

# The Examining of Internet Addiction and its Related Factors in Children Aged 6-18 Years

## 6-18 Yaş Grubu Çocuklarda İnternet Bağımlılığının ve İlişkili Faktörlerin İncelenmesi

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Geliş Tarihi / Received : 08.12.2020 Kabul Tarihi / Accepted : 17.06.2021

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(Sakarya Tıp Dergisi / Sakarya Med J 2021, 11(2):420-433) DOI: 10.31832/smj.835621

### Abstract

Objective	Our research classified variables associated with internet addiction and examined their relations with such addiction. Our study aim was to reveal how variables that may have separate effects on internet addiction predict such addiction as an integral whole. The variables that emerge are important in terms of determining the profiles of internet-addicted individuals and of use as additional indicators of addiction.
Materials and Methods	The research was designed as a cross-sectional survey. The research data were collected from students at primary, middle, and high schools in the province center of Trabzon in the Black Sea region of Turkey in the 2018 academic year. The measurement tools were applied to 8651 students attending 122 schools from the three academic stages. Data were collected using a survey and the Internet Addiction Scale.
Results	As a result of the research, children's current internet addiction status was evaluated and 17% of the children in the sample were determined to be internet-addicted. However, a high level of risk of addiction was also observed (39.8%). Also, variables associated with themes predicting internet addiction, such as 'ownership of and access to technology', 'the family', 'use control', 'activities/hobbies', 'peer/friend influence' and 'purpose of use' were established by making particular use of the previous literature, and relations were examined in a holistic manner.
Conclusion	In the fight against internet addiction risk factors, family, student and environmental factors should be addressed.
Keywords	internet addiction; children; adolescent; regression; family

### Öz

Amaç	Araştırmamız internet bağımlılığı ile ilişkili değişkenleri sınıflandırmak ve bu bağımlılıkla ilişkilerini incelemektedir. Çalışmamızın amacı, internet bağımlılığı üzerinde ayrı etkilere sahip olabilecek değişkenlerin, bu bağımlılığı bütünsel bir bütün olarak nasıl yordadığını ortaya koymaktır. Ortaya çıkan değişkenler, internet bağımlısı bireylerin profillerinin belirlenmesi ve bağımlılığın ek göstergeleri olarak kullanılması açısından önemlidir.
Gereç ve Yöntemler	Araştırma, kesitsel bir araştırma olarak tasarlanmıştır. Araştırma verileri 2018 eğitim öğretim yılında Karadeniz bölgesinde Trabzon İl merkezindeki ilkokul, ortaokul ve lise öğrencilerinden toplanmıştır. Ölçme araçları, üç akademik aşamadan 122 okula devam eden 8651 öğrenciye uygulanmıştır. Veriler bir anket ve İnternet Bağımlılığı Ölçeği kullanılarak toplanmıştır.
Bulgular	Araştırma sonucunda çocukların mevcut internet bağımlılık durumu değerlendirilmiş ve örneklemdaki çocukların %17'sinin internet bağımlısı olduğu belirlenmiştir. Ancak yüksek düzeyde bağımlılık riski de gözlenmiştir (%39.8). Ayrıca, 'teknolojiye sahip olma ve teknolojiye erişim', 'aile' 'kullanım kontrolü' 'aktiviteler / hobiler', 'akran / arkadaş etkisi' ve 'kullanım amacı' gibi internet bağımlılığını öngören temalarla ilişkili değişkenler önceki literatürden özel olarak yararlanılarak kurulmuş ve ilişkiler bütüncül bir şekilde incelenmiştir.
Sonuç	İnternet bağımlılığı ile mücadelede risk faktörleri, aile, öğrenci ve çevresel faktörler ele alınmalıdır.
Anahtar Kelimeler	internet bağımlılığı; çocuklar; ergen; regresyon; aile

## INTRODUCTION

The internet is widely used by people of all ages for access to information, communication, and entertainment. Approximately 55% of the 8 billion world population are internet users. In Europe, internet users comprise 85.2% of the population.<sup>1</sup> The 76 million (93.4%) of the 82 million population in Turkey were subscribers of broad band internet.<sup>2</sup> The positive and negative aspects encountered in many technologies also apply to the internet. The most troubling downside of the internet is perhaps internet addiction. The reported prevalence of internet addiction among young people range from 12% to 30.3%.<sup>3-6</sup>

Internet addiction is a psychosocial disorder involving problems associated with impatience, isolation symptoms, emotional disorders, and social relations.<sup>7</sup> Internet abuse among children and adolescents and its growing psychological and behavioral consequences have been particularly emphasized in recent years.<sup>8-11</sup> Various problems may emerge as outcomes, such as loss of control, academic failure, low life satisfaction, social isolation, and familial conflict, attention deficit.<sup>7,9,11-16</sup>

Selnow<sup>17</sup> proposed the 'electronic friend' hypothesis in which the computer and internet replace the child's real friends, and stated that children who preferred electronic friends to real friends had weak social relations. Another study reported that 14.9% of 535 students with a mean age of 11 years exhibited signs of internet addiction, and that hyperactivity disorder was observed in these.<sup>3</sup> In another study, 18.3% of children aged 11-18 years exhibited pathological internet addiction.<sup>4</sup>

The causes of internet addiction or the factors affecting such addition may be considered under two main headings. The first thesis is related to dependence on the structure and contents of the internet, such as the purpose behind internet access and use. The other thesis is that various individual or social factors, such as psychological disorders and familial problems trigger internet addictions

or encourage direct flight to the internet. The purpose of internet use, easy access, and the associated control mechanism occupy an important place in the development of internet addiction or the dependence process. Individuals who use the internet for purposes such as gaming, gambling, pornography or the social media have been shown in several studies to have a greater risk of addiction than those using it for reasons such as research, monitoring current affairs, study, or communication.<sup>15-18</sup> However, it must be emphasized at this point that not every child using the internet to play games will become addicted, since addiction is too complex a phenomenon to be reduced to a single factor. Some individual factors, such as depression, anxiety, stress, loneliness may affect control of internet use/addiction.<sup>19,20</sup> Control refers to duration restriction and avoidance of harmful content. Not every child possesses the ability or education to impose personal control, and an external force such as the mother, father or teacher may be required. There is no doubt that unrestricted and easy access to the internet makes control on the part of both the child and the parents more difficult. Easy or unrestricted access to the internet is associated with economic factors<sup>21</sup> and familial control. Internet addiction rates in adolescents from families with high socioeconomic levels are much greater than those in adolescents from families with low socioeconomic levels.<sup>22,23</sup>

Children's access to and use of the internet are linked to the family's awareness of internet addiction, intrafamilial relations, and socioeconomic status.<sup>22</sup> This increases families' responsibilities in terms of internet addiction, and their communication with their children must be such as to ensure control over their internet use. The transference of focus from the family to friends that commences in childhood persists in adolescence. To put it another way, peers may have greater influence on adolescents than their families. In a study examining the peer effect in gaming and internet addiction, Gunuc<sup>24</sup> showed that addicted children established friendships with addicted children, and non-addicted children with non-addicted peers. In other

words, the importance of the games played and internet use is very high in intra-group dynamics in groups consisting of close friends. Interest that is gradually transferred to peers as the child or adolescent develops can become problematic due to problems in the family or other familial factors.<sup>25</sup> Uninterested parental behavior and lack of love in a family are known to be associated with negative behaviors in adolescents in particular.<sup>26</sup>

Higher perceived social support levels and lower internet addiction levels have been determined in adolescents who spend time with their mothers in particular.<sup>27</sup> Working mothers, child mothers, and single mothers and fathers exhibit different characteristics in terms of social support.<sup>28,29</sup> Interaction between family members affects the well-being and happiness of every member, and a disturbed or unhealthy member will have adverse effects on the entire family and on familial functioning.<sup>30,31</sup>

Studies have reported that children with poor academic performance, lacking requisite support from families and experiencing problems with them, who lack or unable to make friends, or who rejected by friends constitute specific risk groups.<sup>32-35</sup> Such children are unhappy at home and at school, and feel freer and more at ease and seek to express themselves more easily in a virtual world. Time spent online thus increases, and addiction ensues.

There are other factors that reduce internet addiction or are inversely related to internet addiction. Kim, Kim and Jee<sup>36</sup> revealed that addiction may negatively influence physical health by reducing the amount of physical activity, such as walking, resulting in an increase of fat mass and a decrease of muscle mass associated with adverse health consequences. Concordantly, internet addiction decreases if Students have a hobby or a habit of doing sports.<sup>37</sup> Various personality traits such as the child's intrinsic/ extrinsic motivation, agreeableness, extraversion, resilience, self-esteem, or self-confidence may decrease internet addiction.<sup>19,38-40</sup>

As also shown in the literature, internet addiction is associated with several variables, particularly in children and adolescents. However, many studies have investigated the relation between internet addiction and only one aspect or only a few variables. From that perspective, there is a lack of studies examining several variables from an integral perspective, particularly in Turkish society. In addition, there is a particular need for studies examining internet addiction among children and adolescents in a broad age range and including large populations. Such studies have greater power to represent communities. The present study will make significant contributions to the literature from that perspective. Our research classified variables associated with internet addiction and examined their relations with such addiction. Our study aim was to reveal how variables that may have separate effects on internet addiction predict such addiction as an integral whole. The variables that emerge are important in terms of determining the profiles of internet-addicted individuals and of use as additional indicators of addiction.

## MATERIALS and METHODS

### The research model

The research was designed as a cross-sectional survey. The research data were collected from students at primary, middle, and high schools in the province center of Trabzon in the Black Sea region of Turkey in the 2018 academic year. Children aged 6-18 years from each academic stage, from class 1 to class 12, were included. Comparisons between variables and related tests were performed following the requisite measurements, and the current situation was determined.

### Sampling

Following receipt of Karadeniz Technical University Scientific Research ethical committee approval for the study (approval date and number: 02/07/2018; No:11), the measurement tools were applied to 8651 students attending 122 schools from the three academic stages (primary, middle, and high) (by selecting one branch from classes at each lev-

el). In the study, a questionnaire was applied to one branch of each level from all primary, secondary and high schools in the central district of Trabzon by simple random sampling method. A total of 8311 individuals at 122 schools with data suitable for analysis were finally enrolled.

We determined that 2766 (33.3%) of the 8311 children enrolled had no social media accounts, while 5443 (65%) had at least one such account. In addition, 4724 (56.8%) of children had their own smart phones, tablets and/or computers while 3490 (42%) did not have their own digital devices.

### Data Collection Tools

Data were collected using a survey and the Internet Addiction Scale. The survey prepared by the authors was completed by the children themselves, with the support of families in primary schools, and under the supervision of teachers in middle and high schools. In addition to socio-demographic questions, the survey also included some variables based on previous literature on internet addiction.

Internet Addiction Scale: Developed by Gunuc and Kayri,<sup>41</sup> the scale consists of 35 items and four subdimensions – ‘Withdrawal,’ ‘Controlling Difficulty,’ ‘Disorder in Functionality,’ and ‘Social Isolation.’ The scale’s total standard variance is 47.46%. It has a Cronbach Alpha reliability coefficient of 0.94, while the reliability coefficient in this study was 0.96. Higher total scores indicate greater internet addiction. The minimum possible score is 35 and the maximum possible score is 175. In determining sample addiction levels, no cut-off value was established beforehand, and addiction levels were classified using two-step cluster analysis. In addition, within the aim of the research, the scale was not examined at the subdimension level, and analysis was based on total scores.

### Data Analysis

SPSS 24.0 statistical software was employed at the data

analysis stage. The assumptions of univariate analysis and multivariate analysis<sup>42</sup> were examined after the data had been prepared. For this reason, the missing data, outliers, and normality were examined and checked prior to the analyses. Normality assumptions were confirmed for each group.

Individuals total scale scores were subjected to two-step clustering analysis, and subjects were divided into three groups, dependent, at risk of dependence, and non-dependent. In two-step clustering analysis, individuals in a sample are clustered based on similarities in terms of the variable examined, resulting in more consistent findings. This analysis is an effective technique capable of performing clustering based on logarithmic probability. Two-step clustering analysis was therefore used in addiction classification, and homogeneous subgroups were established. Descriptive statistics, the independent t-test and logistic regression analysis were also employed in the research. Research in the field states that logistic regression analysis can be applied to research designs in which independent variables are defined in a binary manner (such as 1-0, or Yes/No).

## RESULTS

Two-step clustering analysis was first performed in the Findings section in order to determine the addiction status of the children enrolled. Variables were then grouped around principal themes such as ownership of and access to technology, familial relations, control of level of internet use, activities/hobbies, influence of friends/peers, and purposes of internet use. Finally, a model was established by applying logistic regression analysis to the same variables.

As shown in Table 1, children were classified using two-step clustering analysis into three groups, non-addicted, at risk of addiction, and addicted. Three groups were selected instead of two in order to raise the cut-off point of the addicted group and to obtain more definite results for profile description. Accordingly, 17% of the children in the sam-

ple may be described as internet-addicted (Mean=114.83; SD= 18.67). However, the number of children at risk of addiction was also quite high (39.8%).

**Table 1:** Two-step clustering analysis results for total internet addiction scores

Internet addiction status	n	%	M	SD
Non-addicted	3586	43.1%	46.443	8.851
At risk of addiction	3311	39.8%	76.185	8.477
Addicted	1414	17.0%	114.832	18.770
Total	8311	100.0%	69.927	26.803

M=Mean; SD= Standard Division

In the context of ownership of their own technology or of technology in the home, children were asked if they possessed their own technological equipment, if the internet connection was always turned on, whether there was a computer in the home, whether they had a smart phone, whether the computer in the home was shared, whether the smart phone had online access, whether the internet was available in the home, and whether access to the internet was unlimited. The results are shown in Table 2.

**Table 2.** Comparison of internet addiction scores in terms of children's ownership of technology and internet access

Do you have your own technological device?	n	M	SD	df	t	p
No	1594	63.39	26.44	8245	-10.98	.000
Yes	6653	71.54	26.67			
<b>Is the internet connection always turned on?</b>						
No	2027	64.53	25.83	8236	-10.56	.000
Yes	6211	71.72	26.90			
<b>Is there a computer in your room?</b>						
No	5184	65.84	25.67	8239	-12.12	.000
Yes	3219	73.04	27.73			
<b>Do you have a smart phone?</b>						
No	3490	64.01	25.58	8212	-17.49	.000
Yes	4724	74.27	26.82			
<b>Is the computer at home shared?</b>						
No	2648	71.11	28.51	7897	-6.03	.000
Yes	5251	69.67	25.77			
Does the smart phone have internet access?						
No	4944	68.58	26.60	8309	-5.57	.000
Yes	3367	71.91	26.98			
<b>Is the internet available at home?</b>						
No	1866	65.26	27.00	8216	-8.55	.000
Yes	6352	71.27	26.56			
<b>Is the internet unlimited?</b>						
No	2787	65.74	26.13	8048	-10.65	.000
Yes	5263	72.39	26.92			

As shown in Table 3, significant differences were determined in internet addiction scores among 'Yes' and 'No' responses for all variables. In other words, higher internet addiction scores were determined among children "not living with their families", "whose parents were alive but separated", "whose families became angry with or scolded them", "whose families' internet use was restricted", "whose families inflicted physical violence on them", and "who did not feel valued within the family". It may be concluded that all these variables express the child's addiction and the family's reaction to this.

An external control mechanism other than the children themselves, such as the mother or father, is present in children living with their families. This mechanism is particularly frequently encountered in children. In the context of that control mechanism, children were asked whether they felt addicted, whether they themselves determined the time they spent online, or whether their mothers or fathers controlled it. Internet addiction scores were then compared on the basis of the responses received. The findings within that context are shown in Table 4.

As shown in Table 4, children generally correctly identified whether or not they were addicted. In addition, higher internet addiction scores were determined in children who controlled their own levels of internet use without permitting their parents to intervene, or whose parents did not interfere in the amount of use their children made of the internet.

In the context of physical activity, children were asked whether they engaged in physical activities, whether they had any hobbies, and whether they had any interest in art or culture. The findings are shown in Table 5.

As shown in Table 5, there were significant variations in children's responses to these variables. Children who took part in physical activities, who had hobbies and participated in activities in such fields as art and culture had lower

internet addiction scores.

Analysis was applied to determine friends' reactions when children did not use the internet and to compare the effect (peer influence) of those reactions on children's internet addiction scores. The results are shown in Table 6.

As shown in Table 6, higher internet addiction scores were determined in children whose friends mocked them or who did not wish to be friends with them when they did not use the internet, or who pressurized them to use the internet. In other words, children may be mocked, unable to make friends or excluded from the peer group when they do not use the internet, and pressure is placed on such children, which can lead to greater internet use and dependence.

Finally, we examined whether the purpose of internet use produced any variation in terms of addiction, and children were asked the reasons why they went online. The findings are shown in Table 7.

As shown in Table 7, children were asked why they went online, and significant variation was observed among all the reasons investigated. In that context, children who used the internet for e-mailing, social media, chatting, watching films/soaps/videos or gaming had different but significantly higher internet addiction scores than children not using the internet for those purposes. In contrast, children using the internet for research and monitoring current affairs had significantly different and lower internet addiction scores than children not using the internet for those purposes.

We then established a model with logistic regression analysis using variables exhibiting significant variation. These were, in order, ownership of and access to technology, familial relations, amount of control over internet use, activities/hobbies, and reasons for internet use.

**Table 4: A comparison of internet addiction scores in terms of control of children's internet use**

<b>Do you feel addicted?</b>	n	M	SD	df	t	p
No	5116	61.39	23.24	6078	-37.32	.000
Yes	964	93.31	29.60			
<b>Do you determine the time you spend online yourself?</b>						
No	4123	67.94	26.76	8309	-6.73	.000
Yes	4188	71.89	26.71			
<b>Does your mother control that time?</b>						
No	4673	71.65	27.29	8309	6.68	.000
Yes	3638	67.71	26.00			
<b>Does your father control that time?</b>						
No	6201	70.30	26.81	8309	2.18	.029
Yes	2110	68.83	26.75			

**Table 5: A comparison of internet addiction scores in terms of children's physical activity**

<b>Do you engage in physical activities?</b>	n	M	SD	df	t	p
No	1672	71.49	27.99	7652	3.21	.001
Yes	5982	69.12	26.29			
<b>Do you have any hobbies?</b>						
No	988	74.12	27.42	8114	5.33	.000
Yes	7128	69.30	26.57			
<b>Are you interested in culture/art?</b>						
No	5789	70.88	27.38	8309	4.87	.000
Yes	2522	67.76	25.30			

**Table 6: A comparison of internet addiction scores in terms children's friends' when subjects did not use the internet**

<b>They mock me</b>	n	M	SD	df	t	p
No	7810	68.14	26.43	8156	-7.13	.000
Yes	348	78.53	30.72			
<b>They do not want to be friends</b>						
No	7979	68.27	26.47	8156	-7.02	.000
Yes	179	82.40	33.06			
<b>They put pressure on me</b>						
No	7829	68.08	26.41	8156	-8.43	.000
Yes	329	80.70	30.67			

**Table 7: A comparison on internet addiction scores based on purposes behind children's internet use**

For e-mail	n	M	SD	df	t	p
No	6223	68.15	26.39	8309	-10.49	.000
Yes	2088	75.22	27.33			
<b>For research or monitoring current events</b>						
No	1482	75.47	30.84	8309	8.82	.000
Yes	6829	68.72	25.69			
<b>For social media</b>						
No	4108	63.79	25.75	8309	-21.19	.000
Yes	4203	75.93	26.45			
<b>For chatting</b>						
No	4070	64.62	26.16	8309	-18.03	.000
Yes	4241	75.02	26.43			
<b>To watch films/soaps/videos</b>						
No	2337	63.22	26.72	8309	-14.44	.000
Yes	5974	72.55	26.38			
<b>For gaming</b>						
No	2502	63.54	25.98	8309	-14.45	.000
Yes	5809	72.68	26.68			

The data summarized in Table 8 were calculated as  $R^2=.48$ . As can be seen from this value, variables exhibiting significant variation explain 48% of internet dependence. Evaluation of all these variables showed that the model exhibited good agreement.

estimation percentage was calculated as 83.5%. This may be regarded as a good figure. Data for the variables in the model are grouped together under main themes and shown in Table 10.

**Table 8: A summary of the logistic regression model**

	Chi-square	df	Sig.	-2 Log likelihood	Nagelkerke R Square
Model	1406.075	31	.000	2247.79	.48

**Table 9: Logistic regression classification**

Observed	Estimated		
	Non-addicted	Addicted	Accurate estimation percentage
Non-addicted	2345	236	90.9
Addicted	360	604	62.7
Total			83.2

As shown in the classification table, the model identified 236 of the non-addicted subjects as addicted, and 360 of the addicted subjects as non-addicted. The mean correct



**Table 10:** Logistic regression analysis findings

Variable	B	S.E.	Wald	df	Sig. (p)	Exp(B) (OR)	95% CI for EXP(B)	
							Lower	Upper
<b>Technology ownership and access</b>								
Possession of own technological device	.140	.145	.933	1	.334	1.151	.865	1.530
Internet connection always turned on	.062	.179	.120	1	.729	1.064	.749	1.511
<b>Presence of a computer in the child's own room (Ro)</b>	<b>.324</b>	<b>.107</b>	<b>9.141</b>	<b>1</b>	<b>.002</b>	<b>1.383</b>	<b>1.121</b>	<b>1.706</b>
<b>Possession of smart phone (S)</b>	<b>.437</b>	<b>.121</b>	<b>13.025</b>	<b>1</b>	<b>.000</b>	<b>1.548</b>	<b>1.221</b>	<b>1.962</b>
<b>Using the computer alone at home (H)</b>	<b>.285</b>	<b>.112</b>	<b>6.457</b>	<b>1</b>	<b>.011</b>	<b>1.330</b>	<b>1.067</b>	<b>1.658</b>
Internet access in the home	-.356	.195	3.339	1	.068	.700	.478	1.026
<b>Unlimited internet available in the home (Ho)</b>	<b>.434</b>	<b>.153</b>	<b>8.070</b>	<b>1</b>	<b>.005</b>	<b>1.544</b>	<b>1.144</b>	<b>2.083</b>
Connection to the internet via mobile phone	.081	.105	.593	1	.441	1.084	.883	1.331
<b>Family</b>								
Living apart from the family	.134	.317	.179	1	.672	1.144	.614	2.131
Parents being separated	-.018	.251	.005	1	.944	.983	.601	1.607
<b>The family scolding and becoming angry with the child (Fa)</b>	<b>.898</b>	<b>.148</b>	<b>36.950</b>	<b>1</b>	<b>.000</b>	<b>2.456</b>	<b>1.838</b>	<b>3.281</b>
The family restricting internet use	.127	.102	1.554	1	.213	1.135	.930	1.386
<b>The family meting out punishments (Fap)</b>	<b>.653</b>	<b>.212</b>	<b>9.508</b>	<b>1</b>	<b>.002</b>	<b>1.921</b>	<b>1.269</b>	<b>2.909</b>
The family employing physical violence	-.111	.385	.083	1	.774	.895	.421	1.904
<b>The child not feeling valued in the family (Fav)</b>	<b>.907</b>	<b>.170</b>	<b>28.472</b>	<b>1</b>	<b>.000</b>	<b>2.477</b>	<b>1.775</b>	<b>3.456</b>
<b>Control</b>								
<b>The child thinking he is addicted (Add)</b>	<b>2.125</b>	<b>.099</b>	<b>461.922</b>	<b>1</b>	<b>.000</b>	<b>8.371</b>	<b>6.897</b>	<b>10.161</b>
<b>Inability to control time spent online (C)</b>	<b>.373</b>	<b>.129</b>	<b>8.428</b>	<b>1</b>	<b>.004</b>	<b>1.453</b>	<b>1.129</b>	<b>1.869</b>
<b>Mother not controlling time spent online (Mo)</b>	<b>.300</b>	<b>.123</b>	<b>5.994</b>	<b>1</b>	<b>.014</b>	<b>1.351</b>	<b>1.062</b>	<b>1.718</b>
Father not controlling time spent online	.025	.121	.043	1	.836	1.025	.808	1.301
<b>Activities/hobbies</b>								
Lack of access to physical activity	.216	.120	3.220	1	.073	1.241	.980	1.570
<b>Lack of hobbies (Lh)</b>	<b>.356</b>	<b>.155</b>	<b>5.282</b>	<b>1</b>	<b>.022</b>	<b>1.427</b>	<b>1.054</b>	<b>1.934</b>
<b>Lack of interest in culture/art (Li)</b>	<b>.237</b>	<b>.110</b>	<b>4.618</b>	<b>1</b>	<b>.032</b>	<b>1.268</b>	<b>1.021</b>	<b>1.574</b>
<b>Peer/friend influence</b>								
<b>They mock me (Tm)</b>	<b>.476</b>	<b>.241</b>	<b>3.890</b>	<b>1</b>	<b>.049</b>	<b>1.610</b>	<b>1.003</b>	<b>2.584</b>
<b>They do not want to be friends (Tr)</b>	<b>.948</b>	<b>.351</b>	<b>7.303</b>	<b>1</b>	<b>.007</b>	<b>2.580</b>	<b>1.297</b>	<b>5.131</b>
<b>They put pressure on me (Tp)</b>	<b>.550</b>	<b>.243</b>	<b>5.108</b>	<b>1</b>	<b>.024</b>	<b>1.733</b>	<b>1.076</b>	<b>2.792</b>
<b>Purpose of use</b>								
<b>Gaming (Ga)</b>	<b>.480</b>	<b>.121</b>	<b>15.670</b>	<b>1</b>	<b>.000</b>	<b>1.616</b>	<b>1.274</b>	<b>2.049</b>
E-mail	.058	.116	.250	1	.617	1.060	.844	1.330
<b>Not using for research or current affairs (Not)</b>	<b>1.018</b>	<b>.136</b>	<b>55.663</b>	<b>1</b>	<b>.000</b>	<b>2.767</b>	<b>2.118</b>	<b>3.615</b>
<b>For social media (Fs)</b>	<b>.631</b>	<b>.123</b>	<b>26.445</b>	<b>1</b>	<b>.000</b>	<b>1.880</b>	<b>1.478</b>	<b>2.392</b>
For chatting	.222	.127	3.069	1	.080	1.249	.974	1.602
To watch films/soaps/videos	.125	.134	.874	1	.350	1.134	.872	1.474
Constant	1.386	.419	10.957	1	.001	3.998		
CI: confidence interval; OR: odds ratio								

The variables exhibiting significant variation in terms of internet dependence were categorized under main themes once the logistic regression findings had been obtained. In that context, variables were grouped under the main themes of Possession of and access to technology, Family, Control, Activities/hobbies, Peer/friend influence, and Purpose of Use.

The most effective factors were the child having his own computer in his room, possession of a smart phone, unlimited internet in the home, the family inflicting punishments and exhibiting anger, the child not feeling valued within the family, feeling addicted, maternal control of duration of internet use or this being left up to the child, lack of hobbies or cultural activities, using the internet for reasons other than research or monitoring current affairs, and anticipated reactions from friends. As shown in Table 10, in the context of possession of technology and access, the risk of dependence was OR=1.55 (95% CI [1.22, 1.96]) higher in children with smart phones than in those without, and OR=1.54 (95% CI [1.14, 2.08]) higher in children with unlimited internet at home compared to those without. Not feeling valued within the family increased the risk of dependence OR=2.48 (95% CI [1.22, 1.96]), and the family becoming angry with or scolding the child increased the risk OR=2.46 (95% CI [1.84, 3.28]). In terms of control of dependence, the risk of dependence was OR=8.37 (95% CI [6.89, 10.16]) higher among children who thought themselves to be addicted compared to those with no such belief. The risk of dependence in children with hobbies was OR=1.43 (95% CI [1.05, 1.93]) and was OR=1.27 (95% CI [1.02, 1.57]) higher in children engaging in cultural activities than in those with no such activities. In terms of the peer/friend effect, the risk of dependence was OR=2.58 (95% CI [1.29, 5.13]) higher in children who thought they would be unable to make friends if they took no interest in the internet, OR=1.61 (95% CI [1.03, 2.58]) higher in children who thought their friends would mock them, and OR=1.73 (95% CI [1.07, 2.79]) among children who said that pressure would be put on them. The risk of

addiction increased OR=2.77 (95% CI [2.11, 3.61]) if the internet was not used for purposes of research or learning about current affairs. In conclusion, only variables exhibiting significant variation in terms of predicting internet addiction are shown in the model below.

$$\begin{aligned} \text{Internet addiction} = & 1.386 + .324 X \text{Ro} + .437 X \text{S} + .285 \\ & X \text{H} + .434 X \text{Ho} + .898 X \text{Fa} + .653 X \text{Fap} + .907 X \text{Fav} \\ & + 2.125 X \text{Add} + .373 X \text{C} + .300 X \text{Mo} + .356 X \text{Lh} + \\ & .237 X \text{Li} + .476 X \text{Tm} + .948 X \text{Tr} + .550 X \text{Tp} + .480 X \\ & \text{Ga} + 1.018 X \text{Not} + .631 X \text{Fs} \end{aligned}$$

## DISCUSSION

According to the findings elicited in the context of ownership of and access to technology, children with their own technological devices, with internet connections constantly turned on, with a computer in the home, with a smart phone, not sharing a computer with others, with internet access on their smart phones and home computers, and with unlimited internet access had higher internet addiction scores.

Children generally appeared to correctly determine whether or not they were addicted, and this factor also made a significant contribution to estimation at regression analysis. This factor can therefore be used as an indicator or to assist diagnosis or internet addiction. Earlier studies and observations in recent years have reported that individuals were unaware whether or not they were addicted or else denied such addiction, while it appears that children today have a greater awareness on the subject and evaluate themselves much more accurately.

Children who controlled their own length of time spent online and who did not permit their mothers or fathers to interfere in the time spent online, or whose parents did not interfere on the subject, had higher internet addiction scores. Control of use in that context is also one of the important markers and symptoms of internet addiction.<sup>18,41</sup>

Use should be limited, particularly for children (to less than 1-2 hours a day). Parents teaching their children to acquire conscious and safe technology use skills in early childhood will enable this to become a correct habit in later years.<sup>43</sup> In the same context, parents must also take care over the development of personality traits from early childhood in order that the child can acquire his own impulse control skills. Personality traits such as self-esteem and self-confidence being under the child's own control is of considerable importance in conscious technology use and in reducing the risk of addiction.<sup>19,40,43</sup>

In the context of purposes of internet use, children using the internet for reasons such as e-mail, social media, chatting, watching films/soaps/videos, and gaming had higher internet addiction scores. In contrast, children using the internet for research and following current affairs had lower internet addiction scores. A relation between internet addiction and purpose of use has also been identified in previous similar studies.<sup>18,41</sup> On the basis of that finding, children's use of the internet for purposes such as gaming and social media, activities for which they exhibit the greatest preference, should be limited, and parents need to exhibit the requisite sensibility on this subject.<sup>43</sup>

Based on our results concerning activities and relations with friends, children with hobbies, and engaging in physical and cultural/artistic activities had lower internet addiction scores. In contrast, children who were laughed at by their friends, unable to make friends, or pressurized when they did not use the internet had higher addiction scores. Powerful peer influence has been shown in addictions such as gaming and the internet has previously been shown in the literature.<sup>24</sup> The importance of being included in a group of friends and sharing various interests with them, particularly among adolescents, must not be forgotten.<sup>44</sup> This may cause the adolescent to make various sacrifices in order to make friends or be included in a peer group. This in turn may encourage the child or adolescent toward games played in the group or social media

activities, even if these are harmful. The point that parents need to be aware on this subject is that rules concerning the child's internet use must not solely apply to within the home, and the child's friends and school environment must also be kept under observation. The most effective method of doing this is for the child to regularly share his online activities and relations with friends with his parents.<sup>43</sup>

In terms of familial relations, children not living with their families, whose parents were alive but separated, whose families became angry with or scolded them, whose families limited their internet use, whose families punished or inflicted physical violence on them, and who did not feel valuable within the family had higher internet addiction scores. These findings may be interpreted as indicating that parents react in these ways because their child is addicted, or else the children of parents who exhibit such behavior may choose technology as a means of escape from their problems. Both scenarios have been shown to be likely in the literature. Previous studies have also emphasized the importance of the family in internet addiction.<sup>34,43,45,46</sup>

Based on the variables emerging in the regression model, children with a computer in their rooms, with smart phones, not sharing their computers with others, with unlimited internet, whose families scold or become angry with them, whose families punish them, who do not feel valuable within the family, whose time online is not controlled by the child or the mother, who think they are addicted, who have no cultural/artistic activities, who are concerned over their friends' reactions, and who use the internet for gaming and social media are all at greater risk of internet addiction. When the variables not exhibiting significant variation in the regression model were examined individually, significant variation was observed.

Accordingly, we may conclude that variables exhibiting variation in the model were common agent variables for internet addiction. It may also be concluded that varia-

bles for which significant variation was not obtained in the model, despite significant variation being observed individually, such as 'parents being separated' and 'lack of opportunity for physical activity,' were not valid for each group or were not among the holistic factors.

Many factors affecting the child can be examined in the contexts of family, friends, and other areas. Only a few of these were examined in the present study. This is certainly a limitation. However, it is exceedingly difficult, if not impossible, for numerous variables involved in such a multifactorial subject as internet addiction to be examined within the scope of the same study. Nevertheless, examination of multiple factors and different themes within the same sample might make important contributions to the subject. This will make it possible to observe the effect of different factors together and to determine common shares, because although the examination of each factor in different studies is valuable, it is not sufficient. As observed in the present study, although some factors are associated with internet addiction, the inclusion of multiple factors in a model and their holistic prediction of internet addiction may result in variations.

### CONCLUSION

This study investigated relations between internet addiction and a number of variables in a large sample and wide age group among children and adolescents. For that purpose, variables associated with themes predicting internet addiction, such as 'possession of and access to technology,' 'the family,' 'use control,' 'activities/hobbies,' 'peer/friend influence,' and 'purpose of use' were established by making particular use of the previous literature, and relations were examined in a holistic manner. Children's current internet addiction status was evaluated using two-step cluster analysis, and 17% of the children in the sample were determined to be internet-addicted. However, a high level of risk of addiction was also observed (39.8%). Several variables associated and themes related to internet addiction were examined, and the framework shown in Figure 1 was

obtained.

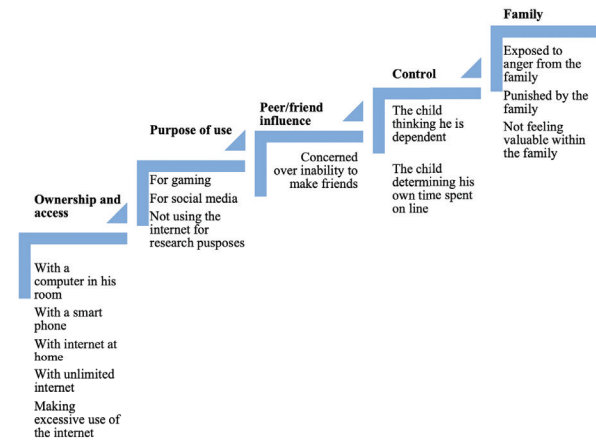


Figure 1. Internet addiction Framework

Although themes such as ownership of and access to technology, the family, control, peer/friend influence, and purpose of use and associated variables were not investigated in terms of a cause and effect relation with internet addiction, it may nevertheless be concluded that these factors increase, trigger, or facilitate internet addiction, or reduce the risk of addiction when the reverse of these variables applies. In contrast, hobbies or physical activity does not appear to be a factor acting together with other agents in predicting addiction or in the development thereof.

### RECOMMENDATIONS

The following recommendations are made for researchers and relevant stakeholders (such as parents, children, and counselors).

#### For Researchers

- Future longitudinal (observational) studies aimed at determining whether the factors in this study are causes or consequences of internet addiction, or else a holistic interpretation including interviews with parents and children in addition to quantitative data may be recommended.
- The identity of the factors associated with the approximately 50% of variance in the model that could not be explained might be investigated. Other themes in

addition to those known factors such as the family, friends, and activities might be included in the model, or further research might be conducted by expanding the scope of those themes.

- New studies might be designed and the contribution of variables predicting internet addiction used as auxiliary factors in the prevention or treatment of addiction might be investigated.

#### **For Stakeholders**

- Parents must restrict their children's internet use and ensure that their children develop self-control skills,
- Parents should encourage their children to take part in artistic, sporting, musical and scientific courses and activities,
- Parents should know who their children's friends are and must warn them against friendships with unsuitable individuals,
- Parents must plan activities at which the family come together and spend time together,
- Children must be made aware of the subject of internet addiction, and general societal awareness also needs to be established,
- Rather than blocking all content on the internet, parents should provide access to web sites and safe games appropriate to their children's ages.
- Children must be encouraged, at home and at school, to use technological devices for purposes of learning, communication, development, and research.
- Parents must communicate with their children and continually make them aware of the risks and dangers on the internet.

#### **Influence Board Approval**

**Approval was obtained from Karadeniz Technical University Scientific Research Ethics Committee for the study. (date and number of approval: 02/07/2018; No: 11).**

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