



Original Research Article

A STUDY ON SLEEP PATTERN AMONG MEDICAL STUDENTS AND ITS IMPACT ON ACADEMIC PERFORMANCE

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ABSTRACT

Background: Sleep deprivation is the condition of not having enough sleep. It can be acute or chronic. Sleep deprivation can affect the academic performance and health status of medical students. Medical students are vulnerable to poor sleep, attributed to long extended study years and high academic load, clinical duties and emotionally demanding work. In India, prevalence of sleep deprivation is 37% & day time sleepiness is 30.6%. Understanding the etiology of sleep difficulties among medical students is vital to improve their overall health and academic performance.

Materials and Methods: An institution based cross sectional study was conducted from December 2021 to May 2022 among 521 medical students of Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar. The sleep quality was assessed by using Pittsburgh sleep quality index scale (PSQI) and day time sleepiness was assessed using Epworth sleepiness scale (ESS).

Results: The mean age of medical student is 21.85±1.34. This study showed that 45% of students are having sleep disturbance and 17.47% of students has excessive day time sleepiness. The association between hours of sleep and Pittsburgh sleep quality index (PSQI) was found to be statistically significant with a p value < 0.01.

Conclusion: Prevalence of sleep disturbance is very high among medical students. This study did not show any association between sleep disturbance and academic performance.

Keywords: Sleep disturbance, Medical students, Academic performance, PSQI, ESS

INTRODUCTION

Sleep is defined as unconsciousness from which a person can be aroused by sensory or other stimuli. It is to be distinguished from coma, which is unconsciousness from which a person cannot be aroused.^[1] Sleep is required for proper functioning of brain. Sleep helps in regulating thought process and mood.^[2] Sleep deprivation is the state of not getting enough sleep. It could be acute or chronic. Sleep deprivation has been shown to have an impact on medical student's health and academic performance. Medical students are susceptible to poor sleep, ascribed to their extended school years, heavy academic load, clinical tasks, rigorous work and

extremely demanding lifestyle.^[3] Prevalence of sleep deprivation is 37% in India,^[4] & excessive day time sleepiness is 30.6% respectively,^[5] due to which they experience struggle in examinations.^[3] Usage of electronic gadgets for long hours especially during nights causes a lot of sleep disturbance in medical students which is affecting their academic performance. Hence, in this study we want to estimate the prevalence of sleep deprivation and its impact on academic performance.

Aim and Objectives

Aim: To study the sleep pattern of medical students and its impact on the academic performance

Objectives

1. To estimate the prevalence of sleep deprivation among medical students
2. To know the impact of sleep deprivation on academic performance

MATERIALS AND METHODS

It was a cross – sectional study done at Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar among students of Phase II, Phase III and Interns recruited through convenience sampling during December 2021 to May 2022. A total of 521 students were enrolled in this study. All the medical students who are willing to participate in the study during the survey period were included. Students who did not give consent, had any sleep disorders, chronic diseases, those who were on anti-depressant medication and 1st year MBBS students were excluded from the study. The questionnaire was divided into 3 parts, namely Part 1: Personal and academic details, Part 2: Pittsburg Sleep Quality Index Scale (PSQI),^[6] and Part 3: Epworth Sleepiness Scale (ESS).^[7] Students took almost 20 minutes to complete the questionnaire. They were asked to fill their previous year final examination aggregate percentage for academic performance. Approval for the study was obtained from the Institutional ethical committee. Statistical Analysis was done using Microsoft Excel 2007 and IBM SPSS statistics version 21.0. Data was represented using appropriate tables and charts in the form of frequencies and percentages. Chi square test was applied to find out statistical association as required. $P < 0.05$ is considered statistically significant.

The Pittsburg Sleep Quality Index (PSQI) differentiates between poor quality and good quality sleepers by measuring 7 aspects which include subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction over the past month. Scoring of an answer is based on a '0' to '3' scale, whereby '3' reflects the negative extreme. The global sum of "5" or greater indicates "poor" quality sleeper while less than "5" indicates "good"

quality sleeper.^[6] The internal consistency of PSQI as estimated by Cronbach's α was 0.793.^[6]

Epworth Sleepiness Scale (ESS) is a brief questionnaire in which the individual rates eight items on the likelihood that they would doze in eight situations with response from 0 (would never doze) to 3 (high chance of dozing).²¹ The score of the ESS is the sum of ratings for the eight items which ranges from 0 to 24. Those with scores 10 and above were considered to have significant levels of daytime sleepiness or known as excessive daytime sleepiness (EDS).^[7] The internal consistency of ESS, estimated by Cronbach's α was 0.658.^[7]

RESULTS

In the present study a total of 521 students who were in phase II and phase III MBBS had participated. The socio demographic Characteristics of the study participants shows that most of the students in the present study were in the age group of 21 to 23 years (77.16%) and most of them are females (68.72%). Maximum number of students are Hostellers 57.59% and day scholars were 42.41%. The students who scored good percentage of marks were 61.42%. [Table 1].

[Figure 1] depicts that most of the students had 6 to 8 hours of sleep (81.38%). The students who slept less than 6 hours were 14.2% and students who slept more than 8 hours were 4.41%

[Figure 2] shows that the prevalence of sleep disturbance among medical students is 45.68% who had a Pittsburgh sleep quality index score of >5

[Table 2] shows that students who slept for less than 6 hours had high sleep disturbance (89.19%) compared to students who slept for 6 to 8 hours and more than 8 hours. The association between hours of sleep and Pittsburgh sleep quality index was found to be statistically significant with p value of <0.01

[Figure 3] The prevalence of day time sleepiness is 17.47% with Epworth sleepiness scale score of >10

[Table 3] shows Students with PSQI score ≤ 5 have better academic performance when compared to students with PSQI >5 . However, there is no association between PSQI and academic performance in this study as the P value is 0.146.

Table 1: Distribution of study participants according to Age (n=521)

Variable	Frequency	Percentage (%)
Age in years		
18 – 20	43	8.2
21 – 23	402	77.1
24 – 26	73	14.0
27 - 29	3	0.57
Gender		
Female	358	68.72
Male	163	31.28
Residence		
Hostel	300	57.59
Day scholar	221	42.41
Percentage of marks in final exams		
Excellent ($>70\%$)	126	24.18
Good (60 - 70%)	320	61.42
Average (50 – 60%)	72	13.82

Poor (<50%)	3	0.58
PSQI > 5	238	45.68
ESS > 10	91	17.47

Table 2: Distribution of study participants according to Association between Hours of sleep & PSQI (n=521)

Hours of sleep	PSQI Interval		Total (%)
	>5 (%)	≤ 5 (%)	
< 6 hours	66 (89.19)	8 (10.81)	74 (100.0)
6 -8 hours	172 (40.56)	252 (59.43)	424 (100.0)
>8 hours	2 (8.70)	21 (91.30)	23 (100.0)
Total	240 (46.1)	281 (53.9)	521 (100.0)

The association between hours of sleep and Pittsburg sleep Quality Index is found to be statistically significant with a p value < 0.01.

Table 3: Distribution of study participants according to Association between sleep disturbance and academic performance (n=521)

Psqi	Scoring				Total (%)
	Excellent (>70%)	Good (60-70%)	Average (50-60 %)	Poor (<50 %)	
>5	49 (20.42)	159 (66.25)	30 (12.5)	2 (0.83)	240 (100.0)
≤ 5	77 (27.40)	161 (57.30)	42 (14.95)	1 (0.35)	281 (100.0)
Total	126 (24.18)	320 (61.42)	72 (13.82)	3 (0.58)	521 (100.0)

The P value is 0.146 and there is no association between the sleep disturbance and academic performance.

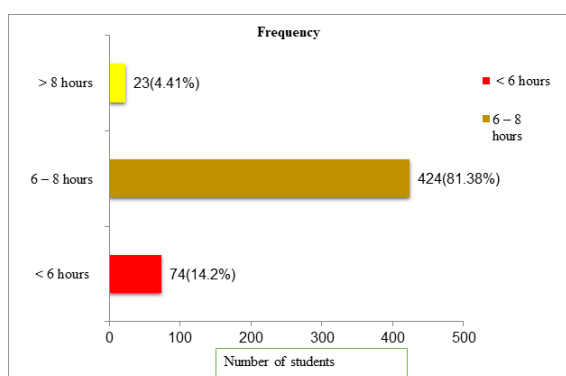


Figure 1: Distribution of study participants according to Number of hours of sleep (n=521)

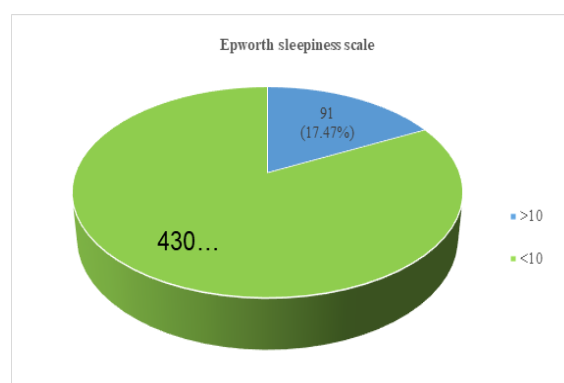


Figure 3: Distribution of study participants according to Epworth sleepiness scale (n=521)

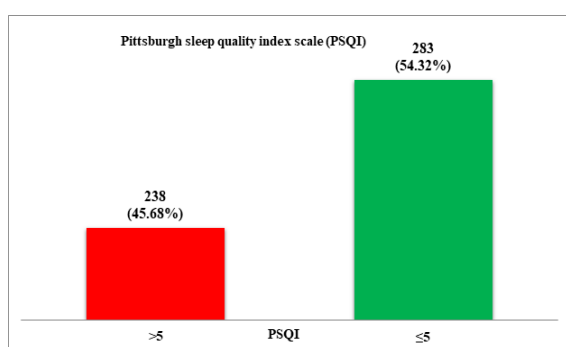


Figure 2: Distribution of study participants according to Pittsburgh sleep quality index (n=521)

DISCUSSION

In the present study, most of the students in the present study belonged to the age group of 21 – 23 years which is similar to the study conducted by Anjan Datta et al in Tripura in 2018.^[3] A study done by Hanan Ez ElArab et.al at Ain Shams University also showed mean age of study participants as 21.4±1.88 similar to our study.^[8]

In the present study, majority of the study participants were females (68.72%). A study study done by Hanan Ez ElArab et.al at Ain Shams University during 2009-2010 showed similar results where most of the participants were female (51.5%).^[8] Our results are in contrast to the study done by Anjan Datta et al study conducted in Tripura in 2018 which showed male preponderance of 57.6%.^[3] Another study done by Jiunn-Horng Kang et al also had males (50.62%) as majority of study participants.^[9]

Most of the students stayed in our study were hostellers (57.59%) which is similar to the study done by Anjan Datta et al in Tripura in 2018 where number of students who stayed in hostel were 64%. This is in contrast to the study done by Ibrahim NK et al King

Abdulaziz University in 2017 where most of the students were day scholars (90.1%).^[10]

In the present study, most of the students (81.38%) had 6 – 8 hours of sleep and the association between hours of sleep and PSQI is found to be statistically significant with a p value < 0.01. A study done by Pey-Peng Lai et.al at Malaysia,^[11] during August 2011 to February 2012 also showed that majority of students (67.1%) were good sleepers who had slept for 7-7.5 hours per day. A study done by Anjan Datta et al in Tripura in 2018 showed most of the students (70.9%) had slept only 4 – 6 hours,^[3] and Neera Goel et al,^[12] in Uttar Pradesh in 2016 which showed majority of the students had 3 – 6 hours of sleep per day which are different from results of our study.

The Prevalence of sleep deprivation in present study is 45% which is in contrast to the Anjan Datta et al study in 2018,^[3] Neera Goel et al,^[12] study in Uttar Pradesh and Jiunn Horng et al,^[9] in 2009 in Taiwan that showed a prevalence of sleep deprivation of 57%, 60% and 33.8% respectively. A study done by Medeiros AL et al in 2003 showed a sleep deprivation of 38.9% among medical students.^[13] Chronic sleep deprivation can cause increase in cardiovascular mortality and morbidity and can have adverse impact on endocrine, metabolic and inflammatory responses. Students with behave impulsively and have difficulty in staying focussed.^[11]

The Prevalence of Day time sleepiness is 17.47% in the present study which is in contrast to the study done by Neera Goel et al,^[12] in Uttar Pradesh in 2016 and Jiunn Horng et al,^[9] in 2009 in Taiwan which showed a prevalence of day time sleepiness of 10% and 14.4% respectively. A study done by Hidalgo MP et al in Brazil in 2002 had showed day time sleepiness of 42.4%.^[14] Day time sleepiness among students can lead to decreased performance and interpersonal problems.^[14,15] Students suffering from day time sleepiness are often involved in occupational accidents which at times are life threatening.^[16,17]

In the present study, students with Excellent, good, average and poor performances were 24.18%, 61.42%, 13.82% and 0.58% respectively when compared with a study done by Anjan Datta et al,^[3] in Tripura in 2018 who had 10.30%, 35%, 46.80% and 7.90%.

The students in our study with 6 – 8 hours of sleep showed good (61.08%) performance. The study by Anjan Datta et al in which the students had 4 – 6 hours of sleep had showed average academic performance (46.80%).^[3] This difference might be due to the students who had good sleep were active during the examination and they could recall better than the students with poor sleep who might have experienced the fatigue and restlessness which highlights the importance of having proper sleep among students.

The present study showed prevalence of sleep disturbance as 45% but there was no significant association between sleep disturbance and its impact on academic performance (P = 0.146) which is similar to the study done by Pey-Peng Lai et. al in

Malaysia which showed a prevalence of 32.9% of sleep disturbance but did not show any significant association with academic performance of students.^[11] A study done by Anjan Datta et. al in Tripura in 2018 showed contrary findings to our study which depicted prevalence of sleep disturbance as 57% and the association between sleep disturbance and its impact on the academic performance was found to be statistically significant (P = 0.03).^[3]

CONCLUSION

The prevalence of sleep deprivation among medical students is 45%. The prevalence of day time sleepiness is 17.47%. This study did not show any significant association between sleep deprivation and academic performance, as most of the students had a sleep of 6 to 8 hours per day. However, it is essential to take measures to reduce sleep deprivation to prevent long term effects on students.

Limitations

This is a self-administered questionnaire and students usually tend to project good habits. This study is done in our medical college and findings cannot be generalised. A Qualitative study with Key informant interviews and large sample size might give us more inputs.

Recommendations

Students has to be educated about the importance of good sleep and sleep hygiene practices. Sleep hygiene includes Going to bed at the same time each night and waking up at same time each morning including weekends. Avoid usage of electronic devices an hour before bed time. Make sure your bedroom is quiet, dark and relaxing. Be physically active.

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