INTERNET ADDICTION, SUBSTANCE USE AND ALEXITHYMIC DIMENSIONS IN TWO DIFFERENT FACULTIES' STUDENTS

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SUMMARY

Objectives: The aim of this study was to evaluate the relationship between internet addiction, substance use and alexithymia among students of education faculty and medical faculty.

Methods: This cross-sectional analytical study included 1,257 faculty students aged 18 and over, studying at Meram Medical Faculty and Ahmet Keleşoğlu Faculty of Education. Young's Internet Addiction Scale, Toronto Alexithymia Scale, Fagerström Tobacco Addiction Test and CAGE alcohol use tests were applied to collect data.

Results: The mean age of the participants was 21.12 ± 1.96 years, 71% (n = 893) of them were females and 29% (n = 364) were males, 37.9% (n = 477) were training at medical faculty, 62.1% (n = 780) were training at the faculty of education. Of the students, 1.5% were internet addicts, 15.3% were possible addicts, and 22.8% had alexithymia. Internet addiction was higher in those with higher alexithymia scores (p < 0.001). Internet addiction was significantly higher in male students, the third grade, ones with lower academic success, students who work their lessons less than 2 hours a week. Internet addiction was also significantly higher in smokers and alcohol users (p < 0.001). While there was a low negative correlation between the first internet using age and internet addiction (p < 0.001), there was a moderately significant positive correlation between spending uninterrupted time on the internet and internet addiction (p < 0.001).

Conclusion: In this study, it was determined that the teacher and doctor candidates, who are studying at the faculties of education and medicine, were at risk of internet addiction. A teacher or a doctor who cannot develop social skills due to excessive internet use will not be a good model to communicate correctly with the target population.

Key words: internet addiction, alexithymia, faculty student

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INTRODUCTION

Internet usage is getting more widespread as information technologies gain importance day by day. Although the purpose of using the internet is primarily to facilitate information seeking, interpersonal communication and commercial transactions, it has now gained a place in the centre of some users' lives (1). The increase in the prevalence of internet use arouses curiosity about this issue and raises overuse problems. Studies reveal that internet users also start to behave similar to other addictions such as drugs, alcohol or gambling (2, 3). With the increasing internet access, usage time and popularity, it brings up the issue of "internet addiction" or "problematic internet use". Internet addiction is generally defined as the inability to prevent the desire for excessive use of the internet, the loss of importance of the time spent without being connected to the internet, extreme irritability and aggression when deprived, and the gradual deterioration of a person's work, social and family life (3). In the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), it was emphasized that more research is needed for the official disorder definition of internet overuse problem and this definition is stated as "internet gaming disorder" (4).

Alexithymia is defined as a personality trait that exhibits difficulties in distinguishing bodily sensations, lack of empathy, inability to express emotions, limitation in fantasy world, and concrete, introverted thinking (5). It has been reported that introverted people with alexithymia seemingly live in harmony with the environment, but these people have little awareness in reality. Studies show that people with high alexithymia characteristics, having problems in recognizing and expressing their own mental states, also have difficulty in regulating their emotions effectively. When a person experiences an intense emotion, if he/she cannot fully detect and regulate it effectively, he/she may turn to some impulsive behaviours in order to alleviate these emotions and it is thought that this impulsivity may strengthen the relationship between difficulty in emotion regulation and internet addiction (6).

Internet addiction will affect teachers' and doctors' professional lives as these professions require social communication skills. In addition, they will not be a correct role model for the society.

This study aimed to evaluate the relationship between the internet addiction and alexithymia status of medical and educational faculty students.

MATERIALS AND METHODS

Study Design and Population

The universe of this cross-sectional analytical study consisted of faculty students aged 18 years and over who were studying at Necmettin Erbakan University (NEÜ) Meram Faculty of Medicine and Ahmet Keleşoğlu Faculty of Education between 1 May 2017 till 31 December 2017. The prepared questionnaires were applied to the students during coffee breaks in classrooms. The Turkish-speaking students, who volunteered to participate in the study, were included in the study.

According to the literature, the rate of internet addiction in Turkey is between 0.8 to 14%. A total of 8,647 students were studying at these two faculties. The number of participants needed in the study was calculated using the formula $n = N.t^2.p.q/d^2 (N-1) + t^2.p.q$. According to this formula, it was planned to reach at least 978 students randomly selected from each department and class. When the incomplete and improperly answered questionnaires were removed, the data of 1,257 students were evaluated in the study.

Data Collection

The Young's Internet Addiction Scale (YIAS), Toronto Alexithymia Scale (TAS), Fagerström Tobacco Dependence Test, and Cut Down, Annoyed, Guilty, Eye Opener (CAGE) alcohol use test were applied to collect data. The information form was prepared in accordance with the literature; 12 questions included demographic information, 3 questions about study and school success, 5 questions about hobbies, 12 questions about information about internet use, and 1 question whether there is a physical complaint about internet use. In inquiries about internet usage: how long they use the internet in a day, week and weekends, how much time they spend on the internet, what time of the day they use the internet most, the presence of internet connection on their phones, in which device they use the internet most frequently, for what purpose they use the internet, which application they use most, first internet use age, factors restricting internet usage and presence of complaints that may be related to internet usage in the last two months. During the envisaged 30-minute filling period, the researcher accompanied students.

Ethics Committee Approval

The research project was approved scientifically and ethically by the Research and Ethics Committee of Necmettin Erbakan University Meram Medical Faculty (No. 2017/870, date 14 April 2017).

Young's Internet Addiction Scale

In this study, the Internet Addiction Scale (IAS) developed by Young was used. The scale is a Likert-type self-report scale with a total of 20 items, scored between 0–5 (0 = never, 1 = rarely, 2 = occasionally, 3 = mostly, 4 = very often, 5 = continuous). A total score between 80 and 100 were defined as "addiction symptoms", 51 and 79 as "limited symptoms", 50 and below as "no symptoms" (7). In this study, 0–49 points were categorized as "no internet addiction", and 50–100 points as "having internet addiction".

Toronto Alexithymia Scale

The Toronto Alexithymia Scale (TAS) is a Likert-type self-report scale scored between one and five (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always) and consists of 20 items. It was developed to detect alexithymia. The 4th, 5th, 10th, 18th, and 19th questions were scored reversely. If the total score is 61 points or above, it is defined as "alexithymia", between 52 and 60 points as "borderline alexithymia", and if the score is 51 or below, "no alexithymia" (8).

Fagerström Nicotine Dependence Test

The Fagerström Nicotine Dependence test (FNDT) was used to evaluate cigarette addiction. It was first proposed by Fagerström and overhauled by Heatherton et al. in 1991. According to the total scores, nicotine addiction can be very low (0–2 points), low (3–4 points), medium (5 points), high (6–7 points), very high (8–10 points) (9). In this study, FNDT score between 0–5 was categorized as "low-moderate dependency", and 6–10 as "high dependency".

Cut Down, Annoyed, Guilty, Eye Opener Test

The Cut Down, Annoyed, Guilty, Eye Opener (CAGE) Test, a test developed by Ewing, is widely used for screening alcohol addiction and consists of four questions answered with yes or no. Two or more yes responses are interpreted as "risky use" and it is a screening test to identify individuals who require an additional evaluation for alcohol abuse and addiction (10).

Statistical Analysis

The data obtained in the study was analysed by SPSS (Statistical Package for Social Science) 20.0. Descriptive statistics for continuous variables were summarized in terms of mean and standard deviation, and descriptive statistics for categorical data were summarized in terms of frequency and percentage. Student's t and one-way analysis of variance (One-Way ANOVA) tests were used for those who met the normal distribution assumption, the Mann-Whitney U test was used in paired groups, and the Kruskal Wallis test was used in triple groups. Chi-square test was used in comparison of categorical data. Statistical significance was accepted as $p < 0.05$. For correlations Pearson's correlation analysis was used and correlation coefficient (r) 0.000–0.249 was evaluated as weak, 0.250–0.499 as medium, 0.500–0.749 as strong, and 0.750–1.000 as very strong correlation.

RESULTS

The mean age of 1,257 participants was 21.12 ± 1.96 (min. 18; max. 28) years, 893 (71%) were women, 29.0% were men,

477 (37.9%) were from the medical faculty, 780 (62.1%) were education faculty students. Of the participants, 515 (41.0%) were living with their families, 185 (14.7%) were smoking, 51 (4.1%) were drinking alcoholic beverages. When leisure activities were questioned "spending time on the internet" was the most frequent answer – 519 (41.3%) students, followed by "spending time with family and friends" – 494 (39.3%) students. The mean YIAS score of the students was 31.80 ± 17.78 points. According to this scale, 19 (1.5%) of the participants showed internet addiction symptoms, while 192 (15.3%) showed limited symptoms. Of the participants, 607 (48.3%) read at least one book per month, 489 (38.9%) did not do any physical exercise, 640 (50.9%) went to the cinema or theatre at least once a month, 419 (33.3%) watched TV at least once a week. Of the participants, 1,083 (86.2%) connected to the internet using phone-tablet, 1,200 (95.5%) of them stated that they had internet connection via their mobile phone network. The most frequent internet connecting reason was "course-research-homework" – 888 (70.6%), it was followed by "watching movies-listening to music" – 851 (67.7%). Of faculty students, 1,210 (96.3%) were using at least one of the internet-mediated visual communication programs. The most commonly used visual communication program was WhatsApp application – 1,166 (96.4%). The median of the students' uninterrupted inter-net use duration was two hours (min. 0.5; max. 36). The mean of first internet use age was 12.2 ± 1.96 (min. 5; max. 19) years old. Students connected internet mostly at nighttime – 835 (66.4%), and 772 (61.4%) thought that the time they spent on the internet was acceptable. Of the students, 509 (40.5%) stated that they had no physical complaint that may be related to internet usage. The most common symptom was "irregularity in sleep hours" (60.5%).

YIAS, TAS, FNDT and CAGE scores and the students' internet addiction, alexithymia, nicotine and alcohol dependence status are given in Table 1. Alexithymia was not detected in 569 (45.3%) of the students, while 401 (31.9%) had borderline alexithymia and 287 (22.8%) had alexithymia. Among smoking students, 5 (2.7%) were heavy smokers. In terms of alcohol use, 38 (73.1%) stated normal use, while 14 (26.9%) had risky use according to CAGE scores.

The relation of internet addiction and alexithymia, nicotine and alcohol dependence are demonstrated in Table 2. Students' TAS and CAGE scores were significantly higher in the dependent group than the non-dependent group ($p < 0.001$, $p = 0.009$, respectively). Linear regression analysis between YIAS and TAS is demonstrated in Figure 1.

The distribution of the scores by gender, faculty type, grades, and academic success are given in Table 3. Students' mean YIAS

Table 1. *Internet, alexithymia, nicotine, and alcohol addiction status of students (N = 1,257)*
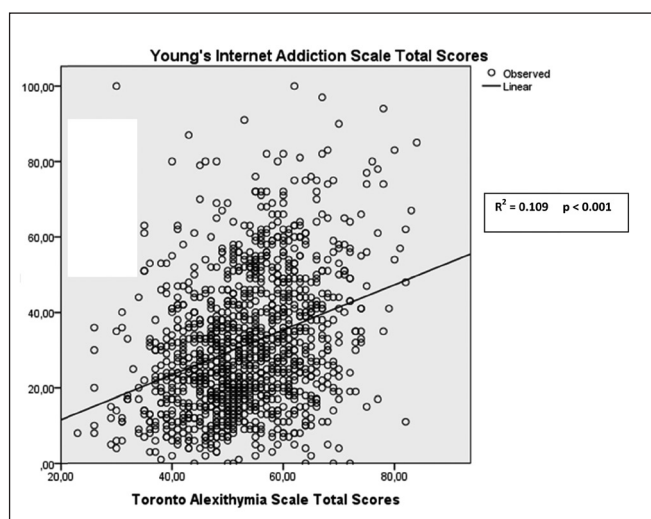
Scales	n	%
YIAS mean (SD) = 31.30 (17.78) points		
0–49 points (no internet addiction)	1,046	83.2
50–79 points (limited symptoms of internet addiction)	192	15.3
80–100 points (internet addiction)	19	1.5
TAS mean (SD) = 53.12 (9.85) points		
≤51 points (no alexithymia)	569	45.3
52–60 points (borderline alexithymia)	401	31.9
≥61 points (alexithymia)	287	22.8
FNDT median (min–max) = 2 (0–9) points		
0–2 points	101	54.6
3–4 points	40	21.6
5 points	14	7.6
6–7 points	25	13.5
8–10 points	5	2.7
CAGE (n = 51) median (min–max) = 1 (0–4) points		
0–1 point	38	73.1
≥2 points	14	26.9

YIAS – Young's Internet Addiction Scale; TAS – Toronto Alexithymia Scale; FNDT – Fagerström Tobacco Dependence Test; CAGE – Cut down, Annoyed, Guilty, Eye opener Test

Table 2. *Internet addiction, alexithymia, nicotine dependence, and alcohol consumption*

YIAS Scales	Internet addiction Mean (SD)	No internet addiction Mean (SD)	t	p-value
TAS score	58.45 (9.87)	52.05 (9.50)	**−8.866**	**< 0.001**
FNDT score	2.28 (2.27)	2.75 (2.43)	1.202	0.231
CAGE score	1.47 (1.01)	0.70 (0.95)	**−2.705**	**0.009**

YIAS – Young's Internet Addiction Scale; TAS – Toronto Alexithymia Scale; FNDT – Fagerström Tobacco Dependence Test; CAGE – Cut down, Annoyed, Guilty, Eye opener Test

Fig. 1. *Linear regression analysis between Young's Internet Addiction Scale and Toronto Alexithymia Scale.*

and FNDT scores were higher in male students than female students (p<0.001, p = 0.005, respectively). The TAS scores of the students in the fourth year and above was significantly lower (p<0.001).

Internet addiction was higher in men, among those who evaluate themselves as unsuccessful, those who studied less than 2 hours a week (p<0.001) (Table 4).

There was a significant relation between students' smoking and alcohol use and their internet addiction levels (p<0.001) (Table 5). Table 6 demonstrates the correlation between YIAS score and age, grade, and other scales.

DISCUSSION

With the widespread use of the internet, our country closely follows current technological developments in parallel with the globalizing and rapidly changing world. The young population is the fastest adapting group to this process. Millions of people are under the risk of internet addiction all over the world. Among all demographic groups, faculty students constitute the riskiest group in terms of internet addiction (11). In this age group, which has grown intertwined with computers and the internet, excessive use of technological devices triggers addiction mechanisms and this generation is more at risk of technology addiction. The participants of this study were selected from the "Generation Y" (1980–1999) group, which grows with the internet and is called the "internet generation" (12). In this study, it was determined that teacher and medical doctor candidates studying at education and medical faculties are at risk of internet addiction.

Table 3. *Internet addiction, alexithymia, nicotine dependence, and alcohol consumption comparison with gender, faculty, grade, and academic success*

	YIAS Mean (SD)	TAS Mean (SD)	FNDT Mean (SD)	CAGE Mean (SD)
Gender				
Women	29.2 (16.6)	53.1 (9.9)	2.0 (2.1)	0.8 (0.9)
Men	36.5 (19.4)	53.1 (9.7)	3.0 (2.4)	1.0 (1.1)
t	**−6.702**	0.034	**−2.834**	−0.526
p-value	**<0.001**	0.973	**0.005**	0.601
Faculty				
Medical	31.8 (17.3)	52.8 (10.1)	2.9 (2.7)	0.9 (1.0)
Education	30.9 (18.1)	53.3 (9.7)	2.4 (2.2)	1.0 (1.1)
t	0.822	−0.900	1.539	−0.130
p-value	0.411	0.368	0.125	0.897
Grade				
1st	32.1 (17.1)	54.3 (9.2)	1.7 (1.9)	2.0 (1.8)
2nd	31.3 (17.1)	54.1 (9.5)	2.6 (2.2)	1.3 (0.6)
3rd	35.1 (20.2)	53.4 (10.8)	2.3 (2.2)	0.9 (0.8)
≥4th	28.4 (16.5)	51.6 (9.7)	3.1 (2.6)	0.6 (1.0)
F	**8.695**	**5.534**	2.377	**2.890**
p-value	**<0.001**	**<0.001**	0.071	**0.045**
Academic success level				
>3.00	28.8 (16.7)	52.5 (9.7)	2.2 (2.3)	0.8 (1.1)
≤3.00	34.2 (18.5)	53.9 (9.9)	2.9 (2.4)	1.02 (1.0)
t	−5.437	−2.463	−2.079	−0.547
p-value	**<0.001**	0.014	0.039	0.587

YIAS – Young's Internet Addiction Scale; TAS – Toronto Alexithymia Scale; FNDT – Fagerström Tobacco Dependence Test; CAGE – Cut down, Annoyed, Guilty, Eye opener Test

Table 4. *Relation of internet addiction with socio-demographic factors (N = 1,257)*

	No internet addiction n (%)	Internet addiction n (%)	X^2	p-value
Gender				
Women	775 (86.8)	118 (13.2)	**0.170**	**< 0.001**
Men	271 (74.5)	93 (25.5)		
Age				
≤ 20 years old	423 (83.8)	82 (16.2)	0.182	0.670
≥ 21 years old	623 (82.8)	129 (17.2)		
Faculty				
Medical	400 (83.4)	77 (16.1)	0.228	0.633
Education	646 (82.8)	134 (17.2)		
Grade				
1st	224 (84.5)	41 (15.5)	**24.068**	**< 0.001**
2nd	226 (84.6)	41 (15.4)		
3rd	210 (73.9)	74 (26.1)		
≥ 4th	386 (87.5)	55 (12.5)		
Living with				
Family	427 (82.9)	88 (17.1)	0.057	0.812
Alone	619 (83.4)	123 (16.6)		
Family income				
≤ 3,000 TL*	617 (83.7)	120 (16.3)	0.324	0.569
> 3,000 TL	429 (82.5)	91 (17.5)		
Personal pocket money				
≤ 425 TL	578 (83.9)	111 (16.1)	0.494	0.480
> 425 TL	469 (82.4)	100 (17.6)		
Parents				
Live together	962 (83.1)	195 (16.9)	0.006	0.936
Live separate	84 (84.0)	16 (16.0)		
Mother education				
Primary school	591 (83.7)	116 (16.3)	0.234	0.628
≥ Secondary school and	452 (82.6)	95 (17.4)		
Father education				
≤ Secondary school and	439 (84.3)	82 (15.7)	0.698	0.403
≥ High school	607 (82.5)	129 (17.5)		
Academic success				
Unsuccessful	323 (76.5)	99 (23.5)	**20.256**	**< 0.001**
Successful	723 (86.6)	112 (13.4)		
Academic level				
≤ 3.00 points	448 (78.0)	126 (22.0)	**20.177**	**< 0.001**
> 3.00 points	598 (87.6)	85 (12.4)		
Weekly studying time				
0–2 hours	346 (77.2)	102 (22.8)	**18.230**	**< 0.001**
3–10 hours	354 (85.7)	59 (14.3)		
10 hours and over	346 (87.4)	50 (12.6)		

TL – Turkish Liras

Table 5. *Relation of alexithymia, nicotine dependence and alcohol consumption with internet addiction*

	No internet addiction n (%)	Internet addiction n (%)	X²	p-value
Tobacco				
Smoker/ex-smoker	148 (74.0)	52 (26.0)	**14.456**	**<0.001**
Never smoked	898 (85.0)	159 (15.0)		
Nicotine dependence (n = 185)				
Low-Medium	110 (71.0)	45 (29.0)	1.372	0.241
High	25 (83.3)	5 (16.7)		
Alcohol consumption				
Yes	32 (62.7)	19 (37.3)	**14.453**	**<0.001**
No	1,014 (84.1)	192 (15.9)		
Alcohol consumption amount				
Normal	27 (71.1)	11 (28.9)	2.397	0.122
Risky	6 (42.9)	8 (57.1)		
Alexithymia				
No alexithymia	526 (92.4)	43 (7.6)	**66.793**	**<0.001**
Borderline aleksitimi	312 (77.8)	89 (22.2)		
Alexithymia	208 (72.5)	79 (27.5)		

Table 6. *Correlations between some parameters*

		YIAS	Age	Grade	FNDT	CAGE	TAS
YIAS	r	1					
	p						
Age	r	**−0.061***	1				
	p	**0.031**					
Grade	r	**−0.076****	**0.771****	1			
	p	**0.007**	**<0.001**				
FNDT	r	−0.076	**0.256****	**0.203****	1		
	p	0.303	**<0.001**	**0.006**			
CAGE	r	**0.383****	−0.277	**−0.356****	0.100	1	
	p	**0.005**	0.047	**0.010**	0.544		
TAS	r	**0.331****	**−0.106****	−0.121	−0.002	0.249	1
	p	**<0.001**	**<0.001**	**<0.001**	0.974	0.074	

*Correlation is significant at the 0.01 level. **Correlation is significant at the 0.05 level.
YIAS – Young's Internet Addiction Scale; FNDT – Fagerström Tobacco Dependence Test; CAGE – Cut down, Annoyed, Guilty, Eye opener Test; TAS – Toronto Alexithymia Scale

In the current study, internet addiction was not affected by age. Since the study group consists of faculty students, it can be due to the narrow age range. Studies conducted with a wider age range may better reveal the relationship between internet addiction and age.

In our study, there is a significant relation between internet addiction and gender. Internet addiction score of male students is significantly higher than female students. While this is compatible with some studies in the literature (1, 13–16), some studies found no difference between genders (17, 18). Internet addiction is more common in men, as men use the internet more (19, 20), spend more time playing games and chatting on the internet (21), and they have more spare time because they are less interested in household chores.

Although it could be expected that internet addiction would be lower among students of the medical faculty due to a more difficult and intensive curriculum and limited spare time, there was no significant difference in internet addiction between the students of the two faculties. This situation may be related to the fact that the medicine is a field that is very intertwined with technology, and it can also be explained by the assumption that the students with the highest scores in the national student selection exam held in our country choose medical faculties and that these students have higher technology using skills. According to the study of Ni et al., there was a significant difference between students' internet addiction level and the departments they study (22).

In the present study, a significant difference was found in terms of internet addiction according to the grades. The average internet addiction score of the third-year students is significantly higher than the others. It may be due to the fact that the first-year students spend more time in social environments during the adaptation process to the faculty, and the 4th and higher grade students are in the preparation process for the postgraduate exams. There are also studies showing that there is no difference between grades (17, 23).

When the relationship between students' academic success, weekly working duration and internet addiction was examined, internet addiction was significantly higher in students with an academic grade average of 3.00 points (over 5 points) and below and in those whose weekly working time was less than two hours. Similarly, it was observed that the incidence of internet addiction decreased as the academic score increased. Students who act with the urge to prove themselves and who have not yet developed a sense of responsibility suggest that they may not be able to limit themselves in the use of the internet. In addition, some researchers think that excessive internet use and attention deficit and hyperactivity disorder may be related to each other (24).

In our study, internet addiction was observed in 1.5% of the students, besides 15.3% had addiction symptoms. Although a different scale was used, in a previous study conducted with 953 faculty students, 23.2% of the participants showed signs of internet addiction (23). In an international systematic review, the prevalence of internet addiction among university students was reported to be between 6–35% (25). According to a study conducted at Pamukkale University Faculty of Medicine among students using the YIAS; 94% were found to be normal users, 5.2% as possible dependents, and 0.8% as addicts (17). In a study conducted with 337 students studying at Kahramanmaraş Sütçü İmam University Faculty of Education, 10.1% of the students were found to be potential addicts and 1.2% were addicted (26). In another study conducted with 2,096 students, internet addiction was found to be 8.6% (27). In a study conducted with university students in Italy, 5.01% of the participants were found to be possible addicts and 0.79% were found addicted (16). Among medical students in Iran, the prevalence of internet addiction was moderate in 38.1%, and in 12.9% severe (28). According to the study conducted by Wang et al. on 14,296 high school students in China, problematic internet use rate was found as 12.2% (29). It is thought that these differences may arise from cultural differences, the period of the research, the selection of samples or the use of different scales.

In this study, when the alexithymia levels of the students were examined, it was found that 22.8% had alexithymia, 31.9% had borderline alexithymia, and 45.3% had no alexithymia. In a similar study conducted on 515 university students in Greece, 57% of the students did not have alexithymia, and 12.5% had alexithymia (6). In our study, a moderate positive correlation was found between alexithymia and internet addiction levels. Alexithymia scores were higher in the group with internet addiction compared to the non-addicted group. This result is consistent with similar studies in the literature. In a study, the relationship between internet addiction and alexithymia and other psychosocial variables was examined, and it was found that participants with higher internet addiction scores had higher alexithymia scores compared to participants with lower internet addiction scores (30). In another study a positive correlation was found between internet addiction and alexithymia scores in parallel with these results (31). In a study by Kandri et al., it was found that the same variables were effective in students with a high level of internet addiction and alexithymia (6). However, it is not known exactly whether alexithymia increases internet addiction or whether alexithymia increases due to social withdrawal in addicted individuals. It would be appropriate to focus on this distinction in future studies.

In this study, no relationship was found between tobacco dependence and internet addiction. In a multicentre study conducted by Durkee et al., although smoking was found to be associated with internet addiction in adolescents, no relation was found between the amount of daily smoking and internet addiction (32). In the study conducted by Mei et al. in China, internet addiction was related with smoking, but no relation was found with alcohol use (33).

In the current study, alcohol use and CAGE scores were associated with internet addiction. This result is similar to other studies (33, 34). In a study with 2,453 university students, it was found that harmful alcohol use is associated with internet addiction, independent of age, gender and depression (35). In the study conducted by Alaçam et al., it was found that the internet addiction was higher in smoking and alcohol consuming participants (27). The fact that behavioural addictions such as pathological gambling, eating and sex have neurobiologically similar aetiopathogenesis with substance-related addictions suggest that internet addiction may also use the same behavioural addiction mechanisms (1). It is thought that the relationship between smoking and alcohol use and internet addiction in our study may be due to this mechanism. This hypothesis suggests that if internet addiction, which seems more innocent than substance addictions, is not prevented, it may lead to substance and other behavioural addictions in the future. In order to prevent any type of addiction, person should have no addictive behaviour at all. Therefore, the internet, which is introduced at very early ages of life, should be in control especially in young children. Another study demonstrated that adolescents with internet addiction had poor outcome for mental health, as did those with substance use (36).

In our study, as the time spent on the internet increases, internet addiction risk increases. In other studies, internet addiction was found to be higher in those who use internet more than 12 hours weekly (37, 38). As stated in the review of Chou et al., one of the main factors for internet addiction is the length of time spent online. This situation coincides with our study results (39).

There are studies in the literature showing that early exposure to the internet increases the risk of internet addiction (40, 41). "European Kids Online" project presented that Turkish children first accessed internet around the age of two and they were online for 1–1.5 hours per day on average (41). In our study, the age of students to meet with the internet is around 12 years. There is a significant negative correlation between the first access age and the YIAS score. It is an expected result for behaviour to become a pattern and attitude as a result of exposure to addictive substances and actions at an early age activated neurochemical addiction mechanisms for a longer time.

The limitations of this study are that the use of social media, which is an important part of internet use, was not questioned in detail. Previous psychiatric diagnoses were not questioned. Simple randomization was done for sample selection instead of stratification by class and by age.

CONCLUSIONS

Internet addiction, a public health problem, is closely related to psychological and social disorders. Students start using the internet at very young ages causing addiction neurochemical processes to be activated from the early stages. Addiction, by its nature, is a chronic, incurable, but manageable disease that can evolve into other addictions. From this point of view, this group, which is at risk of internet addiction at a young age, is also at risk in the future in terms of substance addictions such as alcohol, cigarettes, drugs, and behavioural addictions such as sex, gambling and eating. In periodic health examinations, family physicians' informing adolescents and their families about rational internet use can be a preventive measure for internet addiction. The teachers should be good role models and be vigilant about the excessive use of the internet by the students. Before addiction develops, it is important to prevent addiction with the cooperation of family-teacher-doctor.

Conflict of Interests
None declared

REFERENCES

1. Johansson A, Götestam KG. Problems with computer games without monetary reward: similarity to pathological gambling. Psychol Rep. 2004;95(2):641-50.
2. King DL, Delfabbro PH, Griffiths MD, Gradisar M. Cognitive-behavioral approaches to outpatient treatment of internet addiction in children and adolescents. J Clin Psychol. 2012;68(11):1185-95.
3. Young KS. The evolution of Internet addiction. Addict Behav. 2017;64:229-30.
4. Diagnostic and statistical manual of mental disorders: DSM-5. 5th ed. Washington: American Psychiatric Association; 2013.
5. Kajanoja J, Scheinin NM, Karlsson L, Karlsson H, Karukivi M. Illuminating the clinical significance of alexithymia subtypes: a cluster analysis of alexithymic traits and psychiatric symptoms. J Psychosom Res. 2017;97:111-7.
6. Kandri TA, Bonotis KS, Floros GD, Zafiropoulou MM. Alexithymia components in excessive internet users: a multi-factorial analysis. Psychiatry Res. 2014;220(1-2):348-55.
7. Young KS. Psychology of computer use: XL. Addictive use of the Internet: a case that breaks the stereotype. Psychol Rep. 1996;79(3 Pt 1):899-902.
8. Güleç H, Köse S, Güleç MY, Çitak S, Evren C, Borckardt J, et al. Reliability and factorial validity of the Turkish version of the 20-item Toronto Alexithymia Scale (TAS-20). Klinik Psikofarmakol Bulteni. 2009;19(3):214-20.
9. Uysal MA, Kadakal F, Karşidağ C, Bayram NG, Uysal O, Yilmaz V. Fagerström test for nicotine dependence:reliability in a Turkish sample and factor analysis. Tuberk Toraks. 2004;52(2):115-21.
10. Ewing JA. Detecting alcoholism: The CAGE questionnaire. JAMA. 1984;252(14):1905-7.
11. Li W, O'Brien JE, Snyder SM, Howard MO. Diagnostic criteria for problematic internet use among U. S. university students: a mixed-methods evaluation. PLoS One. 2016;11(1):e0145981. doi: 10.1371/journal.pone.0145981.
12. Kuyucu M. Y Generation and Facebook: a research on the use habits of Facebook of Y Generation. Elektronik Sosyal Bilimler Dergisi. 2014;13(49):55-83. (In Turkish.)
13. Willoughby T. Short-term longitudinal study of internet and computer game use by adolescent boys and girls: prevalence, frequency of use, and psychosocial predictors. Dev Psychol. 2008;44(1):195-204.
14. Morahan-Martin J. Internet abuse: addiction? Disorder? Symptom? Alternative explanations? Soc Sci Comput Rev. 2005;23(1):39-48.
15. Kim K, Ryu E, Chon MY, Yeun EJ, Choi SY, Seo JS, et al. Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: a questionnaire survey. Int J Nurs Stud. 2006;43(2):185-92.
16. Poli R, Arigmi E. Internet addiction disorder: prevalence in an Italian student population. Nord J Psychiatry. 2012;66(1):55-9.
17. Ergin A, Utku Uzun S, Bozkurt Aİ. Internet addiction prevalence and contributing factors in the medical faculty students. Pamukkale Med J. 2013;6(3):134-42. (In Turkish.)
18. Yucens B, Uzer A. The relationship between internet addiction, social anxiety, impulsivity, self-esteem, and depression in a sample of Turkish undergraduate medical students. Psychiatry Res. 2018;267:313-18.
19. Chisholm JF. Cyberspace violence against girls and adolescent females. Ann N Y Acad Sci. 2006;1087:74-89.
20. Liau AK, Khoo A, Ang PH. Factors influencing adolescents engagement in risky internet behavior. Cyberpsychol Behav. 2005;8(6):513-20.
21. Kuzucu Y, Bulut B, Özçelik Ş, Soydemir F. The effect of gender on ınternet addiction when social support is controlled. Adnan Menderes Eğitim Bilimleri Dergisi. 2015;6(2):11-9. (In Turkish.)
22. Ni X, Yan H, Chen S, Liu Z. Factors influencing internet addiction in a sample of freshmen university students in China. Cyberpsychol Behav. 2009;12(3):327-30.
23. Balcı Ş, Gülnar B. Internet addiction among university students and profile of internet addicts. Selçuk İletişim Derg. 2009;6(1):5-22. (In Turkish.)
24. Morahan-Martin J, Schumacher P. Incidence and correlates of pathological internet use among college students. Comput Human Behav. 2000;16(1):13-29.
25. Spada MM. An overview of problematic internet use. Addict Behav. 2014;39(1):3-6.
26. Kır İ, Sulak Ş. Examination of internet addiction levels of education faculty students. Elektronik Sosyal Bilimler Dergisi. 2014;13(51):150-67. (In Turkish.)
27. Alaçam H, Ateşci FÇ, Şengül AC, Tümkaya S. The relationship of internet addiction with smoking and alcohol use among university students. Anadolu Psikiyatri Derg. 2015;16:383-88. (In Turkish.)
28. Sayyah M, Khanafereh S. Prevalence of internet addiction among medical students: a study from Southwestern Iran. Cent Eur J Public Health. 2019;27(4):326-29.
29. Wang H, Zhou X, Lu C, Wu J, Deng X, Hong L. Problematic internet use in high school students in Guangdong Province, China. PLoS One. 2011;6(5):e19660. doi: 10.1371/journal.pone.0019660.
30. Arcan K, Yüce ÇB. Internet addiction and related psycho-social variables: an evaluation in terms of alexithymia. Turk J Psychol. 2016;31(77):46-56. (In Turkish.)
31. Craparo G. Internet addiction, dissociation, and alexithymia. Procedia Social Behav Sci. 2011;30:1051-56.
32. Durkee T, Carli V, Floderus B, Wasserman C, Sarchiapone M, Apter A, et al. Pathological internet use and risk-behaviors among European adolescents. Int J Environ Res Public Health. 2016;13(3):294. doi: 10.3390/ijerph13030294.
33. Mei S, Gao T, Li J, Zhang Y, Chai J, Wang L, et al. Internet addiction in college students and its relationship with cigarette smoking and alcohol use in Northeast China. Asia Pac Psychiatry. 2017;9(4):10.1111/appy.12281. doi: 10.1111/appy.12281.
34. Lam LT, Peng ZW, Mai JC, Jing J. Factors associated with internet addiction among adolescents. Cyberpsychol Behav. 2009;12(5):551-5.
35. Morioka H, Itani O, Osaki Y, Higuchi S, Jike M, Kaneita Y, et al. The association between alcohol use and problematic internet use: A large-scale nationwide cross-sectional study of adolescents in Japan. J Epidemiol. 2017;27(3):107-11.
36. Yen JY, Ko CH, Yen CF, Chen SH, Chung WL, Chen CC. Psychiatric symptoms in adolescents with Internet addiction: Comparison with substance use. Psychiatry Clin Neurosci. 2008 Feb;62(1):9-16.
37. Ko CH, Yen JY, Yen CF, Chen CS, Weng CC, Chen CC. The association between internet addiction and problematic alcohol use in adolescents: the problem behavior model. Cyberpsychol Behav. 2008;11(5):571-6.
38. Tahiroğlu AY, Celik GG, Uzel M, Ozcan N, Avci A. Internet use among Turkish adolescents. Cyberpsychol Behav. 2008;11(5):537-43.
39. Chou C, Condron L, Belland JC. A review of the research on internet addiction. Edu Psychol Rev. 2005;17(4):363-88.
40. Lee JY, Shin KM, Cho S, Shin YM. Psychosocial risk factors associated with internet addiction in Korea. Psychiatry Investig. 2014;11(4):380-6.
41. Karakuş Yılmaz T, Kurşun E, Aslan A, Turgut YE. The changes in safer internet use of children in Turkey between the years 2010 and 2015. EUKO Turkey 2015 Summary Report [Internet]. 2016 [cited 2021 Feb 27]. Available from: http://eukidsonline.metu.edu.tr/file/EUKO_Turkey2015_SummaryReport.pdf.