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Research Article

The Effect of Problematic Internet Use, Internet Gaming Disorder and Cyberbullying/Victimization Levels on Self-Esteem in Obese Adolescents

Eroğlu Doğan H et al. Impact of Risky Online Behaviors on Self-Esteem in Obese Adolescents

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What is already known on this topic?
Studies have been conducted on problematic internet use, internet gaming disorder, self-esteem, and levels of cyberbullying/victimization among obese adolescents. Our research findings support and expand the existing literature.

What this study adds?
It has been found that cyberbullying/victimization and withdrawal symptoms of internet gaming disorder may be associated with self-esteem in obese adolescents. This is the first study to investigate the relationship between problematic technology use and self-esteem in obese adolescents.

Abstract
Objectives: The aim of this study is to compare the levels of problematic internet use, self-esteem, internet gaming disorder and cyberbullying/victimization in adolescents diagnosed with obesity with the control group and to examine the relationship between these variables and self-esteem.
Methods: The study included a total of 166 adolescents (115 females and 49 males). The relationship between the scales of Problematic Internet Use, Cyberbullying/Victimization, Internet Gaming Disorder (IGD) and the Piers-Harris Self-Esteem Scale was analyzed using linear regression methods.
Results: It was determined that self-esteem in adolescents diagnosed with obesity was lower compared to healthy controls, and problematic internet use was higher in obese individuals compared to healthy controls although no difference was found between the groups in terms of internet gaming disorder and cyberbullying/victimization levels. In obese individuals, cyber forgery and verbal cyberbullying victimization, IGD withdrawal subscales, and total scores on the cyberbullying scale have been found to be factors negatively affecting self-esteem.
Conclusions: According to the findings of our study, taking measures to reduce problematic internet use, IGD, and cyberbullying/victimization in obese adolescents can be considered as a protective measure for self-esteem and, consequently, mental health.
Keywords: obese adolescents; self-esteem; problematic internet use; internet gaming disorder; cyberbullying/victimization.

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Introduction

Obesity is a significant public health problem for both developed and developing countries (1). The prevalence and severity of obesity are dramatically increasing in children and adolescents (2). Obesity in childhood is associated with cardiometabolic and psychosocial comorbidities (3). In contemporary times, the increased use of technology has led to adolescents spending most of their time online, thereby exposing them to environmental factors that undermine their self-esteem. Specifically, problematic internet use, cyberbullying, cyber victimization, and internet gaming addiction may pose significant issues that adversely affect the self-esteem of obese individuals.
Self-esteem refers to the way individuals perceive and value themselves (4). In a more detailed manner, it is the extent to which a person believes in their own talents, significance, success, and worth (4). The relationship between obesity and low self-esteem has been demonstrated in various studies (5–7). Low self-esteem in overweight adolescents can play a critical role in the development of a range of mental disorders such as inappropriate eating and dieting behaviors, depression, anorexia nervosa, bulimia nervosa, anxiety, violent behaviors, and substance abuse (8,9). These findings suggest that maintaining self-esteem may help prevent the onset of psychopathology in individuals diagnosed with obesity.
A negative self-concept may trigger problematic internet use and internet gaming disorder (IGD). Problematic internet use is generally defined as the problematic, compulsive use of the internet, which in turn causes significant dysfunction in various life domains of the individual over a long period of time (10). There is a negative relationship between self-esteem and internet addiction(11). It has been reported that for every unit increase in self-esteem, the likelihood of internet addiction decreases by 11% (12). It has been demonstrated that individuals with low self-esteem spend more time on the internet compared to others (13,14). Additionally, research examining the relationship between body weight and internet usage has found that adolescents with problematic internet use are more likely to be obese or overweight (15–17).
Digital game addiction is described as children's continuous playing of games, associating the game with real life, preferring gaming over other activities, and avoiding their real-life responsibilities (18). Low self-esteem has been commonly reported to be associated with gaming and other internet-related disorders (19–21). Individuals with IGD are attracted to games because gaming fosters experiences of power and autonomy, thereby enhancing self-esteem (22). Furthermore, pathological gamers tend to overvalue game rewards, activities, identities (avatars), or other elements, which promotes increased gaming engagement and a diminished interest in less appealing real-life activities (22). Avatars (simulated identities within a game) can amplify feelings of power and strength and facilitate an escape from real-life problems (22). A recent review on self-esteem in gaming disorders has shown a negative relationship between gaming disorders and physical and academic self-esteem (23).

Young people are spending increasing amounts of time using digital technology and, as such, are at great risk of being involved in cyber bullying as a victim, bully, or bully/victim (24). Cyberbullying is the use of information and communication technology in a deliberate, repetitive, and hostile manner to harass and harm (25). Cyberbullying actions include threatening and spreading rumors, sharing other people's private information, and promoting social isolation and exclusion (26). When we look at studies examining the relationship between cyberbullying and obesity in the literature; the findings are contradictory (27,28). The negative association between cyberbullying victimization and self-esteem has been reported in various studies (29,30).

The aim of this study is to evaluate self-esteem, problematic internet use, internet gaming disorder, cyberbullying/victimization, levels of in adolescents with obesity and to compare them with a control group. Additionally, evaluating the relationship between these variables (problematic internet use, cyberbullying/victimization, internet gaming disorder) and self-esteem is another aim of our study. We hypothesize that adolescents with obesity will have higher levels of problematic internet use, internet gaming disorder, cyberbullying/victimization, compared to controls, and that their self-esteem will be lower compared to controls, and these variables may be independently associated with the self-esteem of obese adolescents.

Materials and methods

Subjects

Between March 2022 and September 2022, the eligibility of adolescents diagnosed with obesity who applied to the Pediatric Endocrinology Clinic of Suleyman Demirel University Medical Faculty Hospital was assessed according to inclusion and exclusion criteria.

The inclusion criteria for the obesity group were as follows: (1) aged between 12 and 18; (2) BMI percentile value ≥ 95; and (3) informed consent given by the adolescent and parent. According to reference curves for Turkish children and adolescents, patients with a BMI of ≥95th percentile were accepted as obese (31). All participants were evaluated by a pediatric endocrinology specialist and a child psychiatry specialist. Patients with obesity due to syndromic and endocrinological causes and those taking medications that can cause obesity (e.g., glucocorticoids, anticonvulsants such as carbamazepine and valproate, antidepressants, antipsychotics, or antihistamines) were excluded from the study. Additionally, patients with a major psychiatric disorder (such as intellectual disability, autism spectrum disorder, bipolar disorder, schizophrenia, etc.) and a history of psychiatric drug use were excluded from the present study. 93 adolescents (29 males and 64 females) were taken as the patient group.

The healthy control group was formed from the children who applied to our outpatient clinic for consultancy services and who did not have any psychiatric complaints or history. The inclusion criteria for the healthy control group were as follows: (1) aged 12-18; (2) BMI ≥5 to <85 percentile; (3) informed consent given by the adolescent and parent. The exclusion and inclusion criteria were the same for the control group, except for the presence of obesity. Similarly to the obesity group, all participants in the healthy control group were evaluated by both a pediatric endocrinology specialist and a child psychiatry specialist. 71 adolescents (20 males and 51 females) were taken as the healthy control group.

The study was approved by the Ethics Committee of Suleyman Demirel University Faculty of Medicine (11.02.2022, Protocol no: 72867572.050.01.04-216193). Written informed consent was obtained from the participants and their families.

Procedures

Measures/Instrumentation

The sociodemographic characteristics of all participants were assessed using a sociodemographic data form developed by the authors. Additionally, using this form, the authors recorded information on internet and social media usage duration, total internet connection time, parental online control, and the use of filtering program. In our single-center, cross-sectional study, data was collected using the Piers-Harris Self-Esteem Scale (32), Problematic Internet Use Scale (33), Cyber Victim and Bullying Scale (34), Internet Gaming Disorder Scale (35). These scales were administered to adolescents in both the patient and control groups, and the data between the groups were compared.

Piers-Harris Children's Self-Esteem Scale: PHCSES is also referred to as "Thoughts About Myself". A high score indicates a positive self-concept, while a low score indicates a negative self-concept. The scale consists of six sub-scales. The sub-scales are as follows: 1. Happiness-satisfaction, 2. Anxiety, 3. Popularity, social approval, and being favored, 4. Conduct and compliance, 5. Physical appearance, 6. Mental and school status. The Turkish validity-reliability study of the scale was conducted by Öner. (32).

Problematic Internet Use Scale-Adolescent: PIUS-A consists of three subscales: negative consequences of Internet (NCI), social benefit/social comfort (SB/SC) and excessive usage (EU). High scores from the scale indicate a high level of PIU. The validity-reliability study of the scale was conducted by Ceyhan and Ceyhan. (33).

Cyber Victim and Bullying Scale: The cyberbullying and victimization form consists of three sub-dimensions: Cyber Forgery (CF-10 items), Cyber Verbal Bullying (CVB-7 items), and Hiding Identity (HI-5 items). The validity and reliability study of the scale developed by Çetin et al. has been conducted on adolescents (34).

Internet Gaming Disorder Scale (IGDS): The Internet Gaming Disorder Scale was developed by Pontes et al. (2014). In this scale, (1) salience, (2) mood modification, (3) tolerance, (4) withdrawal symptoms, (5) conflict, and (6) relapse are assessed with 20 items. Cases scoring 69 or above are defined as having a disorder, while those scoring 60 or above are classified as being at risk. The Turkish validity and reliability of the scale was conducted by Çakıroğlu and colleagues (35).

Statistical analysis

The analysis of the data acquired in this study was done by SPSS 26.0. The Kolmogorov–Smirnov test was conducted to assess the distribution of variables, and an Student's t test or Mann–Whitney U test was used to compare continuous parameters between groups according to the findings. The chi-square test was used to compare the differences between categorical variables. Nominal variables were shown as numbers, while measured variables were shown as mean and standard deviation (SD). The relationship between the variables was evaluated with the Pearson Correlation Test. In order to reveal the relationship between clinical variables and self-esteem in a healthier way, linear regression analysis was performed. The significance level for all analyzes was accepted as $p<0.05$. Using the G*Power 3.1.9.7 program, a post hoc power analysis was conducted for a comparison of two independent groups to determine the statistical power of the present study ($\alpha = 0.05$, Cohen's $d = 0.50$, group 1 sample size = 93, group 2 sample size = 71). Based on the Student's t-test, the calculated statistical power was approximately 88%.

Results

A total of 164 adolescents aged 12-18 (115 females and 49 males) were included in the study. In the obesity group (64 females/29 males), the average age was 15.2±1.5, while in the control group (51 females/20 males), the average age was 15.6 ±1.6 years. There was no difference between gender and age groups. The BMI percentile for the obese group was 98.8 ± 1.5, while that of the control group was 29.4 ± 26.4. The demographic characteristics of obese adolescents and controls are given in Table 1.

The total PHCSES score of the obesity group was significantly lower than that of the healthy control group (Table 2). It was found that the obesity group scored lower than the control group in the PHCSES sub-scales of physical appearance, behavior, popularity, anxiety, and happiness satisfaction (Table 2). In the obesity group, the total PIUS score and the PIUS sub-scale scores NCI, EU were statistically higher compared to the healthy control (Table 2). No difference was found between the groups in the total scores of IGDS, CVBS, and their sub-scale scores (Table 2).

Compared to the healthy control group, the obesity group spent significantly more time on the internet and social media (Table 3). It was determined that 30.1% (n=28) of the obesity group and 16.9% (n=12) of the control group used the internet at night (Table 3).

When comparing the monitoring of internet use by family members and the use of filtering programs for internet access between the obesity and control groups, no statistically significant difference was found between the groups (Table 3).

Table 4 shows the results of linear regression analysis of psychiatric scale scores that are thought to be effective on self-esteem in the obesity group. The Piers-Harris Children's Self-Esteem Scale was used as the dependent variable while PIU-A, IGD, CV, CB scale sub-scores, BMI percentiles, gender, and time spent on the internet were taken as independent variables. The analysis revealed that the CV-CF sub-scale ($p=0.003$; $\beta=-0.103$), CV-CVB sub-scale ($p=0.032$; $\beta=-0.057$), and the IGD-withdrawal sub-scale ($p=0.03$; $\beta=-0.084$) were identified as factors that decrease self-esteem in the obesity group.

Table 4 presents the results of the linear regression analysis of psychiatric scale scores thought to be influential on self-esteem in the obesity group. The Piers-Harris Children's Self-Esteem Scale was used as the dependent variable, while the PIU-A, IGD, CV, CB sub-scale scores, BMI percentiles, gender, and time spent on the internet were taken as independent variables. The analysis identified the CV-CF sub-scale ($p=0.003$; $\beta=-0.103$), CV-CVB sub-scale ($p=0.032$; $\beta=-0.057$), and IGD-withdrawal sub-scale ($p=0.03$; $\beta=-0.084$) as negative predictors of self-esteem in the obesity group.

Table 5 presents the results of the linear regression analysis using the Enter method for the total scores of psychiatric scales that we hypothesized could have an effect on self-esteem in the obesity group. While the Piers-Harris Self-Esteem Scale was taken as the dependent variable, the total scores of the scale were taken as the independent variable. The analysis indicated that the total CB score ($p=0.017$; $\beta=-0.289$) was a negative predictor of self-esteem in the obesity group.

Discussion

In this study, it was determined that adolescents diagnosed with obesity exhibited lower self-esteem compared to healthy controls, while problematic internet use was higher among obese individuals relative to healthy controls. However, no differences were found between groups regarding internet gaming disorder and cyberbullying/victimization levels. To the best of our knowledge, this study is the first to examine the relationship between problematic internet use, internet gaming disorder, and cyberbullying/victimization with self-esteem in obese adolescents. Significant findings were identified that both confirm and extend existing research in this area. In obese individuals, cyber forgery and verbal cyberbullying victimization, IGD withdrawal subscales, and total scores on the cyberbullying scale have been found to be factors negatively affecting self-esteem.

Self-esteem refers to a person's self-evaluation or attitude towards themselves and is a fundamental aspect of mental health (36,37). In a study with 2,813 Australian children (average age: 11.3), obese children showed significantly lower athletic competence, physical appearance, and overall self-esteem compared to their normal-weight peers (38). A review of the literature reveals that self-esteem is impaired in obese adolescents in nearly all studies (39). In our study, similar to existing research, it was found that obese adolescents had significantly lower scores in physical appearance, behavior, popularity, anxiety, happiness satisfaction sub-scales, and overall self-esteem compared to the control group. Children in the overweight/obesity group tend to encounter more social pressure and negative events such as peer aggression, teasing, and bullying outside of their homes (40,41). These experiences can often lead to the development of low self-esteem in children with obesity.

Internet Gaming Disorder (IGD), prevalence rates vary between 0.6% to 50% across studies conducted in different countries, showing a range of differences (42,43). Başdaş et al. have found that adolescents diagnosed with obesity have higher digital game addiction scores compared to the control group; they have associated this situation with the fact that adolescents who allocate more time to digital games sit for longer periods and thus are less physically active (44). Being male has been shown to be a risk factor for internet gaming disorder in various studies. In a study conducted with 1,556 students in Korea, it has been shown that males play online games three times more than females (45). In our study, no significant difference was found between adolescents diagnosed with obesity and the control group in terms of internet gaming disorder. %15 of the obesity adolescents and %14 of the adolescents in the control group showed symptoms of risky internet gaming disorder, with internet gaming disorder being identified in %0.4 of the adolescents in the obesity group. In our study, the prevalence of internet gaming disorder was found to be lower than in other studies in the literature. The fact that more than 2/3 of the sample group in our study was composed of girls, and that IGD was more commonly seen in boys, may have resulted in no significant statistical difference being found between the groups in our study and the prevalence of IGD appearing low. In our study, withdrawal symptoms of Internet gaming disorder were found to be a negative predictor of self-esteem in obese adolescents. Withdrawal symptoms are the negative emotions and/or physical effects that arise when gaming is suddenly stopped or reduced (46). It has also been found that low self-esteem triggers pathological gaming behavior (22). Excessive gamers are attracted to games because gaming stimulates the experience of power and autonomy, and strengthens self-esteem (22). Considering the relationship between IGD and self-esteem, monitoring internet gaming in adolescents could be a protective approach for self-esteem.

In the online world, individuals who are overweight and obese may frequently encounter aggressive messages; a systematic assessment of comments on a video-sharing website has reported that weight stigma can 'go viral' on the internet (47). In a study conducted among 4,364 children in the Netherlands, it was found that children diagnosed with obesity were more likely to be both victims and perpetrators of bullying compared to the control group (48). Sergentanis et al. have hypothesized that due to the increasing prevalence of obesity, overweight/obesity has become normalized among adolescents (49). According to data from the Turkish Statistical Institute, the prevalence of obesity is increasing in our country, and being overweight or obese individuals may have also become normalized in our country, which could explain the lack of detected differences between the groups. Nocenti et al. have reported that parental monitoring of online internet use is a protective factor against cyberbullying (50). In our study, no difference was found between the groups in terms of parental monitoring of internet use. Another reason for the lack of differences between the groups in terms of cyberbullying and victimization may be the similar parental internet monitoring.

In our study, it was found that exposure to cyber forgery and verbal cyberbullying victimization could be factors negatively affecting self-esteem in adolescents diagnosed with obesity. Adolescents diagnosed with obesity are often more affected by negative emotional experiences and generally have lower self-esteem compared to their peers (7,38,51). Therefore, cyberbullying victimization may further reduce self-esteem in obese adolescents. Self-esteem becomes increasingly important during adolescence, as this period heightens the significance of peer relationships, peer acceptance, and physical appearance, which can make adolescents more aggressive towards events that may threaten their self-esteem (52). Social relations theory posits that individuals with low self-esteem have weaker social relationships with others and that their lower conformity to social norms increases the risk of aggression (53). Individuals with low self-esteem tend to exhibit aggressive behaviors to gain power and achieve a higher level of self-esteem (54). According to our findings, cyberbullying is another factor negatively affecting self-esteem. Obese adolescents might be exhibiting aggressive behaviors as a means of self-expression due to their low self-esteem, which could further diminish their sense of self-worth. When these findings are considered together, preventing cyberbullying/victimization in obese individuals can be thought of as a protective approach for self-esteem.

Our study has several limitations. The most significant limitation is the cross-sectional design of our study. The cross-sectional design of the study complicates the determination of the direction of the relationships between the variables assessed in individuals with obesity, as well as the establishment of causal relationships. Longitudinal studies are needed to provide more evidence for these relationships. Additionally, only self-report measures have been used. Employing a multi-method approach (for example, integrating self-report measures with interviews) could be a strategy to overcome the limitations associated with collecting self-reported data. At the same time, we selected study samples from patients referred to pediatric endocrinology clinics, and nearly two-thirds of the adolescents in our study were girls. These factors limit the generalizability of our findings.

Conclusion

The findings of this study indicate that obesity is associated with low self-esteem and problematic internet use during adolescence. According to our findings, it was determined that risky online behaviors may be associated with self-esteem. In light of this information, taking preventive measures to reduce problematic online behaviors in obese adolescents can be considered as a protective measure for self-esteem. For the variables in our study to gain clarity in individuals diagnosed with obesity, longitudinal studies in a more homogeneous and larger sample are needed.

Contributors: Evrim Aktepe and Havvanur Eroğlu Doğan conceived of the study and participated in its design and coordination. Evrim Aktepe and Havvanur Eroğlu Doğan supervised the data collection. Evrim Aktepe and Havvanur Eroğlu Doğan drafted the manuscript. Ümit Işık and Havvanur Eroğlu performed statistical analysis of data. All authors read and approved the final manuscript.

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Table 1: Demographic features of adolescents with obesity and control subjects.

	Obesity (n=93)	Controls (n=71)	x²,t,z	p-value
BMI percentile (Mean±SD)	98.82 ±1.54	29.45 ± 26.48	6.345 b	< 0.001
Age,years (Mean±SD)	15.2 ± 1.5	15.6 ± 1.6	-1.803[b]	0.073
Gender (M/F)	29/64	20/51	0.175[a]	0.676

[a]Chi Square test; [b]Student t test; [a]Mann Whitney-U test; BMI, Body mass index.

Table 2. Clinical characteristics of the groups

	Obesity (n=93)	Controls (n=71)	t/z	p-value
PHCSES				
Total (Mean±SD)	47.9 ± 13.2	55.5 ± 11.3	-3.660[a]	**< 0.001**
Mental State (Mean±SD)	3.81 ± 1.75	4.28 ± 1.73	-1.691[b]	0.093
Physical Appearance (Mean±SD)	5.13 ± 2.56	6.19 ± 2.45	-2.660[a]	**0.009**
Behaviour (Mean±SD)	10.66 ± 3.06	12.05 ± 2.41	-3.125[b]	**0.002**
Popularity (Mean±SD)	7.46 ± 2.81	8.73 ± 2.29	-2.916[a]	**0.004**
Anxiety (Mean±SD)	5.52 ± 2.80	6.73 ± 3.10	-2.603[b]	**0.011**
Happiness Satisfaction (Mean±SD)	7.02 ± 3.93	8.52 ± 3.47	-2.539[a]	**0.012**
PIUS-A				
Total (Mean±SD)	66.46 ± 21.01	58.98 ± 19.67	-2.551[a]	**0.011**
NCI (Mean±SD)	30.26 ± 12.31	26.04 ± 10.96	-2.267[a]	**0.023**
EU (Mean±SD)	20.23 ± 5.39	18.42 ± 5.06	-2.359[a]	**0.018**
SB/SC (Mean±SD)	15.95 ± 6.73	14.52 ± 6.12	1.407[b]	0.161
IGDS				
Total (Mean±SD)	41.29 ± 16.11	39.52 ± 16.73	0.685[b]	0.494
Salience (Mean±SD)	5.80 ± 3.05	5.54 ± 3.18	0.524[b]	0.601
Mood (Mean±SD)	7.98 ± 3.11	7.49 ± 3.10	1.012[b]	0.313
Tolerance (Mean±SD)	5.81 ± 2.96	5.81 ± 3.05	0.001[b]	0.999
Withdrawal (Mean±SD)	5.46 ± 3.09	5.28 ± 2.87	0.382[b]	0.703
Conflict (Mean±SD)	10.32 ± 4.17	10.02 ± 4.18	0.449[b]	0.654
Recurrence (Mean±SD)	5.89 ± 3.00	5.35 ± 2.79	1.175[b]	0.242
CVBS				
CB-Total (Mean±SD)	25.76 ± 6.45	25.40 ± 5.25	0.378[b]	0.706
CV-Total (Mean±SD)	28.18 ± 11.1	27.35 ± 7.6	0.263[b]	0.592
CVB-CB (Mean±SD)	8.52 ± 2.97	8.46 ± 2.77	0.136[b]	0.892
CVB-CV (Mean±SD)	9.33 ± 4.25	9.14 ± 3.37	0.313[b]	0.755
HI-CB (Mean±SD)	6.31 ± 2.03	6.36 ± 2.07	-0.867[b]	0.867
HI-CV (Mean±SD)	6.7 ± 3.3	6.5 ± 2.4	0.436[b]	0.663
CF-CB (Mean±SD)	10.92 ± 2.96	10.57 ± 1.40	0.913[b]	0.363
CF-CV (Mean±SD)	12.13 ± 5.06	11.7 ± 3.40	0.625[b]	0.533

[a]Mann Whitney-U test; [b]Student t test; Piers-Harris Children's Self-Esteem Scale, PHCSES; Problematic Internet Use Scale-Adolescent, PIUS-A; Negative Consequences of Internet, NCI; Social benefit/Social comfort, SB/SC; Excessive Usage, EU; Internet Gaming Disorder Scale, IGDS; Cyber Victim and Bullying Scale, CVCB; Cyber Forgery, CF; Cyber Verbal Bullying, CVB; Hiding Identity, HI. Bold values represent significant results.

Table 3. Comparison of the obesity and control groups internet and social media usage times, internet connection times, and supervision of internet use by family members

		Obesity (n=93)	Controls (n=71)	x^2	p-value
internet usage time	less than 1 hour (%)	1 (1)	4 (5)	37,410	**< 0.001**
	1-3 hours (%)	21 (22.5)	42 (59.1)		
	more than 3 hours (%)	71 (76.3)	25 (35.2)		
Social media usage time	less than 1 hour (%)	24 (25.8)	25 (35.2)	11.610	**0.021**
	1-3 hours (%)	33 (35.4)	35 (49.2)		
	more than 3 hours (%)	36 (38.7)	11 (15.4)		
Internet connection time	Morning (%)	3 (3.2)	2 (2.8)	9.689	**0.021**
	Mid day (%)	23 (24.7)	10 (14)		
	Evening (%)	39 (41.9)	47 (66.1)		
	Night (%)	28 (30.1)	12 (16.9)		
Family control online	Yes (%)	32 (34.4)	31 (43.6)	1.457	0.227
	No (%)	61 (65.5)	40 (56.3)		
Filter program entity	Yes (%)	13 (13.9)	17 (23.9)	2.675	0.102
	No (%)	80 (86)	54 (76)		

Chi Square test. Bold values represent significant results.

Table 4. Regression Analyses of Factors Affecting Piers-Harris Self-Esteem Scale in Obese Adolescents

	Unstandardized Coefficients	Standardized Coefficients		95% Confidence Interval for B	
	B	Beta	p	Lower Bound	Upper Bound
CV-CF	-0.270	-0.103	**0.003**	-0.441	-0.099
CV-CVB	-0.177	-0.057	**0.032**	-0.336	-0.018
IGD-withdrawal	-0.358	-0.084	**0.030**	-0.674	-0.042

F=176.836, df=28, p<0.001, Adjusted R^2=0.982. Cyber Victim, CV; CB; Cyber Forgery, CF; Cyber Verbal Bullying, CVB; Internet Gaming Disorder, IGD

Table 5. Regression Analyses of the Total Scores of Scales Affecting Piers-Harris Self-Esteem Scale in Obese Adolescents

	Unstandardized Coefficients	Standardized Coefficients		95% Confidence Interval for B	
	B	Beta	p	Lower Bound	Upper Bound
CB total	-0.589	-0.289	**0.017**	-1.063	-0.115
CV total	-0.069	-0.059	0.642	-0.359	0.221
PIUS total	-0.122	-0.188	0.270	-0.338	0.094
IGDS total	-0.066	-0.079	0.493	-0.254	0.122

F=2.927, df=16, p<0.001, Adjusted R^2=0.630. Cyber Bullying, CB; Cyber Victim, CV; Problematic Internet Use Scale, PIUS; Internet Gaming Disorder Scale, IGDS