

DETERMINATION OF THE INTERNET ADDICTION AMONG STUDENTS OF THE FACULTY OF SPORTS SCIENCES AND THE FACULTY OF HEALTH SCIENCES AND ITS ASSOCIATION TO PHYSICAL ACTIVITY

OKREŚLENIE UZALEŻNIENIA OD INTERNETU WŚRÓD STUDENTÓW WYDZIAŁU NAUK O SPORCIE I WYDZIAŁU NAUK O ZDROWIU ORAZ JEGO ZWIĄZKU Z AKTYWNOŚCIĄ FIZYCZNĄ

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interpretacja danych
E. Preparation of manuscript
przygotowanie artykułu
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wyszukiwanie i analiza literatury
G. Funds collection
zebranie funduszy

Summary

Background. The aim of this study was to determine the Internet addiction level of university students and to investigate if there is an association between the Internet addiction and physical activity (PA).

Material and methods. A total of 1419 participants studying at the Faculty of Sports Sciences (n=609) and the Faculty of Health Sciences (n=810) volunteered in the study and filled in the Personal Information Form. Data for the Internet addiction and PA level was collected by using Young's Internet Addiction Scale and the International Physical Activity Questionnaire (IPAQ), respectively.

Results. According to the results of the study, the Internet addiction level of university students was mainly asymptomatic (90.3%), and only (9.7%) of all students showed limited symptoms. None of the students fell into the category of pathological Internet users in both faculties. The results revealed that 64.8% of the participants were found to be inactive, whereas only 35.2% of the students were physically active. According to the results, 92.3% of students who do high levels of PA were asymptomatic, and only 7.7% of them showed limited symptoms.

Conclusions. Although it is believed that young adults use the Internet very actively and are prone to addiction, the results of the study showed that the rate of the Internet addiction symptoms in students is quite low, and none of the students suffer pathological symptoms of using the Internet.

Keywords: Internet addiction, physical activity, students

Streszczenie

Wprowadzenie. Celem niniejszego badania było określenie poziomu uzależnienia studentów uczelni wyższych od Internetu i sprawdzenie, czy istnieje związek między uzależnieniem od Internetu a aktywnością fizyczną (AF).

Materiał i metody. Łącznie 1419 uczestników studiujących na Wydziale Nauk o Sporcie (n=609) i Wydziale Nauk o Zdrowiu (n=810) zgłosiło się do badania i wypełniło formularz danych osobowych. Dane dotyczące uzależnienia od Internetu i poziomu AF zostały zebrane za pomocą Skali Uzależnienia od Internetu wg Kimberley Young i Międzynarodowego Kwestionariusza Aktywności Fizycznej (IPAQ).

Wyniki. Zgodnie z wynikami badania poziom uzależnienia od Internetu wśród studentów był głównie bezobjawowy (90,3%), i zaledwie (9,7%) wszystkich studentów wykazywało ograniczone objawy. Żaden ze studentów któregośkolwiek z wydziałów nie mieścił się w kategorii patologicznego użytkownika Internetu. Wyniki pokazały, że 64,8% uczestników było nieaktywnych fizycznie, podczas gdy zaledwie 35,2% studentów było aktywnych fizycznie. Zgodnie z wynikami, 92,3% studentów, którzy wykazują wysoki poziom AF, nie miało żadnych objawów, a tylko 7,7% z nich wykazywało ograniczone objawy.

Wnioski. Chociaż uważa się, że młodzi dorośli bardzo aktywnie korzystają z Internetu i są podatni na uzależnienia, wyniki badania wykazały, że odsetek objawów uzależnienia od Internetu wśród studentów jest dość niski, a żaden ze studentów nie cierpi na patologiczne objawy użytkownika Internetu.

Słowa kluczowe: uzależnienie od Internetu, aktywność fizyczna, studenci

Tables: 5
Figures: 0
References: 47
Submitted: 2023 Apr 12
Accepted: 2023 Jun 7

Cincik M, Cicek G, Ozdurak Singin RH. Determination of the Internet addiction among students of the Faculty of Sports Sciences and the Faculty of Health Sciences and its association to physical activity. Health Prob Civil. 2023; 17(2): 179-190. <https://doi.org/10.5114/hpc.2023.128035>

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Introduction

The Internet addiction is defined as uncontrollable use of the Internet for a prolonged period of time per day regardless of any activity once started using [1]. The Internet is an important resource for accessing the latest information, enabling us to communicate with others and encouraging research [2]. Due to the accelerated use of the Internet worldwide, addiction has been a growing threat for public health [3]. The Internet addiction generally refers to a form of using the Internet that leads to psychological, social, educational or occupational problems in a person's life [4]. Widespread use of the Internet has been reported by many researchers worldwide to have led to a relationship between the Internet addiction and mental health problems such as depression, anxiety, stress, reduced happiness and lack of physical activity (PA) [5,6].

The behaviors associated with the Internet addiction are variable and termed as "pathological Internet use" [7], "problematic Internet use" [8], "Internet addiction disorder" [9] and "Internet game addiction" [10]. Pathological Internet use among adolescents and children has become an increasingly concerning issue in the past decades [11]. Recent studies have shown that young adults, such as university students, suffer from a higher risk of developing "Internet addiction" [12]. Since young individuals spend much more time on the Internet for entertainment or educational purpose, the time period they should spend actively turns into a sedentary life [13].

Thus, increased inactivity and lack of PA arose as the most common health-related risk factor for the Internet addiction [13,14]. Inactivity has been linked with traditional forms of screen-based activities (e.g. watching television, playing video games and surfing the Internet). More importantly, a consistent body of literature has shown that more than 80% of people reported typically sitting when using their device [15], and such inactive behaviors are linked to numerous comorbidities, including obesity, cardiovascular disease and metabolic syndrome [16]. The increased amounts of screen time and considerable reductions in daily PA among children and adolescents have been proposed as potential risk factors for multiple health problems [17]. Numerous studies have presented the benefits of PA and the harmful effect of screen-based sedentary behaviors on health in adolescents [18,19].

The practice of PA can contribute to a reduction of mortality rates and can represent a protective factor for the development of chronic non-communicable diseases, such as cardiovascular diseases, high blood pressure, obesity, type 2 diabetes and some types of cancer [20,21]. The benefits of participating in regular PA and reducing sedentary behavior are wide-ranging, such as lowering the risk of coronary heart disease, diabetes, obesity, musculoskeletal disorders, anxiety and depression [22,23].

Therefore, it is hypothesized that exercise-based interventions may be an effective solution to reduce or even eliminate the Internet addiction [10]. With the rapid progress in technologies in recent years, the widespread use of the Internet seems to be expanding and thereby leads to an increase in physical and psychological problems in future [3,13]. Therefore, many studies have been focused on the subject of the Internet addiction and its consequences related to health problems. Especially young adults, who use the Internet for almost everything, are prone to the Internet addiction.

The aim of the study was to determine the Internet addition level of university students and investigate the association between PA and the Internet addiction.

Material and methods

Research type

This study was carried out in the province of Çorum in Türkiye as a cross-sectional study. Students from the 2019-2020 academic year from three different universities (Hitit, Kırıkkale and Gazi) were included.

Research population and sample

A total of 1419 young people studying at the Faculty of Sports Sciences (n=609) and the Faculty of Health Sciences (n=810) in the 2019-2020 academic year from three different universities were included on a voluntary basis in the cross-sectional randomized study. The participants were between 18 and 35 years of age, including 919 female and 500 male university students. The inclusion criteria were being a university student and willingness to participate in the study. In total, 1450 individuals agreed to participate in the study. 31 people were excluded from the study because they filled in the questionnaires incompletely or incorrectly. 1419 students completed the questionnaire items relevant to this study. In order to generalize the research results, the size of the sample was determined using Gpower 3.9.1. In order to determine the sample size, it was calculated with a 95% confidence level and a 3% margin of error, taking into account the number in the universe, and a number of 952 was reached.

Data collection tools

BMI was calculated according to the formula of weight (kg)/height (m²). According to BMI, students were classified as underweight (<19.9 km/m²), normal weight (20-24.9 km/m²) and overweight (25-25.9 km/m²).

Demographic variables

A personal information survey was conducted to collect data for demographic variables such as age, gender, faculty, regular PA habits and average time spent online at once a time.

Physical Activity Level

The PA level was determined by using the Turkish validated short-form version of the International Physical Activity Questionnaire (IPAQ). The validity and the credibility studies of the Turkish adaptation of the questionnaire were conducted by Ozturk [24]. A self-administered short form with 7 questions was used to measure students' levels of PA in the last week. Scores were used to calculate energy expenditure and estimate the metabolic equivalent minutes per week (MET-min/week). The average MET score was attributed to 3 activity levels: 3.3 METs for low activity, 4.0 METs for moderate activity and 8.0 METs for high activity. Students were classified according to their PA in terms of MET scores as low, moderate and high activity groups. The sitting score (sedentary behavior level) was calculated separately.

YOUNG Internet Addiction Scale

The 20-question "Internet Addiction Scale" designed by Young [25] is the expanded version of the 8-question "Diagnostic Questionnaire", which was adapted from the Young DSM-IV's "Pathological Gambling" criteria. The Likert-type scale is prepared as a self-report test where participants choose one of the options "Never", "Very Few", "Occasionally", "Frequently", "Very Often" or "Always" for each question, with a score of 0, 1, 2, 3, 4 and

5 for each option, respectively. The scores of all the items are summed, yielding total scores between 0-100. Participants were classified according to their total scores as “with pathological symptoms” for 80 points and above, as “limited symptoms” for points between 50-79 and “asymptomatic” for 50 points or less [26]. The higher the total score obtained from the scale, the higher the risk of the Internet addiction.

Data analysis

Statistical analysis was performed by using software package IBM SPSS Statistics for Windows, Version 22.0 (Armonk, NY: IBM Corp). Normality of the distribution was tested by using the One-sample Kolmogorov-Smirnov test, and descriptive statistics were tabulated as frequencies, whereas Pearson’s chi-squared test was used to determine the difference between the demographic variables in terms of the Internet addiction levels and PA levels at a significance level of $p < 0.05$, respectively. The relationship between the Internet addition scale scores and PA level was tested using Spearman’s rank correlation coefficient at a significance level of $p < 0.05$.

Ethical dimension of the research

Ethical approval for this study, which was planned in accordance with the Helsinki Principle, was obtained from the Hitit University Non-Invasive Ethics Committee (Acceptance Number: 2019-243).

Results

The participation rate of students from the Faculty of Health Sciences (57.1%) was slightly higher compared to the Faculty of Sports Sciences (42.9%) in all three Turkish universities, as shown in Table 1. Female participants (64.8%) amounted to almost twice more than male participants (35.2%). The majority of students (40.9%) were between 20-21 years of age and fell into the category of normal weight (74.8%) according to their BMI index. However, the same students confirmed that most of them did not perform any PA (64.8%) regularly and spent at least 1 hour on the Internet at one time (54.8%), and the majority of students had a moderate (47.6%) to high (25.7%) and low (26.6%) level of PA. The Internet addiction level of the sample was mainly asymptomatic (90.3%), whereas only 9.7% of all students showed limited symptoms for the Internet addiction. None of the students fell into the category classified as pathological Internet users, thus the pathological Internet user sub-dimension was eliminated in further statistical analysis.

Table 1. Frequency and percentage distributions of the demographic variables of 1419 university students

Group	Variable	n	%
Faculty	Sports	609	42.9
	Health	810	57.1
Age group	18-19	506	35.7
	20-21	580	40.9
	21-35	333	23.5
BMI	Underweight	155	10.9
	Normal weight	1062	74.8
	Overweight	202	14.2
Gender	Female	919	64.8
	Male	500	35.2
Regular PA	Yes	499	35.2
	No	920	64.8

Group	Variable	n	%
Average time spent online at one time	1 hour	778	54.8
	2 hours	422	29.7
	2+ hours	219	15.4
PA level	Low activity	378	26.6
	Moderate activity	676	47.6
	High activity	365	25.7
Internet addiction	Pathological Internet user	0	0
	Limited symptoms	138	9.7
	Asymptomatic	1281	90.3

Faculty ($\chi^2(1, 1419)=0.002; p=0.967$), gender ($\chi^2(1, 1419)=1.42; p=0.232$) and regular participation in exercise ($\chi^2(1, 1419)=1.99; p=0.158$) did not differ in students showing limited symptoms of the Internet addiction compared to asymptomatic students (Table 2). The average time spent online at one time was asked in both groups, and the results showed that asymptomatic students had statistically significant higher proportions of time spent online as being less than 1 hour, whereas students with limited symptoms had higher proportions of time spent online of more than 2 hours ($\chi^2(1, 1419)=49.99; p\leq 0.000$) (Table 2).

Table 2. Comparison of demographic variables of university students according to their Internet addiction level

Variable	Internet addiction variables		
	Limited symptoms n (%)	Asymptomatic n (%)	p value
Faculty			
Sports	54 (8.9)	555 (91.1)	0.967
Health	69 (8.6)	741 (91.4)	
Gender			
Female	83 (9.0)	836 (91.0)	0.232
Male	55 (11.0)	445 (89.0)	
Do you do regular PA?			
Yes	41 (8.2)	458 (91.8)	0.158
No	97 (10.5)	823 (89.5)	
Average time spent online at one time			
1 hour	44 (5.7)	734 (94.3)	0.000*
2 hours	47 (11.1)	375 (88.9)	
2+ hours	47 (21.5)	172 (78.5)	

Notes: * $p < 0.05$.

A chi-square test of independence was performed to examine the relation between PA level and the demographic variables of interest as stated in Table 3. The relation between PA level and almost all variables was significantly different ($p \leq 0.000$). As expected, students of the Faculty of Sports Science had a statistically significant higher PA level compared to students of the Faculty of Health Sciences ($\chi^2(2, 1419)=128.48; p \leq 0.000$), where the highest proportion of students were highly active in sport sciences (40.9%), as students of Faculty of Health Sciences were mainly active to a moderate level (54.7%) (Table 3). Students with low, moderate and high levels of PA showed statistically significant differences. Male students had a significantly higher PA level compared to female students ($\chi^2(2, 1419)=98.27; p \leq 0.000$), and PA level showed a significant statistical difference according to participation in regular exercise ($\chi^2(2, 1419)=169.01; p \leq 0.000$). Not only exercise but also time spent on the Internet was significantly different ($\chi^2(3, 1419)=19.80; p=0.001$) for different PA levels, as shown in Table 3.

Table 3. Comparison of demographic variables of university students according to physical activity level

Variable	PA level			
	Low activity	Moderate activity	High activity	p value
Faculty				
Sports	127 (20.19)	233 (38.3)	249 (40.9)	0.000*
Health	251 (31.0)	443 (54.7)	116 (14.3)	
Gender				
Female	287 (31.2)	472 (51.4)	160 (17.4)	0.000*
Male	91 (18.2)	204 (40.8)	205 (41.0)	
Do you do regular PA?				
Yes	80 (16.0)	190 (38.1)	229 (45.9)	0.000*
No	298 (32.4)	486 (52.8)	136 (14.8)	
Average time spent online at one time				
1 hour	184 (23.7)	409 (52.6)	185 (23.8)	0.001*
2 hour	120 (28.4)	177 (41.9)	125 (29.6)	
2+ hour	74 (33.8)	90 (41.1)	55 (25.1)	

Notes: *p<0.05.

The results of Pearson’s chi-squared test showed that there was no significant difference between asymptomatic students and students with limited symptoms for the Internet addiction according to their PA levels ($\chi^2 = (2, 1419) = 2.92; p = 232$), as seen in Table 4.

Table 4. Comparison of the Internet addiction level of university students according to their PA level

Internet addiction variables	Symptoms		PA level			p value
	Limited symptoms	n	Low	Moderate	High	
	Limited symptoms	n	36	74	28	0.232
		%	9.5	10.9	7.7	
	Asymptomatic	n	342	602	337	
		%	90.5	89.1	92.3	

Notes: *p<0.05.

The results of Spearman’s correlation coefficient test did not reveal any association between the Internet addiction and low ($r = 0.02; p = 0.482$), moderate ($r = -0.02; p = 0.509$) or high ($r = -0.04; p = 0.171$) PA. The total score of the PA scale was also not statistically correlated to the total scores of the Internet addiction scale ($r = 0.01; p = 0.644$), whereas sitting time showed a positively low but highly statistically significant correlation to the Internet addiction ($r = 0.11; p \leq 0.000$) in the sample group of 1419 university students (Table 5).

Table 5. Correlation between the physical activity level and the Internet addiction level of university students

		PA level				
		Low	Moderate	High	PA (total)	PA (sitting time)
Internet addiction	r	0.019	-0.018	-0.036	-0.012	0.114
	p	0.482	0.509	0.171	0.644	0.000*

Notes: *p<0.05.

Discussion

In this study, it was hypothesized that young adults may suffer from the risk of the Internet addiction because of time spent on the Internet for entertainment and educational purposes. Moreover, there might be an association between the Internet addiction and PA level because of the longer time spent on the Internet in young adults. Therefore, the aim was to determine the Internet addiction level of the students of three universities in Türkiye and questioned the association between PA and the Internet addiction. The results of the study showed that 90.3% of university students did not show any symptoms of the Internet addiction, and only 9.7% of them showed limited symptoms. Interestingly, none of the students fell into the category of the Internet addiction with pathological symptoms. This result is in contradiction with the hypothesis that young adults might have a higher risk for the Internet addiction; however, the results are in line with the findings of Ergin et al. who focused on the Internet addiction among medical school students and found that the rate of risky and dependent Internet usage was as low as 6% [27]. Recent studies showed that pathological Internet users among university student were found to be ranging from 0.2% to 8.6% in Türkiye [28,29], 1.1% in Northern Cyprus [30] and 18.3% in the UK [31]. The findings of the study carried out by Durmuş et al. are in line with our results in that none of the university students in his study showed pathological symptoms, and only 10.3% of the students showed limited symptoms in 2013, which decreased to 2.8% in 2016 in Türkiye [32]. Not only in Türkiye, but also in Italy, Coniglio et al. found that none of the Italian university students met the criteria for the Internet addiction with pathological symptoms [33]. The findings of this study, taken together with literature, show that although young adults use the Internet for many reasons, such as education, entertainment and/or communication, they do not show any pathological symptoms, and only a small percentage varying from 0.2% to 11% showed limited symptoms of the Internet addiction, whereas the rest of the population remained asymptomatic. According to these findings, it can be argued that young adults are far behind the level of the Internet addiction with pathological symptoms during their university education. Another possibility for not detecting students with pathological symptoms could be the lack of sensitivity of the measurement in such that the scale might be not sensitive enough to distinguish the pathological Internet addiction until it becomes severe.

The proportion of students with the Internet addiction level of limited symptoms and asymptomatic students also did not differ according to their faculties (Table 2). Since all the participants were students of either the Faculty of Sports Sciences or the Faculty of Health Sciences, where lessons are closely focused on health and PA and are based on practice rather than theory and technology, it is not surprising that the Internet addiction level of students is quite similar for both faculties. These findings are supported by a recent study conducted on university students of five different faculties, where students' Internet addiction levels were significantly lower in the Faculty of Sports Sciences and the Faculty of Health Sciences compared to the Faculty of Theology, Communication and Engineering [34]. Students of the Faculty of Sports Sciences must exercise regularly in the gym to pass their practice lessons in sport, whereas students of the Faculty of Health Sciences attend many hours each day in the hospital for their practice lessons; thus, this might lower the time spent on the Internet and prevent the overuse of technology.

Similarly, the Internet addiction levels of the students did not show a significant difference according to gender and regular PA (Table 2). Several studies in literature argued that there might be an association between gender and the Internet addiction; however, the contradicting findings of studies have shown that there is no strict relationship [14,35]. Although the findings of this study showed that the Internet addiction symptoms did not differ significantly by gender, males (11.0%) had a slightly higher frequency for limited symptoms compared to females (9.0%) (Table 2). The findings were in line with the study of Ghamari et al. (2011), who stated that the risk of the Internet addiction in medical students was higher in males than in females [36]. Alavi et al. (2011), in a study conducted among Isfahan University students, stated that the risk of developing the Internet addiction

in males was three times higher than in females [37]. Another study found gender differences in the levels of the Internet addiction. Young males were slightly more prone to the Internet addiction than females in terms of severity levels of the Internet addiction [38]. Various outcomes related to gender differences and the Internet addiction can be attributed to many factors, such as cultural values, Internet access, institutional policies and personal habits [2].

Although the level of regular PA did not differ between students who showed limited symptoms of the Internet addiction and asymptomatic students, limited symptoms of the Internet addiction were slightly higher for those who did not exercise regularly (10.5%) compared to students who exercised regularly (8.2%) (Table 2). Literature reveals significantly higher average the Internet addiction scores for students who did not engage in any PA compared to students who exercise regularly [2]. Moreover, it was found that PA has a protective role against problematic internet use [39]. On the other hand, Dang et al. showed that the level of PA was low in both the Internet addicted and non-Internet addicted young groups. Similar to the findings of Dang et al. (2018), only 35.2% of university students exercised regularly in our study, whereas 64.8% of students lack regular exercise habits [40].

Gender might be a variable for PA level among young adults, since the PA levels of male students were higher compared to females (Table 3). The findings of this study agree with literature and reveal higher levels of PA for young males compared to young females [41,42]. The PA survey of adolescents and young adults in Poland stated that males had higher levels of PA than women [43]. The PA level was higher for those who were regularly engaged in PA (45.9%) compared to students who did not perform regular PA (14.8%), as expected. Literature shows that participation in sports and exercise is a fundamental step for increasing the level of PA among university students [44,45].

It can be argued that participation in regular PA might have an indirect effect on decreasing screen time, as shown in the findings of our study, in that the PA levels of the students differed significantly in the variable of the amount of time spent on the Internet at one time (Table 3). Our findings concerning the association between PA and the Internet addiction are in line with the findings in literature, which reveals that there is not any clear relationship between PA level and the Internet addiction [40]. The results of this study could not find a correlation between students' PA level, classified as low, moderate and high, and the Internet addiction level of university students, as shown in Table 4. However, we showed that sitting time was positively correlated with the Internet addiction level; thus, it can be assumed that being physically active might have a positive effect on the Internet addiction (Table 5). A study has shown that extensive use of the Internet and computers may be inversely associated with PA, since this involves time that might otherwise be spent engaging in PA [46]. Thus, the longer students spend time in front of the computer, the higher the level of showing symptoms of the Internet addiction becomes. Studies carried out on university students reported that symptoms of the Internet addiction increase with longer periods of time in front of the computer [47]. Taking the two variables together, although not statistically significant in our study, regular exercise and decreased on-screen time might influence the Internet addiction symptoms, showing that necessary steps are required to provide early intervention to emphasize the importance and the benefits of PA [40].

Limitations

Although this study reports many valuable findings, it also has some limitations. First, we emphasize that our sample group was limited to university students in Türkiye; thus, our findings may not be generalized to countries which use technologies and the Internet more often in daily life. Second, our findings are representative for students who study at the Faculty of Sports Sciences and the Faculty of Health Sciences. Thus, the findings cannot be generalized to students for faculties such as engineering, graphical design, etc. that might use the

Internet for educational purpose to a higher extent and variety. Moreover, assessment of the Internet addiction was carried out only with the measurement based on the Internet addiction scale scores, and statements were made without any clinical evaluation similar to previous research [29]. It seems that there is a need for a more sensitive scale based on international standards for the Internet addiction symptoms, and participants should be evaluated clinically as well.

Conclusions

Although it is believed that young adults use the Internet very actively and are prone to addiction, the results of the study showed that the rate of the Internet addiction symptoms in students is quite low, and none of the students suffer from pathological symptoms of the Internet addiction in Türkiye. Moreover, the Internet addiction differed significantly among students when comparing variable time spent on the computer at one time rather than PA level. Although PA was not correlated with the Internet addiction directly, there was a positive correlation between time spent on the Internet and the addiction level of students. Thus, exercise-based interventions may be an effective way to mitigate and even eliminate the Internet addiction indirectly by decreasing time spent in front of the computer. These findings should be supported with longitudinal experimental studies based on clinical assessment.

Disclosures and acknowledgements

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. This work was funded by the authors.

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