

Relationship Between Internet Addiction and Sleep Quality in University Students

Üniversite Öğrencilerinde İnternet Bağımlılığı ile Uyku Kalitesi Arasındaki İlişki

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Abstract

Objective: The purpose of this study was to investigate the relationship between internet addiction and sleep quality in university students.

Method: A total of 424 university students were included in the study. The study was conducted online due to the COVID-19 pandemic. "Personal Information Form", "Young's Internet Addiction Test-Short Form (YIAT-SF)", and "Pittsburgh Sleep Quality Index (PSQI)" were used as data collection tools.

Results: The average internet addiction scores of individuals with poor sleep quality were higher than the average internet addiction scores of individuals with good sleep quality. In addition, internet addiction significantly affected the sleep quality of university students. It has been determined that internet addiction is an important parameter affecting sleep quality, when internet addiction scores increase by 1 unit, the risk of poor sleep quality will increase by 8.7%.

Conclusion: There is a significant relationship between internet addiction and sleep quality of university students and that internet addiction negatively affects sleep quality. In this context, it is expected that holistic studies to be carried out in terms of reducing internet addiction and increasing sleep quality of university students will shed light on both theoretical and applied studies.

Keywords: University, student, internet addiction, sleep quality

Öz

Amaç: Bu çalışmada, üniversite öğrencilerinde internet bağımlılığı ile uyku kalitesi arasındaki ilişkinin araştırılması amaçlanmıştır.

Yöntem: Bu araştırma toplam 424 üniversite öğrencisi ile yürütülmüştür. Çalışma COVID-19 pandemisi sebebiyle online (çevrimiçi) olarak yürütülmüştür. Veri toplama araçları olarak "Kişisel Bilgi Formu", "Young İnternet Bağımlılığı Testi-Kısa Form (YİBT-KF)" ve "Pittsburgh Uyku Kalitesi İndeksi (PUKI)" kullanılmıştır.

Bulgular: Uyku kalitesi kötü olan bireylerin internet bağımlılığı ortalama puanları, iyi uyku kalitesine sahip bireylerin internet bağımlılığı ortalama puanlarına göre yüksek olduğu bulunmuştur. Ayrıca internet bağımlılığının üniversite öğrencilerinin uyku kalitelerini önemli olarak etkilediği saptanmıştır. İnternet bağımlılığının uyku kalitesini etkileyen önemli bir parametre olduğu belirlenmiş ve internet bağımlılığı puanları 1 birim arttığında, kötü uyku kalitesi riskinin %8,7 artacağı tespit edilmiştir.

Sonuç: Bu araştırma sonucunda, üniversite öğrencilerinin internet bağımlılığı ile uyku kalitesi arasında anlamlı bir ilişki olduğu ve internet bağımlılığının uyku kalitesini olumsuz etkilediği sonucu elde edilmiştir. Bu bağlamda üniversite öğrencilerinin internet bağımlılığının azaltılması ve uyku kalitesinin artırılması noktasında yapılacak bütüncül çalışmaların hem kuramsal hem de uygulamalı çalışmalara ışık tutması beklenmektedir.

Anahtar kelimeler: Üniversite, öğrenci, internet bağımlılığı, uyku kalitesi



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Introduction

The internet, which provides many opportunities to its users via its influence on the world, has quickly become an indispensable part of life with the rapid development of information technologies and opportunities it presents in areas such as communication, education and entertainment (1,2). Thanks to the positive opportunities and quick and easy access it provides, it has started to play a large role in many individual's lives. However, excessive and dysfunctional uses of the Internet causes certain problems. One of these negative outcomes is described as internet addiction (3-6).

Internet addiction as a concept was first introduced to the literature by Young (7). In the following years, internet addiction was defined as excessive use of internet in a manner that would cause problems in psychological, social, academic and occupation problems in the lives of individuals (3,8). Internet addiction refers to compulsive behaviors related to any online activity that affects an individual's life and creates stress in his/her social relationships (9). It is defined as a disorder that occurs as a result of the inability of individuals to stop themselves from using the Internet despite having problems in their daily lives, relationships, and business life due to their inability to control and restrain themselves regarding internet use (10). In the context of this information in the literature, internet addiction can be stated as individuals' postponing their responsibilities and having problems in their academic, social and professional lives due to the desire to stay online constantly.

Although the literature in the field of diagnosis and criteria regarding internet addiction includes studies such as Young (7), Suler (11), Griffiths (12) Beard and Wolf (13), and Shapira et al. (14), internet addiction is not included within the Diagnostic and Statistical Manual of Mental Disorders (Fifth edition) (DSM-5), as it is yet to be accepted as a mental disorder. Internet plays an important role in the lives of individuals of all ages. However, its intense and excessive use by the younger demographics and university students is a cause for concern (15). It is thought that there is a need for research on internet addiction in order to further clarify the factors such as the lack of a clear distinction regarding the diagnosis and criteria of internet addiction, and the fact that it is heavily preferred by young population such as university students.

An examination of the literature has revealed that the studies examining variables related to internet addiction generally focus on its relationship between mental states such as depression, loneliness, anxiety, and stress (16-19). In addition to these, it is noted that there are also studies examining its physical outcomes such as back pain, migraine, weight problems, insufficient rest, and psychomotor irregularity (20). Additionally, within the scope of the physical needs of individuals, internet addiction can cause

disruptions by affecting sleep quality, which plays an important role in human health (21). Indeed, studies show that internet addiction is effective on insomnia and other sleep disorders (22-24). Moreover, some studies claim that heavy users of the Internet have higher incidence rates of insomnia since time spent online seriously disrupts the sleep and wake-up schedules of individuals (25-27). However, this also demonstrates that still little is known about the relationship between internet addiction and sleep (22).

It is doubtless that sleep is important for people of all ages, including university students. According to the results of the study, 60% of university students suffer from poor sleep quality, while 7.7% meet all criteria regarding sleep disorders. These results reveal that sleep-related disorders have a great impact on students' daily life (28). It is believed that sleep quality is of utmost importance for university students, as good sleep quality will allow them to achieve better academic performance and prepare them more adequately for their professional lives, while also enabling them to earn successes in this regard.

Sleep quality is among the important factors affecting mental health. Internet addiction is one of the important problems especially for university students. For this reason, it is important for this study to reveal how internet addiction seen in university students affects sleep quality. Therefore, in this study, it was aimed to investigate the relationship between internet addiction and sleep quality in university students. Two hypotheses were determined in the study. These; (1) The sleep quality of university students differs according to age and gender characteristics, and (2) Internet addiction negatively affects the sleep quality of university students.

Method

The type of this study is cross-sectional-relational survey. In this study, it is aimed to investigate the relationship between internet addiction and sleep quality in university students.

Sample

This study was carried out online with the participation of students studying at Afyon Kocatepe University. Snowball sampling method was used in sampling. For the snowball sampling method, one of the units in the universe is reached in any way. Then, with the help of the contacted person, another person is contacted and then another person is contacted in the same way. Thus, the sample is enlarged in the form of a snowball effect. To calculate the number of samples, the sample calculation formula with known universe was used. The required sample size was calculated as 384 with 95% confidence interval and $\pm 5\%$ sampling error for the study. However, more people should be sampled to compare the subgroups. Creating the sample

group also used inclusion criteria. Being 18 years or older and accepting the study were determined as inclusion criteria.

Since it was not possible to meet with the participants physically due to the pandemic, the questions were prepared using Google Forms and sent to the participants via e-mail. Before starting the questionnaire, the students were informed with an informed consent form, and they were asked whether they participated or not. After that, those who accepted to work were able to continue the questionnaire form. During the first stage of the application of the study, the university students were informed about the purpose of the study, that their participation in this study was on a voluntary basis, and that the results obtained from this study would only be used for scientific purposes. The data were collected between 17.10.2020 and 31.12.2020. 924 students were invited, and 424 of them participated in the study. Students who filled out the questions with no attachments were not included in the study. 58.4% (n=248) of the participants are women. The average age of the students participating in the study was found to be 19.74 ± 2.27 (years).

Procedure

Before starting the study, permission was obtained from the ethics committee on 16.10.2020 (Eskisehir Osmangazi University Non-Interventional Clinical Trials Ethics Committee, Number: E-25403353-050.99-107164). In addition, informed consent was obtained from all students. Participation in the study was on a voluntary basis. Students participating in the research were assured that all data was anonymous and would be kept confidential.

Within the scope of this study, the participants (university students) were informed about the purpose of the research, not making any payment to the participants, not giving gifts and volunteering the participation. For the scales used in the study, the researchers obtained permission from the relevant authors via e-mail. Three-part data collection forms were administered online via "Google Forms" (Google Inc., Mountain View, CA, USA), an encrypted and secure online survey software application. The survey software program prevented the same user from filling in the data collection forms more than once. In this way, more than one participation of one person in the study was prevented. The forms were sent to faculty members in different departments to be shared with university students via e-mail. The contact addresses of the faculty members were obtained from the web pages of their institutions. Faculty members delivered the relevant forms to the class representatives. It was ensured that university students received e-mails through class representatives. University students electronically approved the informed consent section on the first page of the online data collection form to express their agreement to participate in this study. In order to evaluate the accuracy and comprehensibility

of these forms, the pilot study of the data collection forms was conducted with 15 participants. In the pilot study, the data of the participants who answered the questions were not included in the research. Filling in the data collection forms took approximately 30 minutes. In addition, the questionnaire consisted of 4 screens. On the first screen, confirmation was asked about participation in the study. Personal information form is presented on the second screen. Young Internet Addiction Test Short Form (YIAT-SF) was on the third screen and Pittsburgh Sleep Quality Index (PSQI) was on the fourth screen. In the study, it was obligatory to fill in each question in the online questionnaire. There was no chance to leave the questions blank. After completing and submitting the questionnaire, individuals were not given a chance to return to the questionnaire. The study is on a voluntary basis and no fee was paid to the participating university students and no gifts were given.

Measures

Data collection tools were "Personal Information Form", "Young's Internet Addiction Test-Short Form (YIAT-SF)" and "Pittsburgh Sleep Quality Index (PSQI)".

Personal Information Form

Between 01.06.2020-01.10.2020, the literature was searched and questions were determined in line with the purpose of the study. The age and gender information of the students were collected through the personal information form (39,40)

Young Internet Addiction Test Short Form (YIAT-SF)

This scale was developed by Young and converted into short form by Pawlikowski et al. The Turkish adaptation of the scale was performed by Kutlu et al. The scale consists of 12 items and is a 5-point Likert-type scale (1 = Never, 5 = Very often). The scale does not contain any items scored in reverse. The scores that can be obtained from the scale vary between 12 and 60 points. The increase in the scores obtained from the scale indicates an increased level of internet addiction. The reliability of the scale was tested with internal consistency (Cronbach's alpha) and test-retest methods, and the Cronbach's alpha coefficient obtained in the reliability study of the Young's Internet Addiction Test Short Form was 0.91 for university students and 0.86 for adolescents. Afterwards, the scale was applied to 180 university students and 98 adolescents with a three-week interval in order to examine the test-retest reliability. Between these two applications, the correlation coefficient was 0.93 for university students and 0.86 for adolescents (29). In this study, the Cronbach's alpha value of the applied scale was determined to be 0.90, and it was found that the Young's Internet Addiction Scale was highly reliable.

Pittsburgh Sleep Quality Index (PSQI)

In the context of this study, the Pittsburgh Sleep Quality Index (PSQI), which is a self-report scale, was used to evaluate sleep

quality. This scale was developed by Buysse et al. The validity and reliability studies of this scale in the context of Turkey were conducted by Agargun et al. They reported Cronbach's alpha value of the scale as 0.80. In this study, the Cronbach's alpha value of the scale was determined to be 0.87. PSQI consists of 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medication and daytime dysfunction. Although PSQI includes 24 items in total, only 19 items are included in its calculation. The index includes open-ended questions (such as "During the past month, when did you usually go to bed at night?") and multiple-choice questions (questions such as "During the past month, how would you rate your overall sleep quality? and answers (such as "Very good, very bad", etc.) Each multiple-choice question in the scale is scored between 0 and 3. The total PSQI score is reached by calculating the total score of all seven components. The total scores obtained from the index vary between 0-21, and those who score above 5 points are considered to have "poor sleep quality", while those who score 5 or less are considered to have "good sleep quality"(30).

Statistical Analysis

Statistical analyzes were performed using a package program called SPSS (IBM SPSS Statistics 24). Frequency tables, descriptive statistics, Chi-square and Mann-Whitney U Test were applied in the interpretation of the findings. Binary Logistic Regression: Backward LR model was used to examine the variables affecting the PSQI classes. Logistic regression is the type of regression used when the dependent variable (sleep quality) is categorical. Logistic regression can be done in studies that do not require that the independent variables are linearly related to the dependent variable, that the dependent variable does not have

to have normal distribution, and that the variances are equal and homogeneous. In addition, a large sample size is needed to perform logistic regression. Considering these conditions, logistic regression analysis was found suitable for our study. All variables (gender, age, PSQI, YIAT-SF) were used in the model.

Results

58.4% (n = 248) of the participants are women. The average age of the students participating in the study was found to be 19.74 ± 2.27 (years). Table 1 shows the averages of the scales. The optimal model, which was created by performing a logistic regression analysis using gender, age, and Young Internet Addiction Test Short Form (YIAT-SF) scores, is presented in the table below.

The results of the chi-square test applied to examine whether there is a difference between age and gender and PSQI classification are given in Table 2. There was no statistically significant difference between age and gender and PSQI classification ($p > 0.005$). The results of the Mann-Whitney U Test applied to examine whether there is a relationship between PSQI classification and YIAT-SF are given in Table 3. A statistically significant relationship was found between PSQI classification and YIAT-SF ($Z = 4.183$, $p = 0.000$). The average internet addiction scores of individuals with poor sleep quality are higher than those of individuals with good sleep quality.

Table 1. Average score of the scales (n=424)

Variables	X \pm SD
YIAT-SF	25.61 \pm 5.4
PSQI	5.4 \pm 2.8
SS= Standard Deviation, X=Mean	

Table 2. The relationship between age and gender and PSQI classification

Variable	Good sleep ≤ 5 (n=187)		Bad sleep > 5 (n=237)		Total (N=424)		Statistical analysis
	n	%	n	%	n	%	
Gender							
Female	162	43,5	210	56,5	372	87,73	$\chi^2=0,380$
Male	25	48,1	27	51,9	52	12,27	$p=0,538$
Age							
20 and below	155	44,4	194	55,6	349	82,73	$\chi^2=0,380$
21-30	32	42,7	43	57,3	75	17,7	$p=0,538$
χ^2 =Kruskall-Wallis H							

Table 3. The relationship between students' PSQI and YIAT-SF

Variable (N=424)	Good sleep ≤ 5 (n=187) $\bar{X} \pm S.D$	Bad sleep > 5 (n=237) $\bar{X} \pm S.D$	Statistical analysis
YIAT-SF	22,67 \pm 7,65	27,92 \pm 8,7	$Z=4,183$ $p=0,000$
SS= Standard deviation, X= Mean, Z= Mann-Whitney U test			

Logistic regression analysis was performed in Table 4. As can be seen in Table 4, Young Internet Addiction Test Short Form (YIAT-SF) value is an important parameter affecting sleep quality in the current model ($p < 0.05$). It was determined that when the Young Internet Addiction Test Short Form (YIAT-SF) scores increased by 1 unit, the risk of poor sleep quality (Poor PSQI) would increase by 8.7% (OR= 1.087).

Discussion

In this study, it was concluded that the average internet addiction scores of individuals with poor sleep quality were higher than the average internet addiction scores of individuals with good sleep quality. In addition, it was concluded that internet addiction significantly affects the sleep quality of university students. Based on the logistic regression analysis performed with gender, age and Young Internet Addiction Test Short Form (YIAT-SF) scores, it was concluded that Young Internet Addiction Test Short Form (YIAT-SF) value is an important parameter affecting sleep quality and the risk of poor sleep quality (Poor Pittsburgh Sleep Quality Index (PSQI)) increased by 8.7% when internet addiction scores increased by 1 unit. In this study, it was concluded that there was no significant difference between age and gender variables and PSQI classification. University period is an important life period for students to develop educationally, professionally, socially and personally. In terms of these developments, effective and efficient use of technology and internet is among the behaviors expected from university students. However, the dysfunctional use of the internet by university students leads to internet addiction and hinders their vital activities and complicates their lives. At this point, healthy internet use of university students has a critical importance. It is thought that raising awareness about internet addiction and determining the variables associated with internet addiction are important in terms of preventive and curative mental health studies (1,3,4).

The relationship between internet addiction and sleep quality obtained from this study seems to support the existing studies in the literature. In the study conducted by Kocas & Sasmaz (21),

it was determined that internet addiction is the most important determinant of poor sleep quality. In other words, the fact internet addiction and poor sleep quality are often seen co-existing is a strong evidence of the link between internet addiction and poor sleep quality. The results of the study conducted by Abolghasem et al. (31) with university students revealed that excessive use of the Internet is associated with poor sleep quality. Karki et al. (32), it was determined that internet addiction was significantly associated with poor sleep quality. In addition, it is emphasized that students with internet addiction suffer from poor sleep quality. In their study, Gupta et al. (33) determined that internet addiction impaired sleep quality and caused sleep disorders in university students. In the research carried out by Lin et al. (34), it was found that there was a significant and negative relationship between the degree of internet addiction and sleep quality. In the study carried out by Najafi et al. (35), a relationship was found between internet addiction and sleep quality of university students. In the study conducted by Nagori et al. (36), it was noted that participants with poor sleep quality had higher internet addiction scores in comparison to participants with good sleep quality, and that there was a positive correlation between the severity of poor sleep quality and internet addiction. It is seen that these mentioned studies in the literature support the findings and results obtained in the present study. Based on this information, it could be said that internet addiction negatively affects sleep quality. In addition, studies conducted by Evcli and Yurtsever (37); Karimy et al. (38); emphasize that there are secondary problems (health, academic performance) that may arise as a result of the negative impact of internet addiction on sleep quality. In this context, it can be said that internet addiction may affect university students' sleep quality as well as negatively affect their health and academic performance.

In this study, it was concluded that there was no significant difference between age and gender variables and PSQI classification. This result Karki et al. (33), Aysan et al. (39) and Aktaş et al. (40) supports the results of the studies. Although there are differences in sleep stages and sleep duration depending on age in different periods of life, the fact that the

Table 4. Logistic regression model based on PSQI status

Variable	B	S.E.	Wald	sd	p	OR bottom	95% confidence interval (OR)	
							Top	
Gender*	0.289	0.315	0.843	1	0.359	1.335	0.720	2.474
Age	0.038	0.046	0.659	1	0.417	1.038	0.948	1.137
YIAT-SF	0.083	0.014	35.088	1	0.000	1.087	1.057	1.117
Constant	-2.845	1.062	7.183	1	0.007	0.058		

*Reference category: MaleCCR=8.7% $\chi^2_{(8)}=7.497$; $p=0.484$

**Abbreviations in the table: B: Beta coefficient, S.E.: Standard error, Wald: Test statistic, p: Possibility, OR: Odd ratio, CRR: Correct classification rate

university students in this study were in the same age group may have affected this result. In addition, sleep is necessary for the survival of every living thing. In this context, the fact that sleep is not a gender-specific variable may have revealed the result of this study.

The results of the research show that internet addiction significantly affects the sleep quality of university students. With this result, previous findings regarding both internet addiction and sleep quality studies were confirmed by adhering to the existing findings in the literature; and original data about the relationship between these two variables were tried to be provided. Therefore, this result reveals the importance and novelty of the research. However, the result of this study is limited to the data obtained from university students. This limitation is thought to be caused by the fact that the research was conducted only with university students and the tools used in the measurement being limited. Therefore, future studies that will examine internet usage and sleep quality can be conducted with the participation of adolescents and individuals of different age groups. Moreover, another issue of limitation regarding this study is related to the fact that other variables were not included in the examinations. By adding different variables to future studies on this subject, the study can be expanded and examined with different aspects. Awareness related ideas that increase sleep quality can be included in the activities that are designed to decrease the internet addiction of university students, such as seminars, training, counselling, psycho-education, etc.

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