STUDENTS' CORNER
SPECIAL REPORT

Assessment and comparison of sleep patterns among medical and non-medical undergraduates of Karachi: A cross-sectional study

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Abstract

To assess and compare patterns, habits and quality of sleep in undergraduate medical and non-medical students.

The cross-sectional study was conducted from February to March, 2018, at Dow Medical College, Karachi, and Pakistan Air Force-Karachi Institute of Economics and Technology. Data was collected by self-reported questionnaires. Sleep quality of individuals was assessed using Pittsburg Sleep Quality Index. Data was analysed using SPSS 21.

Of the 245 subjects, 137(55%) were medical students and 108(45%) were non-medical. Overall, 101(41.2%) subjects said 8 hours of sleep was sufficient for them; 153(62.4%) reported daytime sleeping; and 168(68.5%) did not take naps. The duration of nap was >30 minutes in 118(48%) students. Factors affecting sleep were cited as electronic media 132(53.9%), caffeine 42(17.1%) and stress 126(51.4%). Of the total, 161(65.7%) subjects had poor sleep quality. There was no significant difference between medical and non-medical students (p>0.05).

Majority of medical and non-medical undergraduate students were poor sleepers.

Keywords: Sleep, Sleep hygiene, Sleep deprivation, Medical students, PSQI.

Introduction

Sleep plays very important roles in physical and psychological development and stability. It has long been understood that cognitive capacities like memory and learning are boosted by good sleep.[1] Moreover, regular sleepers taking 7.5 to 8.5 hours of sleep have desirable mood and psychomotor conduct.[2] On the contrary, health and mood are affected by abnormal sleeping patterns and behaviors, and if one happens to be a university student, then it is likely to affect his/her academic performance as well.[3] Other hazards of inadequate sleep include emotional instability, memory loss, excessive daytime sleepiness (EDTS) and decreased concentration.[4]

It is known that university students are prone to sleep disturbance due to multiple environmental factors that affect their sleep-wake cycle like the freedom to self-select bedtime, increased academic demands, economic stresses, and the increased number of hours spent working and/or indulging in extracurricular activities.[5] These behaviours are associated with alteration in sleep-wake timing and reduction in total sleep time, as well as deterioration of sleep quality and daytime functioning.[6]

Globally, several studies are undertaken to assess sleep quality, habits and associated and causative factors of poor sleep among undergraduate university students. Poor sleep habits were found to be associated with excessive internet use and depression in Nepalese undergraduate students.[7] EDTS has been found to be prevalent among Indian undergraduate students.[8] In addition, inadequate sleep is a common problem among medical students in Saudi Arabia, and daily activities of students are affected by poor sleep quality.[9] A study on undergraduate students showed that they suffer from poor sleep quality leading to unsatisfactory academic progress.[10] Poor sleep quality is associated with shifts in sleep timing between weekdays and weekends as well as reduced overall sleep duration, as found among Lebanese university students.[11] Several studies outlined the adverse effects of disturbed sleep on daily life and academic progress of undergraduate university students in Pakistan and identified poor sleep practices along with academic stress being the important factors affecting sleep and academic performance.[12,13] A recent study conducted on medical students also revealed the effects of sleep deprivation such as fatigue, irritability and altered neuro-cognitive functions among them.[14] However, dearth of knowledge on sleep patterns, habits as well as quality and

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causative factors of poor sleep and their association with factors that might degrade academic performance of students of Pakistani universities called for a study to fill the gap. Additionally, a comparison was needed among students enrolled in medical colleges with those of non-medical ones. The current study, as such, was planned to assess and compare patterns, habits and quality of sleep in medical and non-medical undergraduate students. It was designed in a manner to highlight some associations of sleep quality with a few variables that are known to affect academic performance. It was hypothesised that electronic media, high caffeine intake, environment, subjective stress and anxiety about upcoming events may be associated with poor sleep, difficulty in concentration, short attention span and/or dozing off during the class, culminating in poor academic performance.

Subjects and Methods

The cross-sectional study was conducted from February to March, 2018, Dow Medical College (DMC), Karachi, and the Pakistan Air Force-Karachi Institute of Economics and Technology (PAF-KIET), and comprised all full-time students aged 18-25 years regardless of their year of study. Students with known history of sleep disorders (insomnia, parasomnia and obstructive sleep apnoea), pregnant or lactating female students or those on part-time employment, sleeping pills, anxiolytics and/or antidepressants were excluded.

The sample size was calculated by using the OpenEpi software.[15] Confidence interval (CI) of 95% was assumed and poor sleep quality prevalence of 60.5% as per the last study conducted in Pakistan.[16] Approval was obtained from the institutional review boards before starting the survey. A personalised questionnaire was generated comprising three sections; demographics, sleep habits and sleep quality. Demographics included age, gender and marital status. The next section had questions regarding sufficient hours of sleep, daytime sleep, naps and nap durations, causes of sleep disturbance and impact of their sleep patterns on their attention span, dozing off during class and whether they had difficulty in concentration. For sleep quality, Pittsburg Sleep Quality Index (PSQI) was used.[17] A score of 0-4 was for good sleepers while a score of 5 or above denoted poor or inadequate sleep. Significance threshold was set $p<0.05$. A pilot study was performed on 20 students for validation of the questionnaire after which it was distributed to all the subjects after obtaining informed consent.

PSQI assesses subjective sleep quality with 19 questions encompassing seven domains related to sleep, namely; sleep latency (time taken to fall asleep), sleep duration, sleep quality, efficiency, sleep disturbances, use of sleeping medications and daytime dysfunction.

Categorical data was presented as frequency and percentages while continuous data was presented in terms of mean and standard deviation. SPSS 21 was used for analysis of the data and chi square was then applied to determine the correlation between categorical variables.

Results

Of the 245 subjects, 137(55%) were medical students and 108(45%) were non-medical. There were 105(43%) males and 140(57%) females (Table-1).

When asked about how many hours of sleep were sufficient for them, 80(32.7%) subjects said 6 hours, 101(41.2%) said 8 hours and 64(26.1%) said >8 hours.

Table-1: Demographics.

Characteristics	Frequency	Percentage
Age (years)		
Mean (SD)	21.34 (±1.618)	
18-20	67	27.3
21-22	121	49.4
23 and above	57	23.3
Gender		
Male	105	42.9
Female	140	57.1
Marital Status		
Single	236	96.3
Married	9	3.7

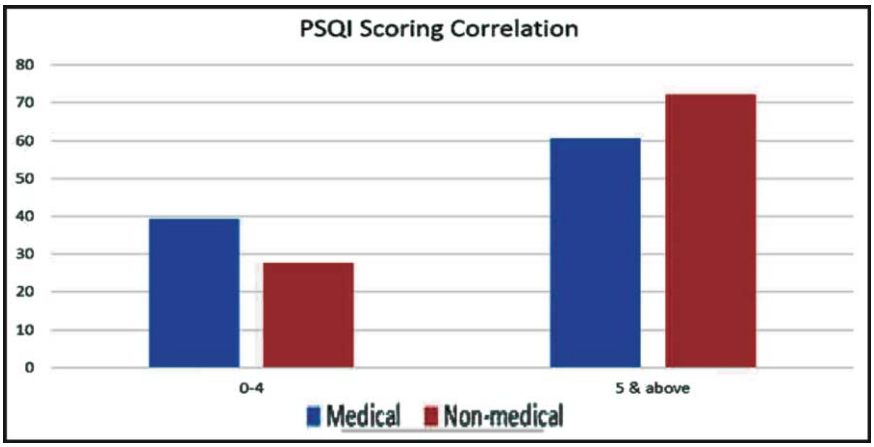

Figure: PSQI scoring correlation.

Table-2: Sleep habits.

	Medical		Non-Medical		Chi-Square	p-value
	n	%	n	%		
Hours of Sleep Sufficient					1.728	0.421
6 hours	40	29.2	40	37		
8 hours	60	43.8	41	38		
>8 hours	37	27	27	25		
Day time Sleep					9.249	0.002
Yes	97	70.8	56	51.9		
No	40	29.2	52	48.1		
No. of Naps					Not Applicable	Not Applicable
None	34	24.8	43	39.8		
1-2	101	73.7	58	53.7		
2-3	1	0.7	3	2.8		
>3	1	0.7	4	3.7		
Duration of Naps					15.947	0.001
5-15 mins	5	3.6	12	11.1		
15-30 mins	18	13.1	15	13.9		
>30 mins	80	58.4	38	35.2		

Table-3: Different factors affecting sleep and effect of sleep on academic performances of subjects.

	Medical		Non-Medical		Chi-Square	p-value
	n	%	n	%		
Factors affecting sleep						
Electronic Media (Cellphone, Laptop, Television etc.)	78	56.9	54	50	1.169	0.280
High Caffeine Intake	30	21.9	12	11.1	4.947	0.026
Environment (Noise, Light etc.)	67	48.9	41	38	2.933	0.087
Stress	79	57.7	47	43.5	4.838	0.028
Social and professional events	107	78.1	89	82.4	0.700	0.403
Effects of Sleep on academic performance						
Difficulty concentration	87	63.5	51	47.2	6.508	0.011
Short attention span	67	48.9	29	26.9	12.325	0.000
Dozing off during class	58	42.3	27	25	8.010	0.005

Responses varied slightly between medical and non-medical students but it was not statistically significant (P>0.05).

In terms of daytime sleep, 153(62.4%) responded in the affirmative and 92(37.6%) said they had no daytime sleep. Among those who had daytime sleep, 97(63%) were medical students.

Overall, 159(64.9%) subjects took 1-2 nap(s) per day, 4(1.6%) had 2-3 naps per day while 5(2%) took >3 naps per day. No significant difference was found between the groups (p>0.05).

Further, 17(6.9%) subjects had nap(s) of 5-15 minutes, 33(13.5%) had 15-30 minutes, and 118(48.2%) had nap(s) of >30 minutes. Medical students exhibited longer duration of naps (Table-2).

When the subjects were asked about whether they thought their use of electronic media like cell phone, laptop and television affected their sleep, 132(53.9%) said 'yes' but no significant difference was found between the groups (p>0.05). Also, 42(17.1%) subjects said 'yes' about the effect of caffeine intake on their sleep.

They were also asked about effects of environmental factors, like noise, light or any specific factor on their sleep, and 108(44.1%) subjects responded that their sleep gets affected by one or more of these factors. There was no significant difference between the groups (p<0.05).

Subjective stress influenced the sleep of 126(51.4%) subjects. A total of 196(80%) subjects also reported that their sleep got affected by an upcoming social or professional event.

Students were asked whether their sleep patterns caused them difficulty in concentration, short attention span and dozing off during classes and 138(56.3%) said they had difficulty concentrating, 96(39.2%) experienced short attention span and 85(34.7%) said they dozed off during classes. The effect was significantly higher on medical subjects in all aspects (Table-3). As an incidental finding, 161(65.7%) subjects had a PSQI score of 5 or above and, among those, 101(63%) had difficulty in concentration (p=0.005).

PSQI scoring correlation (Figure) was done between the medical and non-medical students. Mean score was 5.80±2.95. Total 84(34.3%) subjects had better sleep quality and fell in the category of 0-4 score, while 161(65.7%) subjects had poor sleep quality with scores 5 or above (p=0.057).

Discussion

Inadequate sleep is a common problem among undergraduate university students of our society. Although some studies have been done both nationally and internationally about determining sleep quality in university students, be it medical or non-medical, correlation with potential causative factors has been sparse. The current study found that poor sleep had no significant association with medical students and that most (65%) of the subjects had poor sleep as they scored 5 or greater in PSQI, as in prior studies of North American university students,[6] Lebanese[11] and Chinese university students.[18] In contrast, studies in South American,[19] Taiwan[20] and Palestinian[21] populations revealed lower proportions of university students with poor sleep. While poor sleep seems to be quite common among undergraduates, the reported discrepancies between different studies may be influenced by different socioeconomic stresses and cultural behaviours among the different population groups,[22] thereby acting as a possible confounder.

In our study, the percentages of students with sleep duration of 6 hours, 8 hours and longer than 8 hours were 32%, 42% and 26% respectively. On the other hand, meta-analysis of 57 studies conducted in Chinese universities revealed that the percentages of students with sleep duration shorter than 6 hours, 7 hours, longer than 8 hours and 9 hours were 8.4%, 43.9%, 18.3% and 5.7% respectively.[23] Other studies among Pakistani students have reported sleep duration of 6 to 8 hours mainly.[16,24]

About 65% of students in the current study took daytime naps of greater than 30 minutes and most of them were females which is quite similar to the prior study conducted among undergraduate university students of Karachi.[16] In addition, it was found that 75% of the medical students were taking naps while only 59.7% of the non-medical students did the same, which means there is a stronger association of medical students with daytime naps.

Sleeping difficulties were reported by 53.9% of respondents of the current study due to frequent use of electronic media and gadgets like cell phone, laptop and television. This finding was consistent with that of previous studies which found that the use of technology before bedtime leads to disturbed sleep, with mobile and television being most frequently used.[25] American students said that they were unable to get a good sleep due to the use of electronic devices and were having an impact on areas of functioning.[25] Light and noise affected sleep of 44% of students in our study, which is also reported in a study in which urban population living in noisy area was at higher risk for sleep disturbances than population living in the quiet area.[26] Furthermore, the present study reveals that caffeine was used by 17.1% students to stay awake which is nearly close to the finding of a previous study where 15.3% students took tea and coffee.[24]

Subjective stress is one the major factors affecting sleep among undergraduate students. More than 50% of students in the current study said their sleep was impaired by subjective stress. Many previous studies have comparable results regarding stress and anxiety being contributing factors to poor sleep habits.[13] In majority of the cases, academic and emotional stresses played their part.[6] An interesting finding in our study was that 80% students reported that their sleep was always impaired by an upcoming social or professional event.

Inadequate sleep has been shown to be associated with adverse academic performance among undergraduates.[10] Past studies addressing the influence of sleep disturbance on students' academic performance and health perils have attributed poor sleep quality to irregularity of the sleep-wake patterns in one or more domains.[6] Circadian rhythm controls many aspects of human performance as proposed by a two-oscillator model in a study with one oscillator designated by the core body temperature and the other by the sleep-wake cycle. During disturbed sleep patterns, the two oscillators may be detached from each other and run with dissimilar phases that can decrease the efficiency of performance as seen in jet-lag.[19] Our study also showed significant association of poor sleep with difficulty in concentration during class which may be associated with decline in academic performance. Furthermore, the present study also demonstrated that most of the medical students were having problems like short attention span and dozing off during classes, which

might be associated with poor academic performance.

The current study had its limitations. Only subjective perception of stress was noted. It should be further specified using stress scale or questionnaire. Evaluation should be undertaken between factors that are consequence of poor sleep with academic performance using GPA or some other method.

Conclusion

Majority of medical and non-medical undergraduate students were poor sleepers and no significant difference existed between the two groups. However, certain characteristics were found to be more prevalent in medical students, like daytime sleeping, number of naps taken per day, and duration of those naps. High caffeine intake and stress were also predominantly affecting sleep among medical students. Finally, medical students had difficulty in concentration, short attention span and were dozing off during classes.

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