

The Association between Problematic Internet Use, Suicide Probability, Alexithymia and Loneliness among Turkish Medical Students

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Abstract

Objective: It is known that problematic internet use (PIU) increasing especially among the youth and has become an important public health problem. The aim of the present study was to investigate the prevalence of PIU among the medical students and the relationship between PIU and selected socio-demographic characteristics (e.g. gender), loneliness, alexithymia and probability of suicide.

Method: A total of 328 subjects (44.2% males, 55.8% females) completed four instruments: Young Internet Addiction Test (YIAT), UCLA loneliness scale (UCLA-LS), The 20-item Toronto Alexithymia Scale (TAS-20) and Suicide Probability Scale (SPS).

Results: PIU was detected in 6.4% (n=21) of the participants. Its prevalence was significantly higher in males than in females (p=0.009). We found significant positive correlation between loneliness, alexithymia, suicide probability and PIU. A significant positive relationship was also found between PIU and Hopelessness, Suicide Ideation and Hostility.

Conclusion: PIU was found at a higher rate in male gender and was found to be associated with loneliness, alexithymia and probability of suicide. Prospective studies need to be based on different sampling groups to understand the underlying mechanisms that affect PIU and to explore effective preventative treatment strategies.

Keywords: Alexithymia; Internet; Medical students; Loneliness; Suicide

Introduction

Internet is a communication tool commonly used throughout the world and its use is on the increase. As of June 30 2012, the number of internet users, world-wide had reached 2.405.518.376 i.e. 34.3% of world's population uses internet. In Turkey, as of June 2012, there were 36.455.000 internet users, which corresponds to 45.7% of the population [1]. It is known that the prevalence of internet use is higher among adolescents and the young adults worldwide. It was reported that the age group which uses internet most commonly is 16-24 age group [2]. This age group uses internet mostly for social communication, for entertainment and for professional development, which makes internet indispensable for high school and university students [3].

Although internet has many important advantages, its adverse effects may also arise especially in relation to its purpose and duration of individual use. Internet carries the risk of problematic use and dependence in that it is easily accessible; it is universal, involves intense stimulation, enables one to be anonymous and provides the opportunity of establishing social relations without assuming any responsibility [4]. Internet dependence is also called as PIU in the

literature and is defined as "the inability of the individual to control him/herself impulsively in relation to duration or aim of activity and experiencing physical, social and psychological difficulties in consequence" [5]. Furthermore PIU is described in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as "a condition recommended for further study". Prevalence of PIU among adolescents and young adults has been reported to vary between 0.9- 38% worldwide [6]. The prevalence of PIU among the young in Europe was reported to be 2.5-4% [7]. Widespread use of the internet has started relatively late in Turkey compared to other European countries. However, in the studies carried out in our country on the prevalence of PIU, similar results to those of other European countries were reported [8,9].

Excessive and problematic internet using is associated with many psychosocial and mental health problems. In many studies, PIU was found to be associated with impaired social relations, hostile behavioral patterns, social isolation, attention deficit hyperactivity disorder, conduct disorder, depression and suicidal ideation [10,11]. Individual characteristics of internet users may also be among factors causing problematic internet use e.g., impulsivity, aggression, alexithymia and loneliness [12,13].

In previous studies risk factors associated with PIU, psychiatric comorbidity and related socio-demographic and personality

characteristics were investigated. In the present study, our aim was to investigate the relationship of PIU to alexithymia, loneliness and the probability of suicide among medical students.

Materials and Methods

Participants

A cross-sectional design was applied for the purposes of the study. The study was conducted among medical faculty students aged 19 to 25 years (n=353) at Afyon Kocatepe University (Turkey) between January and March 2013. The recruitment process was performed in classrooms. After oral information and consent was obtained, all participants were asked to complete Young Internet Addiction Test (YIAT), UCLA loneliness scale (UCLA), the 20-item Toronto Alexithymia Scale (TAS-20), Suicide Probability Scale (SPS) and Socio-demographic query form. Twenty five students (n=25) were excluded from the study because of missing data resulting in an analytical sample of 328 students. The study was approved by the Committee of Afyon Kocatepe University School of Medicine Local Ethical Committee for Clinical and Laboratory Studies.

Measures

Socio-demographic query form

We developed a 20-item socio-demographic questionnaire with items pertaining to age, gender, class, type of family, parental occupation and monthly income of the family and internet use habits (e.g., "How many hours do you spend online per day?").

Young internet addiction test (YIAT)

"Young Internet Addiction Test" (YIAT) was developed by Young, as one of the first standardized tests for the assessment of problematic internet use. Each item is scored from 1 to 5, with 1 representing "not at all" and 5 representing "always". Hence, possible total scores range from 20 to 100, with higher scores indicating greater problems associated with internet usage. The following cut-off points were applied to the total YIAT score 1) Normal Internet use (NIU): scores 20~49; 2) Potential problematic internet use (PIU): scores over 50 [14]. Although there are several instruments available in the literature, the YIAT was selected for this study because it had already been validated in a Turkish population study. It was also shown to produce valid and reliable measures in several studies on Turkish youth. The internal consistency of the Turkish YIAT is 0.91 [15].

UCLA loneliness scale (UCLA-LS)

The UCLA-LS developed by Russel, Peplau and Ferguson in order to measure individuals' general levels of loneliness. The UCLA-LS consists of 20 (10 negative and 10 positive) statements to which

responses are given on a 4-point scale ranging from 1 (never) to 4 (often). UCLA-LS scores range from 20 to 80, with higher scores indicating higher levels of loneliness [16]. Turkish version of the UCLA-LS has been validated in a Turkish population study; the scale had an internal consistency coefficient of 0.96, and using the test-repeat technique, a reliability coefficient of 0.94 [17].

The 20-item Toronto Alexithymia Scale (TAS-20)

The Toronto Alexithymia Scale (TAS-20) (20-item version) was used to screen for the prevalence of alexithymia. Each TAS-20 item was rated on a five-point (1-5) Likert scale, with total scores ranging from 20 to 100. The TAS-20 has a three-factor structure: (1) difficulty in identifying feelings (DIF); (2) difficulty in describing feelings (DDF); and (3) externally orientated thinking (EOT). Factor 1 assesses the capacity to identify feelings and to distinguish between feelings and the bodily sensations of emotional arousal (DIF); Factor 2 reflects the inability to communicate feelings to other people (DDF); Factor 3 assesses Externally Oriented Thinking (EOT). The higher scores in TAS-20 indicate higher levels of alexithymia [18]. The Turkish version of the TAS-20 has been validated in Turkish population. The Cronbach's alpha for the total TAS-20 scale was 0.78 [19].

Suicide probability scale (SPS)

SPS is a 36 item, self report measure that assesses suicide risk in adults and adolescents [20]. Individuals are asked to rate the frequency of their subjective experience and past behaviors using a 4-point Likert scale ranging from "None" to "all of the time". High scores of the scale reflect high suicide probability. The SPS also provides four clinical subscales: Hopelessness (12 items), Suicide Ideation (8 items), Negative Self-Evaluation (9 items) and Hostility (7 items) [20]. The Turkish version of the SPS was used in this study. According to the results it was reported that the total score internal consistency coefficient 0.87, test-retest reliability coefficient was 0.98 [21].

Statistical analysis

Statistical analysis was performed using the SPSS package (SPSS 19 for windows; SPSS Inc, Chicago, IL). Student 2-tailed t test was used to compare the significance of the differences between groups. The χ^2 analyses were used to compare categorical variables. Fisher's Exact Test was applied instead when at least one comparison group consisted of ≤ 5 students. Pearson correlation analysis was used to determine the correlation coefficients between the variables. Differences were considered significant if P values were less than 0.05.

Results

The study sample consisted of 328 students (44.2% male, and 55.8% female) with a mean age of 20.5 ± 1.8 years. Socio-demographic characteristics of the cases are shown in Table 1.

Variable	Number (n)	Percentage (%)
Class		
1.year	110	33.5
2.year	81	24.7

3. year	62	18.9
4. year	28	8.6
5. year	47	14.3
Sex		
Male	145	44.2
Female	183	55.8
Place of residence		
At home by him/herself	14	4.3
At home with friends	151	46.0
At home with family	36	11.0
In private dormitory	102	31.1
In state dormitory	25	7.6
Family type		
Nuclear family	288	87.8
Extended family	33	10.1
Mother-father separated	7	2.1
Number of siblings		
None	20	6.1
1	146	44.5
2	95	29.0
3	37	11.2
4	16	4.9
5 or more	14	4.3
Regular sports activity		
Yes	56	17.1
No	272	82.9
Participating in art activities		
Yes	66	20.1
No	262	79.9
Being a member of a club		
Yes	154	47.0
No	174	53.0
The most frequent place to access to internet		
Home	189	57.6
Friend's home	4	1.2
Internet café	8	2.4

School	28	8.5
Dormitory	94	28.8
Other	5	1.5
The frequency of weekly internet use		
Less than once a week	18	5.5
1-2 times a week	38	11.6
3-4 times a week	53	16.2
5-6 times a week	37	11.3
Every day	182	55.4

Table 1: Some socio-demographic characteristics of the participants

According to YIAT 23.3% (n=76) of the cases had mild, 5.5% (n=18) had moderate and 0.9% (n=3) had severe PIU. According to cut point used in the study, PIU was found in 6.45 % (n=21) of the cases.

The comparison of cases with and without PIU is given in Table 2. There was no difference between students with and without PIU with regard to age (t=0.412, p=0.681). PIU prevalence was found to be

significantly higher in males ($\chi^2=6.741$, p=0.009), in those with higher school achievement ($\chi^2=14.306$, p<0.001) and in those whose families live in towns and villages ($\chi^2=5.246$, p=0.022). In addition, it was established that daily use of internet (hours) (t=4.398, p<0.001) and overall duration of internet use (years) (t=3.456, p<0.001) was significantly higher in PIU group than in the non-PIU group.

	Normal	PIU	t	p
	MV \pm SD	MV \pm SD		
Age	20,5 \pm 1,8	20,6 \pm 1,8	0,412	0,681
Daily hours of internet use	2.0 \pm 1.7	4.7 \pm 2.8	4.398	0.000*
Duration of internet use (years)	7.5 \pm 2.5	9.5 \pm 2.7	3.456	0.001*
	n (%)	n (%)	χ^2	p
sex				
Male	130 (42.3)	15 (71.4)	6.741	0.009**
Female	177 (57.7)	6 (28.6)		
School achievement				
moderate	39 (12.7)	9 (42.9)	14.306	0.000**
high	268 (87.3)	12 (52.1)		
Educational status of mother				
<8 years	163 (53.1)	11(52.4)	0.004	0.949**
\leq 8 year	144 (46.9)	10 (57.6)		
Educational status of the father				
<8 years	229 (74.6)	17 (81.0)	0.424	0.612***
\leq 8 years	78 (25.4)	4 (19.0)		
Family income				
Moderate	214 (69.7)	17 (81.0)	1.193	0.332***

Good	93 (30.3)	4 (19.0)		
Place of residence of family				
city	219 (71.3)	10 (47.6)	5.246	0.022**
county, town, village	88 (28.7)	11 (52.4)		
Alcohol use status				
No	224 (73.0)	13 (61.9)	1.199	0.273**
Yes	83 (27.0)	8 (38.1)		
Smoking status				
No	270 (87.9)	17 (81.0)	0.879	0.315**
Yes	37 (12.1)	4 (19.0)		

Table 2: The comparison of participants with and without PIU in terms of socio-demographic characteristics

The most frequent areas of internet use are shown in Table 3. Of all cases included in the study, 52.7% (n=173) stated that they used internet most frequently for accessing social networking sites. Of PIU cases, 66.7% (n=14) stated that they used the internet for accessing social networking sites compared to 51.8% (n=159) of the non-PIU group. No significant difference was found between PIU group and non-PIU group in terms of using internet for accessing social networking sites and for following news. Of the cases with PIU 23.8%

(n=5) stated that they used internet most commonly for playing games compared to 6.5% (n=20) of the non-PIU group. The use of internet for playing games was found to be significantly higher in PIU group ($\chi^2=8.350$, $p=0.015$). In the PIU group, the distribution of reasons for using internet, according to gender, was as follows: 100% (n=5) of the game players were male, 64.3% (n=9) of those accessing social networking sites were male and 35.7% (n=5) were female. Of those following news, 50% (n=1) was male and 50% (n=1) was female.

	Normal	PIU	Overall	χ^2	p
	n (%)	n (%)	n (%)		
For checking my email	10 (3.3)	0 (0.0)	10 (3.0)		
For chatting	6 (2.0)	0 (0.0)	6 (1.8)		
For entering social networking sites	159 (51.8)	14 (66.7)	173 (52.7)	1.745	0.187*
For playing games	20 (6.5)	5 (23.8)	25 (7.6)	8.350	0.015**
For receiving information related to education	19 (6.2)	0 (0.0)	19 (5.8)		
For following news	39 (12.7)	2 (9.5)	41 (12.5)	0.182	1.000**
For surfing the internet	5 (1.6)	0 (0.0)	5 (1.59)		
For listening to music, watching TV	47 (15.3)	0 (0.0)	47 (14.3)		
For shopping	2 (0.7)	0 (0.0)	2 (0.6)		
Overall	307 (100.0)	21 (100.0)	328 (100.0)		

Table 3: The most frequent areas of internet use for participants with and without PIU, *Chi-squared p-value, **Fischer's exact test p-value

In Table 4, the correlation between YIAT and UCLA, TAS and SPS scales (together with their subscales) are demonstrated. Significant correlation was found between YIAT, UCLA, TAS and SPS with the strongest correlation between YIAT and SPS ($r=0.426$, $p<0.001$). On closer examination of the correlation between YIAT and the subscales of SPS, no significant relation was found with

Negative Self-Evaluation subscale ($r=0.046$, $p=0.409$), but significant correlation was found between YIAT and other subscales. In addition, significant correlation was found between YIAT and three subscales of TAS-20. The highest correlation was between DIF (difficulty in identifying feelings) and YIAT ($r=0.342$, $p<0.001$).

Scales		Problematic internet use (PIU)	
		r	P
UCLA-LS		0.141	0.011*
SPS	Hopelessness	0.391	0.000*
	Suicide Ideation	0.315	0.000*
	Negative Self-Evaluation	0.046	0.409
	Hostility	0.395	0.000*
	SPS-Total	0.426	0.000*
TAS-20	Difficulty in Identifying Feelings	0.342	0.000*
	Difficulty in Describing Feelings	0.190	0.001*
	Externally Oriented Thinking	0.218	0.000*
	TAS-20 Total	0.274	0.000*

Table 4: Correlation between Young Internet Addiction Test and UCLA-LS, TAS-20 and SPS scales , UCLA loneliness scale (UCLA-LS), The 20-item Toronto Alexithymia Scale (TAS-20), Suicide Probability Scale (SPS) *P< 0.05

Discussion

In the studies carried out so far on the prevalence of PIU, varying results have been found and in studies on university students, prevalence rate has been found to range from 5.9% to 18.3% [7,22]. In two Turkish studies, PIU rates were reported to be 7.6% and 11.6% respectively [8,23]. In a study on 3557 university students in China, the prevalence of internet dependence was found to be 6.44% [24]. In that particular study, those who had scores of 50+ on the YIAT were considered to have PIU. In the present study, the rate of PIU was found to be 6.4% among a group of medical students, indicating that our results are comparable with those of other studies among young adults.

There are many studies in the literature reporting that the prevalence of PIU is higher among males than females [8,23,24]. At present, adolescents and young adults access internet most frequently for social networking sites such as facebook, msn, twitter, music and video sites such as youtube and dailymotion, game sites and news sites [25]. It was established that females use internet mostly for social networking and obtaining general information, while males prefer to use internet for social networking and playing games, which usually have violent content [8].

As expected, in the present study, the rate of PIU was found to be higher in males, with both males and females using internet mostly for social networking. When we compared PIU and non-PIU groups independent of gender, it was established that the most common use of internet was social networking sites. Although using social networking sites is considered among risk factors for developing PIU, we can state that we are faced with 'social networking websites phenomenon' whether in the healthy user, or the problematic user, and whether in males or females [26]. Those who use internet mostly to play games were significantly higher in number in PIU group than non-PIU group. It has been demonstrated in many studies that games played online produce risks for problematic internet use [4,10]. The fact that males engage in activities causing dependence (play, gambling, cyber porn) at a higher rate, is considered to explain the higher occurrence of PIU in males [8].

In the present study, students with PIU and those without PIU were compared in terms of both their daily duration of internet use, and their overall duration of active internet use (in years) and it was established that duration of both daily use and overall use were significantly higher in PIU groups, which supports the findings of studies reporting that daily or weekly internet use is higher among people with PIU than among normal internet users [8,25]. It is known that people with PIU usually have a compulsive pattern of internet use, they cannot limit their duration of use, and hence remain on internet for longer than the intended period. In the present study, it was found that subjects with PIU spend a mean of 4.7 hours daily connected to internet.

In cross sectional studies, it has been shown that PIU has many adverse effects on life style. In two respective studies carried out in Korea and Taiwan with university students a strong correlation was found between PIU and high consumption of alcohol and cigarettes [27,28]. However, in the present study, no significant difference was found between students with PIU and those without it with regard to alcohol use and smoking. This finding, which is discrepant with those in the literature, is probably related to characteristics of our sample. It is thought that since our sample is composed of medical students, their awareness of health is high, hence resulting in low rates of smoking and drinking alcohol. It was also determined that PIU is associated with low grades from examinations and low academic achievement [29]. Unlike other studies in the present study, subjects with PIU reported higher rates of academic achievement than non-PIU subjects, which is probably related to self-report of the students. Therefore, objective assessment of academic achievement may help to determine the association between PIU and academic achievement more specifically.

There are many studies in the literature reporting that lonely individuals use internet more frequently than those who are not lonely and that they utilize it more to get emotional support [30]. Similarly, in the present study, consistent with the literature, a positive association was found between PIU and levels of loneliness. In various studies, it has been reported that individuals who experience difficulty in interpersonal relations in daily life employ internet to meet their needs for interpersonal relationships, and try to find the satisfaction provided by interpersonal relations in internet [31]. Therefore, there are two different approaches to trying to explain the relation between internet use and loneliness. First approach maintains that excessive use of internet leads to loneliness while the second one holds that lonely individuals use internet excessively. The authors believe that internet exacerbates a young person's loneliness, and that an increase in feelings of loneliness levels leads to a greater tendency towards "cyber relationships". Follow-up studies to investigate the interrelationship between loneliness and problematic internet use which can help with the recognition of causality in this issue are required. Alexithymia is a construct characterized by the difficulty in identifying and describing feelings (affective factors), and by concrete and externally oriented thinking (cognitive factors) [32]. Studies have reported that alexithymia occurs quiet frequently in psychiatric disorders. Alexithymia is found to be associated with personality disorders, eating disorders, alcohol dependence, substance abuse, depression, sexual dysfunction, anxiety disorders such as social phobia and panic disorder and childhood traumas. There are several studies examining the relation between PIU and alexithymia. In the study of De Berardis et al. it was shown that alexithymic individuals have higher risk of PIU than those who are not alexithymic and that there was correlation between alexithymia and dissociative symptoms [12]. Likewise, in the

present study, a significant relation was found between both emotional and cognitive components of alexithymia and PIU. In general, dream content of alexithymic individuals is very restricted and reflects daily life. Their mental activities are concrete, and without emotion, and focus on present moment and are without unconscious phantasies. It is our proposition that the probable role of alexithymia in the pathogenesis of internet dependence should be tested.

One of the conditions associated with problematic internet use is suicidal behavior. In previous studies, it was revealed that there was association between problematic internet use and depression and suicidal behavior and those suicidal ideas occur at a higher rate among those who have PIU [33]. Similarly, in the present study, a relation was found between PIU and probability of suicide. Hopelessness, Suicide Ideation and Hostility subscales of SPS were found to be associated with PIU. Overall, these results support previous findings of a strong relationship between PIU and psychological states such as suicide probability [34]. Future studies should attempt to determine the predictive factors by identifying the causal relations between PIU and suicidal tendencies.

Conclusion

In conclusion, among a group of medical students, PIU was found at a higher rate in males and was found to be associated with loneliness, alexithymia and the probability of suicide. It is thought that, as internet has become a ubiquitous device that everyone can have access to easily, life style and personality characteristics are important parameters for the development of PIU. The determination of factors prompting adolescents in the direction of problematic internet use is important in terms of precautionary measures and interventions to be taken. Therefore, further research should be conducted into predictor variables of problematic internet use. The present study needs to be evaluated in the light of several limitations. First of all, the study was designed as a cross-sectional research. Another limitation is the use of self-report questionnaires instead of structured interview instruments. Thus, the findings indicate relationships between PIU, suicide probability, alexithymia and loneliness without specifying one as being the cause or effect of the other. Longitudinal studies are needed to determine the causality among these variables.

Finally, we suggest further studies with larger sample sizes on university students. Preferably, prospective approach needs to be conducted to confirm these results as well as establishing strategies for better detection and management of PIU when working on university students.

Declaration of Interest

The authors have reported no conflicts of interest

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