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Research / Araştırma

The Internet Addiction and Aggression Among University Students

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ABSTRACT

The internet addiction and aggression among university students

Objective: The aim of this study is to investigate the relationship between the internet addiction and aggression among university students comprehensively.

Method: A correlational research design was used in the study by assuming that a relationship could exist between the internet addiction and aggression. 328 university students from different faculties constituted sample group which was determined by simple random sampling of probability sampling method. Researcher himself collected the data from university students, based on the principle of voluntariness, by using a questionnaire including socio-demographic form, the Internet Addiction Scale (IAS) and Aggression Scale (AS).

Results: Results of the study were obtained in 4 phases. In the 1st phase, after determining mean scores, symptom status groups were identified according to cut-points and lastly, IAS and AS scores variables were investigated with some variables such as gender, mother-father education status, family income level and primary internet usage aim in terms of differences. In the 2nd phase no correlation between the IAS and AS scores was found. In the 3rd phase, no correlation was found between the scales reciprocally. In the 4th and last phase, relationship between the internet addiction and aggression was investigated at the level of causality by using structural equation modeling and no causal relationship was found.

Conclusion: In the study relationship between the internet addiction and aggression was investigated through 4 phases by using correlation and structural equation modeling analysis and no relationship was determined between these two variables.

Key words: Internet addiction, aggression, structural equation modeling

ÖZET

Üniversite öğrencilerinde internet bağımlılığı ve saldırganlık

Amaç: Bu çalışmanın amacı internet bağımlılığı ve saldırganlık arasındaki ilişkiyi üniversite öğrencilerinde kapsamlı bir şekilde sınamaktır.

Yöntem: Çalışma, internet bağımlılığı ve saldırganlık arasında ilişki olabileceği düşüncesinden hareketle ilişkisel desende tasarlanmıştır. Çalışmanın örneklem grubunu, olasılıklı örnekleme yöntemlerinden, basit rastlantısal yöntemle belirlenen farklı fakültelerde öğrenci olan 328 üniversite öğrenci oluşturmuştur. Araştırmacının kendisi çalışma verilerini üniversite öğrencilerinden gönüllülük ilkesine bağlı kalarak, sosyo-demografik form, İnternet Bağımlılığı Ölçeği (İBÖ) ve Saldırganlık Ölçeğini (SÖ) içeren bir anket aracılığıyla toplamıştır.

Bulgular: Çalışmada bulgular temel olarak 4 aşamada toplanmıştır: 1. aşamada ortalama değerler belirlendikten sonra İBÖ üzerinden eşik değerlere göre belirti durumu grupları tespit edilmiş, sonrasında İBÖ ve SÖ puanları, cinsiyet, anne baba eğitim durumu, aile ekonomik gelir durumu ve başlıca internet kullanım amacı gibi bazı değişkenlere göre farklılıklar açısından karşılaştırılmıştır. İkinci aşamada, İBÖ ve SÖ toplam puanları arasında ilişki tespit edilmemiştir. Üçüncü aşamada her iki ölçeğin boyutları arasında herhangi bir ilişki belirlenmemiştir. Dördüncü ve son aşamada ise internet bağımlılığı ve saldırganlık arasındaki ilişki nedensel düzeyde yapısal eşitlik modellemesi yöntemi kullanılarak sınanmış ve herhangi bir nedensel düzeyde ilişki tespit edilmemiştir.

Sonuç: Çalışmada internet bağımlılığı ve saldırganlık, korelasyon ve yapısal eşitlik modeli analizleriyle sınanmış ve bu iki ana değişken arasında, bazı değişkenlere göre farklılaşma belirlenmesine rağmen, her hangi bir ilişki tespit edilmemiştir.

Anahtar kelimeler: İnternet bağımlılığı, saldırganlık, yapısal eşitlik modellemesi

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INTRODUCTION

Internet is an important sharing tool, frequently used by different segments of the society (1). Internet use has been a necessity for communication, research, and entertainment (2) and its popularity has been increasing worlwide (3). Data obtained from the world (4) and our country (5) indicates this increase. This increase had a significant effect on several psychological studies to understand the effects of internet on interaction and interpersonal relations (6).

Dependence may occur to not only alcohol or drugs but also gambling, eating, sexuality and shopping (7-9). Internet use, when taken as a behavior, may also lead to dependence like alcohol, drugs and gambling (9-11). Debate continues on the definition and classification of internet dependence, one of the main variables of the present study (12). The leading cause of this may be that internet dependence has not been formally included in DSM-IV-TR (13) and ICD-10 (14). While academicians have not reach a consensus on any definition, Young (10), by taking pathological gambling as a model, defined internet dependence as an impulse control disorder which does not involve intoxicants and that individual looses control on internet use to cause significant relational, occupational, social impairments (15-17). In this study, we used "internet dependence" term defined by Young (10).

Another main variable of this study is aggression. While there is a very extensive literature on aggression and several different definitions (18), there is no consensus on a single definition of aggression (19), which has a negative impact on the individual, his family, and other people around him. On the other hand, aggression can be defined as an intentional behavior to harm another person (20). Anderson and Huesmann (21) described aggression as a behavior intended to directly harm another individual. In addition to these definitions, Bushman and Anderson (22) and Buss (23) described aggression as a reaction to another organism including harmful stimuli, Geen (24) broadened the concept by adding (i) intention to harm and (ii) expectation of the intented harm to be realized. In subsequent studies, Bushman and Anderson (25), defined aggression as a behavior directed to another individual with the intention of hurting him.

Internet is one of the important factors effecting adolescents in our contemporary World as a mass media interaction tool. This effect, as stated by Ko et al. (26), may lead adolescents to behaviors which can be dangerous to mental health and society, such as aggression. Supporting this hypothesis, there was a high correlation between internet dependence and aggression in the same study. Another study by Ko et al. (27) indicated that although internet use may decrease distress by providing immediate rewards and new windows to different activities, internet dependence, indicated by excessive use of internet is an important risk factor for aggression. Similarly, Yen et al. (28) reported a high correlation between aggressive behaviors and internet dependence.

The aim of this study is to test the association between internet dependence and aggression among college student comprehensively. In this general context, the aims were to detect frequency of internet dependence, investigating the association between internet dependence and aggression in terms of gender, parental education, income, and main reason to use internet, computing the correlation of internet dependence and aggression scale scores and dimensions, and using structural equation modelling to test the causal association between internet dependence and aggression.

METHOD

This study shows the association between aggression and internet dependence in university students. In this aim, a correlational design was used to investigate the association between aggression and internet dependence. In addition, based on internet dependence and aggression variables, a theoretical model was designed with the hypothesis that internet dependence might influence aggression and this theoretical model was tested on causality level by structural equation model (SEM) (29).

Prerequisites of a causal relationship between these two variables are described as (30): (i) Temporal order: presence of a cause before the result indicates the direction of the causality. In this study, we assumed that level of internet dependence cause level of aggression. (ii) Correlation: it is the co-occurence of research variables according to a pattern or co-change of them. In this study, it was thought that internet dependence and aggression co-occured according to a pattern. (iii) Elimination of the alternatives: that is the result of the study not being due to another thing other than causal variables. In this study, in the context of the hypothesized model, it was thought that internet dependence caused aggression, without other variables having a significant effect on the model. In the present study, difference of association between internet dependence and aggression in terms of gender, parental education, family income and main aim of internet use were also compared.

Sample

The universe of the study consisted of 57115 students who were studying in Kocaeli University, at Kocaeli, between 2011 and 2012. Sample group consisted of 328 students from different faculties of Kocaeli University, selected by simple random method, one of the probablity sampling methods (29). The reason to select student group was that internet dependence could be thought as a danger since technology have an important place in students' social lives and education. Of the 329 students in the sample, 172 were female (52.4%) and 156 were male (47.6%), age range was 18-27 (mean±SD=20.9±1.8).

When calculating the representativeness of the sample to the universe confidence interval was 0.1 and error rate was 0.05. Calculations indicated that for 10% confidence interval and 5% error rate, minimum sample size to represent a universe of 57115 units 270. These results indicated that the sample size of 328 unit had sufficient representative power.

Study was conducted during spring terms of 2011-2012. Sociodemographical form, IDS and AS were applied by the researcher regarding volunteerism principle. Of the 386 units data set, 58 units were excluded for missing or faulty data entry and analysis were conducted on a data set consisting of 328 units.

Measures

Sociodemographical Form

This form was developed by the researcher to determine gender, age, family income, parental education and internet use features of the participants.

Internet Dependence Scale (IDS): IDS is a Likert type (6 points: 0=never, 5=always) self-report scale based on DSM-IV-TR pathological gambling diagnostic criteria, which is used to evaluate internet dependence (15). Widyanto and Griffiths (31), reported that the scale involves effects of internet on participants' daily and social lives, productivity, sleep patterns and their emotions. In the original scale (15) cut-off scores 20-39 points implies "ordinary internet user", 40-69 points indicates "internet user with frequent problems", 70 -100 points indicates "internet user with significant problems". However, cut-off scores of the scale published at "www.netaddiction.com" web site defines between 20-49 points as "ordinary internet user", between 50-79 points as "internet user with occasional or frequent problems" and between 80-100 points as "internet user with significant problems". In the first adaptation study of the scale to Turkish (32), scoring table defines participants with scores between 0-49 as group without symptoms, scores between 50-79 points as group with limited symptoms and scores between 80-100 points as pathological internet user group. In the Turkish adaptation which is used in this study used cut-off scores published at "www.netaddiction.com" website (33). Discrepancies between Young (15) and other researchers may be commented as that there is

no definite cut-off of the scale. However, in the present study we used the first adapted form into Turkish (32) in the context of the model proposed by Cakır-Balta and Horzum (33). The scale including 20 items in the adaptation study by Cakır-Balta and Horzum (33) took its final form after item 10 was excluded; this final form had three factors, (i) preferring being online to daily life, (ii) to want to increase duration of being online, (iii) problems due to being online, and Cronbach's α of the final form was 0.89. In this study Cronbach α was 0.92. When the scale is decreased to 19 items, possible maximum score decreased to 95 from 100, and cut-off values were calculated by using this total score: (i) 0-47 points, group without symptoms, (ii) 48-75 points group with limited symptoms (iii) 76-95 points, group with internet dependence.

Aggression Questionnaire (AQ): It is a Likert type (5 points, 1=extremely uncharacteristic of me, 5=extremely characteristic of me), 29 items, self-report scale, developed by Buss and Perry (34) to measure aggression, which has 4 factors (i) anger, (ii) hostility, (iii) verbal aggression, and (iv) physical aggression. The questionnaire has been used in a study in Turkey (35), and the items were grouped into four factors, supporting the findings of Buss and Perry. In this study Cronbach's α was 0.83.

Data Analysis

SPSS 15.0 was used for group comparisons and correlations; LISREL 8.51 software was used for SEM. In this study, for SEM analysis, for standard goodness of fit values GFI and AGFI >0.90 (36,37), for RMSEA ≤0.05; for χ^2/sd 2–5 was accepted as good fit (37) and <2 was accepted as perfect fit (38).

RESULTS

Results were summarized in 4 stages:

1st Stage: After mean values for IDS (mean±SD=25.5±15.4) and AQ (mean±SD=70.1±12.9) were determined, symptom groups were defined based on IDS cut-off scores. Last, internet dependence and aggression variables were compared regarding gender, parental education, family income and main aim to use internet.

IDS results indicated that of 328 students, 302 (54% female, 46% male) did not have symptoms, 20 (40% female, 60% male) students had limited symptoms and 6 (16.7% female, 83.3% male) students had internet dependence. Percent and frequency values of symptom status and gender distribution per symptom status were summarized in Table 1.

When the cut-off scores were taken into account, number of students with internet dependence (n=6) was very small when compared to the number of students without symptoms (n=322), groups were compared in terms of IDS total scores, after controlling for normal distribution with Kolmogorov-Smirnov test. Kolmogorov-Smirnov test results did not indicate normal distribution ($p<0.001$).

For IDS total score did not show normal distribution, non-parametrical statistical analysis were conducted. First, in order to examine gender differences, Mann-Whitney-U test was computed and results showed that males had higher IDS and AQ scores when compared with females ($p<0.005$; $p<0.001$, respectively). Results were shown in Table 2.

Kruskal Wallis-H test examining whether IDS and AQ scores changed with parental education, family income and main aim to use internet showed that while internet dependence variable did not show any

Table 1: Frequencies and percentages for symptom status

Symptom Status	n	%	Females n (%)	Males n (%)
No Symptoms Group	302	92.1	163 (%54)	139 (%46)
Limited Symptoms Group	20	6.1	8 (%40)	12 (%60)
Internet Addicted Group	6	1.8	1 (%16.7)	5 (%83.3)
Total	328	100	172	156

difference in terms of maternal and paternal education (p>0.05), there was a significant difference in terms of family income and main aim of internet use (p<0.05). AQ variable showed a significant difference in terms of parental education and family income (p<0.05). Results of Kruskal Wallis-H tests were summarized in Table 3.

First, in order to detect the source of the difference in paternal education considering AQ, Mann-Whitney-U test was computed and after Bonferroni correction, and the results indicated that students whose fathers were primary school graduates had higher AQ scores when compared with students whose fathers were high-school graduates (p<0.005). There were no significant differences among the other groups in terms of AQ total scores.

Second, in order to detect the source of difference in family income considering AQ, and IDS total scores, Mann-Whitney-U tests were computed and after Bonferroni correction, results indicated that students with family income between 1000-2000 TL had significantly higher IDS score when compared with students with family income lower than 1000 TL (p<0.05). Besides, students with family incomes between 1000-2000 TL and lower than 1000 TL had higher AQ scores when compared with students with family income higher than 2000 TL (p<0.05). There were no significant differences among the other groups in terms of AQ and IDS total scores.

Third, in order to detect the source of difference in main aim of internet use, Mann-Whitney-U tests were computed and after Bonferroni correction, results indicated that, students who use internet mainly for social interactions and entertainment had significantly higher IDS total scores when compared with students who use internet mainly for education (p<0.005, p<0.05, respectively).

2nd Stage: Second, correlations between IDS and AQ total scores were tested with Pearson correlation analysis and no significant association could be detected (p>0.05).

Table 2: The results IAS and AS total scores according to gender (non-parametric Mann Whitney-U Test)

	Gender	n	Mean rank	Σ_{rank}	U	Z	p
IAS	Female	172	148.14	25480	10602	-3.28	0.001*
	Male	156	182.54	28476			
AS	Female	172	147.07	25295	10417.5	-3.49	<0.001*
	Male	156	183.72	28660			

n=328, *p<0.05, Z: Mann-Whitney U Test, IAS: Internet Addiction Scale, AS: Aggression Scale

Table 3: The results of IAS and AS total scores according to parents' education status, family income level and primary Internet usage aim (Kruskal Wallis-H test)

			IAS			AS		
Variable		**n**	**Mean rank**	χ^2	**p**	**Mean rank**	χ^2	**p**
Mother's education status	Primary school	224	161.69	2.06	0.355	170.25	3.76	0.152
	High school	76	163.76			158.19		
	University	28	188.98			135.59		
Father's education status	Primary school	155	163.80	3.31	0.191	181.1	10.42	0.005*
	High school	100	153.95			142.29		
	University	73	180.44			159.68		
Family income level	<1000 TL	68	141.53	6.18	0.045*	179.85	11.33	0.003*
	1000–2000 TL	155	175.70			175.07		
	>2000 TL	105	162.84			138.95		
Primary internet usage aim	Social relations	168	176.07	11.91	0.003*	159.72	1.37	0.504
	Fun	99	167.68			165.37		
	Education	61	127.49			176.25		

n=328, *p<0.05, IAS: Internet Addiction Scale, AS: Aggression Scale, χ^2: Kruskal Wallis-H Test

Table 4: The Pearson correlation matrix between factors of IAS and AS

Variables	1	2	4	5	6
IAS					
1. Preference of being online to daily life	-				
2. The desire of increasing being online	0.85*	-			
3. Problems stemming from being online	0.70*	0.68*			
AS					
4. Anger	-	-	-		
5. Hostility	-	-	0.38*	-	
6. Verbal aggression	-	-	0.33*	0.49*	-
7. Physical aggression	-	-	0.29*	0.29*	0.40*

n=328, *p<0.001, IAS: Internet Aaddiction Scale, AS: Aggression Scale

3rd Stage: Third, correlations between IDS and AQ factors were tested with Pearson correlation and the results indicated that there were significant positive correlations between IDS preferring being online to daily life factor with to want to increase duration of being online (r=0.85; p<0.001) and problems due to being online factors (r=0.70; p<0.001); to want to increase duration of being online factor and problems due to being online factor (r=0.68; p<0.001). AQ anger and hostility (r=0.38; p<0.001); verbal aggression (r=0.33; p<0.001) and physical aggression factors (r=0.29; p<0.001); hostility and verbal aggression (r=0.49; p<0.001) and physical aggression factors (r=0.29; p<0.001); verbal agression and physical aggression factors (r=0.40; p<0.001) were also positively correlated. Results showed that while IDS and AQ factors were inter-correlated, there were no correlations between IDS and AQ factors. Results were presented in Table 4.

4th Stage: Last, causality between internet dependence and aggression was tested with SEM method. SEM analysis is used to test associations between latent variables formed by observed variables (37) and has been used by several different disciplines (39). In this study, the reason to use SEM was to detect causality of the association between IDS and AQ. In the SEM developed for this purpose, IDS and AQ factors were observed variables; internet dependence was latent external variable and aggression was latent internal variable.

SEM analysis results, which was conducted to test causality between internet dependence and aggression among university students in the study context, were presented in Figure 1. While [χ^2(n=328)=14.59, p>0.05, CFI=0.1, GFI=0.99, RMSEA=0.019 (90% confidence interval:0.0, 0.060), sd=13, χ^2/sd=1.12] values obtained in the SEM indicated that the goodness of fit indices were sufficient, t value indicating the association between aggression and internet dependence latent variables was not significant (t=0.46, p>0.05). In order to be significant in SEM analysis, t values must exceed 1.96 (40). Goodness of fit parameters were presented in Table 5.

DISCUSSION

The aim of the study was to test the association between internet dependence and aggression. The possible association between internet dependence and aggression was tested in four stages. In the first stage, after mean values for IDS and AQ were determined, symptom groups were defined based on IDS cut-off scores and latter, internet dependence and aggression variables were compared regarding gender, parental education, family income and main aim to use internet. When the first stage of the study was taken into account, IDS results indicated that of 328 students involved in the sample, 302 (92.1%) did not have symptoms, 20 (6.1%) students had limited symptoms and 6 (1.8%) students had internet dependence. Results

Table 5: Fit indices of SEM

Fit indices	Coefficent
χ^2	14.59
CFI	1
GFI	0.99
RMSEA	0.019
Df	13
χ^2/df	1.12

SEM: Structural Equality Model, CFI: Comparative Fit Index,
GFI: Goodness of Fit Index,
RMSEA: Root Mean Square Error of Approximation

from different countries changed between 1% (41), 4.3% (42), 8% (43), and 13% (44). When the studies conducted in our country were taken into account, results such as %1.1(32) and %1.7(45) were consistent with the results of the present study. When aggression and internet dependence were compared regarding gender difference, it was evident that males were more predisposed to both internet dependence and aggression. Predisposition of male students to internet dependence was consistent with results of the studies by Widyanto and McMurran (46) and Tsitsika et al. (47); while their increased predisposition to aggression was consistent with results reported by Henington et al. (48). While IDS total score and internet dependence were not associated with maternal and paternal education, AQ score and aggression were higher in students whose fathers had primary school education when compared to students whose fathers had high-school education. Both IDS and AQ scores showed significant changes with family income status. Although students with family income between 1000-2000 TL were more predisposed to internet dependence compared to students with family income lower than 1000 TL, when other values considering internet dependence and family income level were taken into consideration, this result might not be commented as low income students were more predisposed to internet dependence. Similarly, detecting significant differences in aggression variable in terms of family income level, when the values obtained were considered, might not be commented as high income students were more disposed to aggression, or vice versa. While IDS total score changed with main aim to use internet, aggression did not. Consistent with some former studies (10,16), those who use internet mainly for social interaction and entertainment were more predisposed to internet dependence.

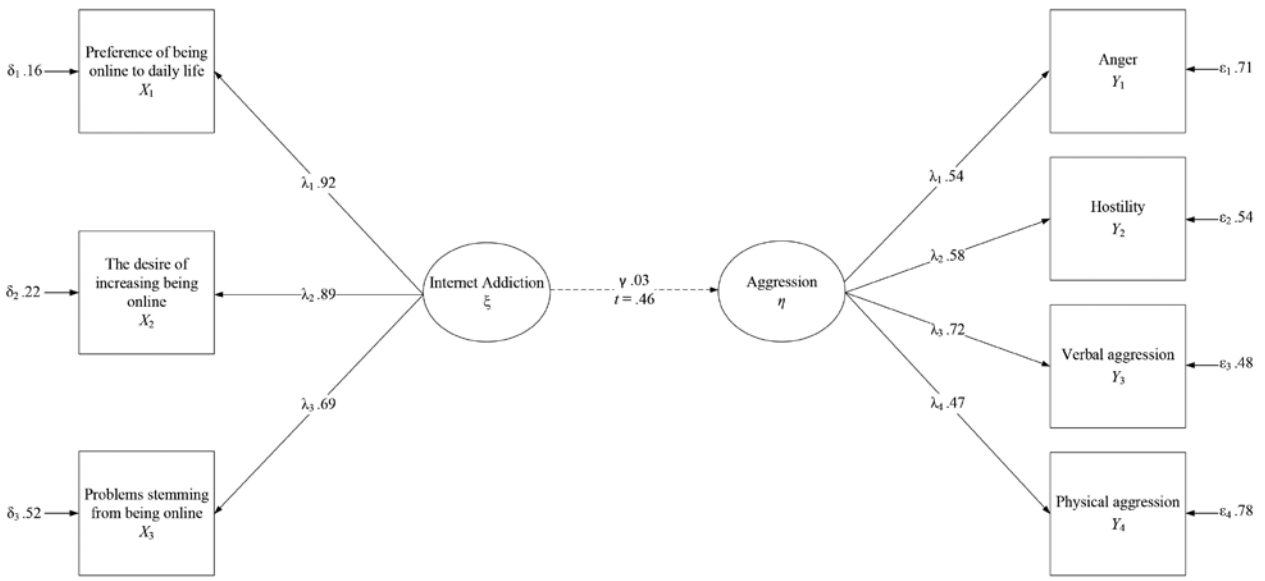

Figure 1: SEM model diagram between internet addiction and aggression

Symbols: X: observed X variable – Y: observed Y variable – **δ**: Errors of measurement for X– **ε**: Errors of measurement for Y – **ξ**: latent exogenous variable– **η**: Latent endogenous variable– **λ**: The factor loadings of observed exogenous and endogenous variables [X – Y],
– **γ**: Coefficients of effects among variables

At the second stage, association between IDS and AQ total scores were tested with Pearson correlation analysis and no association could be detected. At the third stage, correlations between IDS and AQ factors were tested with Pearson correlation analysis and no significant correlation between IDS and AQ factors could be found. At the fourth and the last stage, causality of the association between internet dependence and aggression was tested with SEM method. No significant association between IDS and AQ factors could be detected when the developed model was tested. When the second, third, and fourth stages of the study were taken into account, our results were not consistent with Fisoun et al. (49), who reported an association between internet dependence behavior and aggressive behaviors in 1270 adolescents; with Ko et al. (26), who investigated the association between internet dependence and aggression in 9405 adolescents; with Xiuqin et al. (50), who found that, when personality profiles of 304 male adolescent students were compared, individuals with internet dependence were more predisposed to aggression; with Yen et al. (28,51) who reported that hostility and internet dependence were associated and Ko et al. (26,27) who showed that hostility was a predictor of internet dependence; and with Carli et al. (52) who reported a weak association between internet dependence and hostility. The first reason for this discrepancy might be that, although the sample included 328 students, 302 students were without symptoms and only 26 students were showing limited symptoms or internet dependence, making the sample size not sufficient to detect an association between internet dependence and aggression. Association between internet dependence and aggression can be detected in a more clear way with a sample including more participants with limited symptoms or internet dependence. Supporting this comment, in studies from different parts of the world which reported an association between internet dependence and aggression, Fisoun et al. (49) reported internet dependence as 7.2% in males and 5.1% in females; Ko et al. (26) as 18.8%; Xiuqin et al. (50) as 67.11%; and Yen et al. (51) as 20.8%; all higher than our country. The second reason for this inconsistency might be different socio-cultural values and structures among different societies. Shame, which is a feature of Middle East and Mediterranean societies (53), or warm-spirite of Mediterranean society (54) might lead to less display of aggressive emotions at internet. Some limitations must be taken into account when the results were interpreted. First, when the number of university students in our country was taken into account, it must be necessary to increase the sample size (n=328). Second, main variables of the study, internet dependence and aggression were evaluated with self-report forms. Third, data was obtained only from university students. Besides, it can be suggested that association between internet dependence and aggression could be tested more broadly by adding more variables and increasing the sample size. Importance of the study is that it is the first study in our country to comprehensively test the possible association between internet dependence and aggression. Results of the present study did not show any association between internet dependence and aggression and did not support the claim that these variables were correlated.

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