

Sleep quality among medical students of Karachi, Pakistan

Arif Anwer Surani,¹ Sohaib Zahid,² Asif Surani,³ Salman Ali,⁴ Muhammad Mubeen,⁵ Reem Halim Khan⁶

Abstract

Objective: To characterise sleep quality and assess degree of daytime sleepiness among medical students of Karachi.

Methods: The cross-sectional study was conducted between August and December 2013 and subjects were recruited from five haphazardly selected medical colleges in Karachi. A convenience sample of medical students underwent two validated self-administered questionnaires i.e. Pittsburgh Sleep Quality Index and Epworth Sleepiness Scale. SPSS 17 was used for statistical analysis.

Results: Of the 650 students approached, 504(77.5%) subjects completely filled out the questionnaires. Of them, 300(59.5%) were females and 204(40.5%) were males. Overall mean age was 20±1.4 years. Of them, 199(39.5%) were classified as "Poor Sleepers". Poor sleep quality was associated with female gender ($p < 0.05$), excessive daytime sleepiness ($p < 0.05$), total hours slept ($p < 0.001$) and sleep disturbances ($p < 0.001$). Bed-timing analysis showed 365(72%) students went to bed after midnight.

Conclusion: Sleep quality among Pakistani medical students was significantly poor. Efforts must be directed towards proper sleep hygiene education.

Keywords: Sleep quality, Medical student, Excessive daytime sleepiness, Pittsburgh sleep quality index, Epworth sleepiness scale. (JPMA 65: 380; 2015)

Introduction

Most significant yet ignored part of human life is sleep. Average sleep duration in an adult ranges from 7 to 8 hours, but it varies in individuals. Adequate quality sleep is a prerequisite for optimal functioning of human mind and body. Medical students are very susceptible to developing sleep impairment due to demanding academics and rigorous clinical training. Poor sleep quality among medical undergraduates not only leads to physical and psychological morbidities, but also affects learning, memory and cognition.¹

A sizeable proportion of medical students around the globe demonstrate poor sleep quality. A study conducted in a Nigerian university showed that 32.5% medical students were sleep-deprived.² Similarly, a study conducted in a medical college of Pakistan showed that poor sleep habit was common among medical students and was associated with affected lifestyle.³

The association between poor sleep quality and excessive daytime sleepiness (EDS) has been extensively studied and validated.⁴ EDS is defined as sudden, uncontrollable compulsion to fall asleep during daytime. Daytime

sleepiness among medical students leads to poor concentration, lack of motivation and increased level of stress, which adversely affects academic performance.⁵

The study was planned to characterise sleep quality through validated questionnaires and to assess the degree of daytime sleepiness among medical students.

Subjects and Methods

The cross-sectional study was conducted from August to December 2013 and the study population comprised undergraduate medical students enrolled in first to final years of five-year core Bachelor of Medicine and Bachelor of Surgery (MBBS) degree programme. After prior approval from the review board of Dow University of Health Sciences (DUHS), Karachi, at five haphazardly selected medical colleges namely Dow Medical College, Sindh Medical College, Aga Khan University Medical College, Ziauddin Medical College and Baqai Medical College.

A convenience sample of medical students was drawn from above-mentioned study setting according to their respective proportions. Medical students willing to participate were briefed about the study and its objectives, confidentiality was assured, and none was reimbursed. Pregnant and lactating females, students with a known history of sleep disorders (insomnia, parasomnia and obstructive sleep apnoea) and students unable to understand or comprehend English were excluded. After obtaining informed consent, subjects

.....
¹Department of Forensic Medicine & Toxicology, ^{5,6}Medical Student (4th Year), Liaquat College of Medicine and Dentistry, ²⁻⁴Dow University of Health Sciences, Karachi, Pakistan.

Correspondence: Muhammad Mubeen. Email: mubeeniqbal7@gmail.com

were given two validated self-administered questionnaires i.e. Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESS).

The PSQI questionnaire measures subjective sleep quality, sleep habits and sleep disturbances over the previous month and discriminate between normal and poor sleepers. It consists of 19 questions which produce a summated global PSQI score, which if greater than 5 is consistent with clinically disturbed or poor sleep.⁶ It has a diagnostic sensitivity and specificity of 89.6% and 86.5% respectively.⁶ The ESS scale assesses subject's general level of daytime sleepiness in recent times. It consists of 8 self-rated items which measure subject's likelihood to fall asleep in various commonly encountered situations and produce a summated ESS score. Summated ESS score >10 is considered to be abnormal and indicative of excessive daytime sleepiness.⁷ ESS has an internal consistency of 0.88 and test retest reliability of 0.82.⁷

Data obtained was entered and analysed in SPSS 17. Chi square test and Fisher's exact test, where applicable, was done for categorical data. Unpaired t test and Mann-Whitney U test in case of non-normal distribution was applied for the comparison of continuous variables. Values of $p < 0.05$ were regarded as statistically significant.

Results

Of the 650 students approached, 504(77.5%) subjects completely filled out the questionnaires. Of them, 300(59.5%) were females and 204(40.5%) were males. Overall mean age was 20 ± 1.4 years. Of the total, 120(23.8%) subjects were from the 1st year, 103(20.4%) 2nd year, 98(19.4%) 3rd year, 94(18.6%) 4th year, and 89(17.6%) from the final year. Overall, 199(39.5%) medical students were classified as "poor sleepers" having global PSQI >5. Among the females, frequency of poor sleepers

Table-1: Comparison of various measures of sleep quality between poor and normal sleepers.

Variables	Poor sleepers	Normal sleepers	p value
Mean PSQI scores	7.3±1.5	3.4±1.2	<0.001
Mean total sleep time	5.5±1.2 hours	6.9±1.4 hours	<0.001
Mean sleep onset latency	28.5±19.5 minutes	16.1±12.0 minutes	<0.001
Subjective sleep quality [n (%) of individuals reported sleep quality to be fairly or very bad]	62 (31.1%)	5 (1%)	<0.001
Daytime dysfunction [n (%) 2 or more times a week]	35 (17.6%)	6 (2%)	<0.001
Use of sleep medications [n (%) once or more a week]	8 (4%)	0 (0%)	<0.001

PSQI: Pittsburgh Sleep Quality Index.

Table-2: Comparison of sleep disturbances between poor and normal sleepers.

Sleep Disturbances (Once or more a week)	Poor sleepers n(%)	Normal sleepers n(%)	p value
Cannot get to sleep within 30 minutes	100 (50.2)	50 (16.4)	<0.001
Wake up in the middle of the night or early morning	102 (51.3)	90 (29.5)	<0.001
Have to get up to use the bathroom	36 (18.1)	35 (11.5)	0.119
Cannot breathe comfortably	21 (10.5)	6 (2.0)	<0.001
Cough or snore loudly	16 (8.0)	7 (2.3)	<0.05
Feel too cold	61 (30.7)	41 (13.4)	<0.001
Feel too hot	36 (18.1)	22 (7.2)	<0.001
Have bad dreams	53 (26.7)	42 (13.8)	<0.001
Have pain	26 (13.0)	12 (4.0)	<0.05

was 132(44%) compared to males among whom 67(32.8%) were poor sleepers ($p < 0.05$). Age and year of medical class were not statistically correlated with prevalence of poor sleep quality ($p > 0.05$).

Measures of sleep quality were significantly deranged among poor sleepers when compared to normal sleepers. Statistically significant differences were observed with in total sleep time, sleep onset latency, subjective sleep quality, use of sleep medications and daytime dysfunction (Table-1). In comparison with normal sleepers, poor sleepers also self-reported various sleep disturbances (Table-2). Commonly reported sleep disturbances among poor sleepers were not getting to sleep within 30 min after lying on bed and waking up in the middle of night or early morning.

Analysis of bed timing showed that 21(4.2%) medical students went to bed before 10pm, 89(17.7%) between 10pm and midnight and 365(72.4%) after midnight. Of the total, 92(18.3%) medical students woke up before 6am, while 283(56.2%) woke up between 6am and 8am. Mean total sleep time was 6.4 ± 1.5 hours and mean sleep latency was 21 ± 16.5 minutes.

Mean ESS score among poor sleepers was 8.57 ± 3.85 vs. 7.48 ± 3.84 among normal sleepers. Abnormal ESS scores (ESS Score >10) were 52 (26.1%) compared to normal sleepers 54 (17.7%) ($p < 0.05$).

Discussion

Our study showed that sleep quality among Pakistani medical students is poor with prevalence rate of about 40%. It was well within prevalence estimate (32-57%) reported by other studies using same instrumentation (PSQI questionnaire).^{1,2} Moreover, it was associated with female gender, EDS, lower total sleep time, increased sleep onset latency and increased frequency of self-

reported sleep disturbances.

The association between poor sleep quality and female gender can be partly explained by reportedly increased frequency of various sleep disorders and disturbances among females in general.⁸ Cultural and social norms of our society, where females are actively involved in household chores, can also account for such gender predominance.

Sleep habits of Pakistani medical students were unsatisfactory compared to medical undergraduates from other parts of the world. The majority of medical students (72%) in Pakistan went to bed after midnight. Other comparative studies reported lower frequency of these late night sleepers (<45%).⁹ Mean total sleep time reported by our study was consistent with other studies, showing sleep duration of less than 7 hours.¹⁰ Disruption of sleep-wake behaviour described by our study can be attributed to academic demands, exam stress, social schedule and insufficient sleep education.

The overall prevalence of EDS reported by our study was 21%. It was lower than the prevalence rate reported by other studies conducted on medical students.^{5,10} It can be attributed to differences in study design and ethnic, cultural and geographical variability between studied populations. It is noteworthy to mention here that EDS is also caused by certain medical and psychiatric conditions and sleep disorders. Evaluating causes of EDS, therefore, requires a holistic approach and confirmation by sophisticated objective tests.

Conclusion

More than one-third of the subjects self-reported to have poor sleep quality. It was associated with female gender, total hours slept, sleep onset latency, and leads to increased level of daytime sleepiness. Efforts directed towards educating medical students about proper sleep hygiene and the consequences of poor sleep practices could have a positive impact.

References

1. Sahraian A, Javadpur A, Shiraz E. Sleep disruption and its correlation to psychological distress among medical students. *Med J* 2010; 11: 12-7.
2. James BO, Omoaregba JO, Igberase OO. Prevalence and correlates of poor sleep quality among medical students at a Nigerian university. *Ann Nigerian Med* 2011; 5: 1-5.
3. Khan UA, Pasha SN, Khokhar SK, Rizvi AA. Sleep habits and their consequences: a survey. *Rawal Med J* 2004; 29: 3-7.
4. Singh R, Undevia NS, Schuman C, Attarian H. Excessive daytime sleepiness among attending physicians: a pilot survey study at an academic institution. *Sleep Med.* 2011; 12: 808-10.
5. Rodrigues RN, Viegas CA, Abreu ESAA, Tavares P. Daytime sleepiness and academic performance in medical students. *Arq Neuropsiquiatr* 2002; 60: 6-11.
6. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res* 1989; 28: 193-213.
7. Johns MW. A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep.* 1991; 14: 540-5.
8. Klink M, Quan SF. Prevalence of reported sleep disturbances in a general adult population and their relationship to obstructive airways diseases. *Chest* 1987; 91: 540-6.
9. Nojomi M, GhalheBandi MF, Kaffashi S. Sleep pattern in medical students and residents. *Arch Iran Med.* 2009; 12: 542-9.
10. Abdulghani HM, Alrowais NA, Bin-Saad NS, Al-Subaie NM, Haji AM, Alhaqwi AI. Sleep disorder among medical students: relationship to their academic performance. *Med Teach* 2012; 34 Suppl 1: S37-41.