Original Research Article

Day time sleepiness in medical undergraduates: social media the culprit?

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ABSTRACT

Background: Medical undergraduates have been seen to be suffering from sleep disturbances, especially daytime sleepiness. Social Media usage or social networking has also tremendously increased over the past few years in adolescents. It has also increased in the day-to-day lives of medical students. Authors therefore tried to find out the association, if any, between social Media usage and daytime sleepiness in medical undergraduates and whether daytime sleepiness can affect their academic performance. The objective of the present study was to ascertain the association between daytime sleepiness and usage of social media among medical students and to look for any association of daytime sleepiness with academic performance.

Methods: A self-administered, questionnaire-based study was conducted on medical undergraduate students to assess social media usage. Epworth sleepiness score was determined. 'Analysis of variance' was done to look for any association between (a) social media usage and daytime sleepiness (b) daytime sleepiness and academic performance.

Results: The majority of students (77.14%) used social media for 2-5hours per day and whatsapp was the most commonly used medium by them. Highly significant association was observed between the usage of social media and daytime sleepiness among the medical undergraduates. Daytime sleepiness was also significantly related to the academic performance of the participating students.

Conclusions: Sleep disturbance particularly daytime sleepiness is significantly associated with the usage of social media among first year medical undergraduates and can significantly affect their academic performance.

Keywords: Epworth sleepiness score, Daytime sleepiness, Social media

INTRODUCTION

Sleep is defined as unconsciousness from which the person can be aroused by sensory or other stimuli. Two fundamental dimensions of sleep adequacy have been recognized by Sleep researchers: sleep quantity (total sleep time) and sleep quality. These dimensions cover several attributes of sleep like total sleep time, which is affected/ influenced by late bedtimes, early waking, and sleep onset latency (delay between bedtime and falling asleep); and sleep quality, including night-time waking, nightmares, disturbed sleep-wake transitions, and irregular bedtimes. The first system to suffer from inadequate sleep appears to be executive function, or the brain's ability to plan, organize activities, and pay attention. Good quality sleep is essential for health and life quality in all people and is related to several factors including environmental factors, social life, general health status, and stress.[1,2]

Daytime sleepiness may be defined as the reduced ability to stay awake and alert during normal daytime hours,

resulting in lapses of sleepiness or sleep.[3] Mobile phone use has been shown to be associated with daytime sleepiness in high school students in California.[4]

According to Cain et al the time spent by young people on social media 'SM' may encroach on the time that is available to sleep.[5] Non-users of social networking sites (SNS) have shown better sleep quality than users.[6]

Social networking also increases arousal.[5,7] The increased levels of physiological arousal may make it more difficult for adolescents to fall asleep.[8] Moreover when adolescents engage in SM use they are exposed to bright screen lights, which can disrupt the secretion of the sleep hormone melatonin.[9]

Medical undergraduates have been seen to have sleep deprivation and suffer from daytime sleepiness.[10] Usage of Social networking sites is increasing in the day-to-day lives of medical students.[11] Therefore, a study of daytime sleepiness in medical undergraduate with respect to usage of social media is much needed. Moreover, very few, if any such studies have been conducted in India on this subject so far. One such study reports that the population using mobile phone or any digital media for >2hours a day had increased chances of dozing during daytime.[10]

In this study we tried to identify the daytime sleepiness among medical undergraduate students and assess whether usage of social media has any role on it.

Authors specific aims were to

- Assess the extent of self-reported SM use in Medical undergraduates
- Determine the existence and extent of daytime sleepiness in these students
- Determine the association between SM use and sleep disturbance, particularly daytime sleepiness
- Check if academic performance of the students was affected by daytime sleepiness.

METHODS

The study was carried out in a Medical Institute in North India and was approved by the Institutional Ethics committee of the University. A cross-sectional study was carried out on medical undergraduate students who volunteered for the study. Prior to selection, it was ensured that students were not undergoing any course exam within 2 weeks of the study. Students who did not have access to various social media platforms or had a history of any illness acute/ chronic or undertaking any medication, or with symptoms of depression, anxiety, chronic insomnia, thyroid disturbances, or with a history of alcohol, smoking or substance abuse were not included in the study.

Initially a pilot study was done on 10 students, randomly selected to test the study questionnaire, estimate time needed for study and to identify difficulties in comprehending the questionnaire before conducting the main study.

Once the pilot study was done, the questionnaire and the procedure to fill it, was verbally explained to each subject before obtaining written consent to participate. A self-administered questionnaire was distributed to the participants. Data was collected without personal identifiers to guarantee appropriate confidentiality.

Survey instrument

The survey instrument was a self-administered questionnaire which had different sections. The first section of the questionnaire included general demographic characteristics such as age and gender.

The second section contained questions on the purpose and pattern of social media use such as duration and type of device used.

The final section included questions from the Epworth Sleepiness Scale (ESS), a validated 8-item self-reported questionnaire about subjective sleep propensity in different situations.[12] This scale targets the students' tendency to fall asleep in 8 different situations and was scored accordingly (0 =never doze, 1 = slight chance of dozing, 2 = moderate chance of dozing, 3 = high chance of dozing). A cumulative number of all items produce a score between 0-24, and respondents scoring >10 were considered to have excessive daytime sleepiness.

Subjects were divided into 3 groups based on their hours of usage of social media on weekdays and weekend:

- Group A: Subjects who used media less than 2 hour per day
- Group B: Subjects who used media 2-5 hours per day
- Group C: Subjects who used media for more than 5 hours per day.

Statistical analysis

All the data were entered in excel sheet and analyzed using SPSS software. Statistical analysis was done by analysis of variance to assess the association between SM usage and daytime sleepiness as well as between daytime sleepiness and academic performance. The statistical significance was considered at $p < 0.05$.

RESULTS

Out of 150 participants, data of 140 students was analyzed. 10 participants had incompletely or wrongly filled the questionnaire; therefore, they were excluded from the study. The mean age of participants was 18.89±0.91 yr. The age and gender distribution of the participants is shown in Tables 1 and 2.

Table 1: Age distribution of participants (n=140).

Age	Number (%)
17	5 (3.6%)
18	45 (32.1%)
19	56 (40%)
20	28 (20%)
21	6 (4.3%)

Table 2: Gender distribution of participants (n= 140).

Gender	Number (%)
Male	61 (43.57%)
Female	79 (56.43%)

Mean ESS in male participants was10.69±3.77 whereas in females, the mean ESS was10.26±4.31.

There was no statistically significant difference between the scores of male and female participants. Hence, for further analysis they were considered as a single group.
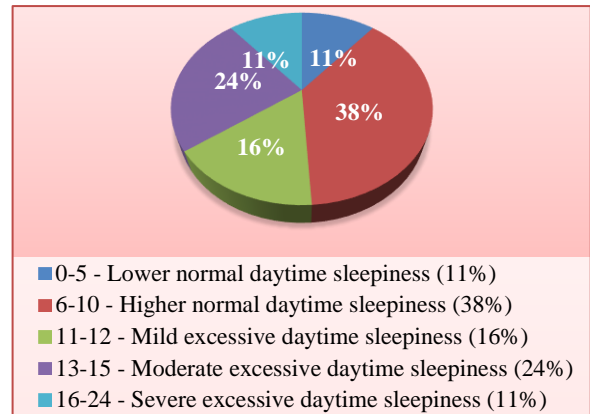

Figure 1: Distribution of participants based on Epworth sleepiness score.

- 0-5 - Lower normal daytime sleepiness (11%)
- 6-10 - Higher normal daytime sleepiness (38%)
- 11-12 - Mild excessive daytime sleepiness (16%)
- 13-15 - Moderate excessive daytime sleepiness (24%)
- 16-24 - Severe excessive daytime sleepiness (11%)

Table 3 shows the Mean and standard deviation of the Epworth sleepiness score among the study participants in different groups. Maximum number of participants belonged to Group B. Group C participants showed the maximum ESS score.

Table 3: Mean and Standard deviation of Epworth sleepiness score in different groups.

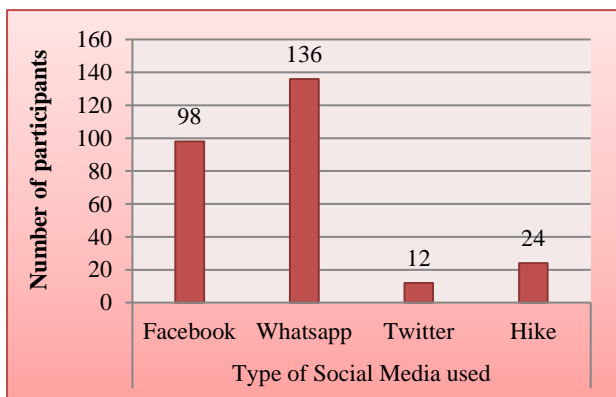|	N	Mean	Std. deviation	Std. error	95% Confidence Interval for mean		Minimum	Maximum
					Lower bound	Upper bound		
Group A	24	5.7917	1.95558	0.39918	4.9659	6.6174	3.00	10.00
Group B	108	11.2870	3.60179	0.34658	10.6000	11.9741	3.00	20.00
Group C	8	14.1250	2.64237	0.93422	11.9159	16.3341	11.00	20.00
Total	140	10.5071	4.00449	0.33844	9.8380	11.1763	3.00	20.00

Figure 2: The different types of Social media platforms used by the participants. Whatsapp followed by facebook was maximally used by the students.

Figure 2 shows the different types of social media platforms used by the participants. Whatsapp followed by facebook was maximally used by the students. Table 4 shows the analysis of variance of the Epworth sleepiness score among the three groups A, B and C. Highly significant positive association p <0.001 was observed between the usage of social media and daytime sleepiness.

Table 4: Impact of social media usage on daytime sleepiness.

EP score					
	Sum of squares	DF	Mean square	F	SIG.
Between Groups	704.058	2	352.029	31.626	0.000*
Within groups	1524.935	137	11.131		
total	2228.993	139			

*p<0.001: Highly significant

Table 5 shows highly significant association of Epworth sleepiness score with academic performance.

Table 5: ESS according to Academic performance.

ANOVA						
Source of variation	SS	DF	MS	F	P-value	F crit
Between groups	456.344	2	228.172	17.63438	1.53E-07	3.062204
Within groups	1772.649	137	12.93904			
Total	2228.993	139				

DISCUSSION

Adequate sleep is vital for optimal physical and mental health, growth, learning, memory, and academic performance in children and adolescents. Sleep disturbance and insufficient sleep duration are associated with daytime sleepiness and a range of poor health outcomes.[13,14]

Excessive daytime sleepiness is a condition in which an individual feels very drowsy during the day and has an overwhelming urge to fall asleep, that can have serious consequences such as accidents, poor school/ college performance or work-related accidents' and more.

The purpose of present study was to assess the daytime sleepiness in medical undergraduate students and whether the usage of social media affects it or not.

Daytime sleepiness was assessed by Epworth Sleepiness Scale. The ESS specifically distinguishes reports of dozing behavior (and estimates of average sleep propensity) from feelings of fatigue and drowsiness/sleepiness, in the sense of weariness from exertion.[12] Respondents to the ESS rate their chances of having dozed off or fallen asleep in particular situations in recent times.

In general, ESS score is interpreted as follows

- 0-5 - Lower normal daytime sleepiness
- 6-10 - Higher normal daytime sleepiness
- 11-12 - Mild excessive daytime sleepiness
- 13-15 - Moderate excessive daytime sleepiness
- 16-24 - Severe excessive daytime sleepiness

In present study authors saw that 38% of the total participants had higher normal daytime sleepiness, 51% participants had excessive daytime sleepiness including mild, moderate and severely excessive daytime sleepiness. There was no statistically significant difference between the scores of male and female participants. Daytime sleepiness can be due to several reasons. One of the most important cause of daytime sleepiness can be social networking before bedtime.

Access to the Internet is increasingly easy due to improvements in mobile technology and the prevalence of smartphones.[15] Smartphones are popular devices capable of processing more information than other phones; they include many features such as games, access to the Internet and social networks, messaging, videos, multimedia, and navigation, in addition to their use for communication. 100% of present study participants had smartphone. They were using their smartphones for the purpose of social networking. Though, some of the participants were also using their desktop or laptops along with smartphone for social networking.

Whatsapp was the most common form of social media used i.e. by 97% of the participants followed by Facebook; which was used as social networking tool by 70% of the participants. Other forms of social media used were Hike, Twitter, etc.

Prolonged use of media can cause physical discomfort, such as muscle pain and headaches, which can negatively affect sleep.[16] Several studies found that TV, video games, cell phones, music, computers, and social media were significantly related to difficulty in falling asleep because of stimulation.[17,18]

Insufficient sleep negatively affects cognitive performance, mood, immune function, cardiovascular risk, weight, and metabolism.[19-21]

Previous researchers found that light, especially short wave-length light, emitted from screens may alter circadian processes such as melatonin release.[22-24] SM involve interactive screen time, which may be more stimulating and engaging, and thus potentially detrimental to sleep-compared with more passive activities such as watching television and reading books.[25] The findings of the present study may lend support to this theory, as all the technology devices are found to affect daytime sleepiness.

Authors found that there were consistent, substantial, and progressive associations between SM use and daytime sleepiness. Highly significant positive association p <0.001 was observed between the usage of social media and daytime sleepiness.

Academic performance of students with lower normal daytime sleepiness was significantly different (p<0.001) from those with excessive daytime sleepiness. Previously, Naeem et al, found that the prevalence of Excessive Daytime Sleepiness increased significantly (p<0.001) with a decline in school performance.[26]

Since the current study was cross-sectional, authors cannot confirm that daytime sleepiness is solely due to excess SM usage or that the academic performance is entirely dependent on social media usage or daytime sleepiness. However, the associations cannot be neglected.

This study had several factors that may limit generalizing the results. First, data is a small cross-sectional study. The data may have been subject to recall bias. As this study was focused on social media usage, other potential confounding factors that could affect medical undergraduate students' daytime sleepiness have not been taken into consideration. This may inflate significant correlations between technology use and daytime sleepiness. Additionally, because this study was limited to young adults, ages 17 to 21, the results cannot be generalized to other age groups.

CONCLUSION

Sleep disturbance particularly daytime sleepiness is significantly associated with the usage of Social Media among first year medical undergraduates and can significantly affect their academic performance. This study can guide medical undergraduates to judiciously use these devices such that it does not affect their sleep or academic performance.

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