Research Article

Effect of Internet Addiction on Sleep Quality in University Students

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Abstract

The objective of the research was to investigate the effect of the internet addiction on sleep quality in university students.

Materials and Methods. The sample of the study consisted of the students who were studying in Erzincan Binali Yildirim University, 2017-2018 academic year (n=419). The study data were collected using the Personal Information Form, the Young Internet Addiction Questionnaire-Short Form and the Pittsburgh Sleep Quality Index. Analysis of the data was performed using percentile, averages, and Pearson correlation analysis.

Results. The average age of the adolescents participated in the study was 20.54±1.92; 65.6% were female. Adolescents' Young İnternet Addiction Test total score average was 26.58±8.96 and the Pittsburgh Sleep Quality Index total score average was 6.51±2.99. A positive and statistically significant (26.2%) correlation was found between the Young İnternet Addiction Test total score and the Pittsburgh Sleep Quality Index total score of the adolescents.

Conclusions. Internet addiction disrupts sleep quality in university students and causes sleep disorders.

Keywords

nursing; internet addiction; student; sleep quality

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Problem statement and analysis of the latest research

Today, more than 80% of young people around the world access the internet and spend a long time in online activities [1, 2]. Especially university students spend a significant part of their time on the internet [3]. The increasing use of the internet causes a problem that is defined as Internet Addiction or Problematic Internet Use [4]. Internet addiction often means damaging and uncontrollable internet use. Young defines internet addiction as the use of the internet for more than 38 hours per week and suggests that it is a form of behavioral addiction [5]. Internet addiction, which means psychological dependence, is seen in 20% of adults and 0.3% to 8% of adolescents [6].

Technology and daily communication are among the most effective factors on health; on the other hand, the phenomenon of access to and dependence on the internet and social networks has become widespread among students due to its various applications and attractiveness [7]. Since education environments such as universities are the place of development of internet addiction, students who use excessive amounts of mobile phones and spend too much time on the internet may be exposed to lifestyle changes, poor academic performance and abnormal sleep patterns [8].

Sleep is a physiological condition that occurs during transformation with wakefulness, and its duration and quality are equally important for an

individual's quality of life [9]. Adequate sleep time and quality are crucial for children and adolescents to continue their physical and mental development [10]. The current sleep time required for adolescents is between eight and ten hours per night [11]. However, sleep problems are common among university students and the prevalence of poor sleep quality in this population is reported to be between 19.17% and 57.5% [12]. Changes in sleep process affect daily functions, memory and mood, academic achievement and limit interpersonal interactions in young people [13]. Due to the habits of using electronic devices such as computers and taking caffeine, general sleep changes such as insufficient sleep at night and excessive insomnia during the day occur [14]. Excessive internet use plays a major role in initiating and increasing sleep problems among adolescents [15].

Few studies have shown the relationship between high-speed internet use and internet addiction and sleep quality. Therefore, **the objective of the research** was to investigate the effect of the internet addiction on sleep quality in university students.

1. Materials and Methods

1.1 Type of Research, Place and Time
The research was conducted as a descriptive study in order to examine the effect of internet addiction on sleep quality in university students who were studying in Erzincan Binali Yıldırım University, 2017-2018 academic year (n=419).

1.2 Data Collection Tools
Question form. In this section, some socio-demographic characteristics of the students, the class they are studying, internet usage and questions about determining sleep status are included.

Young İnternet Addiction Test Short Form (YIAT-SF). YIAT-SF, developed by Young and converted into short form by Pawlikowski *et al*., consists of 12 items and is a 5-point Likert (1 = Never, 5 = Very Frequently) scale. As a result of confirmatory factor analysis, HRCT-CF was found to be in good agreement (χ^2 = 173.58, sd = 53, the Comparative Fit İndex (CFI) = 0.95, the Standardized Root

Mean Squared Residual (SRMR) = 0.064 and the Root Mean Square Error of Approximation (RMSEA) = 0.079). The internal consistency reliability coefficient of the scale was calculated as 0.85. High scores obtained from the scale indicate that the level of internet addiction is high [16].

Pittsburgh sleep quality index (PSQI). The PSQI was developed by Buysse *et al*. in 1989 to assess patients' sleep quality in clinical trials. The validity and reliability studies of this scale in Turkey were conducted by Ağargün *et al*. Cronbach's alpha reliability coefficient of the scale was found to be 0.804. The PSQI evaluates the quality of sleep in the last month. The 19 questions in the PSQI, which includes a total of 24 questions, are answered by the individual himself and 5 questions are answered by a spouse or a roommate. Five questions answered by an individual's spouse or roommate are used for clinical information and are not included in the scoring. The 19th question in the scale asks whether a spouse or a roommate is present and the answer is not included in the calculation of the PSQI total and component scores. The first 18 questions answered by the individual himself are used to calculate the PSQI total and component scores. Eighteen questions are divided into 7 components. Each component is evaluated on a score of 0-3. The total PSQI score is obtained by adding 7 component points. The total score is between 0 and 21 points. A higher total score indicates poor sleep quality. The total PSQI score greater than 5 is considered as the cut-off score indicating poor sleep quality. The 7 components include subjective sleep quality (component 1), sleep latency (component 2), sleep duration (component 3), habitual sleep activity (component 4), sleep disturbance (component 5), sleep medication use (component 6), and daytime sleep dysfunction (component 7) [17].

1.3 Ethical Principles of Research
Legal and ethical permits were obtained from the relevant institutions in order to conduct the research.

1.4 Data Collection
The research was carried out with students studying at Erzincan Binali Yildirim University in 2017-2018

spring term. As a data collection method, socio-demographic data including open-ended questions, the YIAT-SF and the PSQI questionnaire link were formed via Google forms.

1.5 Data Analysis and Evaluation

When evaluating the findings obtained in the study, IBM SPSS Statistics 22 for statistical analysis (SPSS IBM, Turkey) programs were used. The suitability of the variables to normal distribution was evaluated by Kolmogorov Smirnov test, Q-Q graphs and histograms. Descriptive statistical methods (mean, standard deviation, frequency, percentage) as well as the relationship between quantitative data were used to evaluate the data. Cronbach's alpha reliability coefficient was used to evaluate the reliability of the scales. Significance was evaluated at $p<0.05$.

1.6 Limitations of Research

The results of the research are limited only to the students at the university where the study was conducted. Adolescents' sleep quality was limited by the PSQI and internet use was limited to the structures in the YIAT-SF.

2. Results

The distribution of the general and internet usage characteristics of the adolescents included in the research is given in Table 1. The age of the students ranged between 17 and 35 years and the mean age was 20.54 ± 1.92 years. It was found that 54.8% (n = 229) were 20 years or younger; 65.6% (n = 274) were girls; 29.7% (n = 124) were 1st grade students; 54.5% (n = 228) of the students had access to the internet only by mobile devices; 44.7% (n = 187) were connected to the internet within 4-6 hours; 93.5% (n = 391) were in bed before sleeping. It was found that 59.8% (n = 250) thought that using the internet caused changes in sleep hours.

The total scores of the students' YIAT-SF ranged between 12 and 60 and the mean was 26.58 ± 8.96 (Table 2). The subjective sleep quality subscale scores of the students ranged from 0 to 3, with a mean of 1.28 ± 0.71; sleep latency subscale scores ranged from 0 to 3, with a mean of 1.07 ± 0.68;

sleep duration subscale scores ranged from 0 to 3, with an average of 0.81 ± 0.94; habitual sleep activity subscale scores ranged from 0 to 3, with a mean of 1.05 ± 1.26; sleep disorder subscale scores ranged from 0 to 3, with a mean of 1.06 ± 0.55; sleep drug use effectiveness subscale scores ranged from 0 to 3, with a mean of 0.15 ± 0.50; daytime dysfunction subscale scores ranged from 0 to 3, with a mean of 1.10 ± 0.85; the PSQI total scores ranged from 1 to 21, with a mean of 6.51 ± 2.99.

The total YIAT-SF scores and subjective sleep quality (p = 0.001), sleep latency (p = 0.001), sleep disorder (p = 0.001), sleep medication use (p = 0.001), daytime dysfunction (p = 0.001) subdimension and the total PSQI (p = 0.001), showed a positive correlation between the 22.2%, 18.6%, 32.8%, 21.9%, 28.8% and 26.2% levels, respectively ($p < 0.01$).

3. Discussion

In this study, the effect of internet addiction on sleep quality in university students was discussed and the data obtained were discussed in the aspect of literature.

Internet is becoming an important part of our daily lives [18]. Internet, which is used for entertainment, communication and education, despite its advantages, overuse causes a problem defined as "Internet Addiction" or "Problematic Internet Use" [4]. In the last decade, the prevalence of internet use among adolescents has increased immensely. The prevalence of internet addiction varies between 0.3% and 8% in adolescents and 20% in adults [6].

It was found that the students included in the study had an internet addiction score higher than the average according to the YIAT-SF (Table 2). Kılıç and Durat [19] investigated the relationship between general psychological symptoms and social phobia of problematic internet use among university students and found that students had moderate internet addiction scores. In the study of Demir and Kutlu [20], which examined the relationship between adolescents' internet addiction, academic motivation, academic procrastination, and school attachment levels, it was found that students had

Table 1. Descriptive characteristics of students (N = 418).

		min-max	Mean±Sd
Age (year)		17-35	20.54±1.92
		N	%
Age group	≤20 year	229	54.8
	>20 year	189	45.2
Gender	F	274	65.6
	M	144	34.4
Class level	1st	124	29.7
	2nd	100	23.9
	3rd	114	27.3
	4th	80	19.1
Most commonly used device to connect to the Internet	Computer and mobile phone	190	45.5
	Only mobile phone	228	54.5
Internet use duration (d)	Less than 1 h a day	11	2.6
	1-3 h a day	122	29.2
	4-6 h a day	187	44.7
	More than 7 h a day	98	23.4
Do you connect to the internet just before sleeping?	Yes	391	93.5
	No	27	6.5
Does internet affect your sleeping?	Yes	250	59.8
	No	127	30.4
	Not sure	41	9.8

Table 2. YIAT-SF and PSQI subscale and total scores of the students (N = 418).

		min-max	Mean ±Sd
YIAT-SF		12-60	26.58±8.96
PSQI	Sleep Quality	0-3	1.28±0.71
	Latency	0-3	1.07±0.68
	Duration	0-3	0.81±0.94
	Habitual Sleep	0-3	1.05±1.26
	Efficiency	0-3	1.06±0.55
	Disturbance	0-3	0.15±0.50
	Use of Medications	0-3	1.10±0.85
	Daytime Dysfunction	1-21	6.51±2.99
	TOTAL		

above-average internet addiction scores. In the study of Salam et al. (21), 48.6% of the students were normal internet users according to the YIAT Internet Addiction Scale; however, 49.5% and 1.9% of the students had moderate and severe internet addiction, respectively. Similarly, in the studies of Hasanzadeh et al. [22] examining internet addiction in university students, it was found that university

students had moderate internet addiction score.

Sleep is a physiological condition that occurs alternately with wakefulness, and its duration and quality are equally important for an individual's quality of life [9]. Adequate sleep time and quality are especially important for children and adolescents to maintain their ongoing physical and mental development [24]. Poor sleep quality is a major problem affecting health. Although sleep disorders are seen in all age groups, it is reported to be more common especially in university students and their sleep quality is poor [25]. The prevalence of sleep disorders in young people is estimated to be between 27% and 40% [6].

It was determined that sleep quality of the students included in the study was poor according to the PSQI and the mean score was 6.51 $\pm$ 2.99 (Table 2). Ergün *et al*. (24) evaluated the factors affecting sleep habits and quality of the students in the school of health and the students had poor sleep quality and the PSQI score was 6.52 $\pm$ 2.81. In the study of Yılmaz, Tanrıkulu and Dikmen [25], it was found that nursing students had a poor sleep quality and a mean score of 6.52 $\pm$ 3.17. Lin *et al*. [26] examined the relationship between internet addiction and sleep quality among university students and found that sleep quality was poor. Similarly, Ji and Wang [27] evaluated sleep quality of university students in China and found that the students had poor sleep quality and the PSQI scores above seven.

One of the most common factors affecting sleep quality among university students is internet use [27]. Light and sound from the screens of devices such as computers, tablets and mobile phones can keep a person awake and affect the hormone secretions that are the means to sleep, disrupt an individual's sleep rhythm, delay the transition to sleep, reduce sleep time and reduce sleep quality by causing sleep breaks [4].

In this study, it was found that internet addiction was an important risk factor in terms of sleep quality and there was a positive relationship between students' internet addiction scores and sleep quality scores (Table 3) (p <0.01).

Evcili and Yurtsever [28] examined the relationship between problematic internet use, sleep

Table 3. Students' YIAT-SF and PSQI sub-dimension and total correlation scores (n=418).

(PSQI)	YIAT-SF TOTAL	
	R	P
Sleep Quality	0.222	0.001**
Latency	0.186	0.001**
Duration	0.027	0.579
Habitual Sleep Efficiency	-0.048	0.327
Disturbance	0.328	0.001**
Use of Medications	0.219	0.001**
Daytime Dysfunction	0.288	0.001**
TOTAL	0.262	0.001**

Notes: r: Pearson's correlation coefficient
**p<0.01

quality and academic achievement in Turkish university students and found a positive significant relationship between sleep quality and problematic internet use. In a study conducted by Koças and Şaşmaz [29] to investigate the relationship between online communication and internet addiction and poor sleep quality, a meaningful relationship was found between sleep quality and internet addiction. Jahan *et al*. [6] examined the relationship between internet addiction and sleep quality among medical students and found that students with moderate and severe internet addiction had poor sleep quality. Kyung [14] also found a positive relationship between internet addiction and sleep quality. The results of the research are similar to the literature.

4. Conclusions

As a result, it was found that the majority of the students had access to the internet only by mobile device connected to the internet for 4-6 hours a day, used the internet while in bed before sleeping and thought that the internet usage caused a change in sleep hours. It was found that the students had an internet addiction score higher than the average according to YIAT-SF; sleep quality was poor according to the PSQI; internet addiction had a negative effect on sleep quality.

The widespread use of the Internet all over the world brings problematic internet usage and affects

the general health of the youth negatively. In line with these results, the effects of advancing technology on the health of young people should not be ignored and internet addiction screening should be conducted and health promotion programs should be organized for the use of internet for young people. In addition, interventions and education strategies aiming at gaining good sleep quality habits should be developed.

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