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Original Article

Association of problematic internet use with health-related daily habits in adolescents: evidence from a school-based survey

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ABSTRACT

Background. With the development of technology, easier access to the internet and its excessive use have led to problematic internet use (PIU). The prevalence of PIU and its association with lifestyle behaviors in adolescents have become subjects of increasing academic interest. This study aimed to determine the prevalence of PIU among Turkish high school students and to investigate its association with sleep, physical activity and dietary habits.

Methods. This cross-sectional study was conducted on high school students between October 2019 and March 2020. Participants completed a questionnaire regarding demographic characteristics, internet use, lifestyle habits and the "Young Internet Addiction Test-Short Form (YIAT-SF)".

Results. Among the total 951 participants, the mean age was 15.3±1.0 years, 42.3% were female, and the prevalence of PIU was determined as 12.1%. It was shown that having daily internet usage time ≥2 hours on weekdays, having at least one type of sleep problem, having breakfast less than 3 days per week, eating salty snacks ≥3 days per week, consuming sugary-carbonated drinks ≥3 days per week were associated with PIU.

Conclusions. PIU is a widespread public health problem that is negatively associated with the daily health habits of adolescents. There is a need for nationwide school screening programs for this problem and rehabilitation of adolescents diagnosed with PIU.

Key words: problematic internet use, internet addiction, sleep, dietary habits.

"Problematic Internet Use (PIU)" is characterized as the individual's inability to control internet use, resulting in feelings of distress and functional impairment in daily activities.[1] It has also been reported that adolescents are the most at-risk group for PIU. This may be because adolescents are more prone to risky behaviors and resort to addictive applications to cope with anxiety, disappointment, and failure, to satisfy the need for excitement or the feeling of invincibility, or because the internet offers adolescents the opportunity to distance themselves from their own identities and feel free.[2]

Studies reporting the prevalence of PIU have shown marked differences around the world.[3] According to the results of a recent meta-analysis, the global prevalence of PIU exhibits substantial variation across geographical regions and

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demonstrates a progressive increase over time. The highest prevalence rates were reported in the World Health Organization African Region (34.53%) and Eastern Mediterranean Region (30.11%), whereas the lowest rates were observed in the Americas Region (11.06%) and the European Region (11.06%). In the same meta-analysis, the prevalence of PIU among adolescents was reported to range from 10.60% to 13.70%.[4]

As the prevalence of PIU has increased, its effect on health-related behaviors has become more prominent.[5] Kim et al.[6] demonstrated an association between PIU and negative dietary behaviors such as skipping meals, snacking, inadequate fruit and vegetable intakes, consumption of carbonated soft drinks and fast food and negative lifestyle habits such as decreased physical activity. Koças et al.[7] reported that internet addiction was associated with worsening sleep quality among high school students. Previous studies also reported lower rates of PIU among those who engaged in more physical activity and found an association between PIU and poor physical health.[8,9]

The number of studies simultaneously investigating the relationship between sleep patterns, physical activity, and nutritional habits in conjunction with PIU remains limited. The present study aimed to assess the associations between these three health-related daily behaviors and PIU, as well as to determine the prevalence of PIU among high school students residing in the Inner Aegean Region of Türkiye.

Materials and Methods

Study design

This cross-sectional study was conducted in high schools between October 01, 2019 and March 13, 2020. Permission to carry out the study was approved by the local ethics committee. All study procedures were performed in accordance with the Declaration of Helsinki.

Sample size and selection

The minimum sample size was calculated as 886 with a 99.9% confidence interval (CI) using "OpenEpi (https://www.openepi.com/SampleSize/SSPropor.htm) calculator" according to $n = [DEFF*Np(1-p)]/ [(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$ equation. Among the parameters, N (Total number of high school students living in Afyonkarahisar province) was accepted as 13862; p as 12±5% (previously reported percentage frequency of internet addiction risk among high school students);[10] d (confidence limit) as 1%; DEFF (design effect) as 2 and $Z^2_{1-\alpha/2}$ as 1.96. Taking into account the 20% non-participation margin, a total of 1051 students were planned to be included in the study. After determining the schools with different socioeconomic levels in cooperation with the Research and Development unit of the National Education Directorate, the schools were selected using the cluster sampling method. A total of 6 schools were randomly identified: one private school with a high socioeconomic level, two schools with a medium socioeconomic level, and three schools with a low socioeconomic level. In order to reach 175 students from each school, two classes from the 9th, 10th, 11th and 12th grades were selected. Students who agreed to participate in the research after obtaining parental and student consent, were included in the study. Students whose parents or themselves did not agree to participate in the research, those without internet access and those who had a history of chronic mental illness (such as obsessive-compulsive disease, anxiety disorder) or physical illness (such as diabetes, cardiac diseases) that could affect daily health-related habits such as diatary habits and physical activity were excluded from the study.

Data collection

After explaining the purpose and procedure of the research, written consent forms for adolescents and parents were distributed to students who verbally agreed to participate. The next day, the students, whose consent was

obtained, were asked to fill out the survey form and a scale to test PIU.

Measures

Questions regarding internet usage habits and lifestyle habits were prepared based on previous studies[6,7,11] and the lifetime status of habits was questioned in terms of their presence/absence or frequency. The following questions were asked in the questionnaire: (i) Demographic characteristics of students and their families (age, sex, residence, education level of parents). The age variable was evaluated as under or over 15 years, and a distinction was made between 9th-10th grades and 11th-12th grades. (ii) Internet usage characteristics (year of internet use, average daily internet usage time on weekdays and weekends, presence or absence of usage of internet cafe) (iii) Sleep characteristics (daily sleep duration; according to the recommendations of the US National Sleep Foundation, the short sleep duration limit was considered to be <8 hours[12] and presence or absence of sleep problems; difficulty falling asleep, frequent interruption of sleep, difficulty waking up in the morning, feeling sleepy in the morning) (iv) Using a mobile phone other than an alarm for the first time after waking up in the morning (v) Regular sports habit (regularly participating in licensed or unlicensed individual or team sports) and regular physical activity status (exercise for at least one hour a day, on certain days of the week), and (vi) Nutritional characteristics (how many days per week they skipped breakfast, skipped meals, consumed salty or sugary snacks, consumed sugary sodas and, whether they consumed caffeinated beverages and energy drinks). The adequacy of the questions was checked with a preliminary study with 20 high school students and the questionnaire was given its final form.

In our research, Youth Internet Addiction Test-Short Form (YIAT-SF) was used to test PIU. The original form of the "Internet Addiction Test (IAT)" was developed by Young[13] converted into a short form by Pawlikowski et al.[14] and adapted into Turkish by Kutlu et al.[15] YIAT-SF consists of 12 items and is a five-point Likert (1 = Never, to 5 = Very often) type scale. The Turkish version of the YIAT-SF has been previously shown to be reliable and valid for adolescents.[15] There is no reverse scored items in the scale. High scores from the scale indicate a high level of internet addiction. To calculate the frequency of internet addiction among participants, the cutoff score was accepted as 36, as recommended in the literature.[14,16] Scores of 36 and above indicated that the students had PIU.

Statistical analysis

IBM-SPSS 26.0 (SPSS Inc., Chicago, IL, USA) program was used for statistical analysis. Normal distribution of the data was evaluated with the Shapiro-Wilk test. Categorical variables were expressed as n (%) and normally distributed data from continuous variables were expressed as mean ± standard deviation. All variables were first tested with bivariate analysis. Participants were analyzed in two groups according to the presence or absence of PIU. Chi-square test or Fisher's exact test was used to compare the percentage distributions of categorical data between groups. Then multiple logistic regression analysis was performed to test the relations of the risk of PIU with internet and health variables by adjusting for age, sex, maternal education status, paternal education status and residence. Variables with a p value <0.05 in the univariate analyses were included in the multiple logistic regression backward step model. Multiple logistic regression results are reported as adjusted odds ratios (AOR) with 95% CI. A $p<0.05$ level was considered significant.

Results

A total of 1051 students participated in the study. Data from a total of 951 participants were analyzed by excluding students with chronic diseases (n=32) and incompletely filled out questionnaires (n=68). The mean age of the students was 15.3±1.0 years. Of the students, 42.3% (n=402) were female. The prevalence of PIU

among participants was determined as 12.1%. Table I shows the distribution of participants' demographic and internet usage characteristics according to PIU status. The proportion of more than >5 years of internet use (p=0.001), daily internet usage time more than 2 hours per week on weekdays (p<0.001) and weekends (p<0.001), use of internet cafes (p=0.015) were significantly higher in participants with PIU.

Table II shows the comparison of participants' health-related daily habits with PIU. The frequency of having at least one type of sleep problem (p<0.001), use of a mobile phone other than an alarm within the first hour after waking up (p<0.001), skipping breakfast (p<0.001) or other daily meals (p<0.001), eating sugary snacks (p=0.004) and salty snacks (p<0.001), consuming sugary-carbonated drinks (p<0.001), caffeinated drinks (p=0.015), and energy drinks (p=0.001) were significantly higher in participants with PIU.

By adjusting the age, sex, maternal education, paternal education and residence, risk of PIU presence according to internet-related (Year of internet use >5 vs. ≤5 years, daily internet usage time [weekdays] ≥2 vs. <2 hours, daily internet usage time [weekend] ≥2 vs. <2 hours, usage of internet cafe) and health-related variables (having at least one type of sleep problem, time of mobile phone use after waking up in the morning ≤1 vs. >1 hour, having breakfast <3 vs. ≥3 days/week, skipping daily meals ≥3 vs. <3 days/week, eating sugary snacks ≥3 vs. <3 days/week, eating salty snacks ≥3 vs. <3 days/week, consuming sugary-carbonated drinks ≥3 vs. <3 days/week), consuming caffeinated drinks, consuming energy drinks) was tested with multiple logistic regression analysis with

Table I. Distribution of participants' demographic and internet-related variables according to the presence of problematic internet use (N=951)

Variables		Total, n (%)*	PIU present, n (%)	PIU absent, n (%)*	P value (χ^2 test)
Age	<15 years	548 (57.6)	69 (60.0)	479 (57.3)	0.58
	≥15 years	403 (42.4)	46 (40.0)	357 (42.7)	
Sex	Female	402 (42.3)	54 (47.0)	348 (41.6)	0.28
	Male	549 (57.7)	61 (53.0)	488 (58.4)	
Maternal education	< high school	529 (55.6)	60 (52.2)	469 (56.1)	0.43
	≥ high school	422 (44.4)	55 (47.8)	367 (43.9)	
Paternal education	< high school	331 (34.8)	38 (33.0)	293 (35.0)	0.67
	≥ high school	620 (65.2)	77 (67.0)	543 (65.0)	
Residence	Urban	789 (83)	97 (84.3)	692 (82.8)	0.67
	Rural	162 (17)	18 (15.7)	144 (17.2)	
Year of internet use	≤5 years	531 (55.8)	48 (41.7)	483 (57.8)	<0.01
	>5 years	420 (44.2)	67 (58.3)	353 (42.2)	
Daily internet usage time (weekdays)	<2 hours	539 (56.7)	29 (25.2)	510 (61.0)	<0.001
	≥2 hours	412 (43.3)	86 (74.8)	326 (39.0)	
Daily internet usage time (weekend)	<2 hours	293 (30.8)	18 (15.7)	275 (32.9)	<0.001
	≥2 hours	658 (69.2)	97 (84.3)	561 (67.1)	
Usage of internet cafe	Yes	34 (3.6)	9 (7.8)	25 (3.0)	0.02**
	No	917 (96.4)	106 (92.2)	811 (97.0)	
YIAT-SF score	Non-PIU (<36)	836 (87.9)	-	-	
	PIU (≥36)	115 (12.1)	-	-	

PIU: Problematic internet use, YIAT-SF: Young Internet Addiction Test - Short Form
*Column percentage
**Fisher's exact test

backward stepwise model (Table III). Having daily internet usage time ≥2 hours on weekdays (adjusted odds ratio [AOR]: 3.45, 95% CI: 2.17-5.51), having at least one type of sleep problem (AOR: 2.04, 95% CI: 1.29-3.25), having breakfast less than 3 days per week (AOR: 2.22, 95% CI: 1.45-3.40), eating salty snacks ≥3 days per week (AOR: 1.98, 95% CI: 1.27-3.10), consuming sugary-carbonated drinks ≥3 days per week (AOR: 1.70, 95% CI: 1.06-2.61) were associated with PIU.

Discussion

This study showed that the prevalence of PIU among high school students is 12.1%. This is consistent with the worldwide prevalence of PIU for adolescents ranging from 10.60% to 13.70% reported by Meng et al.[4] However, it is slightly below the prevalence reported as 21.1% in the Black Sea region and 18.5% in the Marmara region in Türkiye.[8,9] The difference in the prevalence of PIU among high school students living in different geographical

Table II. Comparison of participants' health-related variables according to the presence of problematic internet use (N=951)

Variables		Total, n (%)*	PIU present, n (%)	PIU absent, n (%)*	P value (χ^2 test)
Daily sleep time	< 8 hours	787 (82.8)	93 (80.9)	694 (83.0)	0.57
	≥ 8 hours	164 (17.2)	22 (19.1)	142 (17.0)	
Having at least one type of sleep problem[a]	Yes	498 (52.4)	84 (73.0)	414 (49.5)	<0.001
	No	453 (47.6)	31 (27.0)	422 (50.5)	
Time of mobile phone use after waking up in the morning[b]	≤1 hour	623 (65.5)	93 (80.9)	530 (63.4)	<0.001
	>1hour	328 (34.5)	22 (19.1)	306 (36.6)	
Doing sports regularly	Yes	332 (34.9)	34 (29.6)	298 (35.6)	0.20
	No	619 (65.1)	81 (70.4)	538 (64.4)	
Regular physical activity status	Yes	556 (58.5)	65 (56.5)	491 (58.7)	0.65
	No	395 (41.5)	50 (43.5)	345 (41.3)	
Having breakfast	<3 day/week	306 (32.2)	61 (53.0)	245 (29.3)	<0.001
	≥3 day/week	645 (67.8)	54 (47.0)	591(70.7)	
Skipping daily meals	<3 day/week	810 (85.2)	86 (74.8)	724 (86.6)	<0.01
	≥3 day/week	141 (14.8)	29 (25.2)	112 (13.4)	
Eating sugary snacks	<3 day/week	493 (51.8)	45 (39.1)	448 (53.6)	<0.01
	≥3 day/week	458 (48.2)	70 (60.9)	388 (46.4)	
Eating salty snacks	<3 day/week	679 (71.3)	56 (48.7)	623 (74.5)	<0.001
	≥3 day/week	272 (28.7)	59 (51.3)	213 (25.5)	
Consuming sugary-carbonated drinks	<3 day/week	705 (74.1)	61 (53.0)	644 (77.0)	<0.001
	≥3 day/week	246 (25.9)	54 (47.0)	192 (23.0)	
Consuming caffeinated drinks	Yes	429 (45.1)	64 (55.7)	365 (43.7)	0.02
	No	522 (54.9)	51 (44.3)	471 (56.3)	
Consuming energy drinks	Yes	76 (8.0)	18 (15.7)	58 (6.9)	<0.01
	No	875 (92.0)	97 (84.3)	778 (93.1)	

PIU: Problematic internet use
*Column percentage
[a] Type of sleep problems are difficulty falling asleep, frequent interruption of sleep, difficulty waking up in the morning, feeling sleepy in the morning
[b] Time of using a mobile phone other than an alarm for the first time after waking up in the morning

Table III. Risk of problematic internet use presence according to internet-related and health-related variables, multiple logistic regression*

Variables	AOR	95% CI	p
Daily internet usage time (weekdays) (≥2 vs. <2 hours)	3.45	2.17-5.51	<0.001
Having at least one type of sleep problem[a] (Yes vs. No)	2.04	1.29-3.25	0.002
Having breakfast (<3 vs. ≥3 days/week)	2.22	1.45-3.40	<0.001
Eating salty snacks (≥3 vs. <3 days/week)	1.98	1.27-3.10	0.002
Consuming sugary-carbonated drinks (≥3 vs. <3 days/week)	1.70	1.06-2.61	0.027

AOR: adjusted odds ratio, CI: confidence interval
*Controlled for age, sex, maternal education, paternal education and residence
[a]Type of sleep problems are difficulty falling asleep, frequent interruption of sleep, difficulty waking up in the morning, feeling sleepy in the morning

regions in Türkiye may be due to the variability in the ability of families with different sociocultural norms to cope with excessive use of the internet. It may also be due to the use of different scales to detect PIU in these studies. However, Burkauskas et al.[17] reported that although the same instrument (IAT) and cutoff score (≥50) were used, the prevalence of PIU differed even in studies from the same country or region. Regional differences in prevalence can be assessed more clearly with a national, multicenter, longitudinal study using more robust measurement tools that test the diagnosis of internet addiction.

In our study, we found that the frequency of PIU did not change with age and sex. In previous studies, findings regarding the association between age, sex and PIU have varied. Some recent studies have reported that older high school students are more likely to have PIU.[3,18] However, in the study of Seyrek et al.[19] no significant association was found between internet addiction and age and sex. Khan et al.[20] found that internet addiction in medical school students did not differ between sexes. Cam et al.[8] also reported no significant correlation between PIU severity and sex. Dafour et al. showed that boys spent significantly more time online than girls, that a greater proportion of girls used social networks intensively, while boys used multiplayer online role-playing games, and that there was no significant difference between sexes in terms of internet addiction risk.[21] However, some previous studies also determined that the internet addiction rate was significantly higher in males.[3,22-24]

In this study, the ratio of PIU was found to be significantly higher in participants who used the internet for more than two hours on weekdays, but no similar finding was found for weekends. In a study conducted in South Africa in 2019, Salubi et al.[25] showed that 34.8% of the participants used the internet for more than ten hours a day, and the time spent on the internet was associated with internet addiction. In a study conducted among university students in India in 2020, Jain et al.[26] examined the association between internet addiction and the time spent on the internet per day. Internet use of two hours or more per day was found to be significantly associated with internet addiction. Şaşmaz et al.[22] also reported that internet addiction was related to the duration of daily computer use.

The present study determined that students with PIU were more likely to have at least one type of sleep problem such as difficulty falling asleep, frequent interruption of sleep, difficulty waking up in the morning, and feeling sleepy in the morning, but it was shown that the frequency of PIU did not change with sleep duration. Kojima et al.[5] examined the association between health-related behaviors and internet use in Japanese adolescents and found a significant association between PIU and sleeping after midnight. Park et al.[27] investigated the association between depressive

symptoms and PIU and sleep problems and reported that sleep-wake behavior problems, insomnia, and excessive daytime sleepiness increased as IAT scores increased in the non-depressed group. In their study examining the association between sleep habits and problems and internet addiction in Japanese adolescents, Kawabe et al.[28] showed that night sleep time was shorter, bedtime and morning waking time were later in the addicted group. Yang et al.[29] examined PIU and accompanying sleep problems in adolescents and showed that the risk of sleep disorders increased in the presence of PIU. It is known that excessive internet use undermines the time devoted to sleep and other life habits and therefore causes sleep problems. Yang et al.[29] also referred to "Time displacement theory" to clarify the association between PIU and sleep problems, which is used to explain that internet use generally reduces the time devoted to other activities.

Findings from previous studies examining the association between physical activity and PIU vary. Khan et al.[20] showed that medical students with low physical activity had a higher frequency of internet addiction than students with regular physical activity. It was also reported that physically active students are less likely to be problematic internet users among South Korean adolescents.[30] On the other hand, Dang et al.[11] reported that physical activity had no significant association with internet addiction in Vietnamese youth and adolescents. Similar to the present study, Haripriya et al.[31] showed that there was an association between smartphone addiction and sleep quality, but not with physical activity. In our study, we did not find a relationship between PIU and students' regular sports and regular physical activity habits. This may be due to the fact that students use the internet in their remaining free time, even if they do regular sports or physical activity. It may also be due to the confounding effects of other variables that affect physical activity habits, such as family income level, suitability of school and home environment for physical activity, and excessive school workload.

This study found that poorer breakfast habits, consuming more salty snacks and sugary-carbonated drinks were associated with PIU. A recent study observed a positive correlation between PIU and disordered eating attitudes[32] and a meta-analysis study identified internet addiction as a determinant of eating disorders.[33] Gür et al.[34] found a significant association between internet addiction scores and physical behavior problems (going to bed late, skipping meals, eating in front of the computer) in secondary school students. Kojima et al.[5] also found a significant association between PIU and skipping breakfast. Kim et al.[6] found a higher frequency of skipping dinner and consuming frequent snacks in high-risk internet users. They did not show any significant difference in favorite snacks according to the level of internet addiction. Similarly, a previous study found that use of social networking sites was associated with an increased likelihood of skipping breakfast and consuming sugar-sweetened beverages and energy drinks.[35] The reasons for the association between PIU and unhealthy eating habits may be due to increased exposure to unhealthy food advertisements via the internet, easier consumption of unhealthy snacks such as sugary drinks or chips while on the internet, and missing healthy meal times because of excessive time spent on the internet. Prospective studies are needed to elucidate the mechanisms of this relationship.

A key strength of this study is the simultaneous investigation of the associations between sleep patterns, physical activity, dietary habits, and PIU within a relatively large sample. By including these variables in the same model and applying logistic regression analysis, potential confounding effects were controlled, allowing a clearer delineation of their independent relationships with PIU.

There are also some limitations in our study that should be taken into account. The first limitation is that the study was conducted in

a single province and therefore the results are not generalizable. The second limitation of this study is that we did not use validated scales to test sleep, physical or sports activity, and dietary habits. Additionally, this study only measured general internet addiction. Specific addictions that may vary by gender, such as online gaming and problematic use of social media, were not measured, which constitutes a third limitation of the study. Future studies should examine the source of the problem, such as for what purposes adolescents use the internet, what their motivations are for using the internet, and how addictive devices such as game consoles or smartphones affect the total duration of internet use.

Conclusion

In this study, we determined that PIU is common among high school students and observed that PIU is associated with some health-related life habits. Having at least one type of sleep problem, skipping breakfast, and consuming salty snacks and sugary-carbonated drinks more were found to be associated with PIU.

PIU has become a new public health problem with a high prevalence that negatively affects the daily health habits of adolescents. It would be appropriate to address the action plans to be implemented to solve this problem in two ways. First, awareness of this issue should be raised among individuals who have frequent contact with adolescents, including parents, clinicians, and teachers. Providing families with guidance on developing a family media plan and implementing bedroom screen-time recommendations, delivered through clinicians or educators, as well as conducting screenings for PIU using validated tools within school counseling services to facilitate referral to professional help, may contribute to addressing the problem. In addition, both national and international health policy developers and implementers need to show the necessary sensitivity to this issue, and the implementation of large-scale measures globally should not be delayed.

Ethical approval

The study was approved by Afyonkarahisar Health Sciences University's Clinical Research Ethics Committee (date: 14.06.2019, number: 2011-KAEK-2). Written informed consent was provided by each participant. All study procedures were performed in accordance with the Declaration of Helsinki.

Author contribution

The authors confirm contribution to the paper as follows: Study conception and design: EÇ, AO; data collection: EÇ, AO; analysis and interpretation of results: EÇ, AO, AB; draft manuscript preparation: EÇ, AO, AB. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

REFERENCES

1. Shapira NA, Lessig MC, Goldsmith TD, et al. Problematic internet use: proposed classification and diagnostic criteria. Depress Anxiety 2003; 17: 207-216. https://doi.org/10.1002/da.10094
2. Karacic S, Oreskovic S. Internet addiction through the phase of adolescence: a questionnaire study. JMIR Ment Health 2017; 4: e11. https://doi.org/10.2196/mental.5537
3. Xin M, Xing J, Pengfei W, Houru L, Mengcheng W, Hong Z. Online activities, prevalence of Internet addiction and risk factors related to family and school among adolescents in China. Addict Behav Rep 2017; 7: 14-18. https://doi.org/10.1016/j.abrep.2017.10.003

4. Meng SQ, Cheng JL, Li YY, et al. Global prevalence of digital addiction in general population: a systematic review and meta-analysis. Clin Psychol Rev 2022; 92: 102128. https://doi.org/10.1016/j.cpr.2022.102128

5. Kojima R, Sato M, Akiyama Y, et al. Problematic Internet use and its associations with health-related symptoms and lifestyle habits among rural Japanese adolescents. Psychiatry Clin Neurosci 2019; 73: 20-26. https://doi.org/10.1111/pcn.12791

6. Kim Y, Park JY, Kim SB, Jung IK, Lim YS, Kim JH. The effects of Internet addiction on the lifestyle and dietary behavior of Korean adolescents. Nutr Res Pract 2010; 4: 51-57. https://doi.org/10.4162/nrp.2010.4.1.51

7. Koças F, Şaşmaz T, Yazar S, Tayyar Şaşmaz P. Internet addiction increases poor sleep quality among high school students. Turkish Journal of Public Health 2018; 16: 167-177. https://doi.org/10.20518/tjph.407717

8. Cam HH, Ustuner Top F. Prevalence and risk factors of problematic Internet use and its relationships to the self-esteem and health-related quality of life: data from a high-school survey in Giresun province, Turkey. J Addict Nurs 2020; 31: 253-260. https://doi.org/10.1097/JAN.0000000000000365

9. Sayılı U, Vehid S, Erginöz E. Problematic Internet use in Turkish high school students: prevalence and related factors. Am J Health Behav 2021; 45: 31-43. https://doi.org/10.5993/AJHB.45.1.3

10. Yavuz O. The effects of Internet addiction on school success during adolescence. OPUS International Journal of Society Researches 2018; 8: 1056-1080. https://doi.org/10.26466/opus.426914

11. Dang AK, Nathan N, Le QNH, et al. Associations between internet addiction and physical activity among Vietnamese youths and adolescents. Child Youth Serv Rev 2018; 93: 36-40. https://doi.org/10.1016/j.childyouth.2018.06.030

12. Hirshkowitz M, Whiton K, Albert SM, et al. National Sleep Foundation's sleep time duration recommendations: methodology and results summary. Sleep Health 2015; 1: 40-43. https://doi.org/10.1016/j.sleh.2014.12.010

13. Young KS. Caught in the Net: How to Recognize the Signs of Internet Addiction-and a Winning Strategy for Recovery. New York: John Wiley & Sons; 1998: 248.

14. Pawlikowski M, Altstötter-Gleich C, Brand M. Validation and psychometric properties of a short version of Young's Internet Addiction Test. Comput Human Behav 2013; 29: 1212-1223. https://doi.org/10.1016/j.chb.2012.10.014

15. 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(Suppl. 1):69-76. https://doi.org/10.5455/apd.190501

16. Zhang MWB, Tran BX, Huong LT, et al. Internet addiction and sleep quality among Vietnamese youths. Asian J Psychiatr 2017; 28: 15-20. https://doi.org/10.1016/j.ajp.2017.03.025

17. Burkauskas J, Gecaite-Stonciene J, Demetrovics Z, Griffiths MD, Király O. Prevalence of problematic Internet use during the coronavirus disease 2019 pandemic. Curr Opin Behav Sci 2022; 46: 101179. https://doi.org/10.1016/j.cobeha.2022.101179

18. Nakayama H, Ueno F, Mihara S, Kitayuguchi T, Higuchi S. Relationship between problematic Internet use and age at initial weekly Internet use. J Behav Addict 2020; 9: 129-139. https://doi.org/10.1556/2006.2020.00009

19. Seyrek S, Cop E, Sinir H, Ugurlu M, Şenel S. Factors associated with Internet addiction: cross-sectional study of Turkish adolescents. Pediatr Int 2017; 59: 218-222. https://doi.org/10.1111/ped.13117

20. Khan MA, Shabbir F, Rajput TA. Effect of gender and physical activity on Internet addiction in medical students. Pak J Med Sci 2017; 33: 191-194. https://doi.org/10.12669/pjms.331.11222

21. Dufour M, Brunelle N, Tremblay J, et al. Gender difference in Internet use and internet problems among Quebec high school students. Can J Psychiatry 2016; 61: 663-668. https://doi.org/10.1177/0706743716640755

22. Sasmaz T, Oner S, Kurt AÖ, et al. Prevalence and risk factors of Internet addiction in high school students. Eur J Public Health 2014; 24: 15-20. https://doi.org/10.1093/eurpub/ckt051

23. Lachmann B, Sariyska R, Kannen C, Cooper A, Montag C. Life satisfaction and problematic Internet use: evidence for gender specific effects. Psychiatry Res 2016; 238: 363-367. https://doi.org/10.1016/j.psychres.2016.02.017

24. Kożybka M, Radlińska I, Kolwitz M, Karakiewicz B. Problematic Internet use among Polish students: prevalence, relationship to sociodemographic data and Internet usage patterns. Int J Environ Res Public Health 2023; 20: 2434. https://doi.org/10.3390/ijerph20032434

25. Salubi O, Muchaonyerwa N, Nekhwevha F. Digital media usage and prevalence of internet addiction among undergraduate students in South Africa. Int J Web Appl 2018; 10: 127-136. https://doi.org/10.6025/ijwa/2018/10/4/127-136

26. Jain A, Sharma R, Gaur KL, et al. Study of internet addiction and its association with depression and insomnia in university students. J Family Med Prim Care 2020; 9: 1700-1706. https://doi.org/10.4103/jfmpc.jfmpc_1178_19

27. Park MH, Park S, Jung KI, Kim JI, Cho SC, Kim BN. Moderating effects of depressive symptoms on the relationship between problematic use of the Internet and sleep problems in Korean adolescents. BMC Psychiatry 2018; 18: 280. https://doi.org/10.1186/s12888-018-1865-x

28. Kawabe K, Horiuchi F, Oka Y, Ueno SI. Association between sleep habits and problems and Internet addiction in adolescents. Psychiatry Investig 2019; 16: 581-587. https://doi.org/10.30773/pi.2019.03.21.2

29. Yang J, Guo Y, Du X, et al. Association between problematic Internet use and sleep disturbance among adolescents: the role of the child's sex. Int J Environ Res Public Health 2018; 15: 2682. https://doi.org/10.3390/ijerph15122682

30. Park S. Associations of physical activity with sleep satisfaction, perceived stress, and problematic Internet use in Korean adolescents. BMC Public Health 2014; 14: 1143. https://doi.org/10.1186/1471-2458-14-1143

31. Haripriya S, Samuel SE, Megha M. Correlation between smartphone addiction, sleep quality and physical activity among young adults. J Clin Diagnostic Res 2019; 13: 5-9. https://doi.org/10.7860/JCDR/2019/42168.13212

32. Kamal NN, Kamal NN. Determinants of problematic Internet use and its association with disordered eating attitudes among Minia University students. Int J Prev Med 2018; 9: 35. https://doi.org/10.4103/ijpvm.IJPVM_489_17

33. 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: 2151. https://doi.org/10.3390/nu11092151

34. Gür K, Yurt S, Bulduk S, Atagöz S. Internet addiction and physical and psychosocial behavior problems among rural secondary school students. Nurs Health Sci 2015; 17: 331-338. https://doi.org/10.1111/nhs.12192

35. Sampasa-Kanyinga H, Chaput JP, Hamilton HA. Associations between the use of social networking sites and unhealthy eating behaviours and excess body weight in adolescents. Br J Nutr 2015; 114: 1941-1947. https://doi.org/10.1017/S0007114515003566