

Original Article

Relationship between Problematic Internet Use and Eating Awareness in Adolescents: A Correlation Study

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Abstract

Purpose: Internet use, which has become an integral part of life all over the world, causes some eating and nutritional disorders, especially in adolescents. This study aims to determine the relationship between problematic internet use (PIU) and nutrition/eating awareness in adolescents.

Methods: This study was applied on 11th and 12th grade students studying at three high schools in Turkey. 390 students participated in the study. During data collection, Generalized Problematic Internet Use Scale 2 (GPIUS2) and Mindful Eating Questionnaire (MEQ) were used. Frequency, percentage, arithmetic mean, and standard deviation were used for descriptive data. Chi-square test, t-test, ANOVA, Kruskal Wallis variance analysis, Pearson correlation analysis, and multiple linear regression analysis were employed for data analysis.

Results: The mean of the GPIUS scores of the students participating in the study is 52.5 ± 21.5 . 28.5% of the adolescents have stated that they daily use the internet for 5 hours or more. In the study, the adolescents who have stated that they consume energy drinks have higher PIU scores than those who do not consume ($P < 0.05$). The PIU scores of the adolescents who have stated that they are influenced by food advertisements on the internet are found to be significantly higher ($P < 0.05$). In the study, an opposite correlation is determined between GPIUS and subscale scores, and MEQ and its subscales ($P < 0.05$).

Conclusion: Adolescents with higher PIU scores have stated that they are influenced by food advertisements more, those who consume energy drinks have higher PIU scores and, as PIU scores increase, eating awareness decreases.

Key words: Problematic internet use, adolescent health, eating awareness, internet addiction, mindful eating

Introduction

Today internet has become increasingly widespread and this has made internet addiction, which is an increasing public health issue, debatable. Adolescents are among the age groups who are mostly affected by technological developments and also who use them most (Shamel et al., 2012). The period of adolescence is defined as a suitable period to gain new knowledge and skills as well as to learn to manage sentiments and relationships. As the capabilities of the adolescents are under development during this period, when

they start to act outside the frontiers of their families, they could be vulnerable. **Σφάλμα! Δεν έχει οριστεί σελιδοδείκτης.** Internet addiction (or problematic internet use) is characterized with loss of control when using the internet and feeling distress, mood swings, distancing from society, and decrease of social, professional and academic performance in the absence of the internet.

Today, internet has become an indispensable part of everyday life in the whole world. With the recent and ongoing Covid-19 pandemic; the use of the internet has increasingly

become more prevalent due to remote working, education, socializing, shopping, entertainment, and banking transactions. In order to alleviate the effects of the Covid-19 pandemic and prevent it from spreading, many countries have decided to make their citizens stay at home. When staying at home, people have started to spend more time on the internet to combat the fear and anxiety caused by this disease. However, this situation can become pathological, especially in vulnerable individuals (Királyet al., 2020).

Although technological developments facilitate accessing knowledge and communication, it is pointed out in the literature that excessive use of the internet and smartphones may lead to several mental and physical health problems (Derevensky, 2019). Lack of self-control and impulsivity in adolescents, who are at their growth and development stage, causes problematic internet use. In this context, the internet may lead to good use of the technology such as obtaining information about healthy eating as well as harmful uses such as the negative effects of the technology on body image and the abuse of online information by people with eating disorders (Shamel et al., 2012).

Adolescence is assumed to be a vulnerable period of life especially in terms of nutrition due to various reasons. Some of these reasons include increased need of nutrients and calories due to dramatic increases in physical growth and development in a relatively short period of time, the change of lifestyles and eating habits of the adolescents, and exercising (Rickert, 1996). Overweight and obesity, which are among the most common nutrition problems in the world, are increasingly observed in children and teenagers. It is reported that the prevalence of overweight and obese children and adolescents, between the ages of 5 and 19, increased from 4% to 18%, from 1975 to 2016.

In Turkey, it has been determined that within the age group of 15 to 24 years, 8.6% of the males and 17.7% of females are underweight, 18.7% of the males are pre-obese and 3.5% of them are obese, and 14.6% of the females are pre-obese and 4.1% of them are obese. In several studies, it has been reported that

problematic internet use is associated with different eating disorders such as weight control, anorexia nervosa, and bulimia nervosa as well as with eating attitudes (Hinojo-Lucena et al., 2018; Berber-Celik et al., 2015).

Mindful eating corresponds to the formation of the eating behavior, being aware of the hunger-fullness concepts, eating habits, and why and what we eat, as well as conscious nutrition (Tulloch et al., 2015; Colak and Aktac, 2019). At the same time, mindful eating is used to denote the non-judgmental awareness of physical and emotional sensations in eating or food related settings (Wansink, 2004).

It is pointed out in the literature that awareness-based approaches can decrease compulsive over-eating, handle related behavioral and emotional disorders, and promote the internalization of the change (Kristeller et al., 2014). A study by Kim et al. (2020) determines that high-risk internet users have malnutrition behavior and poor diet quality, which may result in insufficient growth and development. It is suggested that nutritional education should be given to high-risk internet users to ensure proper growth and development (Kim et al., 2020). In this study, we aim to examine problematic internet use in adolescents and its effect on mindful eating.

Materials and methods

Kind of study: The study is a cross-sectional one

Population: This study has been applied on 11th and 12th grade students who study at three different high schools in Giresun province of Turkey.

Sample: The high schools are determined by simple random sampling. In order to conduct the study, written permission is obtained from Provincial Directorate of National Education. Data is collected at the classrooms after contacting the principles of the high schools and determining the dates and times of data collection with them. Required explanations were given to the students and volunteering students have been included in the study. This study complies with the principles of Helsinki declaration. A total of 390 students have participated in the study.

Instruments of data collection: The data is obtained using a questionnaire form which includes questions regarding socio-demographic characteristics and internet usage practices

The Generalized Problematic Internet Use Scale 2 (GPIUS2) and Mindful Eating Questionnaire (MEQ).

GPIUS2, which has been developed by Caplan et al. (2000), investigates problematic internet use among university students together with its relationship with some psycho-social variables such as depression, solitude, self-esteem, and shyness. Its reliability and validity study in Turkey is performed by Deniz and Tutgun-Unal (2016) on university students. The reliability and validity study on high school students in Turkey is performed by Canogullari-Ayazseven and Cenkseven-Onder (2019). The scale comprises 15 items and 5 factors, and is easy to use. In its adaptation to Turkish, two factors are combined into one and hence the total number of factors is 4. These factors include preference for social interaction on the internet, mood regulation, lack of self-control, and negative consequences. In the evaluation of the scale, the responses range from 1 (strongly disagree) to 8 (strongly agree). The total score that can be obtained from the scale ranges from 15 to 120, and as the total score increases, problematic internet use is assumed to increase (Caplan et al., 2000; Deniz and Tutgun-Unal, 2016).

MEQ is a scale developed by Framson et al. (2009) to assess mindful eating and comprises questions of 5-point Likert type. Its reliability and validity study for Turkish is conducted by Kose et al. (2016). The scale has 7 sub-dimensions: disinhibition, emotional eating, eating control, focus, eating discipline, awareness, and interference. Higher total scale scores correspond to higher rates of mindful eating (Kose et al., 2016).

In this study, SPSS version 18 and Excel are used for data analysis and graphics. Frequency, percentage, arithmetic mean, and standard deviation are used for descriptive data. For data analysis, Chi-square test, t-test, ANOVA test, Kruskal Wallis variance analysis, Pearson correlation analysis, and multiple linear regression analysis are

performed. $P < 0.05$ is assumed to be significant.

Ethical Issues: Prior to conducting this study, written permission is obtained from Provincial Directorate of National Education.

Consent for participation: Explanations regarding the study are provided to the students and those students who agreed to participate are included in the study.

Consent for publication: Information regarding the publication of the data analysis results in a scholarly journal is provided to the students and Provincial Directorate of National Education.

Results

Socio-demographic characteristics and practices of adolescents regarding internet usage are presented in Table 1. The mean age of the adolescents who have participated in the study is 17.2 ± 0.8 . 53.3% of the participants are males and 88.5% of them reside in the city. 8.7% of the participating adolescents have reported that they have a chronic disease and 16.9% of them suffer from vision problems. 43.1% of the students have stated that they spend 3 to 4 hours a day on the internet while 28.5% of them have stated they spend more than 5 hours on the internet every day. 80.8% of them use the internet for the purpose of Instagram while 70% use it for music, 52.3% use it for lessons, 42.8% for games, and 37.0% for Facebook.

The percentage of the participants who think that internet negatively affects their health is 34.6%. 52.6% of the participating students do not have breakfast regularly, and based on their statements, 36.9% of them smoke, 44.9% of them consume energy drinks, and 41.8% of them are influenced by food and beverages that they see on the internet and want to have those food and beverages (Table 2).

The mean score of the female students from the problematic internet use (PIU) scale is 52.57 ± 20.1 ; that of the male students is 52.37 ± 22.6 , and no significant difference is found between female and male students with respect to problematic internet use ($P > 0.05$). For those students who spend 5 hours or more on the internet, the problematic internet use scale scores are found to be significantly high ($P < 0.01$) (Table 2).

The mean score on the PIU scale of the students who have stated that they are influenced by the food and drink advertisements on the Internet and want to have them is 56.02 ± 20.3 , and the difference these students and those who have stated that they are not influenced is significant ($P < 0.01$). No significant difference is found between the mean scores of the PIU scale of smoking and non-smoking students. The PIU score of the students who have stated that they drink energy drinks is 55.21 ± 23.0 , and it is significantly higher than those who have stated that they do not drink energy drinks ($P < 0.05$).

Mean of the total MEQ scores is 95.23 ± 14.1 for female students and 94.57 ± 12.6 for male students, and no significant difference is found between female and male students in terms of mindful eating ($P < 0.05$). It is observed that eating awareness of the students who daily spend 4 hours or less on the internet is higher than those students who spend 5 hours or more on the internet, and this difference is statistically significant ($P < 0.05$). Eating awareness of the students who have their breakfasts regularly is significantly higher ($P < 0.05$). MEQ scores of the students who do not smoke are found to be

significantly higher ($P < 0.05$). No significant difference is observed between those students who state that internet affects their health and those who state that it does not affect ($P > 0.05$). Eating awareness of those adolescents who state that they are not influenced by the food and beverage advertisements is higher compared to that of the adolescents who state that they are influenced, and the difference is statistically significant ($P < 0.05$).

The correlation between PIUS and subscale scores, and MEQ and subscale scores is presented in Table 3. Opposite correlation is determined between the PIU and MEQ scores of the adolescents participating in the study ($P < 0.001$) (Figure 1). Negative correlation is found between MEQ and mood regulation subscale of PIU ($P < 0.001$). Negative correlation is also observed between MEQ and lack of self-control subscale of PIU ($P < 0.001$). Similarly, negative correlation is found between MEQ and negative consequences subscale of PIU ($P < 0.01$). Negative correlation is observed between PIU and MEQ subscales including disinhibition, emotional eating, eating control, eating discipline, and interference, as well ($P < 0.001$).

Table 1: Socio-Demographic Characteristics and Internet Usage Practices of Adolescents

Characteristics		N	%
Gender	Female	181	46.4
	Male	208	53.3
Place of Residence	City	345	88.5
	Town	7	1.8
	Village	30	7.7
Chronic Disease	Yes	34	8.7
	No	351	90.0
Vision Problem	Yes	66	16.9
	No	320	82.1
Medium for Internet Use	Cellular phone	367	94.1
	Computer	150	38.5
	Tablet	90	23.1

Time Spent on the Internet (Daily)	1-2 hours	105	26.9
	3-4 hours	168	43.1
	5 hours or more	111	28.5
Purpose of Internet Use	Instagram	315	80.8
	Facebook	145	37.2
	Education	204	52.3
	Movies	242	62.1
	Games	167	42.8
	Music	273	70.0
	News	128	32.8
	Banking	14	3.6

Table 2: The Means of Problematic Internet Use (PIU) Scores of Adolescents and Distribution of Mean Mindful Eating Questionnaire (MEQ) Scores with respect to Some Variables

Characteristics		PIU			MEQ		
		N	Mean	P	N	Mean	P
Does Internet Affect Your Health?	Yes	122	51.5±21.7	0.197	109	94.5±13.5	0.929
	No	219	51.4±21.4		181	94.7±13.3	
Do You Smoke?	Yes	124	54.2±20.3	0.225	110	92.7±12.0	0.048
	No	214	51.2±22.0		178	96.0±14.2	
Do You Have Breakfast Regularly?	Yes	160	51.6±21.2	0.578	134	96.5±13.6	0.034
	No	179	52.9±21.6		154	93.1±13.2	
Do You Drink Energy Drinks?	Yes	155	55.2±23.0	0.023	126	94.7±13.1	0.999
	No	184	49.9±19.7		162	94.7±13.8	
Are You Influenced by Food and Beverage Advertisements on the Internet?	Yes	141	56.0±20.3	0.007	127	90.5±13.4	0.000
	No	190	49.6±21.9		155	98.2±12.2	

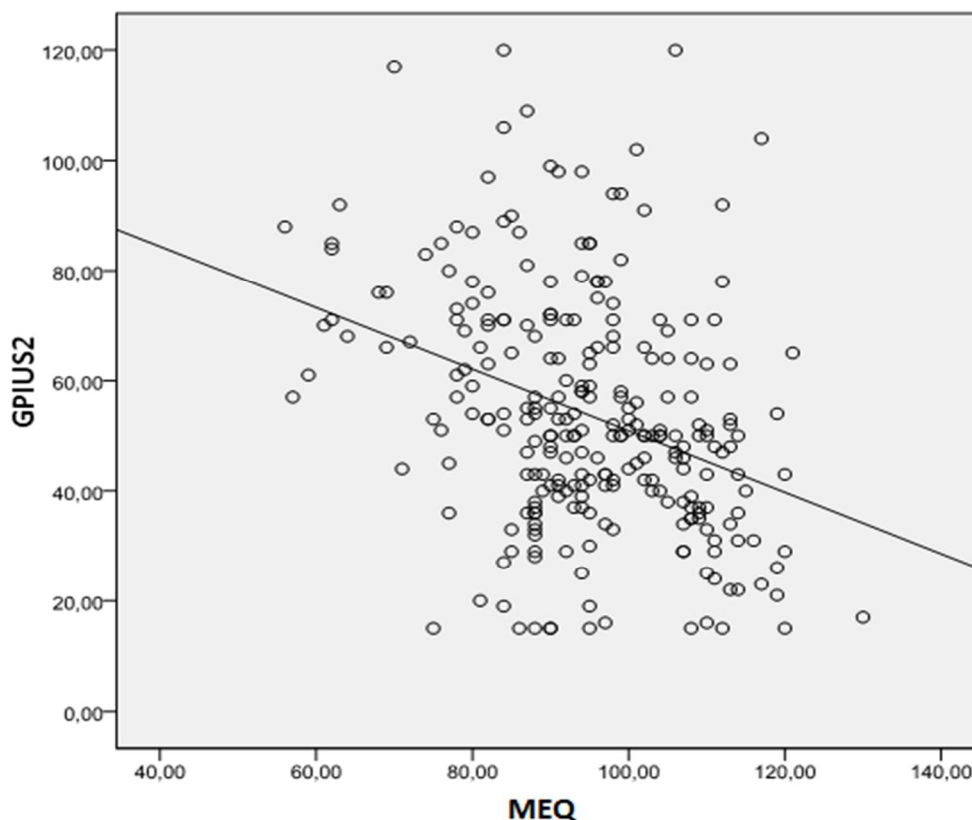


Figure 1. The Correlation between GPIUS2 and MEQ Scores.

Table 3: The Correlation between Problematic Internet Use Scale (PIUS) and Subscale Scores and Mindful Eating Questionnaire (MEQ) and Subscale Scores

	PIUS		Preference for social interaction		Mood regulation		Lack of self-control		Negative consequences	
	R	P	R	P	R	P	R	p	R	P
MEQ	-0.344**	0.000	-	0.007	-0.201**	0.000	-0.284**	0.000	-	0.005
			0.147**						0.154**	
Disinhibition	-0.293**	0.000	-0.082	0.065	-0.205	0.000	-	0.000	-0.112*	0.019
							0.279**			
Emotional eating	-0.231**	0.000	-0.076	0.078	-	0.000	-0.190**	0.000	-0.103*	0.027
					0.177**					

Eating control	-0.209**	0.000	- 0.171* *	0.001	-0.115*	0.015	-0.155**	0.002	-0.053	0.163
Focus	0.016	0.387	0.043	0.214	0.076	0.079	-0.108*	0.021	-0.038	0.239
Eating discipline	-0.155**	0.003	- 0.129**	0.008	-0.097*	0.035	-0.104*	0.026	-0.058	0.142
Awareness	-0.107*	0.027	-0.086	0.056	-0.110*	0.021	0.026	0.315	-0.033	0.271
Interference	-0.209*	0.000	- 0.189**	0.000	-0.061	0.125	-0.125	0.009	-0.106*	0.023

*P<0.05, **P<0.001

Discussion

The use of the internet and smartphones has increased considerable all over the world. This situation leads to several benefits for individuals, yet, it is also associated with several health problems due to excessive use (WHO, 2015). In a study conducted by Kucuk(2017) on university students, 60.8% of the participants have stated that internet affects their health and 43.1% have indicated that internet negatively affects their health.

The novel coronavirus disease (COVID-19) has led to widespread school closures and physical distance measures, and it in turn has made online platforms and communities necessary to maintain a sense of normality. Children and their families are increasingly turning to digital solutions to support children's learning, socialization and playing games. While digital solutions provide significant opportunities to uphold and promote children's rights, the same tools can also increase children's exposure to online risks.

At the time the study is conducted, the mean problematic internet use score of the students is 52.55±21.5 and is at a medium level. 28.5% of these adolescents use the internet for 5 or more hours daily. The PIUS scores of the adolescents using the internet for 5 or more hours daily are significantly high (P<0.01). In

a study conducted by Jang et al. (2008) on Korean students, it is determined that increase in the hours spent on the internet daily is related with problematic internet use. In another related study, it is pointed out that the most important factor that affects internet addiction is internet usage time (Zirhlioglu, 2011).

In this study, 44.9% of the adolescents have stated that they consume energy drinks and the PIUS scores of these adolescents are significantly higher compared to that of the adolescents who do not consume energy drinks (P<0.05). In another study carried out by Costa et al. (2014) on young adolescents it is concluded that adolescents consume energy drinks without knowing that they are personally harmful and that the advertisements and attractiveness of energy drinks show similarities to that of alcohol and tobacco.

Exposure to food advertisements can increase the desire to consume products. Online strategies that are used to promote high-energy, low-nutritional foods are particularly worrisome because of their impact on children (Pettigrew et al., 2013). In the current study, 41.8% of the participating students have stated that they are influenced by the food and drinks that they see on the internet, and the PIUS scores of these students are

significantly higher. In a study by Durmus(2018), which investigates obesity and problematic internet use in adolescents, it is determined that snacking in front of computer and not having breakfast are associated with problematic internet use.

Eating awareness is defined as nutrition by recognizing the causes of eating behavior, being aware of feelings and thoughts about nutrition, focusing on food to be consumed without being affected by environmental factors (Baer et al., 2005). In the study by Yildirim(2016) who analyzes the relationships between internet addiction, obesity, and self-respect, it is found that internet addiction stands as a risk for obesity during adolescence period and that it threatens health by affecting dietary habits and lifestyle. In our study, we have determined that eating awareness of those adolescents who daily spend 5 hours or more on the internet is significantly lower compared to that of the adolescents who daily spend 4 hours or less on the internet. In the related study (Hinojo-Lucena et al., 2018), it is concluded that there is a relationship between PIU and eating disorders, and it is also emphasized that there is a need to prevent PIU during childhood and adolescence.

In our study, an opposite correlation is found between PIU and subscale scores, and mindful eating and subscale scores. It is observed that as PIU increases eating awareness decreases. In the study by Eliacik et al. (2016), a significant relationship between internet addiction and obesity was observed. In studies conducted on children, adolescents, and teenagers, a relationship is determined between eating disorders and PIU. Students under the risk of PIU are more under risk for eating disorders (Yu, 2019). Preventive trainings on this subject can be given in education levels before university education (Hinojo-Lucena et al., 2018).

Conclusion: It is recommended to carry out more studies on the effects of problematic internet use on mindful eating in adolescents, to provide trainings for adolescents on internet use and healthy nutrition, and to

integrate trainings on healthy nutrition and healthy internet use into lessons.

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