Original Research Article

Association of sleep quality and internet addiction among the medical students

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ABSTRACT

Background: The side effects of Internet overuse have been emerging progressively causing the emergence of a problem that is defined as internet addiction or problematic internet use. It also disrupts the sleep wake cycle so adversely affecting quality of sleep. This study is a preliminary step toward understanding the effect of internet addiction on sleep quality among medical college students in India.

Methods: This was an observational, cross-sectional, single-centred, and self-assessable. Questionnaire based study administrated among 525 consenting medical students. The participants were assessed by proforma containing demographic details, variables related with internet use, questionnaires of IAT (Internet Addiction Test for Internet Use) and PSQI (Pittsburgh Sleep Quality Index for Sleep quality. Statistical data were analysed by Graph Pad InStat version 3.06 using Chi–square test and Mann-Whitney test.

Results: There were 9.3% of all participants were considered problematic internet users with frequency of internet addiction 0.9%. Participants with problematic internet use are likely to have poor sleep quality (p<0.0001). 23.8% of all participants had poor sleep quality and 76.2% of the students had good quality of sleep. Participants with poor quality of sleep were having high IAT scores in comparison to participants with good quality of sleep. Severity of poor sleep quality is positively correlated with internet addiction (r^2=0.233, p<0.0001).

Conclusions: Participants with problematic internet use were more likely to have poor quality of sleep and vice a versa.

Keywords: Internet addiction, Sleep quality, IAT scores

INTRODUCTION

Today, the Internet has become an important element in people's lives. It is used for entertainment, communication, and education. Despite its advantages, the side effects of Internet overuse have been emerging progressively causing the emergence of a problem that is defined as Internet Addiction or Problematic internet use.[1] Kimberly Young, a well know researcher describes Internet addiction as follows: "Internet addiction is defined as any online-related, compulsive behaviour which interferes with normal living and causes severe stress on family, friends, loved ones, and one's work environment. Internet addiction has been called Internet dependency and Internet compulsivity. By any name, it is a compulsive behaviour that completely dominates the addict's life".[2]

Its symptoms include the desire to extend the time spent on the internet, dreaming about networking, spending more time than planned online and the emergence of other physical, psychological or social problems.[3]

Heavy internet use has many associations, with depression, poor sleep quality, mood changes, and poor health outcomes such as obesity and low self-esteem.[4] Being addicted to the Internet can also cause physical discomfort or medical problems such as: Carpal Tunnel Syndrome, dry eyes, backaches, severe headaches, eating irregularities, (such as skipping meals), failure to attend to personal hygiene, and sleep disturbance.[5]

Although time is not a direct function in diagnosing Internet addiction, addicts generally are excessive about their online usage, spending anywhere from 40 to 80 hours per week, with sessions that could last up to 20 hours. Sleep patterns are disrupted due to late night logins, and addicts generally stay up surfing until 2:00, 3:00, or 4:00 in the morning with the reality of having to wake up early for work or school.

In extreme cases, caffeine pills are used to facilitate longer Internet sessions. Such sleep deprivation causes excessive fatigue, impairing academic or occupational performance, and may decrease the immune system, leaving the addict vulnerable to disease.[6]

Sleep is necessary for cognitive functions related to academic performance in higher education. As students approach the college stage, they will be in an entirely different atmosphere. They will experience greater responsibilities with increasing pressure and more chaotic schedules affecting their sleep quality.[7] Sleep deprivation can result in serious outcomes including reduced coping mechanisms, poor academic performance, and increased risk of motor vehicle accidents.[8]

The studies in the literature also reports that internet addiction among teenagers and the intense use of online communication tools adversely affect sleep quality.[9-11] A study conducted in China notes that students with internet addiction had 1.73 times greater poor sleep quality than others.[12] Another Turkish study also confirmed the relationship between internet addiction and poor sleep quality.[13] The effect of internet addiction on sleep quality has been studied extensively in East Asia, Korea for example, because of the growing rate of Internet addiction in their communities.[14] The widespread use of cell phones and easy accessibility of the internet worsen the issue.

This study is a preliminary step toward understanding the effect of internet addiction on sleep quality among medical college students in India.

METHODS

In the present study 525 students were enrolled from Medical College including MBBS students, interns and postgraduate students after prior approval from local ethics committee for conducting the study. The study period was from October 2014 to March 2015.

Purpose of study was explained to all the participants and written informed consent was taken from them. They were given a proforma containing details of demographics (name, age, gender), designation, purpose of using the internet (by choosing among the options like education, entertainment, news, gaming or social networking), money spent per month on internet, place of access (home, cybercafé, or college), the time of day when the internet is accessed the most and the average duration of use per day. It also included the self-assessable questionnaire which was based on following scales: The Internet Addiction Test (IAT; Young, 1998) which is a 20-item 5-point Likert scale that measures the severity of self-reported compulsive use of the internet. Total internet addiction scores were calculated, with possible scores for the sum of 20 items ranging from 20 to 100. According to Young's criteria, total IAT scores 20-49 represent average users with complete control of their internet use, scores 40-79 represent over-users with frequent problems caused by their internet use, and scores 80-100 represent internet addicts with significant problems caused by their internet use.

The Pittsburgh sleep quality index (PSQI) which is a self-report instrument designed to evaluate sleep quality over the last month. It consists of 19 items to produce 7 aspects of sleep quality (sleep onset latency, sleep duration, efficiency, quality disturbances, medication, and day-time dysfunction). The sum of these 7 aspects (0-3) yields a global score of sleep quality (0-21); a high sore is an indication of poor sleep quality. The cut-off score of >5 has been found to be an accurate cut-off score to distinguish between patients with primary insomnia and those without insomnia.

The statistical analysis was done with Graph Pad InStat version 3.06 (San Diego, California, US). Proportions of participants were compared by using Chi-square test while scores of IAT and Pittsburgh Sleep Quality Index was compared by using Mann-Whitney test or Kruskal-Wallis test followed by Dunn's post-hoc multiple comparisons. A p value of <0.05 was considered statistically significant. Statistical co-relation between internet addiction and sleep quality were assessed by spearman's rank correlation.

RESULTS

The study questionnaire was administered in the Medical College and responses were obtained from 525 medical students including MBBS students, Interns and Postgraduate students. Among these 280 (53.3%) were females and 245 (46.6%) were males. Data was collected during routine lectures, clinical postings or practical hours. The mean age of the students was 20.2 years. The subjects belonged to different levels of medical course. Using Young's original criteria, the users were divided into groups as average users (56.4%), moderate users or possible addicts (8.4%) and addicts (0.9%) (Table 1).

Table 1 : Overall analysis to find out proportion of study subjects falling in the category of internet addicts on the basis of scoring system adapted for study (n=525).

Scoring interval*	Pattern	No. of students (525)	Males (245)	Females (280)	%
<20	Less than average	180	62	118	34.3%
20-49	Average user	296	150	146	56.4%
50-79	Moderate user/possible addict	44	30	14	8.4%
80-100	Addict	05	03	02	0.9%

*Scoring is based on Internet Addiction Test (IAT)

Table 2: Association of Internet Addiction (based on IAT scores) with Sleep Quality (PSQI scores).

	NON- problematic use of internet IAT score <50, N=476	Problematic use of internet IAT score ≥50, N= 49	P value
PSQI Scores	3.63±2.38	6.38±2.76	P<0.0001

IAT- Internet addiction test for internet use and PSQI - Pittsburgh sleep quality index for sleep quality

Table 3: Association of Sleep Quality (PSQI scores) with Internet use (IAT scores).

	PSQI > 5 poor sleep quality, N = 125	PSQI ≤ 5 good sleep quality, N = 400	p value
IAT	42.58±16.49	23.31±13.06	p<0.0001

IAT- Internet addiction test for internet use, PSQI - Pittsburgh sleep quality index for sleep quality

The main purpose of using the internet in medical students were for social networking (81.5%) and for education (81.3%) followed by entertainment (72.2%) and then the other purposes. Average duration of daily usage of internet was 2.5 hours and years of exposure to internet was 3 years. Around 68% students were having preferred time of internet use from 8pm to 8am, followed by 38.3% from 2pm to 8pm and 9.5% from 8am to 2pm.

Figure 1. Correlation graph between Sleep Quality (PSQI score) and Internet Use (IAT score).

Participants were grouped into 2 groups; non-problematic use of internet (IAT score <50 i.e. average online users and less than that) and Problematic use of internet (IAT score ≥50 i.e. moderate internet users and internet addicts) as per Table 2. Participants with problematic internet use scored significantly higher values in PSQL scores with (p<0.0001) as compared with participants of non -problematic use of internet. Based on quality of sleep participants were divided into 2 groups i.e. PSQI >5 poor sleep quality n = 125 and PSQI ≤5 good sleep quality n = 400 as shown in Table 3. Participants with poor quality of sleep were having high IAT scores with p value <0.0001 which is considered to be extremely significant in comparison to participants with good quality of sleep.
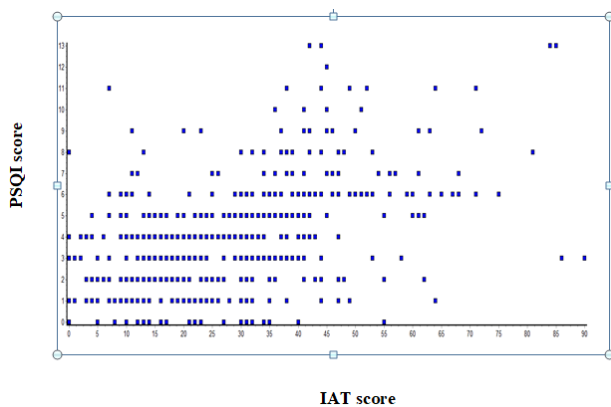
Correlating the IAT score with PSQI score in Figure 1, there is significant correlation between them ($r^2 = 0.233$, p<0.0001).

DISCUSSION

Our study showed that 8.4 % of total number of participants were at risk with moderate use of internet and 0.9 % were addicted users, so 9.3 % of all participants were considered problematic internet users with frequency of internet addiction 0.9%. According to our study, there was a significant association found between internet addiction and sleep quality suggestive of poor quality of sleep in problematic internet users as compared to non-problematic group. It is in consistent with other study.[12]

Our study showed that 23.8% of the participants had poor sleep quality and 76.2% of the students had good quality of sleep. Participants with poor quality of sleep were having high IAT scores in comparison to participants with good quality of sleep. A previous study showed that most students with sleep problems spend their time checking social networking websites and watching

television.[15] Moreover, students who use Internet excessively have a higher chance of experiencing sleep problems.[16]

The results of the study showed that internet addiction was a significant risk factor in terms of poor sleep quality. There are some studies in the literature examining the relationship between internet addiction and sleep quality. A study conducted in Turkey on college students found that students with sleep disorders have a higher average of internet addiction scale grade.[13] Again a study on college students in Taiwan showed that poor sleep quality occurred 1.4 times greater in the students with internet addiction relative to the students without internet addiction.[17] Another study reported that there was a positive correlation between internet addiction and poor sleep quality in students in Canada.[18,19] The time spent in front of any kind of screen may adversely affect the process of a person's preparation for sleep. The light and sound coming from screens of tools like computers, tablets and mobile phones may keep an individual awake and affect the hormone oscillations that are instrumental to sleep. This process can disrupt an individual's sleep rhythm, delay his or her transition to sleep, decrease the time left for sleep and ruin the sleep quality by causing breaks during the sleep. This indicates a growing need to increase awareness of healthy sleep habits to improve the quality of sleep. Furthermore, strategies are required to moderate the use of internet.

CONCLUSION

Our findings showed that sleep quality is strongly correlated with Internet addiction level. Different study designs with larger sample sizes are needed in order to fully explore the factors that affect sleep behavior and Internet addiction among university students in India.

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