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The association between Internet addiction and sleep quality among Sohag University medical students

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Abstract

Background: Internet addiction (IA) is a growing issue with multiple impacts on psychological functions, including sleep. Consequently, the present study aimed to assess the correlation between IA as well as the quality of sleep among medical students. A total of 525 students from Sohag University were included in the study. Young Internet Addiction Test (YIAT) was utilized in order to evaluate IA. Demographic information, university-related factors, and Internet usage patterns of the participants were documented. Pittsburgh Sleep Quality Index was utilized so as to evaluate the quality of sleep.

Results: The prevalence of IA was 4.95% for severe addiction and 39.62% for moderate addiction. About 81.62% of subjects who suffer from IA significantly had poor quality of sleep. Young age, male gender, low academic performance, computer presence at home, Internet presence at home, using the Internet for chatting and gaming, and poor sleep quality are strong predictors of Internet addiction.

Conclusions: The prevalence of IA and its impact on the quality of sleep have been found to be substantial among medical students. There is a need for programs to raise awareness towards IA as well as its impact on sleep among university medical students.

Keywords: Internet addiction (IA), Medical students, Sleep quality

Background

The Internet has evolved into one of the most crucial aspects of modern life. It is utilized in many disciplines for a variety of things, including entertainment, education, as well as communication. In spite of having a broad spectrum of merits, the other side of addiction to the Internet has been quietly but steadily emerging [1], as about 54.4% of the population use the Internet [2]. Addiction to the Internet is a dysfunctional pattern of Internet usage that induces distress or impairment [3]. The prevalence of IA ranges from 0.3 to 38% in many studies, and this difference might be induced by utilizing various methods and diagnostic instruments [4]. Sleeping is the optimum method for people to rest. People feel energized and ready for a new day after waking up following a good night's sleep. The quality of sleep is influenced by different variables, including environmental factors, lifestyle, social life, work, stress, general health status, and economic status [5, 6]]. The impaired quality of sleep is a condition that may disrupt everyday living and induce a slew of issues. Sleep deprivation can have dangerous outcomes such as decreased academic performance, elevated accidents, and alleviated coping mechanisms [7]. Many studies have proven the influence of the IA on problematic sleep and insomnia, and insomnia was found in 3% of heavy Internet users [8].

Our aim in this study is to assess the correlation between Internet addiction and quality of sleep in medical students.

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Methods

A cross-sectional study was conducted from January 2021 to October 20 21. Four medical Faculties in Sohag University (Medicine, Nursing, Pharmacy, and Veterinary Medicine) were chosen to be involved in the current study. The sample size was calculated to be 525 students as calculated using the Open EPI program. We selected the students for our study by using a multistage clustering sampling method. The students were selected by random cluster sampling method as follows: 125 students from the Faculty of Veterinary Medicine in the year and in the last year, 125 students from the faculty of Pharmacy in the first year and in the last year, 125 students from the faculty of Nursing in the first year and in the last year, and 150 students from faculty of Medicine in the first year and in the last year. The random cluster sampling method was also used to choose sections and departments among four facilities. We applied these scales during sections and lectures.

Tools

1. For assessment of socio-demographic, academic data of the student, and patterns of Internet usage (use of the Internet by computer or by mobile phone, hours spent in Internet use, the use of the Internet at home or outside, and the main aims for Internet use), a self-administered questionnaire was applied.
2. Young Internet Addiction Test (YIAT) [9]. The YIAT includes 20 items, each assessed on a Likert scale of six points. It has a score range from 0 to 100. According to the YIAT manual, the normal user (YIAT total score $\leq$20), the mild user (YIAT total score between 20 and 49), the moderate user (YIAT total score between 50 and 79), and severe or excessive user (YIAT total score $\geq$80). Because moderate users usually lack the potential to regulate their Internet usage, we categorized both excessive as well as moderate users with a YIAT total score of $\geq$50 as IA. Additionally, according to the IA test manual, we classified participants with a score between 0 and 49 as normal Internet users. We used the Arabic version translated by Hawi [10].
3. The Pittsburgh Sleep Quality Index (PSQI) is a questionnaire evaluating the quality of sleep by asking questions on seven major categories: sleep latency, sleep duration, subjective sleep quality, sleep efficiency, sleep disorders, daytime functions, and the use of sleeping aids. The questions are graded on a scale of 0 and 3; high scores indicate an impaired quality of sleep. Each of these major components is initially assessed within itself. Subsequently, the scores of seven elements are added together. Students with scores of 5 or more were categorized as bad sleepers, and participants with a score of less than five were classified as good sleepers [11]. We used the Arabic version translated by Suleiman et al. 2009 [12].

Firstly, we applied the Young Internet addiction test and a self-administered questionnaire on the students; then, we applied Pittsburgh Sleep Quality Index (PSQI).

Ethical consideration

The Scientific Research Ethical Committee of Sohag University's Faculty of Medicine provided the ethical approval. In addition, we obtained informed consent from each student before responding to the questionnaires.

The statistical analysis

The data were analyzed using [SPSS] version 20. Quantitative data were represented as the mean and standard deviation (mean $\pm$ SD), and the *t* test was utilized for comparing means for groups. Qualitative data were presented as percentages and numbers, and we used the chi-square test to evaluate the association between distinct items. In addition, the correlations between the addiction to the Internet and the studied variables were verified utilizing logistic regression. The level of significance was set at a p-value of < 0.05.

Results

The present study enrolled 525 subjects. About 55.43% of the participants had normal Internet use, 39.62% had a moderate IA, and 4.95% had a severe IA (Fig. 1).

The mean age among Internet addicts was 19.95$\pm$1.37, and among normal Internet users was 23.32$\pm$1.42, and this was statistically significant. Internet addiction was significantly more among male students than students of low academic performance and students whose fathers were employed (Table 1).

Students with Internet addiction significantly had computers and the Internet at home and used the Internet for chatting and games (Table 2).

81.62% of students with Internet addiction significantly had poor quality of sleep (Table 3)

Final logistic regression analysis identified that poor sleep quality, using the Internet for chatting and gaming, young age, having access to the Internet and a computer at home, male gender, and low academic performance are strong predictors of IA (Table 4).

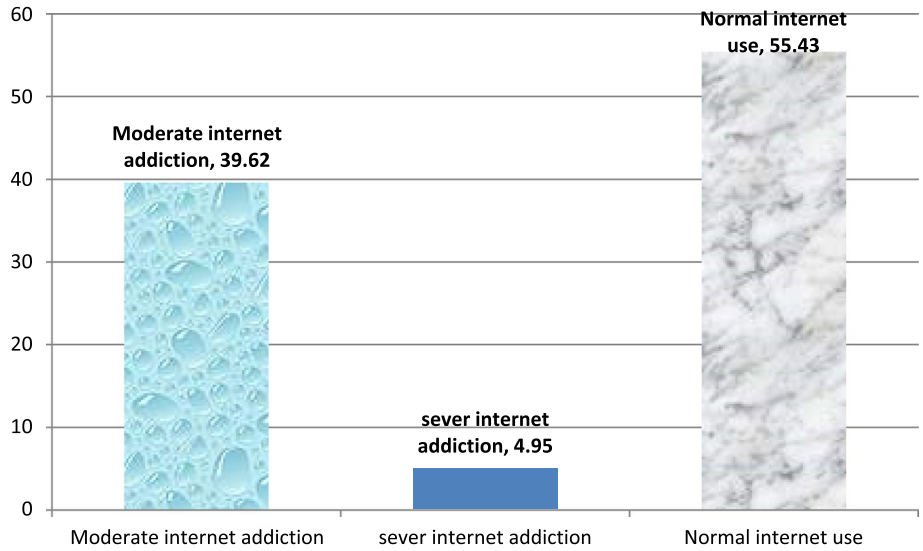

Fig. 1 Distribution of studied students according to Internet addiction

Table 1 Association between IA and socio-demographic and academic data

Socio-demographic and academic data	Normal Internet users *N*=291		Internet addicts *N*=234		*P*-value
	N	Percentage%	*N*	Percentage%	
Age/years					
Mean ± SD	23.32±1.42		19.95±1.37		0.001
Gender					
Females	163	56.01%	70	29.91%	<0.0001
Males	128	43.98%	164	70.08%	
Residence					
Rural	125	42.95%	109	46.58%	0.68
Urban	166	57.04%	125	53.41%	
Father job[a]					
Farmer	49	16.83%	7	2.99%	0.01
Official employed	107	36.77%	152	64.95%	
Self-employed	73	25.08%	46	19.65%	
Retired	62	21.30%	29	12.39%	
Academic performance[b]					
Average	141	48.45%	82	35.04%	0.004
Good	34	11.68%	94	40.17%	
Excellent	116	39.86%	58	24.78%	

[a] The occupation of the student father; official employed=governmental work; self-employed=private work other than farmers. [b]Academic performance=the average academic grades in the last years in the faculty

Discussion

This study was carried out in order to detect the prevalence of IA among university students and investigate the relationship between sleep quality as well as IA.

In our study, the prevalence of IA was 4.95% and 39.62% for severe as well as moderate addiction, respectively. Our findings were consistent with the (IA) prevalence results revealed by two studies in Menoufia University [13, 14]. The former found that 48.5% of medical students were pathological users of the Internet. In contrast, the second noted that 13.2% of both non-medical and medical students were problematic users of the Internet, whereas

Table 2 Association between Internet addiction and patterns of Internet use

	Pattern of Internet use				*P*-value
	Normal Internet users *N*=291		Internet addicts *N*=234		
	N	Percentage%	*N*	Percentage%	
Presence of computer at home					
Not present	120	41.24%	42	17.95%	0.002
Present	171	5876%	192	82.05%	
Availability of Internet at home					
Not present	122	41.92%	23	9.83%	0.001
Present	169	58.08%	211	90.17%	
The main aim of Internet use					
Chatting	63	21.65%	89	38.03%	0.0001
Games	55	18.90%	84	35.89%	
Gather information	88	30.24%	36	15.38%	
News	85	29.21%	25	10.68%	

Table 3 Association between PSQI and Internet addiction

Quality of sleep	Normal Internet users *N*=291		Internet addicts *N*=234		*P*-value
	N	Percentage%	*N*	Percentage%	
Good sleepers	143	49.14%	43	18.38%	0.001
Poor sleepers	148	5876%	191	81.62 %	

Table 4 Final logistic regression model of factor affecting the presence of Internet addiction

Variable	Odds ratio	*P*-value
Bad sleepers vs. good sleepers	5.5	<0.0001
Chatting vs. gather information	4. 5	<0.0001
Gaming vs. gather information	3. 2	<0.0001
Age/years	0.61	<0.0001
Presence of computer at home	3.1	<0.0001
Availability of Internet at home	2.7	0.001
Males vs. females	1.7	0.001
Academic performance		
Excellent vs. good	0.40	0.001
Academic performance		
Average vs. good	0.87	0.01

39.1% were potential problematic Internet users. Other studies done in Palestine and Greece illustrated that the pervasiveness of IA was 30.1% and 34.7%, respectively [15, 16]. The disparity between our findings and those of other research might be attributed to the unavailability of a specific definition and accurate assessment of (IA), besides different samples and methods used.

Internet addiction is significantly more among younger age than normal Internet users. This finding is in agreement with many studies reporting that IA was more frequent among young people [13, 17, 18]. This does not agree with lee and Stapinski [19], who found no significant association between age and Internet addiction.

Regarding gender, Internet addiction was more prevalent among males compared to females, which is consistent with most previous studies, suggesting that the male gender is a predictor of IA [20, 21]. Chou et al. [22] found that male users of the Internet were riskier to have IA due to regular use of sexual issues; however, female users either were asymptomatic or may present with mild symptoms. However, another study did not detect any gender differences regarding IA [23].

We found that fathers of students with IA were significantly more employed than those with normal Internet users. IA is more elevated among students whose mothers and fathers are employed due to increased access to the Internet and the absence of control over their Internet use [24].

Our study demonstrated that the incidence of IA was higher among students with low academic performance. The current study's findings agreed with [17, 25], who detected a significant negative association between IA and the students' academic performance.

Students with Internet addiction significantly had computers and the Internet in their homes than students of normal Internet use. The results of our study were consistent with [25], who showed that most students with home Internet access with cell phones as well as computers.

Students with Internet addiction significantly used the Internet in chat as well as games more compared with students with normal Internet use. Many studies have shown a link between excessive video game playing and IA [3, 26, 27]. Internet chatting has been revealed as a risk factor for IA [26].

In this study, it was found that students with Internet addiction significantly had poor sleep quality. This finding is in agreement with a study in KSA, where 511 subjects were included. Sleep disturbance was detected in approximately 50% of the study sample, markedly correlated with IA. In that study, poor quality of sleep was related to high Internet use [28].

The current study's findings on the adverse effect of IA on the sleep quality of medical students in current research are comparable to research carried out in India and China [29]. Research performed on university students in Taiwan illustrated that the quality of sleep who

were addicted to the Internet slept 1.4 times worse than students who were not addicted to the Internet [30]. Another research in Canada revealed a positive correlation between IA as well as poor quality of sleep [31]. Another research on university students found that the median scores of IA in students with sleeping disorders were more elevated than in the group without sleep disorders [32].

The mechanisms underlying the link between IA and sleep disorders have not been conclusively established [33]. The most probable is a multifactorial and two-sided model of mutual influence. Sleep disorders, reflecting psychosocial problems, depression, and anxiety-phobic disorders, can precede and contribute to the formation of IA [34]. Internet addiction has been found to contribute to disturbed circadian rhythm [34] that may negatively influence bedtime and sleep duration. Another possible explanation is the emission of blue light through the screens that are known to suppress melatonin secretion from the pineal gland, leading to prolongation of sleep latency [35].

Limitations

There are certain limitations to the present research. First, data was gathered from limited research locations. The research could not include all medical students. Furthermore, data collection has relied on self-reported questionnaires, which resulted in memory bias. In addition, a cross-sectional investigation was unable to establish a cause-and-effect link.

Conclusions

The pervasiveness of IA and its impact on the quality of sleep among medical students were found to be significant. The study concluded that young age, male gender, low academic performance, computer presence at home, Internet presence at home, using the Internet for chatting and gaming, and poor sleep quality are strong predictors of Internet addiction.

Recommendation

Programs for increasing awareness of IA and its effects on sleep are needed among university medical students.

Abbreviations

IA: Internet addiction; PSQI: Pittsburgh Sleep Quality Index; YIAT: Young Internet Addiction Test.

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Authors' contributions

O.A.M: Selecting the idea of research, application of questionnaires, statistical analysis, and manuscript writing. S.H.: Determining the idea of research, application of the questionnaires, statistical analysis, paper writing, revision of the references, and paper submission. T. A. S.: Recruiting and interviewing the participants, administrating the questionnaires, collecting the samples, statistical analysis, and writing the manuscript. The authors have read and approved the final manuscript.

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Availability of data and materials

The datasets utilized and/or analyzed in the present study can be provided upon reasonable request from the corresponding author.

Declarations

Ethics approval and consent of participation

The Medical Research Ethics Committee of the Faculty of Medicine, Sohag University, authorized the current study protocol. Informed consent was collected from all subjects recruited in the study. The researchers confirmed each participant's confidentiality and voluntary participation if they agreed to enroll in the present study.

Consent for publication

Consent for publishing has been obtained.

Competing interests

The authors declare that they have no competing interests.

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