Study of Sleep Pattern And its Effects on Quality of Life Among Undergraduate Students in A Medical College of West Bengal

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Abstract:
Aim: *To assess the sleep pattern and burden of sleep problems among 1st year MBBS students.*
Materials and Methods: *This cross-sectional study was conducted at GIMSH, Durgapur, West Bengal, India from February to April 2017 among 77 first year MBBS students. Pittsburgh Insomnia Rating Scale (PIRS): a 65 item self-administered open source questionnaire to note sleep patterns of previous week was used.*
Results : *>51% students have mild to moderately high sleep distress score. There's no significant difference in sleep distress score between male and female students but median sleep distress score is significantly higher among female (43 vs. 32.5) (P=0.008).Majority of students (3/4th of male and 2/3rd of female) show minimal sleep parameter score. 50% of male students suffered mildly impaired and 43.2% suffered moderately impaired sleep related quality of life and 75.7% female students suffered moderately impaired sleep related quality of life. Quality of life score were higher among female which is statistically significant by chi-square test. Regarding total score, majority of the male (43.1%) and female (60.6%) had score between 0 – 39 and 40 – 78 respectively, and this distribution was found to be statistically significant (P < 0.05).*
Conclusion: *Female students suffer poorer sleep pattern than male and they also suffer worse sleep related quality of life than male.*
Keywords: *sleep study, sleep pattern, sleep habits, undergraduate medical student, undergraduate college students.*

I. Introduction

Sleep disorders are common in the general population. Sleep disturbances, especially chronic partial sleep loss, has been linked to problems with the cardiovascular system, including heart attack, irregular heartbeat and stroke. Sleep is an important modulator of appetite and metabolism. Shortened sleep duration has been shown to alter leptin and ghrelin levels, which in turn stimulate appetite and may in part explain the association between increased weight and short sleep duration[1,2]. These findings are particularly relevant in modern societies, where chronic sleep restriction is common and food is readily available. In a study done by Zammit and associates, it was found that those with insomnia had significant impairment in the quality of life [3].

Furthermore,sleep has a big impact on learning. Sleep deprivation affects memory, cognition and motivation and the effects are compounded when it's long term sleep loss [4]. For those reasons, there's been a lot of interest in the education world in studying the sleep habits of students. The college years are a time of critical transition from adolescence to adulthood. For many individuals this transition is associated with inadequate sleep and day time sleepiness. Many factors contribute to this, including the student's own circadian physiology. Inadequate sleep hygiene is common, as students often use technology and substances that compromise sleep quality and quantity. This chronic sleep deprivation may impair academic performance as well as physical and mental health. How much sleep a young adult needs is not clearly known but the Centre for Disease Control (CDC) recently recommended that the average person get about 7 hours of sleep per night, down from the usual 8 hours recommendation of which many are familiar. For college students, however, the amount of sleep that is obtained every night, on average, can be quite a bit lower. According to CDC report 7 out of 10 college students get less than the recommended amount of sleep every night.68% of American college students say that they have trouble being able to fall asleep at night because they're stressed out because of their

academics or something that's affecting them emotionally. Although the statistics seem extraordinarily high and they do the world from a US perspective,the global average of sleep deprivation is 46.5%.Day time sleepiness, sleep deprivation and irregular sleep schedules are highly prevalent among college students, as 50% report day time sleepiness compared to 36% of adolescents and adults [5] and 70% attain insufficient sleep [6].As reported at an Architecture school in the Midwest, only 4%of students obtainedat least 7 hours of sleep at night, the average sleep duration was 5.7 hours [7].Moreover,82% of college students believe that inadequate sleep and sleepiness impact their school performance [8].Students rank sleep problem second only to stress in factors that negatively impact academic performance [9].Though there's a lot of study on sleep pattern and sleep disorders among college students in western literature but there're paucity of similar study among Indian students. In thisbackground, the present study was conducted with the objective of to assess the sleep pattern and burden of sleep problem among first year MBBS students in a medical college of West Bengal, India.

II. Materials And Methods

This was an institutional based study, approved by Institutional Ethics Review Board.The study was conducted between Feb'2017 to April'2017 in GouriDevi Institute of Medical Sciences and Hospital, Durgapur,West Bengal,India. The subjects were 1st year MBBS students,18-25 years old, residing in hostels.Day-scholars have not been approached to participate in the study as they don't share same sleeping environment. Confidentiality had been assured to all students who were asked to volunteer and given a brief description about the study and its objectives. Out of 120 hostel students, including boys and girls, who were willing to participate and didn't satisfy any of the following exclusion criteria were selected for study and a written consent was obtained from each of them. Altogether 77 students were included in the study. Studentshaving any diagnosable psychiatric illness as per DSM-V criteria, presently taking any psychotropic medicine and suffering any serious general medical condition like bronchial asthma, rheumatoid arthritis etc. have been excluded from the study.

Study tool contained Pittsburgh Insomnia Rating Scale(PIRS), which is a 65 item self-administered open source questionnaire. Scores were generated from the subjects according to the last weeksleep experience. It had three broad sections. Section B has 46 questions which have to he answered on the likert scale from 0-3(0=not at all bothered, 1= slightly bothered, 2 = moderately bothered, 3 = severely bothered). It's scored by adding all the answers. This is sleep distress score. Section C has 10 questions which have to be answered on the likert scale 0-3 with variable answers depending on the question. Score of this section is the addition of all and is termed as sleep parameters score. Section D has 9 questions which have to be answered on the likert scale from 0-3 (0=excellent, 1 = good, 2 = fair, 3 = poor). Addition of all the answers gives the finalscore which is termed as quality of life score. Section A of the scale is nothing but a 10 centimetre line to mark the quality of sleep in the past week. This answer is not used in the scoring. Section E is about comments which the patient wants to put in but it's not included in the scoring. Final score is the grand total of section B, C and D. Minimum score is 0 (good) and maximum is 195 (worst).

Measurements: The participants were asked to self-report the PIRS questionnaire depending on their previous week's experience. Manual (Non-digital) type of weighing scale was used to record weight to the nearest 500 grams and each student was asked to remove the footwear to record the weight. Height was measured in centimetre with the measuring tape. Each student stood straight with head held in Frankfurt horizontal plane. After noting height and weight, BMI was calculated as weight (kg) divided by height (metre)^2. The data was stored as physical records and later was transferred to computer.

2.1Statistical Analysis

Collected data were compiled in Microsoft excel worksheet (Microsoft, Redwoods, WA, USA). Categorical data were expressed in number and proportion. For continuous data, normality distribution was checked by Kolmogorov Smirnov Test. Significant P value indicated skewed distribution. Thus continuous data were expressed in median and interquartile range (IQR) was used for their dispersion. Association between categorical variables was assessed by Pearson's chi-square test. Difference between distributions of the scores between two groups was checked by non-parametric Mann Whitney U test due to its skewed distribution. Data analysis was done in SPSS software, version 19.0 (Statistical Package for the Social Sciences Inc., Chicago, IL, USA). P value 0.05 or less was considered as statistically significant.

III. Results

Altogether 77 students were studied, out of which 57.1% were male and 42.9% were female. Median age of male and female was 19 and 20 respectively with no significant difference between them (P = 0.295). While median BMI was 26 and 25 in males and females respectively with no significant difference (P = 0.365) (TABLE 1).

Majority of the male subjects (43.2%) had BMI 26 to 30, while most of the female subjects (39.4%) had BMI 21 to 25. Both the groups were comparable to each other as the distribution of male and female did not differ statistically (P = 0.81) (TABLE 2).

Largest group of male (43.1%) and female (48.6%) had B score inbetween0 to 23 followed by 27.3% subjects having B score 24 to 46. Thus, a large number (> 40%)of students have minimal sleep distress score.But a majority of students (54.6% of male and 51.4% of female)had B score in between 24 to 69.Thus, majority of students, both male and female, showmild to moderate sleep distress.Number of male and female did not differ significantly in variation with B score (P = 0.29). But median B score were significantly higher among females compared to males (43 vs. 32.5) (P=0.008).

Again majority of the male (75%) and female (66.7%) had C score in between 0 to 10 followed by in the range of 11 to 20.Although median C score was higher among females (9 vs. 7.5) but it was not statistically significant compared to males (P = 0.155).Thus majority of students (3/4th of male and 2/3rd of female) show near normal sleep parameter score. But about 1/5th (20.5%) of male and 1/3rd (33.3%) of female had moderately high sleep parameter score (C score in between 11 to 20).

Regarding D score, half of the male subjects (50%) had score in between 0 to 9; but approximately 3/4[th]of the female subjects (75.7%) had score in between 10 to 18, and it was statistically significant by Chi-square test. Moreover female had significantly higher median D score compared to males (13 vs. 9.5) (P = 0.014).Thus, half of male students suffer mildly impaired and nearly half (43.2%) suffer moderately impaired sleep related quality of life whereas more than 3/4th female students suffer moderately impaired sleep related quality of life.

Regarding total score, majority of the male (43.1%) and female (60.6%) had score between 0 – 39 and 40 – 78 respectively, and this distribution was found to be statistically significant (P < 0.05). Again, median total score was significantly higher among females compared to males (66 vs. 47.5) (P = 0.006) (TABLE 3). Thus majority of male and female students show mild to moderate sleep distress, and near normal sleep parameter score. Half of male students suffer mildly impaired and rest half show moderate to severely impaired quality oflife score whereas majority of female suffer moderate to severely impaired quality of life score. Total PIRS score was significantly higher among female.

Table 1: Distribution of the study subjects according to sex, age and BMI distribution.N = 77

Sex	No (%)	Age (Years) Median (IQR)	BMI (Kg/M^2) Median (IQR)
Male	44 (57.1)	19 (19 – 20)	26 (23.5 – 28.5)
Female	33 (42.9)	20 (19 – 20)	25 (22.5 – 26.5)
Mann Whitney U Test, P Value	77 (100)	Z = -1.04 P = 0.295	Z = -0.907 P = 0.365

Table 2: Distribution of the study subjects according to sex and BMIN = 77

BMI range	Male No. (%)	Female No. (%)
15 – 20	5 (11.4)	4 (12.1)
21 – 25	13 (29.6)	13 (39.4)
26 – 30	19 (43.2)	12 (36.4)
31 – 35	3 (6.8)	3 (9.1)
36 – 40	4 (9.0)	1 (3.0)
Total	44 (100)	33 (100)

$\chi^2 = 0.96$, df = 3 (last 2 rows have been clubbed), P = 0.81

Table 3: Distribution of the sleep scores among both male and female study subjects.
N = 77

Score	Male No. (%)	Female No. (%)	Statistical test
B Score			
0 – 23	19 (43.1)	16 (48.6)	
24 – 46	12 (27.3)	9 (27.3)	Chi-square test = 2.47 df = 2 P = 0.29
47 – 69	12 (27.3)	8 (24.1)	
70 – 92	1 (2.3)	0 (0.0)	
Median [IQR]	32.5 [18.75 – 48]	43 [35 – 61]	Mann Whitney U test = -2.66 P = 0.008*
C Score			
0 – 10	33 (75.0)	22 (66.7)	
11 – 20	9 (20.5)	11 (33.3)	Chi-square test = 0.41

21 – 30	2 (4.5)	0 (0.0)	df = 1 P = 0.52
Median [IQR]	7.5 [5 – 11]	9 [7 – 11]	Mann Whitney U test = -1.42 P = 0.155
D Score			
0 – 9	22 (50.0)	6 (18.2)	
10 – 18	19 (43.2)	25 (75.7)	Chi-square test = 8.25
19 – 27	3 (6.8)	2 (6.1)	df = 1 P < 0.05*
Median [IQR]	9.5 [4.75 – 15]	13 [11 – 17]	Mann Whitney U test = -2.46 P = 0.014*
Total Score			
0 – 39	19 (43.1)	3 (9.1)	
40 – 78	15 (34.1)	20 (60.6)	Chi-square test = 11.00
79 – 117	10 (22.8)	9 (27.3)	df = 2
118 –156	0 (0.0)	1 (3.0)	P < 0.05*
Median [IQR]	47.5 [28.5 – 75.75]	66 [55 – 85]	Mann Whitney U test = -2.76 P = 0.006*

* Statistically significant

IV. Discussions

Regarding sleep distress score, majority (more than 51%) of students scored in between 24 to 69 (out of maximum possible score 138) which indicate that they suffer mild to moderatesleep distress. In the present study it's revealed that female students don't suffer more sleep distress with compare to male students, but median sleep distress scoreis significantly higher among female students, which implies that few female students may have some individual factors like sleep disorder or any psychiatric illness.

Regarding sleep parameter scale, more than two-thirds (75% male and 66.7% female) of students scored in the minimum range (0 to 10, out of maximum possible score 30), which indicate that majority of students have near normal sleep parameters.

Regarding quality of life score, half of male students (50%) scored in minimum range (0 to 9, out of worst possible score 27) but three-fourth of female students (75.7%) scored in between 10 to 18, which implies that female students suffer significantly poorer sleep related quality of life than male students. Thus it's noteworthy that though female don't suffer significantly more sleep distress than male but their quality of life is significantly more impaired than male.

Finally regarding total score, female significantly scored higher than male whichdenotes that overall sleep pattern among female students poorer with compare to male students.

In a similar study among 1922 first year college students in Taiwan, 44% students reported sleep problems with insufficient sleep being the most common (23.9%) [10], which is comparable to findings (more than 51% of students had some amount of sleep distress) of our study. In another sleep study among 191 undergraduate students at a rural university, Walter C. Buboltz… et al.,[12] found that women reported more sleep disturbances than men. Like our study, they found that majority (more than 73%) of students had reported only occasional sleep problems.Unlike present study, in a similar Indian study by PA Giri … et al., [11] among 150 undergraduate & postgraduate medical students and interns, it's revealed female having better sleep quality than male.On the contrary, in another study byE. Lindberg … et al.[13] among 529 subjects aged between 20 to 45 years, found that difficulties maintaining sleep, absence of feeling refreshed in the morning and excessive daytime sleepiness were significantly more common among females.In general, women are 1.4 times more likely than men to report insomnia[14,15]. Increased sleep complaints in young women can be explained by the fact that sleep is influenced by the phases of the menstrual cycle. Women may note sleepiness during the early luteal phase, but during the late luteal phase, they present with insomnia that is often exacerbated during menses. Ovulation is also characterised by a transient insomnia[16,17]. These may explain the finding of poorer sleep pattern and sleep related quality of life among female students with compare to male students.

V. Conclusions

As student's data are self-reported there was possibility of subjective variation of interpretation of the nature of sleep difficulties they were experiencing.Secondly, this was a cross-sectional study based only on the previous week which might not be representative of the students' general sleep behaviour. Further studies based on longer period with separate data on weekdays and weekends are needed. In spite of these limitations we can conclude that poor sleep patternand consequent poor quality of life are common among undergraduate medical students andfemale students suffer worse sleep related quality of life than male. New comer medical students should be educated regarding importance of sleep behind healthy life and academic performance. Proper counselling, better planning and support should be provided to students so that they don't suffer sleep related poor quality of life.

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