

Relationship between Sleep Quality and Internet Addiction among First Year Medical Students in a Government Medical College in West Bengal: A Cross-sectional Study

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ABSTRACT

Introduction: Internet overuse has emerged progressively and the pathological use of the internet- conceptualised as ‘internet addiction’- a menace which disturbs the sleep quality in a community. There is not much evidence proving the association of internet addiction and sleep disturbances and the severity of this association remains unclear.

Aim: To find the association between internet addictions and sleep quality among undergraduates in a Government Medical College in West Bengal, India.

Materials and Methods: This was cross-sectional observational study conducted among 211 undergraduate medical students from January 2019-March 2019 using a predesigned pretested structured selfadministered questionnaire, which consisted of information on the sociodemographic profile and lifestyle questions, Pittsburg Quality of Sleep Index (PQSI) scale and the Internet Addiction Test (IAT) scale. The participants were divided into two groups: PQSI score ≤ 5 (good sleep quality) and those with PQSI score > 5 (poor sleep quality) and IAT scores. Statistical analysis was done using the statistical software of Statistical Package for the Social Sciences (SPSS) version 23.0.

Independent sample t-test (continuous variables) and Fisher’s-exact test (categorical variables) were used to analyse the significance of difference in demographic data and IAT scores and PSQI scores between the groups.

Results: Students with poor quality of sleep were having high IAT scores compared to ones with good quality of sleep and this finding was statistically significant (p -value < 0.001). Among all participants 33.2% were “moderate users or possible addicts” of internet. Approximately, 49.3% of all participants had poor sleep quality and rest of them had good quality of sleep as per PSQI scale. Mean IAT score was significantly higher among participants living on campus ($p=0.006$) as compared to ones residing off campus. As far as sleep quality was concerned, mean PSQI scores were significantly higher among participants who were aged more than 20 years and among those who were involved in “less than three times per week physical activity” ($p=0.028$ and 0.004 , respectively).

Conclusion: Quality sleep is a key to good health and internet addiction should not hamper it. Proper counseling if needed should be done to attain it.

Keywords: Internet addiction test, Internet overuse, Pittsburg quality of sleep index

INTRODUCTION

Sleep, a necessary entity in every individual's life is related to good health and wellbeing of an individual. A deep, restful, unbroken, uneventful sleep and feeling of freshness after awakening is an indication of a good quality sleep. Stress in life due to work, health or family issues may hamper the quality and quantity of sleep leading to sleep disorders. Insomnia, a sleep disorder, is a diagnostic feature of poor sleep quality [1]. As per a study conducted by Lemma S et al., it was found that sleep quality score was significantly associated with academic performance in college students [2]. Moreover, internet addiction has become more prevalent now-a-days and this has led to poor quality of sleep besides other co-morbid psychiatric disorders such as loneliness, depression, harm avoidance, anxiety symptoms, impulsivity and Attention Deficit Hyperactivity Disorder (ADHD) in college students [3-5]. It is no longer just used for educational and research purposes but also for various entertainments of which social media is an important one. With 2 billion global users, in India, there were a predicted total of 354 million internet users in 2015 [6]. Adolescents and young adults are especially at increased risk for internet addiction compared to the elderly.

The term “internet addiction” was introduced by Goldberg I [7]. Internet addiction has been defined as “excessive or poorly controlled preoccupations, urges or behaviours regarding computer use and internet access that lead to impairment or distress [8]. It is a

compulsive behaviour which completely dominates the addict's life” [9]. The daily lifestyle of an individual is hampered. There is excessive desire to spend time over networking which in the long run leads to emergence of physical, psychological or social problems. Excessive internet usage may lead to sleep disturbance and poor quality sleep deteriorates the academic and cognitive performance of students. A few studies available till date that tell us about the prevalence of internet overuse in professional groups like medical students where workplace functioning is of utmost importance [10,11]. With the above background, this study was conducted with an aim to understand the association of sleep quality and internet addiction among the first year medical students in a Government Medical College in Kolkata, West Bengal, India.

MATERIALS AND METHODS

A cross-sectional observational study was conducted among first year MBBS students in Nil Ratan Sarkar Medical College (NRSMC), a Government Medical College in Kolkata, West Bengal, India, over a period of three months from January 2019-March 2019. After getting the Institutional Ethics Committee clearance, (No/NMC/588) the students were briefed about the purpose and nature of the study; their informed written consent was taken, their confidentiality and anonymity were ensured in all aspects. Out of 250 first year MBBS students only 211 gave consent for participation in the study and hence they were included.

Inclusion criteria: All first year MBBS students who were present during the data collection period and gave written informed consent to participate in the study were included.

Exclusion criteria: Seriously ill students during the study period were excluded.

Study Procedure

Study tools were a pre designed pre tested structured self-administered questionnaire, which consisted of information on the sociodemographic profile and lifestyle questions (physical activity and BMI [12]), PQSI scale and the IAT.

The PSQI scale is a self-administered questionnaire used to assess sleep quality in last one month. There are 19 individual items which generates seven subcomponents of sleep quality i.e. sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications and daytime dysfunction. A combined PSQI score is obtained by summing up the subcomponents. PSQI score ranges from 0-21. A score less than or equal to five indicates good sleep quality and scores higher than five indicates poor sleep quality. PSQI score has high internal consistency Cronbach's alpha of 0.83 and high-test retest reliability of 0.85 ($p < 0.001$) [12,13].

IAT 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, scores ranging from 20 to 100. According to Young's criteria, total IAT scores 20-39 represented "average users" who had complete control over their internet use, scores 40-79 represented "over-users" who had frequent problems due to their internet use, and scores 80-100 represented internet "addicts" who had significant problems because of their internet use [9].

STATISTICAL ANALYSIS

Data was entered in Microsoft Office Excel 2010, was analysed in SPSS Version 23.0 (IBM SPSS Statistics for Windows, Version 23.0. IBM Corp, Armonk, NY). All categorical data were represented in terms of numbers and percentages and continuous data were summarised using the mean and standard deviation. Independent sample t-test was used to study differences in means with respect to categories. A $p < 0.05$ was considered to be statistically significant.

RESULTS

The study questionnaire was administered among 211 undergraduate medical students of first year in the Physiology Department of NRS Medical College, Kolkata, West Bengal, India. Among them 125 (59.2%) were males and 86 (40.8%) were females. A 193 (91.5%) were less than or equal to 20 years age and only 18 (8.5%) were aged more than 20 years. The mean \pm SD of age was 19.3 \pm 0.9 years. As far as Body Mass Index (BMI) was concerned, maximum students (56.4%) had normal BMI (18.5-24.9 kg/m²) [Table/Fig-1].

The study participants were divided into two groups, ones with PSQI ≤ 5 (n=107, 50.7%) having good sleep quality and others with PSQI > 5 having poor sleep quality (n=104, 49.3%). It was seen that students with poor quality of sleep were having high IAT scores compared to ones with good quality of sleep and this finding was statistically significant (p-value < 0.001) [Table/Fig-2].

Using IAT the participants were divided into groups: out of which 65.9% were "average users", 33.2% were "moderate users or possible addicts", only 2 students were "less than average users" and there were no "addicts" with scoring interval between 80-100 [Table/Fig-3]. The mean scores of PSQI and IAT were tested for probable association with the socio-demographic characteristics of the study participants. The mean IAT score was almost similar for participants aged more than 20 years and for those aged less than and equal to 20 years. Same was the condition among both males and females and these were not significantly associated with internet addiction. On the contrary internet use was significantly

Variables	Number	Percentage
Age (in years) Mean\pmSD	19.3 \pm 0.9	
≤ 20	193	91.5
> 20	18	8.5
Gender		
Male	125	59.2
Female	86	40.8
Residence		
Rural	60	28.4
Urban	151	71.6
Religion		
Hindu	156	73.9
Muslim	48	22.7
Others	7	3.4
Place of residency		
In campus	163	77.3
Off campus	48	22.7
BMI (Body Mass Index) (kg/m²)		
< 18.5	25	11.8
18.5- 24.9	119	56.4
25-29.9	67	31.8
≥ 30	0	0
Physical exercise (in a week)		
0	83	39.3
1-3 times/week	104	49.3
> 3 times/week	24	11.4

[Table/Fig-1]: Distribution of the study subjects as per their socio-demographic profile (n=211).

	PSQI > 5 (n=104) Poor sleep quality	PSQI ≤ 5 (n=107) Good sleep quality	p-value*
IAT	44.23 \pm 16.29	35.43 \pm 12.08	< 0.001

[Table/Fig-2]: Association of sleep quality (PSQI scores) with internet use (IAT scores). IAT: Internet addiction test for internet use; PSQI: Pittsburgh sleep quality index for sleep quality *Independent sample t-test

Scoring interval*	Pattern of use	Male	Female	No. of students	Percentage
< 20	Less than average	2	0	2	0.9
20-49	Average	80	59	139	65.9
50-79	Moderate/Possible addict	43	27	70	33.2
80-100	Addict	0	0	0	0

[Table/Fig-3]: Distribution of the study subjects according to the pattern of internet addiction on the basis of scoring system (n=211). *Score as per Internet Addiction Test (IAT)

higher among participants living on campus ($p = 0.006$) as compared to ones residing off campus. As far as sleep quality was concerned mean PSQI scores were significantly higher among participants who were aged more than 20 years and among those who were involved in "less than 3 times per week physical activity" ($p = 0.028$ and 0.004 , respectively) [Table/Fig-4].

	n (%)	IAT score		PSQI score	
		Mean (SD)	p*	Mean (SD)	p*
Age (in years)					
≤ 20	193 (91.5)	44.23 (12.31)	0.885	5.44 (2.57)	0.028*
> 20	18 (8.5)	44.67 (9.52)		6.83 (2.30)	
Gender					
Male	125 (59.2)	44.57 (12.11)	0.667	5.74 (2.40)	0.210
Female	86 (40.8)	43.84 (12.09)		5.29 (2.79)	

Residence					
Urban	151 (71.6)	42.66 (12.47)	0.547	5.87 (2.52)	0.276
Rural	60 (28.4)	42.07 (11.10)		5.44 (2.59)	
Place of residency					
In campus	163 (77.3)	49.79 (15.39)	0.006*	5.47 (2.58)	0.336
Off campus	48 (22.7)	44.12 (15.09)		5.88 (2.54)	
Physical exercise (in a week)					
<3 times/week	163 (77.2)	43.15 (13.45)	0.335	4.97 (2.50)	0.004*
≥3 times/week	48 (22.7)	44.67 (12.09)		4.33 (2.57)	

[Table/Fig-4]: Comparison of mean scores of sleep quality and internet addiction with demographic characteristics.

*Independent sample t test was used to compare means; PSQI: Pittsburgh sleep quality index; IAT: Internet addiction test

DISCUSSION

In this study, it was seen that 49.3% of the students suffered from poor sleep and remaining 50.7% had normal sleeping pattern. In a study done by Basu M et al., 63.48% undergraduate medical students had poor sleep quality as per PSQI scale [14]. There were several studies done across the country and abroad such as a study done by Priya J et al., which concluded that 67.42% students had poor sleep, study by Ibrahim NK et al., at Saudi Arabia found 70.4% had poor sleep [15,16]. 63.5% by Gassara I et al., at Tunisia, Africa, 62.6% by Shad R et al., at Delhi and 79.3% by Machado-Duque ME at Universidad Tecnológica de Pereira (Columbia) were some other studies which had more or less similar results [17-19]. In a study conducted by Nagori N et al., almost two thirds of the study participants had good sleep quality and one third had poor sleep quality [20]. Similar was the finding of Chutani A et al., study which revealed that only 23.6% of MBBS students had poor sleep quality [21]. A study among Indian medical students too had reported that two out of ten medical students suffers from poor sleep quality [22]. However, another study reported that 62.6% of the Indian undergraduate students had poor sleep quality. Studies conducted in China and Chile reported that 40-55% of students had poor sleep quality [23-25]. Thus it is seen that there is varied difference in prevalence of good vs. poor sleep quality. In comparison to all studies present study had relatively low percentage of students with sleep abnormalities except Nagori N et al., [20]. A possible reason could be that present study was conducted only among first year medical students who were just introduced to the field of medical science and had just started their career of rigorous studies which in the long run might as well affect their sleep pattern.

According to present study, it was seen that students with poor quality of sleep were having high IAT scores compared to ones with good quality of sleep and this finding was extremely significant. This finding was consistent with other studies like the one done by Nagori N et al., and Cheng SH et al., [20,26]. A study conducted in Turkey also revealed that students with sleep disorder have higher tendency to use internet [27]. Sleep time could be hampered by excessive internet use. Though present study had no 'addicts' yet there was a significant association between quality of sleep and IAT scores. Increased screen time in any form was a definite hazard.

This study showed that using IAT, 65.9% of the participants were "average users", 33.2% were "moderate users or possible addicts", only 2 students were "less than average users" and there were no "addicts" with scoring interval between 80-100. In a study conducted in Gujarat [20], 9.3% of all participants were considered problematic internet users, which was in contrast to this study. This could be explained by the fact that in their study, the participants were MBBS students, interns and postgraduate students, but in present study participants were only first year medical students. Medical students have to experience high levels of stress which increase as years pass by. A study in Odisha revealed 1.0% of the study population had severe internet addiction whereas 13% were moderate internet addicts [28].

In the present study, internet use was significantly higher among participants living on campus as compared to ones residing off campus. Present study findings were similar to the findings of the study by Awasthi AA and Kaur G, were the mean IAT score was higher in students who lived in a hostel compared with students staying at home with families [22,29]. This finding could be explained by the fact that students who live in hostel or on campus are free from direct parental supervision as compared to the ones who travel from home or are days scholar.

In the present study, PSQI scores were significantly higher among participants who were aged more than 20 years and among those who were involved in "less than 3 times per week physical activity". In the studies conducted by Awasthi AA et al., and Wolniczak I et al., there was no significant difference in total PSQI scores with regards to demographic characteristics [22,23]. On the contrary, mean PSQI scores were significantly higher in males as compared to females and among participants who were not involved in physical activity. Study done by Giri PA et al., revealed that those who exercise daily had less disturbances in sleep. It can be inferred that regular physical activity improves sleep quality [30].

Limitation(s)

Limitation of the study was its cross-sectional nature. A longitudinal study could have given a better idea about the temporal associations between the socio-demographic factors if any. This study did not deal with the possible causes of internet addiction among the participants. This study did not deal with parameters of sleep quality (i.e., subjective sleep quality, sleep latency, sleep duration, sleep disturbance, use of sleep medication, and daytime dysfunction) and its associations with internet addiction.

CONCLUSION(S)

This study showed that almost 50% of the students had poor sleep quality and remaining 50% had good sleep quality and there were no participants who were internet "addicts" though there were some who were moderate addicts. The study also revealed a strong association between sleep quality and internet addiction or use. Medical students are at increased risk to undergo stress and care must be taken to carry out counselling sessions to wave off such stressors. To improve the sleep quality regular exercise and a positive environment is the need of the hour.

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