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Examining internet addiction levels of high school last-grade students

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Technological developments in the 21th century have enabled the emergence of tools that enable mass communication. This communication environment has brought about a continuing passion for technology in individuals and, with this passion, a communication pollution and addiction have begun to emerge. In this study, Internet addiction of high school last-grade students studying in Yeşilyurt district of Malatya city was analyzed and investigated according to gender and family monthly income. The population of the study consisted of 3442 last-grade students studying in 37 public high schools located in Yeşilyurt district of Malatya city in 2016 to 2017 academic year. The sample of the study was composed of 606 last-grade students from 17 high schools randomly selected from the schools in the population. The study model was the survey model. In the study, "Internet Addiction Scale" developed by Günüç (2009) was used to determine the Internet addiction levels of the students. This scale is composed of "withdrawal", "controlling difficulty", "disorder in functionality", and "social isolation" subscales. In the analysis of the data, arithmetic mean (\bar{x}) frequency (f), standard deviation (sd), k-mean set method, t-test and one-way ANOVA test were used. When these results were taken into consideration, it was observed that majority of the students in the sample were in the non-addicted group (43.3%). A significant difference was determined between gender and Internet addiction mean scores of the students. On the other hand, no significant difference was found between family monthly income and the internet addiction mean scores of the students.

Key words: Internet, Internet addiction, addiction, technology, technology dependence.

INTRODUCTION

The Internet, which has been developing and changing rapidly globally since its emergence, has greatly affected our lives and paved the way for advances in many areas. Internet has influentially shown its existence in many

fields such as economy, education, art, science, and daily life and even today it has become a must. The benefits of the Internet and its reflections on our daily lives are of course beyond measure. In addition, it has also led to the

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development of some negative behaviors. Internet addiction is the first of these. In general, addiction and substance use are thought to fulfill the function of helping an individual to overcome difficulties in daily life (Flores, 2004: 1). Addiction, which often refers to repeated behavioral routines mostly to obtain chemical substance, sometimes without purpose, is a psychiatric disorder in which the individual exhibits repetitive obsessions or imperative behaviors (Marks, 1990, 1389). Although it is traditionally seen as a phenomenon caused by psychotropic substances affecting human behaviors such as alcohol or cocaine, studies conducted in the last 30 years have shown that individuals can get harmed due to their behaviors and habits showing addiction signs. Overeating, gambling, shopping, sex and Internet usage can create similar problems with psychotropic substances (Padwa and Cunningham, 2010: 1). Therefore, the concept of addiction has started to be increasingly used to explain the behavior of many people (Netherland, 2012: 11).

The technology dependence which was defined as a non-chemical addiction type involving human and machine communication in these times when computers started to be used extensively was first introduced by Griffiths (1995: 14,15). With the spread of the Internet around the world from the mid-90s, Internet addiction has been defined as an important legal psychological disorder affecting cognitive, emotional, and social development of individuals (Price, 2011: 7). It was found that 6% of online users in America in 1998 are faced with this problem (Brenner, 2000: 452). However, unlike chemical dependency, excessive internet use has come to the forefront with some technological benefits that it provides to society rather than being criticized as addictive (Young, 2009: 217). When the first signs of Internet addiction appeared, it led to discussions among clinicians and academicians. Excessive Internet use has been considered by some as a type of pathological, addictive and technological addiction (Widyanto and Griffiths, 2006: 31).

The Internet use, one of the realities of the information age, has affected not only almost every field of life but also significantly the structure and presentation of education programs in education and school system. The Internet has made not only access to information easier, but also information independent of time and space. As a natural result of this situation, access to information seems to have ceased to be a problem (Aydemir et al., 2013: 1073). Proper definition of the concept of Internet addiction has shown variation depending on the perspectives. It is generally characterized by impulses or behaviors related to computer and Internet use which lead to distortion and distress along with uncontrollable engagement (Shaw and Black, 2008: 353). While some researchers have associated Internet addiction with dependencies including alcohol and substance use (Griffiths, 1999: 246), some others have associated it with

recurrent obsessions or compulsive (impulse) control disorders (Belsare et al., 1997). The expressions of pathological Internet use (Davis, 2001:187) and problematic Internet use (Caplan, 2003: 625) have also been used to describe this problem.

The concept of Internet addiction, the last link of technological dependence, was first mentioned by Ivan (Goldberg, 1996; Suler, 1999). Internet addiction is an uncontrollable, significantly time-consuming process resulting in problematic or social and professional difficulties (Shapira et al., 2000. s. 268). According to Young (2004), Internet addiction as a rapidly growing phenomenon is a concept including a wide range of behavior variety and impulse control disorder associated with gambling addiction (p. 402). Griffiths (1999) stated that Internet may not be an addiction for most of excessive users and other addictions can be a tool of satisfaction.

The number of Internet users which was 360 million people worldwide in 2000 (Internet World Status [IWS], 2019) exceeded 4.02 billion people in 2018 (Bayrak, 2018). According to data in 2018, the rate of Internet use among individuals in the age group of 16-74 years was 59.6 and 72.9%, respectively (Turkish Statistical Institute [TÜİK], 2018). The number of users was recorded as approximately 44 million people (IWS, 2019). This means that nearly one in two people is an active user. With such increase in the place of Internet in daily life, the relationship between many variables, especially psychological factors, and Internet addiction has been investigated. These studies have revealed that there was a correlation between problematic Internet use and psychological disorders such as attention deficit and hyperactivity disorder (Dalbudak and Evren, 2013; Ko, 2009; Öztürk et al., 2013; Yen et al., 2007), depression (Choi et al., 2014; Koronczi et al., 2013; Şahin et al., 2013; Şenormancı et al., 2014; Yang et al., 2014), loneliness (Yao and Zhong, 2014), neurotic personality (Tsai et al., 2009; Wang et al., 2011), low self-esteem (Armstrong et al., 2000; Aydın and Sarı, 2011; Sariyska et al., 2014), low self-control (Özdemir et al., 2014), academic failure (Stavropoulos et al., 2013), feelings of hostility (Koç, 2011) and insomnia (Anderson, 2001; Lam, 2014).

In this context, the aim of the study is to determine the Internet addiction status of the students with related literature and feedbacks from the students, identify the relationship of Internet addiction with the gender variable and family's monthly income, and to make contribution to the literature.

METHODOLOGY

In this study, the survey model, which aims to describe the situation as it is, was used. The survey models are the survey conducted on the whole population or a group; example or sample to be taken from the population in order to make a general judgment about the population in a population composed of many elements (Karasar,

2011: 110).

Study group

While conducting the sampling, first, it is necessary to define the study population by limiting the population in which the results are intended to be generalized in line with the purposes of the study. There is a study population which is the most appropriate one according to the purposes of the The population of the study consisted of 3442 students studying in the 4th grade in 37 high schools in Yeşilyurt District of Malatya city in the 2016-2017 academic year.

According to certain rules, the sample is a small cluster selected from a certain population and accepted as a adequacy of representation of the population in which it was selected. Studies are mostly carried out on sample sets and the obtained results are generalized to relevant populations (Karasar, 2011). The sample of the study consisted of 606 last-grade students who were randomly selected from 17 high schools.

Data collection tool

In order to determine the Internet addiction levels of the students in the study, "Internet Addiction Scale" developed by Günüç (2009) was used. The scale consists of 35 items including "withdrawal", "controlling difficulty", "disorder in functionality" and "social isolation" subscales.

Data analysis

In the study, the data related to the participants were analyzed by using The Statistical Package for Social Sciences (SPSS) 22.0 packaged software. After uploading the data obtained with scales into the computer environment, Test of Normality was conducted to determine whether they had normal distribution or not. In a statistical study, the distribution should be normal or close to normal for many tests to be performed (Kalaycı, 2006). While many features show a normal distribution in the population, deviations from the normal distribution will occur if the measurements of a property of interest are obtained from a small group ($n < 30$). As the size of the group increases, the distribution will approach normal (cited by Büyüköztürk et al., 2014: 63 from Ravid, 1994). Tabachnick and Fidell (2005) have accepted that the distribution is normal when skewness and kurtosis values vary between +1.500 and -1.500 (p. 81). As a result of the applied test of normality, it can be asserted that the distribution in the study was normal since the skewness (0.762) and kurtosis (0.074) values of the scale items were between the values of +1.500 and -1.500. For this reason, arithmetic mean (\bar{X}), frequency (f), standard deviation (sd), k-mean set method, t-test and one-way ANOVA test were used to analyze the data in the study. The significance value was taken as ($p < 0.05$) in the data analysis.

RESULTS

Information related to the distribution of the students in terms of their demographic characteristics are given in frequency and percentage in Table 1. As seen in Table 1, 52% (51.6%) of the students in the sample group were female and 48% (48.4%) were male students. Besides, it was found that the monthly income of the families of the students was mostly (39.2%) between 1501-3000 TL.

The score distribution of the students from their answers to the scale was examined and Table 2 shows the analysis results.

As seen in Table 2, the lowest mean score of the participants from Internet Addiction Scale was 1.00 and their highest mean score was 4.94. The arithmetic mean obtained from the scale was $\bar{X} = 2.37$ and standard deviation was $sd = 0.89$.

In order to determine the group with or without Internet addiction and to obtain more detailed results about the addiction statuses of the individuals, "clustering analysis" technique from sample classification techniques was applied. The general purpose of the clustering analysis is to reveal the similarities of the units according to their certain characteristics and to classify the units into the correct categories based on these similarities (Çokluk et al., 2014: 139). This method has also allowed to reveal some extreme values found to be implicit in the sample. With this clustering method, addiction levels of individuals can be classified in a healthier way (Günüç and Kayrı, 2009: 171).

In order to determine a more detailed result in the determination of the addiction statuses of individuals, the clustering analysis was applied and it was observed to consist of three sub-clusters. Accordingly, as seen in Table 2, "addicted group" was in the first cluster, "group with the addiction risk" was in the second cluster and "non-addicted group" was in the third cluster. In the naming of clusters, Günüç (2009)'s classification was taken as an example. Table 3 shows frequency and percentage distributions of the Internet addiction scores of students by considering the students' scores obtained from the scale total related to their Internet addiction levels.

In Table 3, the majority (43.3%) of 606 high school fourth-grade students participating in the study were seen to be in non-addicted group. This was followed by Risk Group (42.6%) and Addicted Group (14.1%), respectively. In the literature review conducted based on these data, it was observed in the study by Özdemir (2016) that 1.5% of the sample were addicted Internet users. Addicted group forms 7% of the sample in the study by İşleyen (2013), 10.1% in the study by Günüç (2009), 0.4% of the study by İnan (2010), 0.2% in the study by Çalışgan (2013), 23.2% in the study by Balcı and Gülnar (2009), 17% in the study by Durualp and Çiçekçioğlu (2013) and there was no addicted group in the studies by Yücelten (2016) and Döner (2011). These rates were found in some other studies as 4% (Wang et al., 2011), 1.1% (Bayraktar, 2001), 3.1% (Kaltiala-Heino et al., 2004), 2% (Johansson and Götestam, 2004), 20.7% (Yen et al., 2007), 2.4% (Cao and Su, 2007), 8% (Elizabeth and Tee, 2007), and 4.3% (Jang et al., 2008) (Cited., by Günüç, 2009; p. 89). It was observed that 14% of the sample in the study by Özdemir (2016) were risky Internet users, 9% of the sample in the study by İnan (2010) were the group showing Internet addiction

Table 1. Demographic characteristics of the students.

Variable	Options	Frequency	Percentage
Gender	Female	313	51.6
	Male	293	48.4
	Total	606	100
Family monthly income	0-1500	137	22.6
	1501-3000	238	39.2
	3001-4500	141	23.2
	4501 and higher	90	15.0
	Total	606	100

Table 2. Distribution of the mean scores of the students from internet addiction scale.

	Number of people (N)	Lowest score	Highest score	\bar{X}	Standard deviation
Score Value	606	1.00	4.94	2.37	0.89

Table 3. Frequency and percentage distributions related to Internet addiction levels of the students.

Clustering (k-mean)	f	Total (%)
1 (Addicted Group)	85	14.1
2 (Risk Group)	258	42.6
3 (Non-addicted Group)	262	43.3
Total	606	100

symptom, 28.4% of the sample in the study by Balcı and Gülınar (2009) were risky Internet users, 11% of the sample in the study by Yücelten (2016) were Internet addiction risk group, 9% in the study by Döner (2011) were those showing limited symptom, 23% of the sample in the study by İşleyen (2013) were risk group, 14% of the sample in the study by Şahin (2011) were those showing limited symptoms, 66% of the study of Durualp and Çiçekçioğlu (2013) were risk group, and 29% of the sample in the study by Günüş (2009) were risk group.

Table 4 shows the mean scores used in the determination of these three groups obtained as a result of the applied clustering analysis method. When Table 4 was examined, it was determined that the mean score of the students in the addicted group was 3.58, the mean score of the students in the risk group was 2.40 and the mean score of non-addict students was 1.51. Table 5 shows the results of "t-test" conducted to determine whether there is a significant difference between the Internet addiction scores of high school last-grade students by their gender. When Table 5 was examined, no differentiation was determined in withdrawal subscale of the Internet addiction scale of high school last-grade students based on gender variable 0.11 ($p>0.05$).

Internet addiction mean scores significantly differentiated in terms of gender at the value of $p<0.05$ in overall Internet addiction scale ($p=0.04$), controlling difficulty ($p=0.00$), disorder in functionality ($p=0.03$) and social isolation subscales ($p=0.04$). When the arithmetic means were examined, it was observed that the male students caused the significant difference. The study results revealed that male students were under more risk in terms of Internet addiction compared to female students. In the literature review conducted in this context, a large number of studies supporting the study results were found. The correlation between the Internet addiction and gender was examined in the study conducted by Usta (2016) and a significant correlation was found between Internet addiction and gender variable. As a result of the analysis, it was concluded that male students showed more Internet addiction behavior than female students. Similarly, Gencer (2017) stated that male students showed more Internet addiction behaviors than female students. Ayaroğlu (2002) examined the correlation between Internet uses of the university students and their loneliness levels and concluded that men spend more time than women in the fields of surfing on web and file transfer. Scherer (1997) examined 531

Table 4. Group averages of the students related to their internet addiction statuses.

Clustering (k-mean)	\bar{X}
1 (Addicted Group)	3.58
2 (Risk Group)	2.40
3 (Non-addicted Group)	1.51

Table 5. Internet addiction levels of the students on the gender variable.

Dimensions	Gender	N	\bar{X}	sd	t
Withdrawal	Female	313	2.57	0.97	4.27
	Male	293	2.58	1.07	
Controlling difficulty	Female	313	2.27	0.88	0.25
	Male	293	2.31	0.91	
Disorder in functionality	Female	313	2.22	0.94	0.28
	Male	293	2.26	0.96	
Social isolation	Female	313	2.31	0.88	3.52
	Male	293	2.41	0.92	
Internet addiction scale (general)	Female	313	2.36	0.80	1.22
	Male	293	2.37	0.85	

N=606, p<0.05.

students in terms of Internet usage and determined that the majority of students (71%) determined to be Internet addicts were male students. Similarly, Döner (2011) reached a total of 624 students including 282 females and 342 males in her study and, according to the results of the study, Internet addiction of the male students differed significantly compared to female students and this difference was observed in favor of men. Similarly, Morahan-Martin and Schumacher (2000), Chou and Hsiao (2000), Bayraktar (2001), Koch and Pratarelli (2004), Aktaş (2005), Yang and Tung (2007), Balta and Horzum (2008), Ögel and Cömert (2009), Günüş (2009), Kelleci et al. (2009), Tsai et al. (2009), Esen (2010), Gürcan (2010), Yıldız (2010), Taçyıldız (2010), Gençer (2011), Liberatore et al. (2011), Carli et al. (2012), Gökçearslan and Günbatar (2012), Yılmaz (2013), Zorbaz (2013), Türkoğlu (2013), Azher et al., (2014), Waldo (2014), Ceyhan (2016), İşsever (2016) and Ünsal (2016) also found that male students had higher Internet addiction levels than female students in terms of gender variable. These results support the data obtained concerning the variable of gender in the study.

It is also possible to find studies in the literature that show that there is no significant differentiation between Internet addiction and gender. Brenner (2000), Batıgün (2011), Kaya (2011), Jelenhick et al. (2012), Hawii (2012), Çalışgan (2013), Andreou and Svoli (2013),

Dikme (2014), Dalgali (2016), and Yücelten (2016) have also found that gender has no effect on Internet addiction. A limited number of studies have revealed that Internet addiction is in favor of female students (Beşaltı; 2016; Griffiths, 1995).

The differentiation between the gender variable and Internet addiction is thought to be caused by the measurement type of Internet addiction level in the studies or the cultural differences due to different countries (Balta and Horzum, 2008: 187-205). When the studies are examined in general, the reasons why men have higher Internet addiction level than women are that there is gender inequality in the society, men are left more comfortable and free in the society, and men can go Internet cafés more than women (Çavuş and Gökdaş, 2006: 57; Taşpınar and Gümüş, 2005: 80). On the other hand, female students can be deprived (Atlasma and Gökdaş, 2006), their spare time is taken away by taking many responsibilities at home or their areas of freedom is reduced by interfering (Cited, Yılmaz, 2013: 75).

In Turkish society, males can be more comfortable and free compared to females due to the reasons such as tendency of men to move away from family after a certain age, adolescent period syndromes and friend environment. Besides, the general family structure of the Malatya province may be one of the reasons of higher Internet addiction scores of men. Table 6 shows

Table 6. Variance analysis results of the students' internet addiction scores based on family monthly income.

Dimensions	Income level	Sum of squares	Sd	Mean of squares	F
Withdrawal	Intergroup	11.251	9	1.25	1.311
	Intragroup	567.497	595	0.95	
	Total	514.585	604		
Controlling difficulty	Intergroup	9.828	9	1.09	1.123
	Intragroup	579.795	596	0.97	
	Total	589.624	605		
Disorder in functionality	Intergroup	12.063	9	1.34	0.313
	Intragroup	608.200	596	1.02	
	Total	620.263	605		
Social Isolation	Intergroup	14.582	9	1.62	0.403
	Intragroup	688.019	596	1.15	
	Total	702.601	605		
Internet Addiction Scale (General)	Intergroup	9.274	9	1.03	1.295
	Intragroup	474.089	596	0.79	
	Total	483.363	605		

$p < 0.05$.

arithmetic mean and standard deviation of the students related to Internet addiction according to the family monthly income.

When Table 6 was examined, a significant difference was determined between Internet addiction status of the students and their family income level at the level of $p < 0.05$ ($p = 0.23$) for the overall Internet addiction scale. When the subscales of the scale were examined, no significant difference was observed in all of the subscales at the level of $p < 0.05$. No significant difference was determined between Internet addiction of the students and the monthly income level of their families.

The fact that Internet access is cheap and comfortable for individuals from all socio-economic levels can be shown as the reason why there was no significant difference between Internet addiction and the families' monthly income levels. This result supports most of the results in the literature conducted in terms of the variable of family monthly income level. According to the study by Song (2003) and Balta and Horzum (2008), it was found that there was no correlation between the Internet addiction and socio-economic level. Bakken et al. (2009) also found no significant difference between the income level and Internet addiction. Esen (2010), İnan (2010), Gençer (2011), Beşaltı (2016), Ceyhan (2016) and Dalgacı (2016) have also found similar results.

In the literature, it is possible to see studies contrary to the findings from the present research. In the study by

Yılmaz (2013) it was found that students with high economic level were more Internet addicted than the students with moderate economic level. According to Şahin (2011) as the families' income level increased, the students' tendency to Internet addiction increased. Similarly, Bayraktar (2001), Batıgün and Kılıç (2011), and Sevindik (2011) also found a significant and positive difference between economic level and Internet addiction. The study by Kayri and Günüş (2016) revealed that "the children of families with high socioeconomic levels are more likely to have Internet addiction".

Conclusion

Based on the results obtained from the study, the following conclusions were reached.

(i) As a result of the clustering analysis conducted to investigate the Internet addiction levels of high school last-grade students, 14% of the students were in addicted Group, 42% were in the group with addiction risk and 43% were in non-addicted group.

(ii) It was determined that the students' mean scores from Internet addiction scale differed according to the variable of gender. This differentiation was observed in favor of male students. The mean scores of male students were higher than the mean scores of female students.

(iii) The family's income levels of the students were found to be mostly between 1501-3000 TL and there was no significant correlation between their mean scores of Internet addiction scale.

The following recommendations may be given in accordance with the findings and results obtained from this study:

(i) When considering that 42% of the students were involved in the risk group, high school students should be informed about Internet addiction in both information courses and in other related courses and necessary contents can be added into these courses.

(ii) Families and children can be aware of addiction through various channels using the developing technological possibilities and mass media in order to stand out that the Internet addiction has an important place like other substance addiction.

(iii) Although high school students are open to new ideas and innovations, it is generally accepted that they do not have enough experience to question the validity of these ideas and innovations. Therefore, parents should limit and guide the Internet use of their children.

(iv) Parents should be informed about the family protection programs and the necessary support for the effective use of the program should be provided by the relevant institutions.

(v) This study was carried out with high school students studying in Yeşilyurt District of Malatya city and similar studies can be conducted in other regions with larger population and sample.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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