

# The Association Between Internet Addiction and Eating Attitudes of University Students: A Cross-Sectional Design

## Üniversite Öğrencilerinin İnternet Bağımlılığı ve Yeme Tutumları Arasındaki İlişki: Kesitsel Bir Araştırma

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**ABSTRACT Objective:** The fact that young people's excessive internet use, which can be defined as addiction, may cause health problems, including eating disorders and obesity. This cross-sectional descriptive study aimed to determine the associations between internet addiction and the eating attitudes of university students. **Material and Methods:** This study was conducted with 509 undergraduate students. The short version of Young's Internet Addiction Test was used to identify internet addiction, and Eating Attitude Test was used to determine irregular eating patterns. **Results:** As internet addiction increased, the risk of eating disorders, obesity anxiety, and excessive interest in losing weight among the participants increased simultaneously ( $p<0.001$ ). The regression analysis revealed that internet addiction might be associated with the eating attitudes of university students ( $R^2=0.03$ ,  $df_{1,2}=1-507$ ,  $F=15.185$ ,  $p<0.001$ ). The body mass index (BMI) of all problematic internet users was  $\geq 30$  kg/m<sup>2</sup> ( $30.5\pm 8.31$ ). **Conclusion:** Although the internet has become an essential part of our lives, excessive use may bring the risk of addiction and also may trigger eating disorders. In this study, it was observed that internet addiction might cause an increase in BMI. Accordingly, as the students actualize the contents on the internet in real life and the effects on their eating behavior and choices increase, the risk of impairment in their eating attitudes increases. Consequently, there is a need to raise awareness about being a conscious internet user.

**Keywords:** Students; internet addiction disorder; eating behavior; feeding and eating disorders; obesity

**ÖZET Amaç:** Bağımlılık olarak da tanımlanabilecek olan genç bireylerin aşırı internet kullanımı, yeme bozuklukları ve obezite gibi sağlık sorunlarına yol açabilir. Bu kesitsel tanımlayıcı çalışmada, üniversite öğrencilerinin internet bağımlılık düzeyleri ile yeme tutumları arasındaki ilişkinin belirlenmesi amaçlanmıştır. **Gereç ve Yöntemler:** Bu çalışma, 509 lisans öğrencisi ile gerçekleştirilmiştir. Çalışmada, öğrencilerin internet bağımlılığını belirlemek için Young'ın İnternet Bağımlılığı Testi'nin kısa versiyonu, düzensiz yeme örüntülerini belirlemek için ise Yeme Tutum Testi kullanılmıştır. **Bulgular:** Çalışmadan elde edilen verilere göre üniversite öğrencilerinin internet bağımlılık düzeyleri arttıkça yeme bozuklukları riski, obezite kaygıları ve kilo vermeye aşırı ilgileri de aynı anda artmaktadır ( $p<0,001$ ). Regresyon analizi bulguları, internet bağımlılığının üniversite öğrencilerinin yeme tutumları ile ilişkili olabileceğini ortaya koymaktadır ( $R^2=0,03$ ,  $df_{1,2}=1-507$ ,  $F=15,185$ ,  $p<0,001$ ). Üniversite öğrencileri arasında tüm problemlili internet kullanıcılarının beden kütle indeksi (BKİ)  $\geq 30$  kg/m<sup>2</sup> ( $30,5\pm 8,31$ ) olarak tespit edilmiştir. **Sonuç:** İnternet, hayatımızın vazgeçilmez bir parçası hâline gelse de aşırı kullanımının bağımlılık riskini de beraberinde getirdiği ve yeme bozukluklarını tetikleyebildiği unutulmamalıdır. Bu çalışmada, internet bağımlılığının BKİ üstünde artışa neden olabileceği gözlenmiştir. Dolayısıyla üniversite öğrencilerinin internetteki içerikleri gerçek hayatlarına uyguladıkça ve bu durumun yeme davranışlarına ve seçimlerine etkileri arttıkça yeme tutumlarında bozulma riski de artmaktadır. Sonuç olarak, toplumda bilinçli bir internet kullanıcısı olma konusunda farkındalık yaratılmasına ihtiyaç olduğu görülmektedir.

**Anahtar Kelimeler:** Öğrenciler; internet bağımlılığı bozukluğu; yeme alışkanlığı; beslenme ve yeme bozuklukları; obezite

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Undesirable eating behaviors of individuals due to excessive internet occupation, which can be defined as internet addiction, may increase the risk of both eating disorders (EDs) and obesity.<sup>1</sup> Some types of EDs and obesity show similar characteristics, including severe impairment, typical eating behavior, overeating in a short time, lack of satisfaction with the body shape, desire to lose weight steadily, and excessive anxiety about food.<sup>2</sup> Although all these risk factors are an important problem for individuals of all ages, specifically children, university students, and women under 25 years are at even higher risk of cementing unhealthy eating attitudes.<sup>3-5</sup> Because unhealthy eating behaviors such as inadequate snacking, skipping meals, excessive consumption of energy-dense foods, insufficient consumption of vegetables and fruits, and increased portion sizes, triggered by excessive use of computer or telephone are common among university students, as well as irregular sleep patterns, sedentary lifestyle, and substance use.<sup>5-7</sup>

Students also reported being affected by individual factors, including taste preferences, increased self-determination in decision-making, their social communication networks, parental control, transitioning to independent life, friends, accessibility and availability of foods, and macro environments such as media and advertising.<sup>6,7</sup>

While the World Wide Web (WWW) revolution enables an interactive communication process around the world, it is considered one of the obesogenic factors that has a significant impact on people's eating behaviors and brings impulsive psychiatric disorders, including internet addiction.<sup>8</sup> However, addiction meant only substance or drug misuse in the past; today, it also refers to excessive gambling and internet occupation, which is mostly associated with social media and gaming.<sup>9</sup>

It is evident that the internet is a tool for seeking information, but social media brought out another dimension to this by allowing people to follow actual food choices trends, share and discover food experiences, and seek food suggestions. Studies indicated that pro-anorexia content/videos which received a high number of positive feedback and encouraged anorexia are the vast majority of the shared content

on the internet.<sup>10,11</sup> Additionally, the idealization of thin body structure by objectifying women through various platforms leads to negative body perception, more irregular eating, and weight anxiety that may cause eating pathology and adversely affect self-esteem.<sup>12-14</sup> Excessive occupation on image-based platforms on the internet has been associated with orthorexia nervosa and the perception that thin individuals are more attractive and have a higher status.<sup>13-16</sup> This tendency was predominantly seen among adolescent women users with more health and fitness-related content.<sup>17</sup> Content accenting lower body mass index (BMI) is displayed more by individuals with EDs, particularly bulimia nervosa, who are more prone to try unhealthy practices, including unnecessary detox or laxative use.<sup>17</sup> The results point out that media-ideal internalization envisaged a person to think about their body from the external observer's point of view, which may cause negative emotional experiences about their body and appearance, which were found to trigger subsequent dietary restrictions followed by overeating.<sup>18</sup>

Despite all mentioned negative links, some opposing views about internet occupation and health exist. The terms "fitspiration" and "thinspiration" came into our lives which comprised of "fitness," "thinness," and "inspiration." However, these terms are specially used for exercise and healthy nutrition-based sharings that aim to urge people to healthy alternative nutrition plans; they are designed to motivate people to lose weight and idealize thin bodies.<sup>12,15,17</sup>

It is necessary to develop measures that take into consideration promoting healthy nutrition because healthy eating attitudes of university students may have public health importance in terms of both their health and as a model of healthy eating behaviors for future generations. Thus, this study aimed to determine university students' internet addiction level and its possible effects on their eating attitudes.

## MATERIAL AND METHODS

### PARTICIPANTS AND PROCEDURE

This cross-sectional descriptive study was designed to observe undergraduate students' internet addiction

and eating attitudes at a private university in the academic calendar of October 9, 2019-May 8, 2020 in İstanbul. Only volunteered participants who are students at 26 Ağustos campus of Yeditepe University was included to the study. The study protocol started after the ethical approval was taken from the Non-Interventional Clinical Research Ethics Committee of Bezmialem University with the decision numbered 54022451-050.05.04-dated 16.04.2019. All processes of this study were conducted in accordance with the Helsinki Declaration ethical principles.

The study universe consists of 16,450 students studying in the undergraduate programs of 13 faculties. The sample size was calculated as a minimum of 370 at the 95% confidence interval and stratified regarding the number of registered students in each faculty.<sup>19</sup> Eventually, the study was completed with 509 volunteered participants over 18 years (mean±SD=21.5±2.32), using convenience sampling. Data were collected via face-to-face (at the campus simultaneously) and online questionnaire methods (via the google forms).

## MEASURES

The data collection form consists of 3 parts, including demographic (sex and age) & anthropometric characteristics (self-reported weight and height), internet use & addiction characteristics, and eating attitudes of the students.

The BMI was calculated with self-reported anthropometric measures (height, weight).

## INTERNET USE & ADDICTION CHARACTERISTICS

Three questions were asked to obtain information about the internet user characteristics of the participants: “Do you think your use of the internet affects your eating behavior?”, “Do the visuals you have seen on the internet affect your eating choices?” and “Have you tried the recipes you’ve seen on the internet?” Additionally, the Young’s Internet Addiction Test (s-IAT), which was developed in 2004, was converted into a short form in 2013, adapted to Turkish in 2015, and was used to assess the internet addiction of the students.<sup>8,20,21</sup> The test consists of 12 items; accordingly, higher scores indicate high levels of internet addiction. In addition, according to Meerkerk’s

study, scores  $\leq 30$  were accepted as “Acceptable internet use,” and scores  $> 30$  were accepted as “Problematic or Pathological internet use.”<sup>22</sup>

## EATING ATTITUDES

The Eating Attitude Test (EAT)-40, developed in 1979 and adapted to Turkish in 1989, was used to evaluate the signs of possible disorders in eating behaviors among university students.<sup>23</sup> It is a multidimensional self-report scale with 40 items, and the total score is obtained by summing up the scores from each item. Factor analysis of the scale revealed 4 interpretable factors, including obesity anxiety-excessive occupation with obesity factor (OAF), diet-regime factor (DRF), the perception factor of social pressure regarding weight gain (PF), and excessive interest in losing weight factor (LWF).<sup>24</sup>

## DATA ANALYSIS

The analysis was computed regarding the students’ EAT-40 and s-IAT scores, and the data set was published in the Mendeley data repository (Keküllüoğlu, Kaya Cebioglu 2021). Quantitative variables were described as mean, standard deviation (SD), and range, while qualitative variables as frequency. Student t-tests, one-way ANOVA tests, and non-parametric alternatives were used for continuous parameters. Pearson’s rank correlation coefficient ( $r_s$ ) was calculated for the inter-correlations. The confidence interval was determined as 95% in all analyses, and the results were considered statistically significant for  $p < 0.05$ . Variables that were found to be correlated with the EAT-40 score were analyzed with a simple linear regression analysis developed using the enter method. All data were analyzed with SPSS version 25.0 (IBM Inc. Corp., Version 25.0, Chicago IL, USA).

## DATA AVAILABILITY STATEMENT

The data supporting this study’s findings are openly available in Mendeley Data at <http://dx.doi.org/10.17632/zrn4kpx247.1>.

## RESULTS

All demographics & anthropometric characteristics and other variables of the students were presented in [Table 1](#). Of those 509 students, 68% were women,

70.7% with a mean age  $21.5\pm 2.31$ . The students were in the normal weight range, 14.1% were in the overweight range, 4.75% were in the obese range, and the rest were underweight. Furthermore, the mean BMI of the students was  $22.42\pm 3.94$ , with a range of 15.24 to 40.47.

The scores of the s-IAT of the participants range from 12 to 59 ( $26.9\pm 8.19$ ). Moreover, students were classified according to Meerkerk's study regarding their s-IAT scores, and 71.3% of them scored  $\leq 30$ , which is considered "Acceptable internet use," and 28.7% of them scored  $>30$ , indicating "Problematic or Pathological internet use."<sup>22</sup> In addition to this, the mean daily internet occupation of the students was  $3.1\pm 1.75$  (1-13) hours. According to the questions investigating the internet user characteristics, the majority of the students indicated that the use of the internet affects their eating behavior (54.2%), the visuals on the internet affect their eating choices (73.2%), and also 70.3% of them tried the recipes seen on the internet (Table 1).

The mean total score of EAT-40 of the students was  $12.9\pm 6.5$  (range from 0 to 37), and 1.4% of the students scored  $\geq 30$ , indicating impaired eating attitude (Table 1).

Regarding the score of EAT-40 and s-IAT of the students, no significant difference was observed between sexes and BMI groups ( $p>0.05$ ). However, it is noteworthy that all problematic or pathological (s-IAT $>30$ ) internet users were obese BMI, while students in other BMI groups exhibit acceptable (s-IAT $\leq 30$ ) internet use. Furthermore, both women and men showed acceptable internet use ( $27.1\pm 8.3$  and  $26.4\pm 8$ , respectively) (Table 2).

However, those who mentioned that their eating behavior is affected by their internet use had significantly higher EAT-40 scores ( $13.8\pm 6.7$   $p<0.000$ ) and s-IAT scores ( $28.3\pm 8.2$   $p<0.000$ ) than those who were not affected. Similarly, those who indicated that their eating choices were affected by the visuals on the internet had significantly higher EAT-40 and s-IAT scores ( $13.4\pm 6.7$ ,  $p=0.004$ , and  $27.6\pm 8$ ,  $p=0.002$ ,

TABLE 1: Descriptive properties of overall students.

		Mean $\pm$ SD	Minimum-maximum
Age		21.5 $\pm$ 2.3	18-29
BMI		22.42 $\pm$ 3.94	15.24-40.47
Hours spending on internet		3.1 $\pm$ 1.75	1-13
EAT-40 score		12.89 $\pm$ 6.49	0-37
s-IAT score		26.9 $\pm$ 8.19	12-59
		n (509)	%
Sex	Women	346	68
	Men	163	32
BMI	Underweight	53	10.4
	Normal	360	70.7
	Overweight	72	14.1
	Obese	24	4.8
s-IAT	$\leq 30$	363	71.3
	$>30$	146	28.7
EAT-40	$<30$	502	98.6
	$\geq 30$	7	1.4
Do you think your use of the internet affects your eating behavior?	Yes	276	54.2
	No	233	45.8
Do the visuals you have seen on the internet affect your eating choices?	Yes	373	73.3
	No	136	26.7
Have you tried the recipes you've seen on the internet?	Yes	358	70.3
	No	151	29.7

BMI: Body mass index; sIAT: Internet Addiction Test; EAT-40: Eating Attitude Test-40.

**TABLE 2:** The comparison of mean scores of eating disorders and internet addiction according to variables.

		EAT-40 total score		s-IAT score	
		Mean±SD (minimum-maximum)	p value	Mean±SD (minimum-maximum)	p value
Sex	Women (n=346)	13.3±6.6 (0-37)	0.050**	27.1±8.3 (12-59)	0.379**
	Men (n=163)	12.1±6.3 (2-36)		26.4±8 (12-48)	
BMI	Underweight (n=53)	12.2±5.6 (3-28)	0.952*	26.6±9 (13-50)	0.171*
	Normal (n=360)	12.9±6.8 (0-37)		26.7±8.2 (12-59)	
	Overweight (n=72)	12.9±5.8 (2-27)		26.9±7.1 (15-45)	
	Obese (n=24)	13.6±6.2 (5-32)		30.5±8.3,1 (17-49)	
Do you think your use of the internet affects your eating behavior?	Yes	13.8±6.7 (0-37)	0.001**	28.3±8.2 (12-59)	0.000**
	No	11.8±6.1 (2-36)		25.2±7.9 (12-51)	
Do the visuals you have seen on the internet affect your eating choices?	Yes	13.4±6.7 (0-37)	0.004**	27.6±8 (12-59)	0.002**
	No	11.5±5.6 (2-28)		25.0±8.3 (12-50)	
Have you tried the recipes you've seen on the internet?	Yes	13.9±6.7 (2-37)	0.000**	27±8.4 (12-59)	0.704**
	No	10.6±5.2 (0-28)		26.7±7.8 (12-47)	

\*p value calculated via one way-ANOVA test; \*\*p value calculated via t-test; SD: Standard deviation; EAT-40: Eating Attitude Test-40; s-IAT: Internet Addiction Test short form; BMI: Body mass index.

respectively). However, those who tried the recipes seen online had significantly higher scores on the EAT-40 (13.9±6.7,  $p<0.000$ ). However, this group had slightly but insignificantly higher scores on the s-IAT ( $p>0.05$ ) (Table 2).

Regarding the sexes, women scored significantly twice as higher (1.6±1.9  $p<0.000$ ) for the OAF and significantly lower for the PF. As expected, individuals with obesity and overweight had significantly higher scores of the OAF than those underweight and normal weight ( $p=0.017$ ). The findings showed that those students in the underweight range had higher scores on the PF than those in other BMI groups, indicating they perceived significantly higher social pressure regarding weight gain ( $p<0.000$ ). Individuals displayed similar scores for the diet regime factor (DRF) and the LWF in terms of their BMI (Table 3).

Students emphasizing that the visuals they see on the internet affect their eating preferences or try the recipes found on the internet or that their eating behaviors were affected by the internet had higher scores in all sub-factors of the EAT-40 except PF. Furthermore, the findings indicate that the internet use characteristics of students have a significant effect on their eating behaviors, increasing obesity anxiety (OAF), avoidance of food (DRF), a preoc-

cupation with being thinner and excessive interest in losing weight (LWF) ( $p>0.05$ ) (Table 3).

Besides, a significant positive weak correlation was found between the scores of s-IAT and the EAT-40 and its subfactors, including OAF, PF, and LWF ( $p<0.05$ ). Furthermore, according to the correlation analysis, as the BMI of the participants increased, the risk of eating disorders, the scores of OAF, and DRF increased, but, the level of PF decreased simultaneously ( $p<0.05$ ). But, no correlation was observed between hours spent on the internet and all other parameters ( $p>0.05$ ) (Table 4). Apart from these findings, the regression analysis revealed that internet addiction might be associated with the eating attitudes of university students ( $R^2=0.03$ ,  $df_{1,2}=1-507$ ,  $F=15.185$ ,  $p<0.001$ ) (Table 5).

## DISCUSSION

This study was carried out specifically for the sample of university students who are in the high-risk group in terms of technology and social media addiction since they are prone to spend their entire time in a digital environment and master using it in many aspects of their lives.<sup>25</sup> This is because young people can adapt to technological developments more quickly, and they are more likely to prefer social

**TABLE 3:** The comparison of mean scores of EAT-40 sub-factors according to variables.

		OAF		DRF		PF		LWF	
		Mean±SD	p value	Mean±SD	p value	Mean±SD	p value	Mean±SD	p value
Sex	Women	1.6±1.9	0.000**	1.8±2.3	0.980**	0.7±0.9	0.021**	0.5±0.8	0.719**
	Men	0.7±1.2		1.8±2.4		1±1.3		0.5±0.9	
BMI	Underweight	0.5±1.2	0.017*	1.4±1.9	0.574*	1.7±1.3	0.000*	0.4±0.8	0.531*
	Normal	1.3±1.8		1.9±2.4		0.7±1.1		0.5±0.8	
	Overweight	1.6±1.8		1.8±2.2		0.5±0.7		0.5±0.9	
	Obese	1.6±1.9		1.8±1.8		0.8±0.8		0.4±0.6	
Do you think your use of the internet affects your eating behavior?	Yes	1.6±1.9	0.000**	2±2.3	0.027**	0.8±1.1	0.83**	0.5±0.9	0.029**
	No	0.9±1.6		1.6±2.2		0.8±1.1		0.4±0.7	
Do the visuals you have seen on the internet affect your eating choices?	Yes	1.5±1.9	0.001**	1.9±2.4	0.023**	0.8±1.1	0.832**	0.5±0.9	0.013**
	No	0.8±1.4		1.5±2.1		0.9±1.2		0.3±0.6	
Have you tried the recipes you've seen on the internet?	Yes	1.4±1.9	0.007**	2.1±2.4	0.000**	0.8±1.1	0.168**	0.5±0.8	0.008**
	No	0.9±1.5		1.2±1.9		0.9±1.2		0.3±0.8	

\*p value calculated via one way-ANOVA test/Kruskal Wallis; \*\*p value calculated via t-test/Mann-Whitney U; SD: Standard deviation; BMI: Body mass index; OAF: Obesity anxiety-excessive occupation factor with obesity; DRF: Diet-regime factor; PF: The perception factor of social pressure regarding weight gain; LWF: The excessive interest about losing weight factor; Q1: Do you think your use of the internet affects your eating behavior? Q2: Do the visuals you have seen on the internet affect your eating choices? Q3: Have you tried the recipes you've seen on the internet?

**TABLE 4:** Correlations between internet addiction, social media addiction, eating attitudes, and BMI.

		s-IAT	BMI	EAT-40	OAF	DRF	PF	LWF	Hours spent online
s-IAT	rs	-	0.04	0.15*	0.15*	0.02	0.10**	0.12*	0.33
BMI	rs		-	0.11**	0.20*	0.12**	-0.27*	0.08	0.06

s-IAT: Young's Internet Addiction Test-Short Form; EAT-40: Eating Attitude Test; OAF: Obesity anxiety-excessive occupation factor with obesity; DRF: Diet-Regime Factor; PF: The perception factor of social pressure regarding weight gain; LWF: Excessive interest about losing weight factor; BMI: Body mass index.

**TABLE 5:** Association between internet addiction (s-IAT), and eating attitudes (EAT-40 score).

	β	Standard error	Beta	t	Sig.	R square	Change statistics	
							F	df <sub>1,2</sub>
Constant*	9.258	0.974	-	9.504	0.000	0.03	15.185	1-507
s-IAT	0.135	0.035	0.171	3.897	0.000			

\*Stands for the independent variable; Eating attitudes; s-IAT: Internet Addiction Test.

media for interactions with acquaintances than elders; as age increases, social media addiction among individuals decreases linearly.<sup>25</sup> However, it should be highlighted that this situation poses a health risk, as previous studies have indicated that addiction to the internet/social media may cause EDs along with body dissatisfaction and weight anxiety.<sup>11,16</sup> This current study aimed to identify whether the internet use of students affects their eating behaviors and may result in EDs and obesity.

In this present study, students spend fewer hours than another study sample who spend more than 5 hours daily on the internet, most of which spend on social media.<sup>26</sup> University students are prone to use the internet for social media, as social networks and blogs were reported to be the top online destinations.<sup>25</sup> As a consequence of the individuals' expectations of being connected to others, the tendency to be addicted to social media may increase.<sup>27</sup> However, there are conflictual results in the literature about this

addiction; for instance, a study reported lower addiction levels for both sexes in an Italian sample.<sup>28</sup>

In this study, although both women and men showed acceptable internet use, women had a slightly but insignificantly higher internet addiction, similar to another study.<sup>29</sup> Women also significantly had a higher risk of having impaired eating attitudes than men, in line with the literature.<sup>17,30,31</sup> Studies suggested that sex impacts internet/social media addiction, and women spend longer online.<sup>27,32</sup> But contrary results indicate that the rate of internet addiction in men students was higher; on the other hand, similar to our results, a study reported no differences.<sup>29,32,33</sup> Especially among the young population and adolescents, the use of social media and being online has become a part of their socialization and a rising trend that has an important place in their lives regardless of the sexes. Finding new friends, social support, information, and entertainment were reported as the primary motivations for the social media occupation of university students.<sup>27</sup> But regarding sexes, while women use the internet to socialize, communicate with their peers, and kill time, men use it as an instrumental way for online gaming and entertainment.<sup>27</sup> Another motivation for women to turn to the internet is their desire to follow the people with the ideal body they aspire to. It should be highlighted that there has been a significant decrease in body sizes depicted by media for ideal bodies. Therefore, women are at a higher risk of body dissatisfaction, and it has also been reported that this makes them more vulnerable to experiencing lifetime EDs compared to men.<sup>30</sup> This study also observed a similar trend among women and individuals with obesity and overweight.

Obesity anxiety arises particularly due to the increased exposure to idealized and objectified bodies on visual platforms because, in western societies, low waist/hip ratio and low BMI in women's bodies are perceived as most attractive.<sup>31</sup> Besides, individuals are more likely to feel social pressure regarding weight gain, even if they are at a normal weight or even in the low BMI range. Recently, the pro-anorexic content in which excessive weight loss and perfectionism were encouraged on various social media sites has become an emerging public health

concern.<sup>10,34,35</sup> With the proliferation of pro-anorexic visuals and comments, the perception of idealization created on social media has become even more supported, as the members of these online communities tend to have higher eating disorders.<sup>10,15,34</sup> Following the literature, the findings of this present study have revealed the concerns that bring the possible health risks, especially for university students. Similar patterns were also observed as much as internalization of the visuals and content seen on social media by university students. This pattern is also important because the prevalence of subclinical eating problems, including inappropriate diet practices, increases among adolescents.<sup>18</sup> Even though the content internet appears to be promoting a healthy lifestyle, women who shared fitspiration images were reported to be at higher risk of EDs and displayed a higher level of compulsive exercise attitudes.<sup>12</sup> The pro-anorexia content, which exacerbates EDs and promotes anorexic attitudes, is reported to be likely to become more popular among those who are more vulnerable to EDs as they are more related to their appearance.<sup>11,35</sup> In particular, highlighting health-supportive claims in this content further increases the risk by promoting EDs and discouraging individuals from health-seeking behavior.<sup>35</sup>

## LIMITATIONS

Despite the advantage of reaching a large sample size compared to similar studies in the literature, this study has several limitations. Firstly, the students' hours spent on social media were reported based on their declaration of approximate daily usage, which is a limitation to accurately determining the hours occupied on the internet. Additionally, the BMI of the university students was calculated by self-reported measures, which may result in under or overestimation. This research reflects the information, perception, and thoughts of the interviewed university students within the timeframe they responded and does not have the opportunity to determine the changes that may occur over time. It is suggested that further longitudinal research should conduct to determine the actual change in lifestyle behaviors due to internet/social media occupation. Notwithstanding the limitations mentioned above, this study reveals

significant findings and warrants further longitudinal studies.

## CONCLUSION

Although the internet is an essential part of the lives of young adults, excessive occupation may bring the risk of addiction and also may trigger eating disorders. This study concluded that; university students are more prone to internalize the visuals, comments, and suggestions shared on social media, which may lead to body dissatisfaction and, consequently, eating disorders. Moreover, it was revealed that those with higher BMI have higher tendency to have internet addiction. For this reason, raising awareness about being a conscious internet user is needed in order not to be at risk of both obesity and eating disorders. Therefore, young people must be encouraged to use these technologies efficiently before the university. Moreover, families should be encouraged to protect their children from becoming addicted to the internet.

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## Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

## Authorship Contributions

**Idea/Concept:** Melis Keküllüoğlu, İrem Kaya Cebioğlu; **Design:** Melis Keküllüoğlu, İrem Kaya Cebioğlu; **Control/Supervision:** İrem Kaya Cebioğlu; **Data Collection and/or Processing:** Melis Keküllüoğlu; **Analysis and/or Interpretation:** Melis Keküllüoğlu, İrem Kaya Cebioğlu; **Literature Review:** Melis Keküllüoğlu, İrem Kaya Cebioğlu; **Writing the Article:** Melis Keküllüoğlu, İrem Kaya Cebioğlu; **Critical Review:** İrem Kaya Cebioğlu.

## REFERENCES

- Hinojo-Lucena FJ, Aznar-Díaz I, Cáceres-Reche MP, Trujillo-Torres JM, Romero-Rodríguez JM. Problematic internet use as a predictor of eating disorders in students: a systematic review and meta-analysis study. *Nutrients*. 2019;11(9):2151. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorder*. 5th ed. Washington, DC: American Psychiatric Publishing, Inc; 2013. [[Crossref](#)]
- Saul J, Rodgers RF, Saul M. Adolescent eating disorder risk and the social online world: an update. *Child Adolesc Psychiatr Clin N Am*. 2022;31(1):167-77. [[Crossref](#)] [[PubMed](#)]
- Giordano S. Eating disorders and the media. *Curr Opin Psychiatry*. 2015;28(6):478-82. [[Crossref](#)] [[PubMed](#)]
- Crombie AP, Ilich JZ, Dutton GR, Panton LB, Abood DA. The freshman weight gain phenomenon revisited. *Nutr Rev*. 2009;67(2):83-94. [[Crossref](#)] [[PubMed](#)]
- Chen HY, Yarnal C, Bram B. "Borrowing happiness from the future": exploring college students' own experiences on health-related lifestyles. *Journal of College & Character*. 2017;18(2):112-29. [[Crossref](#)]
- Thorpe MG, Kestin M, Riddell LJ, Keast RS, McNaughton SA. Diet quality in young adults and its association with food-related behaviours. *Public Health Nutr*. 2014;17(8):1767-75. [[Crossref](#)] [[PubMed](#)]
- Young KS. Internet addiction a new clinical phenomenon and its consequences. *American Behavioral Scientist*. 2004;48(4):402-15. [[Crossref](#)]
- Van Den Eijnden RJ, Lemmens JS, Valkenburg PM. The Social Media Disorder Scale: Validity and psychometric properties. *Computers in Human Behavior*. 2016;61:478-87. [[Crossref](#)]
- Oksanen A, Garcia D, Sirola A, Näsi M, Kaakinen M, Keipi T, et al. Pro-anorexia and anti-pro-anorexia videos on YouTube: sentiment analysis of user responses. *J Med Internet Res*. 2015;17(11):e256. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Syed-Abdul S, Fernandez-Luque L, Jian WS, Li YC, Crain S, Hsu MH, et al. Misleading health-related information promoted through video-based social media: anorexia on YouTube. *J Med Internet Res*. 2013;15(2):e30. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Holland G, Tiggemann M. "Strong beats skinny every time": disordered eating and compulsive exercise in women who post fitspiration on Instagram. *Int J Eat Disord*. 2017;50(1):76-9. [[Crossref](#)] [[PubMed](#)]
- Smith AR, Hames JL, Joiner TE Jr. Status update: maladaptive Facebook usage predicts increases in body dissatisfaction and bulimic symptoms. *J Affect Disord*. 2013;149(1-3):235-40. [[Crossref](#)] [[PubMed](#)]
- Tiggemann M, Slater A. NetGirls: the Internet, Facebook, and body image concern in adolescent girls. *Int J Eat Disord*. 2013;46(6):630-3. [[Crossref](#)] [[PubMed](#)]
- Turner PG, Lefevre CE. Instagram use is linked to increased symptoms of orthorexia nervosa. *Eat Weight Disord*. 2017;22(2):277-84. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Walker M, Thornton L, De Choudhury M, Teevan J, Bulik CM, Levinson CA, et al. Facebook use and disordered eating in college-aged women. *J Adolesc Health*. 2015;57(2):157-63. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Carrotte ER, Vella AM, Lim MS. Predictors of "liking" three types of health and fitness-related content on social media: a cross-sectional study. *J Med Internet Res*. 2015;17(8):e205. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]



18. Dakanalis A, Carrà G, Calogero R, Fida R, Clerici M, Zanetti MA, et al. The developmental effects of media-ideal internalization and self-objectification processes on adolescents' negative body-feelings, dietary restraint, and binge eating. *Eur Child Adolesc Psychiatry*. 2015;24(8):997-1010. [[Crossref](#)] [[PubMed](#)]
19. Murray RS, Larry JS. *Shaum's Outlines of Theory and Problems of Statistics*. 4th ed. New York: The McGraw-Hill Companies, Inc; 2008.
20. Pawlikowski M, Altstötter-Gleich C, Brand M. Validation and psychometric properties of a short version of Young's Internet Addiction Test. *Computers in Human Behavior*. 2013;29(3):1212-23. [[Crossref](#)]
21. Kutlu M, Savci M, Demir Y, Aysan F. Turkish adaptation of Young's Internet Addiction Test-Short Form: a reliability and validity study on university students and adolescents. *Anatolian Journal of Psychiatry*. 2016;17:69-76. [[Crossref](#)]
22. Meerkerk GJ. Pwned by the internet: Explorative research into the causes and consequences of compulsive internet use. University Medical Center Rotterdam. 2007. Cited: November 18, 2022. Available from: [[Link](#)]
23. Garner DM, Garfinkel PE. The Eating Attitudes Test: an index of the symptoms of anorexia nervosa. *Psychol Med*. 1979;9(2):273-9. [[Crossref](#)] [[PubMed](#)]
24. Savaşır I, Erol N. Yeme tutum testi: Anoreksia nervosa belirtiler indeksi. *Journal of Psychology*. 1989;7(23):19-25. [[Link](#)]
25. Bolton RN, Parasuraman A, Hoefnagels A, Migchels N, Kabadayi S, Gruber T, et al. Understanding Generation Y and their use of social media: a review and research agenda. *Journal of Service Management*. 2013;24(3):245-67. [[Crossref](#)]
26. Chen IH, Strong C, Lin YC, Tsai MC, Leung H, Lin CY, et al. Time invariance of three ultra-brief internet-related instruments: Smartphone Application-Based Addiction Scale (SABAS), Bergen Social Media Addiction Scale (BSMAS), and the nine-item Internet Gaming Disorder Scale- Short Form (IGDS-SF9) (Study Part B). *Addict Behav*. 2020;101:105960. [[Crossref](#)] [[PubMed](#)]
27. Kuss DJ, Griffiths MD. Online social networking and addiction--a review of the psychological literature. *Int J Environ Res Public Health*. 2011;8(9):3528-52. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
28. Monacis L, de Palo V, Griffiths MD, Sinatra M. Social networking addiction, attachment style, and validation of the Italian version of the Bergen Social Media Addiction Scale. *J Behav Addict*. 2017;6(2):178-86. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
29. Hardie E, Tee MY. Excessive internet use: the role of personality, loneliness and social support networks in internet addiction. *Australian Journal of Emerging Technologies and Society*. 2007;5(1):34-47. ISSN 1449-0706
30. Affi TO, Sareen J, Fortier J, Taillieu T, Turner S, Cheung K, et al. Child maltreatment and eating disorders among men and women in adulthood: Results from a nationally representative United States sample. *Int J Eat Disord*. 2017;50(11):1281-96. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
31. Brierley ME, Brooks KR, Mond J, Stevenson RJ, Stephen ID. The body and the beautiful: health, attractiveness and body composition in men's and women's bodies. *PLoS One*. 2016;11(6):e0156722. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
32. Cao F, Su L. Internet addiction among Chinese adolescents: prevalence and psychological features. *Child Care Health Dev*. 2007;33(3):275-81. [[Crossref](#)] [[PubMed](#)]
33. Alkan H, Doğan B. A research of the relationship between high school students' social media usage and their well-being. *International Journal of Educational Research Review*. 2018;3(4):97-102. [[Crossref](#)]
34. Rodgers RF, Skowron S, Chabrol H. Disordered eating and group membership among members of a pro-anorexic online community. *Eur Eat Disord Rev*. 2012;20(1):9-12. [[Crossref](#)] [[PubMed](#)]
35. Rouleau CR, von Ranson KM. Potential risks of pro-eating disorder websites. *Clin Psychol Rev*. 2011;31(4):525-31. [[Crossref](#)] [[PubMed](#)]