especially in the lives of adolescents and young people. While internet provides access to all kinds of information anytime and anyplace, it also causes an addiction [6]. Internet addiction is a technological addiction type which is characterized by having no limitations on the use of internet, insisting on using despite the negative effect on the social and academic life and feeling anxiety when internet access is limited [24]. One of the basic reasons why internet use becomes an addiction type is the time spent on the internet. As the time spent on the internet increases, the addiction rate is reported to increase significantly [9, 10, 18, 22, 27, 30].

Although it can be seen in all age groups, the age with the biggest risk for internet addiction is adolescents between the age of 12-18 [6]. Turkey provides a suitable platform for

this recently defined disorder especially with its young population, being a developing country, increasing internet use, high unemployment rates and uncontrolled increase in the number of internet cafes [3, 42]. According to data obtained from the Turkish Statistical Institute [17], the percentage of the population that uses internet in Turkey is 55.9%. The percentage of households with internet access in Turkey is 69.5% in 2015.

In the study conducted by Flora [25] with 13.284 adolescents between 14-17 years of age in Greece, Germany, Holland, Iceland, Poland, Romania and Spain, it was found that internet addiction rate in the total sample group was 1.2% and the risk for internet addiction was 12.7%. In their study, Lee et al. [35] reported that 85.2% of Korean young internet users were general users, 11.9% had a potential risk for internet addiction and 3% had a high risk for internet addiction. Durkee et al. [19] found that the prevalence of pathological internet use among adolescents was 4.4% and men had higher prevalence than women. In their study conducted in Taiwan, Yeh et al. [46] reported that low social support rate in real life and high visual social support rate can be associated with depression in both men and women. Additionally internet addiction in men was found to directly or indirectly effect on the virtual social support with depressive symptoms. Tsai and Lin [43] reported in their study in adolescents that the internet world has become a place where adolescents use to ease their depression. Depression is observed in people with internet addiction and there is strong relationship between depression and internet addiction [1, 11, 31] Durak and Durak [18] reported in one of his studies that the presence of a psychopathology such as depression or anxiety increases susceptibility to problematic internet use.

It is a known fact that adolescents are more vulnerable and need more support at this stage. Considering physical, biological and psychological development processes and their efforts to find self-identity, adolescents tend to take more wrong decisions, and are more susceptible to emotional turbulences, various psychological problems, addictions and suicidal thoughts. Therefore more research should be conducted in adolescents who are not psychologically mature and need help; affecting

factors for their mental health should be determined, protective mental health policies should be developed and necessary actions should be taken.

This is a cross sectional study conducted in high school students in the city center of Trabzon, Turkey to determine internet addiction, affecting factors and relationship between internet addiction and depression risk.

## **Materials and Methods**

### *Study Design*

This cross sectional study was conducted in five schools in Trabzon, a Province of Black Sea Region.

### *Participants*

The population of this study was a total of 17.583 high school students studying in the city centre of Trabzon during the spring semester of the school year 2013-2014. There are 24 schools under the National Education Office in Trabzon. Schools to be involved in the study were selected to represent each school type in the region (Science High School, Anadolu High School, Vocational High School, Trade Vocational and Vocational High School for Health). There were 3289 students studying in the spring term of 2013-2014 in these 5 schools. The sample size was 345 with 95% confidence interval. The design effect was estimated at 2 and the study aimed to include 690 students however since some of the students did not give answers to some of the items in the data collection tools, and some of them changed their minds later and left the study, the results of these students were removed from the study and the data obtained from 669 students (96.95%) were evaluated.

### *Instrument*

A Personal Information Form, Internet Addiction Scale and Beck Depression Scale was used in this study.

### *Personal Information Form:*

The personal information form consisted of 51 questions about characteristics of students and student families, which had a potential to affect the sense of loneliness and was based on a literature review done to obtain characteristics of adolescents in high schools [13,16,23,40]. These questions were prepared under five sections: general demographics, parental and socio-economical characteristics, school and

peer relationship characteristics, use of internet and telephone for communication purposes, healthcare problems and quality of life of adolescents.

#### *Internet Addiction Scale:*

The original of the Internet Addiction Scale was developed by the Internet Addiction Center led by Young [48]. The original scale comprises 20 items and uses Likert type scale. The Scale was adapted into Turkish by Bayraktar [7] Cronbach alpha coefficient of the scale which was adapted for the 12-17 age group adolescents is 0.91; and the Spearman Brown coefficient of the scale is 0.87.

The participants are asked to give one of the following ratings for each question in the Internet Addiction Scale: "Rarely = 1", "Occasionally = 2", "Mostly = 3", "Very frequently = 4" and "Always = 5".

According to the Internet Addiction Scale, the participants who scored 80 and over are defined as "Pathological Internet User". Those who scored 50-79 points are defined as "Showing Limited Symptoms", those who scored 50 or less are defined as "no symptoms" [7].

#### *Beck Depression Scale:*

The scale developed by Beck et al. [8] intends to measure the level and severity of depression of individuals using emotional, cognitive, somatic and motivational elements. The original scale comprises 21 items. The scale was adapted into Turkish by Hisli [28]. The validity and reliability study of the Turkish version was done by Hisli [28]. Internal consistency of the scale is 0.93; and item-total correlations are 0.45 and 0.72. In the Beck Depression Scale, each item can be rated between the range of 0-3 points based on the complete text of the inventory. The lowest possible score is 0 and the highest possible score is 63. In the Turkish adaptation of the scale 17 points was determined as the cut-off point and people who scored 17 and less are shown not to have depression and those scored higher than 17 are shown to have depression [28].

#### *Data Analysis*

Descriptive statistics (frequency and percentage values, minimum, maximum, mean and standard deviation), unrelated measurements t test, Levene homogeneity test, Kruskal Wallis test and LSD test for multi-comparisons Kruskal Wallis tests are used to evaluate the data.

### **Ethical Considerations**

The permission for the research was obtained in the decision no 4 of with the protocol no 2014/320 dated 17.01.2014 granted by the Non-Invasive Clinical Research Ethics Board of the Medical School of Adnan Menderes University. Necessary permissions were obtained from the National Education Office in Trabzon for the research. Students were provided necessary explanations and voluntarily signed consent forms.

### **Results**

In the study, 46.0% (n=361) of the adolescents were female, 30.6% (n=205) were in 9th grade, 30.9% (n=207) were 17 years old, 31.2% (n=209) were in Imam Hatip High School, 91.8% (n=614) lived with their parents, 82.8% (n=554) had nuclear families, 59.8% (n=400) lived with their parents in the city, parents of 96.9% (n=648) of the students were alive, 98.5% (n=659) did not have any step family member, 68.0% (n=455) reported that their family's income and expenses were balanced, 77.4% (n=518) had sufficient amount of monthly allowance, 39.5% (n=264) had three siblings, 69.5% (n=465) has good relations with their sibling(s), 27.5% (n=184) reported that their fathers were high school graduate, 54.6% (N=365) reported that their fathers were self-employed, 79.7% (n=533) had good relations with their fathers, 67.9% (n=454) reported that their fathers were tolerant towards them, 39.0% reported that their mothers were elementary school graduates, 78.8% (n=527) reported that their mothers did not work, 88.6% (n=593) had good relations with their mothers, 76.4% (n=511) reported that their mothers were tolerant towards them, 59.5% (n=398) were moderately successful in school, 88.2% (n=590) reported that they never had to repeat a year, 57.4% (n=384) had good relations with their teachers, 75.6% (n=506) had good relations with their friends, 94.8% (n=634) had a close friend 68.5% (n=458) had memberships to online friendship sites, 95.2% (n=637) did not have friends through internet, 74.3% (n=497) had internet connection at home, 35.9% (n=240) went online at home, 94.9% (n=635) had a device that could make them online at home, 87.9% (n=588) had a device that could make them online at home other than computers, 7.2%

(n=48) used all devices to be online, 42.5% (n=248) did not send text messages using their cell phones. 25% (n=167) of the high school students participated in this study reported that they used computers to play games-study 59.5% (n=398) played online games, 76.1% (n=509) spent 1-4 hours on the internet, 57.5% (n=385) reported that their parents also used the internet, 83.7% (n=560) did not qualify themselves as internet addicts, 84.6% (n=566) reported that internet use did not cause them to have anger/depression. In the study, 93.1% (n=623) of the adolescents reported that they did not have any health problem or disability; 91.8% (n=614) reported that they did not have any chronic disorder, 77.0% (n=515) enjoyed life; 62.5% (n=418) believed that some of their expectations would realize, 91.0% (n=91.0) reported that they did not have alcohol, tobacco or drug problem, 85.8% (n=574) reported that they did not have any thoughts about self-harm. 1.3% of the adolescents (n=9) with self-harming behavior reported that they cut themselves and 62.8% (n=420) used computers and internet. When regular activities of the students were questioned, 13.3% (n=89) reported that they played basketball. It was found that 74.3% of the adolescents felt calmed, and relaxed after their free time activities.

It was determined that 97.5% (n=652) of the participants did not show any internet addiction symptoms, 2.1% (n=14) of the adolescents had limited symptoms of internet addiction and 0.4% were pathological internet user. The mean score of the high school students in the internet addiction scale was  $\bar{x} = 11.63 \pm 10.29$  (min=0.00, max = 90.00) and their internet addiction levels were determined to be very low.

The internet addiction levels of high school students who were male (t=2.557, p=0.011), who reported that their allowances were partly sufficient or insufficient (t=2.673, p=0.008), who had a moderate level of relationship with their siblings (t=3.120, p= 0.002), whose fathers were university or higher level graduates (KW=14.998, p=0.002), whose fathers were civil servants (KW=9.782, p=0.008), whose fathers were authoritarian (KW=6.155, p=0.046), whose mothers were university or higher level graduates (KW=12.546, p=0.006), whose mothers worked (t=2.198, p=0.028), who had moderate level of relationships with their mothers (t=3.449, p=0.001), who had moderate level of relationships with their teachers (t=4.728, p=0.000) and who did not have any close friends (t=2.580, p=0.010) were higher (Table 1).

Variables		n	$\bar{x} \pm SD$	Test, p	Difference
Gender	Female	361	10.56±13.09	*t= 2.557 p= 0.011	Male>Female
	Male	308	13.33±14.97		
School year	9th year	205	13.88±15.04	**Levene=7.558 p=0.000 ***KW=15.364 p=0.002	9>12
	10th year	157	12.22±15.97		10>12
	11th year	157	12.30±12.64		11>12
	12th year	150	8.15±10.97		
Age	14-15 years	193	13.04±15.46	**Levene=6.077 p=0.029 ***KW=9.549 p=0.023	18-20<14-15
	16 years	160	13.59±14.77		18-20<16
	17 years	207	11.11±12.91		
	18-19-20 years	109	8.51±11.70		
School Type	Science School	114	13.54±16.44	**Levene=7.558 p=0.000 ***KW=20.502 p=0.000	Anadolu Science
	Anadolu High School	94	8.33±10.67		Anadolu/vocationall
	Vocational High School for Health	125	14.71±14.42		high school for health/ Anadolu
	Imam Hatip High School	209	10.53±12.94		/vocational high school /
	Vocational High School	127	12.20±14.66		Imam Hatip/ Vocational high school for health
Insufficient pocket money	Yes	518	11.05±12.83	*t= 2.673 p= 0.008	Partly/No>Yes
	Partly/No	151	14.51±17.36		

Number of Siblings	One	225	13.51±15.41	**Levene=9.840 p=0.000 ***KW= 21.584 p=0.000	Three and over> others
	Two	264	12.53±13.70		
	Three and over	159	7.80±10.11		
Relation with siblings	Good	465	10.37±12.92	*t= 3.120 p= 0.002	Moderate> good
	Moderate	170	14.04±13.64		
Father's education level	Elementary school or no education	170	9.81±13.40	**Levene=3.564 p=0.011 ***KW=14.998 p=0.002	University and higher> others
	Secondary school	155	11.99±14.48		
	High school	184	11.19±11.88		
	University and higher	155	14.87±16.28		
Father's occupation	Civil Servant	169	13.07±12.54	**Levene=6.513 p=0.000 *** KW=9.782 p=0.008	Civil servant> self employed
	Retired	102	12.18±14.22		
	Self employed	365	10.81±13.45		
Father's attitude	Authoritarian	90	15.56±19.43	**Levene=8.702 p =0.000 *** KW=6.155 p=0.046	Democratic> tolerant
	Democratic	70	13.41±14.00		
	Tolerant	454	10.39±12.08		
Mother's Education level	Elementary school or no education	301	11.01±13.76	**Levene=4.626 p=0.003 ***KW=12.546 p=0.006	University and higher>others
	Secondary school	155	11.39±13.44		
	High school	138	11.10±11.94		
	University and higher	75	17.41±18.36		
Employment status of the mother	Employed	142	14.13±15.79	*t= 2.198 p= 0.028	Civil servant>self employed
	Homemaker	527	11.22±13.48		
Relation with the mother	Good	593	11.04±13.67	*t= 3.449 p= 0.001	Moderate>good
	Moderate	62	17.42±15.44		
Relations with teachers	Good	384	9.27±11.39	*t= 4.728 p= 0.000	Moderate>good
	Moderate	255	14.06±14.12		
Close friends	Yes	634	11.51±13.22	*t= 2.580 p= 0.010	Yes>no
	No	35	17.77±24.16		

Table 1. Comparison of internet addiction levels of high school students according to socio-demographics

Internet addiction levels of the high school students who were members to dating sites (t=5.351, p=0.000), who preferred to have friends on online dating sites (t=6.125, p=0.000), who had an internet connection at home (t= 4.429, p=0.000), who had a technological tool to connect to the internet at home (t=2.369, p=0.018), who sent 101 and more messages/texts on mobile phones (KW=18.488, p=0.000), who had technological tools other than computers to

have access to the internet (t=3.64, p=0.000), who used computers to have access to social networks (KW=89.873, p=0.000), played online games (t=3.841, p=0.000), who spent 5 hours and over on the internet (KW=61.421, p=0.000), whose parents used the internet (t=3.25, p=0.001), who self-reported to have internet addiction (t=14.475, p=0.000), who reported that internet use led to anger and depression (t=6.79, p=0.000) were found to be higher than other adolescents (Table 2).

Variables		n	$\bar{X} \pm SD$	Test, p	Difference
Membership to online dating sites	Yes	232	13.77±14.94	*t= 5.351 p= 0.000	Yes>No
	No	398	7.64±10.76		
Have online friends	Yes	32	26.28±21.48	*t= 6.125 p= 0.000	Yes>No
	No	637	11.11±13.18		
Internet access at home	Yes	497	13.23±14.73	*t= 4.429 p= 0.000	Yes>No
	No	172	7.80±10.91		
Technological devices for Internet access at home	Yes	635	12.13±14.20	*t= 2.369 p= 0.018	Yes>No
	No	34	6.29±9.30		
Number of messages sent with mobile phones	None	284	10.73±13.54	**Levene=3.095 p=0.046 ***KW=18.488 p=0.000	101 and over> others
	1-100	238	10.91±12.89		
	101 and over	147	15.48±16.12		
Technological devices other than computers for Internet access at home	Yes	588	12.56±14.49	*t= 3.641 p= 0.000	Yes>No
	No	81	6.56±8.61		
Purpose of computer use	Only to study	114	4.80±10.31	**Levene=22.897 p=0.000 ***KW=89.873 p=0.000	Study<others Study-games< social networks and others Social networks > others
	To study and play games	167	9.60±10.57		
	Social networks	152	17.49±17.67		
	Other	236	13.17±13.42		
Play online games	Yes	398	13.54±14.19	*t= 3.841 p= 0.000	Yes>No
	No	271	9.33±13.47		
Daily average time spent on the Internet	I do not use Internet	102	7.91±14.11	**Levene=17.826 p=0.000 ***KW=61.421 p=0.000	5 hours and over>others Non-users<others
	1-4 hours	509	11.05±12.14		
	5 hours and over	58	25.64±20.47		
Internet use of parents	Yes	385	13.34±14.30	*t= 3.259 p= 0.001	Yes>No
	No	284	9.79±13.45		
Internet addiction	Yes	109	27.39±19.68	*t= 14.475 p= 0.000	Yes>No
	No	560	8.81±10.22		
Internet use leading to anger/depression	Yes	103	20.20±17.85	*t= 6.795 p= 0.000	Yes>No
	No	566	10.31±12.67		

\*t test: Unrelated samples t test \*\* Levene test: Homogeneity of variance test \*\*\*KW: Kruskal Wallis test

Table 2. Comparison of internet addiction levels of high school students according to the use of internet and telephone for communication

The internet addiction level was found to increase in the high school students with a health problem (disability) ( $t=2.840$   $p=0.005$ ), who reported that they did not enjoy life ( $t=6.500$ ,  $p= 0.000$ ), who believed that none of their expectations would realize ( $KW=25.381$ ,  $p=0.000$ ), who used tobacco,

alcohol and drugs ( $t=33.00$ ,  $p=0.001$ ), who had thoughts of self-injury within the last year ( $t=6.508$ ,  $p=0.000$ ) and in the students who had self-inflicted injuries in the last year ( $t=7.709$ ,  $p= 0.000$ ) (Table 3).

Variables		n	$\bar{x} \pm SD$	Test, p	Difference
Health problems (disability)	Yes	46	17.48±21.37	*t= 2.840 p= 0.005	Yes>No
	No	623	11.42±13.28		
Enjoy life	Yes	515	9.96±11.97	*t= 6.500 p= 0.000	No>Yes
	No	154	18.10±18.12		
Future expectations	I believe all my expectations will realise	204	9.50±12.26	**Levene=15.433 p=0.000 ***KW=25.381 p=0.000	Those who have no expectations >others
	I believe some of my expectations will realise	418	11.69±13.12		
	I don't believe any of my expectations will realise	47	23.26±21.96		
Use of tobacco, alcohol or drugs	Yes	60	17.50±20.73	*t= 3.300 p= 0.001	Yes>No
	No	609	11.28±13.10		
Thoughts of self inflicted injury within the last year	Yes	95	20.26±20.24	*t= 6.508 p= 0.000	Yes>No
	No	574	10.44±12.21		
Self inflicted injury within the last year	Yes	27	31.41±25.88	*t= 7.709 p= 0.000	Yes>No
	No	642	11.01±12.71		

\*t test: Unrelated samples t test \*\* Levene test: Homogeneity of variance test \*\*\*KW: Kruskal Wallis test

Table 3. Comparison of internet addiction levels of high school students according to health and life expectations

Internet addiction levels of high school adolescents differed significantly based on their depression risks ( $t_{(667)}=7.497$ ;  $p<0.05$ ). When the answers of the adolescents to the internet addiction scale were reviewed, the internet addiction levels of adolescents with a depression risk ( $\bar{x} = 19.40 \pm 18.61$ ) were significantly higher than those who did not have

any depression risk ( $\bar{x} =9.81\pm11.77$ ). 21.1% (n=141) of the high school students were determined to have depression risk that may require therapy according to the Beck Depression Scale. The relationship between depression risk and internet use is shown in Table 4.

Scale	Depression Tendency	n	$\bar{x}$	SD	sd	t	p
Internet Addiction Scale	No Depression Risk	528	9.81	11.77	667	7.497	0.000
	Depression Risk	141	19.40	18.61			

Table 4. T test results for the measurements of internet addiction levels of high school adolescents that are unrelated with depression risk

### Discussion

Internet addiction levels of high school adolescents in the study differed significantly

based on their depression risks. When the answers of the adolescents to the internet addiction scale were reviewed, the internet

addiction levels of adolescents with a depression risk were significantly higher than those who did not have any depression risk.

When the literature is reviewed, some of the studies found a relationship between depression and internet addiction just as in our findings [1, 11, 14, 29, 31, 32, 36, 47] while others did not determine any relationship between depression and internet use [34, 38].

The reason for this can be the scales used in these studies, size and characteristics of the sample groups, and cut off points of the scales. The relationship between depression risk and internet addiction is an expected condition. According to the cognitive theory, the presence of depression and anxiety alters the reaction of an individual to events, increases the individual's pessimistic-negative thoughts, and increases the depressive state with reduced rational thinking. It is also reported that lack of health interpersonal relations also causes depression. In our case, adolescents who do not have satisfactory interpersonal relations can resort to the internet. This finding also supports the findings of our study that depression and internet addiction in adolescents are influenced by their relationship with their teachers, with their mothers, siblings and whether they have close friends.

It was determined that 97.5% (n=652) of the participants did not show any internet addiction symptoms, 2.1% (n=14) of the adolescents had limited symptoms of internet addiction and 0.4% were pathological internet user. In the literature, adolescents were shown to have internet addiction ranging the highest 14% to the lowest 0.3 - 0.7 % [5, 6, 9, 25, 35]. Internet addiction levels in our findings are lower both from the other studies conducted in Turkey [5,6] and from other studies conducted in other countries [9, 25, 35]. The reason for this may be the use of different scales in the above studies and that the students did not perceive themselves as addicted as the scale used in this study was a self-reporting scale and the characteristics of the study location.

The internet addiction levels of high school students who were male, who reported that their pocket money was partly sufficient or insufficient, who had a moderate level of relationship with their siblings, whose fathers were university or higher level graduates, whose

fathers were civil servants, whose fathers were authoritarian, whose mothers were university or higher level graduates, whose mothers worked, who had moderate level of relationships with their mothers, who had moderate level of relationships with their teachers and who did not have any close friends were higher.

Similar to the findings of our study, some studies in adolescents reported a higher internet addiction in male students when compared to female students [15, 18, 23, 25, 36, 44, 45], while some other studies reported a higher internet addiction rate among female students when compared to male students [19, 37]. In their study in adolescents, Eftekin [21] and Şahin [41] did not find a significant difference between genders in internet addiction. The reasons for this can be the geographic region where the students lived, their family structure and families' biases against different genders as well as the way adolescents spend their time on the internet. Furthermore, since male students use internet to play games or for similar things, these interest areas can increase the time spent on the internet and provide a basis for internet addiction.

When the literature was reviewed, it was found that internet addiction is associated with parent characteristics [2, 10, 15, 19, 44], that education level of parents, father's occupation and employment status of the mother can be associated with the economic condition of the family, improved economic condition of the family leads to an increase in internet addiction and furthermore that the availability of technology and usage rates can be associated with the education level and economic status. Easy access to the internet increases addiction rates. Since computer/internet use increases with the increasing education level of parents, the results of another finding of our study and this finding match. An adolescent with a father who is indifferent or oppressive will most likely behave different than another adolescent whose father is democratic and tolerant. And the father's attitude towards internet use also plays an important role. Oppressive or similar attitude towards adolescents may cause them to get angry and upset leading them to other means of comfort. It can cause the adolescents to have other communications even if this means virtual relations. Especially internet is the most



attractive one. Because internet allows the adolescent to have the relation he/she cannot have with his/her family with others online and allows him/her to choose the chat/sharing environment for which only he/she will determine to be correct. This is risky for the adolescent however given the fact that adolescents like to take risks in this period, this can cause them to have internet addiction. It is an interesting finding that authoritarian fathers predict internet addictions and more consideration should be given on this finding.

Furthermore and interestingly our study found that internet addiction was affected by the relationship the adolescent had with his/her mother. The reason for this finding can be the cultural characteristics of the study region and the status of the mother in the family. Another reason can be the difference in the cultural positions and roles of the mother and father in our society.

In the study conducted in adolescents; Günüç [27] found a negative relationship between the perceived social support from the family and friends and internet addiction. In other words, as the perceived level of social support of the family and friends decreased, the level of internet addiction increased. In their study, Çevik and Çelikkaleli [15] found significant relationships between friendship ties of female and male adolescents and internet addiction. In their study in adolescents Yen et al. [47] found that negative and positive effects and interpersonal relationships were not associated with the severity of internet addictions. In their study in adolescents Cho and Lee [12] found that support of friends and loneliness had direct and significant effects on internet addiction. In a study conducted in high school students Bayhan [6] reported that the percentage of students who perceived themselves as internet addicts increased with the decreasing success in school.

Many findings in the literature support the findings of our study. Communication has a critical importance in a person's life. The findings of our study made us believe that when individuals cannot establish effective communication with their family, friends and society in general they choose to communicate online. Furthermore, these findings are important in that it demonstrates how important

a role teacher's play in an adolescent's life and how important social communication is to help the adolescent go through this developmental stage.

Adolescents with three or more siblings had a lower level of internet addiction compared to adolescents with one or more siblings. According to our study findings, adolescents with three or more siblings and who had good relations with their siblings had a lower level of internet addiction compared to adolescents with one sibling however adolescents with one sibling had a lower internet addiction compared to those with two siblings. When we investigate the literature, we can suppose that factors such as communication, interpersonal relations and loneliness can play an important role in these findings. Everything starts in the family, and of course in communication. A good deal of life activities such as happiness, success etc. depends on the relations we have with people. Internet use and thus internet addiction rate increases when we use internet to meet our communication needs due to the decreasing interpersonal/face-to-face communication and interpersonal problems. Positive perception of social support sources in people's lives can help them to have less existential anxiety.

The internet addiction level was found to increase in the high school students with a health problem (disability), who reported that they did not enjoy life, who believed that none of their expectations would realise, who used tobacco, alcohol or drugs, who had thoughts of self-harm within the last year, who had acts of self-harm within the last year. Çam [14] determined that tobacco, alcohol and drug abuse was more frequently seen in the adolescents who had problematic internet use. In their study in secondary school students in Taiwan Chang et al. [10] found that there was a relationship between internet addiction, being victims of cyber bullying, tobacco-alcohol consumption and depression. In their study Lee et al. [35] reported that 21.2% of the students included in the study used alcohol. 12.2% of the students reported that they smoked and 9% reported that they used drugs. It was found that tobacco and drug use posed a risk for internet addiction. In their study in adolescents Ko et al. [33] reported that internet addiction had a relationship with problematic alcohol use. In their study in high

school students Üneri and Tanıdır [45] did not find a statistically significant relationship between tobacco use and internet addiction.

In some studies conducted in adolescents, a significant relationship was found between internet addiction, suicidal thoughts and suicide attempts [31, 35]. Our findings are similar to other findings. It is clearly seen that mental health plays a critical role in developing internet addiction. Gender factor, depression are also other factors for internet addiction. Furthermore, considering the influence of online environment, online friends, insecure/unreliable online environment and relationships on the adolescents with their swiftly changing moods and thoughts in their search for their identity and development, internet use can be highly risky for adolescents.

#### Limitations of the study

This is a cross sectional study and therefore not knowing the sequencing of cause-effect relation of depression and internet addiction can be considered as the limitation of the study. The research is limited with five schools.

#### Conclusion

When all findings are evaluated; it is concluded that high school adolescents were influenced especially by interpersonal relationships, and the relationship between depression risk and internet addiction was remarkably high. It is possible to comment that necessary education should be provided based on these results and risk groups should be evaluated.

Depression is rapidly becoming a disorder which can affect everyone at any age and stage of their lives and it is possible to say that depression finds its way easier through emotional turbulences during adolescence. Many factors such as family, social environment, relationships, exams, identity search can also be influential. Therefore it can be recommended to organize psycho-educational programs that will also include families, to provide education to families and psychological consultancy services.

There is a positive relationship between depression risk and internet addiction. It can be recommended to have more frequent and more comprehensive education programs to protect mental health.

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#### Conflict of interest

The authors declare that they have no competing interests.

#### Authors' contributions

Concept: Hülya Arslantaş, Design: Hülya Arslantaş, Kamile Öner, Data Collection or Processing: Kamile Öner, Analysis or Interpretation: Kamile Öner, Hülya Arslantaş, Literature Search: Kamile Öner, Hülya Arslantaş, Writing: Hülya Arslantaş, Kamile Öner.

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