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Sleep Patterns of Medical Students in Ahmedabad: A Cross Sectional Study

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Abstract
Back ground: Sleep pattern is related to psychological, clinical, and social aspects. The medical student population is one of the populations that appear to be at increased risk for sleep deprivation. Sleep deprivation has been found to affect cognitive function in medical students.
Objectives: To assess the sleep pattern among medical students.
Methodology: A cross-sectional questionnaire-based study was done in 400 medical students. Questionnaire includes general information, sleeping patterns details and The Epworth Sleepiness Scale (ESS). Data analysis was done by Microsoft Excel and Epi-Info.
Results: 80.75% students had sleep of 7 to 10 hours daily and 69.75% students were taking mid-day nap. 44.25% students were studying 4 to 6 hours daily. The Epworth Sleepiness Scale was normal in 63% participants.
Conclusion: Medical students who suffer from sleep deprivation run a major risk of compromising their health but also are prone to commit medical errors in the care of patients.

Keywords: sleep, medical student, Epworth Sleepiness Scale (ESS)

1. Introduction
Sleep is an important, reversible and involuntary action coupled with repeated periods of time when the person will be awake. It is a source of diversion from day to day stress and a state of mind denoted by a temporary lack of consciousness as well as reduced vigilance and responsiveness. [1, 2] The sleep-wake cycle, one of our biological rhythms, is driven by a circadian rhythm and influenced by physiological functions, the light-dark cycle, school and work schedules and other activities. [3]
The consequences of sleep problems, whether due to insufficient sleep or an untreated sleep disorder can be serious. Sleep problems have been associated with deficits in attention and academic performance [4], drowsy driving [5], risk-taking behaviour [6], impaired relationships [7], and poor health [8]. Excessive daytime sleepiness due to sleep deficiency was associated with increased risks for accidents, decreased productivity and difficulties in interpersonal relationships [9]. It was reported that insomnia caused problems such as impaired concentration, impaired memory and decreased ability to accomplish daily tasks [10].
Medical students are submitted to a lot of pressure due to academic demands. Moreover, the sleep-wake cycle of the students is characterized by insufficient sleep duration, delayed sleep onset and occurrence of napping episodes during the day. [11]
The purpose of the present study was to assess the sleep pattern of medical students in Ahmadabad city of Gujarat.

2. Materials and Methodology
Study setting
A study was conducted among 400 students of B.J. Medical College, Ahmedabad, Gujarat, from the second, third academic years and interns.
Study period: April 2015 to June 2015.
Study Design: Cross Sectional study
Data collection: A self-administrated questionnaire was developed and questionnaire was piloted on 40 participants for further validation and finalization depending on the feedbacks from the pilot study. The feedback of the participants of the pilot group was incorporated and utilized in the finalization of the questionnaire. The questionnaire was designed in English language containing questions enquiring about age, gender, academic year, total sleep time per 24 hours, naps during days and total study hours per day.
Further daytime sleepiness (DTS) was studied using the Epworth Sleepiness Scale (ESS) which

is a reliable validated sleep questionnaire to measure DTS. It consists of eight items including different situation and activities of everyday life. The total ESS score is a measure of the average sleep propensity of falling asleep in those conditions. The total score ranges from 0 to 24, and the upper limit of normal in healthy adults is to be 10. Hence, an ESS score of >10 indicates increased DTS [12, 13].

The participation was voluntary and the student agreements were taken before the study.

Data analysis: Data entry was done in Microsoft Excel and Data were analyzed using Epi Info software (7.1.0.6).

3. Results

Table 1: Baseline Information of study participants (N=400)

Variables	No. (%)
Gender	
Males	261(65.25)
Females	139(34.25)
Age(Years)	
18-20	220(55.00)
21-23	159(39.75)
24 or more	21(5.25)
Academic Year	
2nd year MBBS	72(18.0)
3rd/Ist year MBBS	227(56.75)
3rd/IInd year MBBS	32(8.00)
Interns	69(17.25)
Residence	
Hostelite	252(63.0)
Localite	148(37.0)

Table 1 depicts baseline information of study participants. Among 400 medical students, 261 (65.25%) were males and 139(34.25%) were females. Total 220 (55.00%) students were 18 to 20 years old and 227 (56.75%) were studying in 3rd/Ist MBBS. Out of total 400 students, 252 (63.0%) students were host elite.

Table 2: Information regarding sleep pattern and study hours (N=400)

Variables	Males (n=261) No. (%)	Females (n=139) No. (%)	Total (n=400) No. (%)
Daily sleep hours			
More than 10 hours	24 (9.20)	4(2.88)	28(7.00)
7-10 hours	206(78.93)	117(84.17)	323(80.75)
4-6 hours	31(11.88)	18(12.95)	49(12.25)
Mid-Day Nap			
Yes	191(73.18)	88(63.31)	279(69.75)
No	70(26.82)	51(36.69)	121(30.25)
Daily study hours			
More than 6 hours	54(20.69)	30(21.58)	84(21.00)
4-6 hours	119(45.59)	58(41.73)	177(44.25)
1-3 hours	88(33.72)	51(36.69)	139(34.75)

Table 2 shows 323 (80.75%) students had sleep of 7 to 10 hours daily and 279 (69.75%) students were taking mid-day nap. Total 177(44.25%) students were studying 4 to 6 hours daily.

Table 3: The Epworth Sleepiness Scale (ESS)

Situation	*Chance Of Dozing (N=400) No. (%)			
	0	1	2	3
1. Sitting and reading	106(26.05)	170(42.50)	67(16.75)	57(14.25)
2. Watching television	167(41.75)	128(32.00)	75(18.75)	30(7.50)
3. Sitting inactive in a public place (e.g. a theatre or meeting)	147(36.75)	142(35.50)	73(18.25)	38(9.50)
4. As a passenger in a car for an hour without a break	71(17.75)	128(32.00)	129(32.25)	72(18.00)
5. Lying down to rest in the afternoon when circumstances permit	53(13.25)	90(22.50)	139(34.75)	118(29.50)
6. Sitting and talking to someone	180(45.00)	103(25.75)	70(17.50)	47(11.75)
7. Sitting quietly after a lunch without alcohol	123(30.75)	123(30.75)	90(22.50)	64(16.00)
8. In a car, while stopped for a few minutes in the traffic	229(57.25)	80(20.00)	45(11.25)	46(11.50)

*[0 = would never doze, 1 = slight chance of dozing,
2 = moderate chance of dozing, 3 = high chance of dozing]

Table 3 shows various responses given by students for The Epworth Sleepiness Scale (ESS).It has mentioned chance of dozing in various situation.

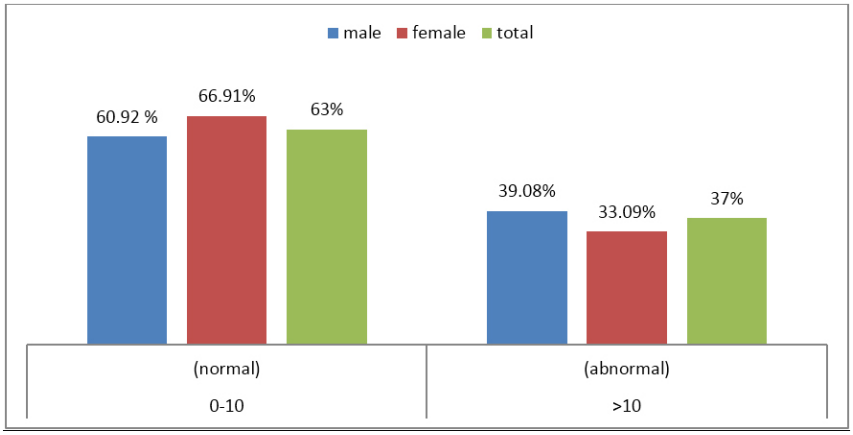

Fig 1: The Epworth Sleepiness Scale (ESS).

Figure 1 shows out of 400 students, 252 (63%) had The Epworth Sleepiness Scale (ESS) between 0-10 (Normal) and 148 (37%) had more than 10.

Table 4: Analysis of ESS scores with other study variables.

variable	ESS score 0-10 (normal) N=252	ESS score >10 (abnormal) N=148	Total N =400	Test of significance
	No. (%)	No. (%)	No. (%)	χ^2 value
Gender				
Males	159(60.92)	102(39.08)	261(100)	χ^2 =1.39
Females	93(66.91)	46(33.09)	139(100)	P=0.23
Age(Years)				
18-20	132(60.00)	88(40.00)	220(100)	χ^2 =5.59
21-23	102(64.15)	57(35.85)	159(100)	P=0.06
24 or more	18(85.71)	3(14.29)	21(100)	
Academic Year				
2nd year MBBS	42(58.33)	30(41.67)	72(100)	
3rd/Ist year MBBS	140(61.67)	87(38.33)	227(100)	χ^2 =19.1
3rd/IInd year MBBS	13(40.63)	19(59.38)	32(100)	P=0.00
Interns	57(82.61)	12(17.39)	69(100)	
Residence				
Hostelite	153(60.71)	99(39.29)	252(100)	χ^2 =1.53
Localites	99(66.89)	49(33.11)	148(100)	P=0.22
Daily sleep hours				
More than 10 hours	13(46.43)	15(53.57)	28(100)	
7-10 hours	200(61.92)	123(38.08)	323(100)	χ^2 =9.25
4-6 hours	39(79.59)	10(20.41)	49(100)	P=0.01
Mid Day Nap				
Yes	180(64.52)	99(35.48)	279(100)	χ^2 =0.910
No	72(59.50)	49(40.50)	121(100)	P=0.340
Daily study hours				
More than 6 hours	58(69.05)	26(30.95)	84(100)	
4-6 hours	124(70.06)	53(29.94)	177(100)	χ^2 =14.6
1-3 hours	70(50.36)	69(49.64)	139(100)	P=0.001

Table 4 shows The Epworth Sleepiness Scale (ESS) was normal in 159(60.92%) males and 93(66.91%) females. There was no gender-wise, age wise, mid day nap wise difference in ESS.

4. Discussion

In present study, 65.25% participants were male and 34.25% were female. Total 55% students were 18 to 20 years old and 56.75% were studying in 3rd/Ist MBBS. These findings of present study similar to H. M. Abdulghani *et al*., study done in Saudi Arabia, in which Male respondents were 62.5% and female 37.4% which is in keeping with the gender distribution of the college and the mean age was 24 years, ranging from 18 to 23 years.[14]

In present study 80.75% students had sleep of 7 to 10 hours daily and 69.75% students were taking mid-day nap. Total 44.25% students were studying 4 to 6 hours daily. In H.M. Abdulghani *et al*., study, a daily sleeping hours of 4–6 h were reported by 48% of the participants and 7–10 h by 46.67% while a small numbers of students were sleeping less than 4 h (2.6%) or more than 10 h (2.6%).In that study, 44.6% participants reported less than 2 hours followed by 40.5% reported 2 to 4 hours and 58.6% students were taking mid-day nap. [14]

In present study, 63% had The Epworth Sleepiness Scale (ESS) between 0-10 (Normal) and 37% had more than 10. The Epworth Sleepiness Scale (ESS) was normal in 60.92% males and 66.91% females. There was no gender-wise, age wise, mid-day nap wise difference in ESS. In H.M. Abdulghani *et al*., study ESS was normal in 63.5% participants and gender wise significant difference was present(among males 74.5%, among females 46.1%).[14]

5. Conclusion

Sleep has a relevant facilitating role in learning and memory processes. Conversely, sleep deprivation and/or fragmentation usually impairs these functions. Medical students who suffer from sleep deprivation run a major risk of compromising their health but also are prone to commit medical errors in the care of patients. This study was designed on the assumption that medical students are at greater risk of sleep disorders than the students enrolled in other disciplines. In this regard our study is the first study focused on comparison of sleep patterns between non-medical and non-medical student

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