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Original Article

Assessment of Sleeping Patterns among Health Care Students in Chennai – A Cross Sectional Study

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Abstract

Background: Sleep is a fundamental physiological need, and disturbances in sleep quality can have detrimental effects on the quality of life. Poor sleep quality can particularly impact the academic performance of students, especially when they face a heavy academic workload that demands their full attention and activity. This study aimed to assess the factors influencing the sleep quality of medical students in a private medical college.

Methods: This is a cross-sectional, questionnaire based observational survey was conducted among health care students of first, second, third, final years, Interns and post graduates students in a private medical college with the total sample of 451 students. This sampling methodology was designed to assess the sleep patterns and sleep deprivation medical students using Pittsburgh Sleep Quality Assessment.

Results: The prevalence of poor sleep quality was found to be 47.2% among the medical students, with higher rates detected among 3rd-year students. The study identified significant factors associated with poor sleep quality, including learning difficulties, anxiety related to exams, and the habit of going to bed late and waking up early.

Conclusion: The study reveals that sleep quality among medical students is influenced by various factors. Poor sleep quality not only affects daily functioning but also impacts the students' ability to maintain enthusiasm and meet the demands of their medical education.

Keywords : Healthcare students, sleep pattern, Pittsburgh sleep quality index

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INTRODUCTION

Sleep is an important component of normal human physiology. It serves a restorative homeostatic function and appears to be crucial for normal thermoregulation and energy conservation (1). Both the quantity and quality of sleep can have a significant impact on a person's physical and mental functioning (1). Adult age groups are prone to psychological and physical stress due to the transitional nature of human life (1). Physical, mental, and environmental factors like age, gender, employment, lifestyle, emotional stress, and noise can also affect sleep patterns and issues.

The amount of sleep that people need might vary by age and person. Adults normally require around six to ten hours of sleep every 24 hours, with most people preferring around 8 hours of sleep each day, according to sleep specialists (2). Sleepiness is described as the inability to perform or difficulty in keeping awake during the day's major waking phase, resulting in unintentional falls into sleepiness or sleep (2). Estimates of prevalence depend on the definition of insomnia used in the epidemiological research. The most common symptoms of insomnia are difficulty initiating and maintaining sleep and waking up refreshed in the morning (2). Their sleeping patterns are characterized by short sleep intervals, slow sleep initiation, and recurrent daytime naps (2). Sleep has a significant impact on cognitive processes, which in turn affect efficiency of a human (3). Due to their lengthy study periods, heavy academic loads, frequent exams, anxiety about failing, intense clinical responsibilities, emotionally taxing job, and extremely demanding lifestyles, health care professionals are seen to be the most challenging group of students (4).

The performance of medical students is impacted by excessive daytime sleepiness (EDS), which is caused by poor quality sleep (4). Hence, there is a high prevalence of sleep disorders in university students, especially those that affect the wake-sleep rhythm (5). Academic commitments place a substantial amount of pressure on many health care students (6). For this reason, the interest in establishing relationships between sleep and cognitive processes such as memory, learning ability and motivation, has gained attention during the last years (6). In the current study, our objectives were to: (a) design a "sleep habits questionnaire," (b) examine sleep patterns, chronotypes, and habits; and (c) study at how sleep patterns affect academic performance in a health care student.

MATERIALS AND METHODS

A cross-sectional, questionnaire-based observational survey was conducted among health care students at a private medical college. The study was conducted between May and June 2023 with the total sample of 451.The study included students from various healthcare disciplines, such as Medical, Dental, Physiotherapy, Nursing, Allied Health Science, and Pharmacy, across different academic years, including first, second, third, final year, interns, and postgraduates. Ethical clearance was obtained before starting the research, and data collection was conducted without disrupting their academic responsibilities. Participation was voluntary, and informed consent was obtained from each participant. However, students who were continuously absent or unwilling to participate were excluded based on the study's criteria to ensure a representative sample. A self-administered questionnaire in English was designed, containing 36 questions covering topics like age, refreshing sleep, the effect of sleep disturbance on daily social activities, total sleep time at night, bedtime, and daytime sleepiness using the Pittsburgh Sleep Quality Assessment. The questionnaire consists of two sections in which the first section records the demographic details of students and questions to assess sleeping pattern and the second question contained question associated with Pittsburgh Sleep Quality Assessment Participants were asked to provide information about their sleeping patterns, including the average number of hours of sleep per night, sleep quality, and any sleep disorders they may have. A pilot study was conducted among 30 samples from the target population to validate the questionnaire and to get the required sample size. The questionnaire showed adequate validity and reliability (Cronbach's alpha = 0.78). Data was collected by approaching the students personally after obtaining permission from the concerned authorities. After obtaining the list of students in each department, the participants were selected through simple random

sampling. Once they satisfy the inclusion criteria, the purpose of the study was explained to them and expressed oral consent was obtained. The methodology was designed to assess the sleep patterns of healthcare students at the specified college, providing valuable insights into their sleep habits and potential areas for intervention or support.The PSQI consist of 19 items measures several different aspects of sleep, offering seven component scores and one composite score.The global PSQI score is then calculated by totaling the seven component scores, providing an overall score ranging from 0 to 21, where lower scores denote a healthier sleep quality. The collected data were coded and analyzed using IBM SPSS Version 26 software. Descriptive statistics were calculated for demographic variables and the responses provided by the participants, including frequency, percentage, mean, and standard deviation. Cross tabulations were made and statistical significance between good and bad sleepers was assessed using Pearson's Chi-square test with the level of significance set at $p<0.05$.

RESULTS

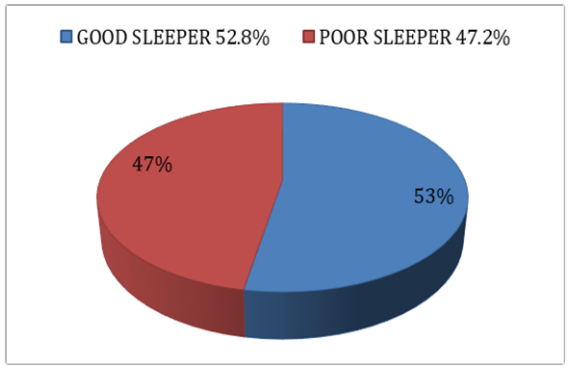
The total sample size of the current study was 451. The age of the individuals ranged from minimum of 17 years to a maximum of 32 years with the mean of 21 years. The participants were nearly equally distributed between both the genders. Most of the participants were dental students which was followed by medical, physiotherapy, nursing, and allied health sciences. The participants were then categorized into good sleeps (Global score < 5) and poor sleepers (Global score >5). Among the study population, 238 individuals are categorized as "Good Sleepers," while 213 individuals fall under the "Poor Sleepers" category (Figure 1). The comparison of demographic and general characteristics showed that there was no statistically significant difference between the good and poor sleepers in their gender, residence, and department in their medical college. However, a significant difference was noted in the year of study in the medical college (Table 1).

Table 1: Comparison of sleep quality of healthcare students with their demographic and general characters

Demographic Characteristics	Good Sleepers (N=238) N (%)	Poor Sleepers (N=213) N (%)	Total (N=451) N (%)	p Value
Gender				
Male	67 (52.3%)	61 (47.7%)	128 (28.4%)	0.909
Female	171 (52.9%)	152 (47.1%)	323 (71.6%)	
Residence				
Rural	70 (50.0%)	70 (50.0%)	140 (31%)	0.429
Urban	168 (54.0%)	143(46.0%)	311 (69%)	
Year of study				
1st year	16 (40.0%)	24 (60.0%)	40(8.9%)	
2nd year	30 (41.7%)	42 (58.3%)	72 (16%)	
3rd year	52 (54.7%)	43 (45.3%)	95(21.1%)	0.000*
4th year	64 (50.8%)	62 (49.2%)	126 (27.9%)	
Internship	42 (53.8%)	36 (46.2%)	78 (17.3%)	
PG	34 (85.0%)	6 (15.0%)	40 (8.9%)	
Department				
Allied health science	9 (39.1%)	14 (60.9%)	23 (5.1%)	
Dental	106 (48.2%)	114 (51.8%)	220 (48.8%)	
Medical	37 (67.3%)	18 (32.7%)	55 (12.2%)	0.072
Nursing	94 (5.0%)	11 (55.0%)	20 (4.4%)	
Pharmacy	24 (58.5%)	17 (41.5%)	41 (9.1%)	
Physiotherapy	53 (57.6%)	39 (42.4%)	92 (20.4%)	

*Statistically significant (Pearson's Chi square test)

Figure 1: Sleeping pattern among health care students



Regarding factors affecting the sleep quality of healthcare students, family problems were notably higher among poor sleepers (14.1%) than among good sleepers (5.9%). Smoking was slightly higher among poor sleepers (5.2%) compared to good sleepers (5%). Distance to college significantly affected poor sleepers, and learning difficulties were significantly higher among poor sleepers (16.9%) than among good sleepers (10.5%). Notably, 23.5% of poor sleepers reported difficulty with medical subjects compared to 17.2% of the other group with the same complaint. A higher percentage of poor sleepers (50.7%) worried significantly more about examinations than good sleepers (28.6%). Poor sleepers consumed significantly more tea or coffee per day (Table 2).

Table2: Comparison of factors affecting sleep quality among studied groups of health care students

Factors affecting sleep quality	Good Sleepers (N=238) N (%)	Poor Sleepers (N=213) N (%)	Total (N=451) N (%)	p Value
Family problems				
Yes	14 (5.9%)	30 (14.1%)	44 (9.8%)	0.000*
No	115 (48.3%)	119 (55.9%)	234 (51.9%)	
To some extent	109 (45.8%)	64 (30%)	173 (38.4%)	
Smoking				
Yes	12 (5%)	11 (5.2%)	23 (5.1%)	0.953
No	226 (95%)	202 (94.8%)	428 (94.9%)	
Distance to college				
<30 minutes	137 (57.6%)	91 (42.7%)	228 (50.6%)	0.007*
30- minutes	41 (17.2%)	52 (24.4%)	93 (20.6%)	
> 60 minutes	60 (25.2%)	70 (32.9%)	130 (28.8%)	
Learning difficulties				
Yes				
No	25 (10.5%)	36 (16.9%)	61 (13.5%)	0.023*
To some extent	96 (40.3%)	97 (45.5%)	193 (42.8%)	
	117 (49.2%)	80 (37.6%)	197 (43.7%)	
Difficulty of medical subjects				
Yes				
No	41 (17.2%)	50 (23.5%)	91 (20.2%)	0.006*
To some extent	66 (27.7%)	78 (36.6%)	144 (31.9%)	
	131(55%)	85 (39.9%)	216 (47.9%)	
Worry about examinations				
Yes				
No	68 (28.6%)	108 (50.7%)	176 (39%)	0.000*
To some extent	45 (18.9%)	45 (21.1%)	90 (20%)	
	125 (52.5%)	60 (28.2%)	185 (40%)	
Tea or coffee during the day				
≤ 2 / day	199 (83.6%)	149 (70%)	348 (77.2%)	
3- /day	27 (11.3%)	36 (16.9%)	63 (14%)	0.001*
> 4 /day	12 (5%)	28 (13.1%)	40 (8.9%)	

*Statistically significant (Pearson's Chi square test)

Table 3 shows the comparison of sleep patterns among good and poor sleepers. It is evident that excess daytime sleep is significantly higher in poor sleepers (25.4%) compared to (15.5%) of good sleepers. Times of un-refreshing sleep are significantly higher in poor sleepers compared to good sleepers (62.6% vs. 24.9%). A significantly higher percentage of good sleepers reported being completely satisfied with their sleep (39.9%) compared to the other group (17.8%). Sleep apnea, nightmares, and restless leg syndrome were observed more frequently and significantly in the poor sleep quality group.

Table 3: Comparison of sleep pattern among studied groups of healthcare Students

Factors affecting sleep quality	Good Sleepers (N=238) N (%)	Poor Sleepers (N=213) N (%)	Total (N=451) N (%)	p Value
Excess day time sleep				
Yes	37 (15.5%)	54 (25.4%)	91 (20.2%)	
No	94 (39.5%)	104 (48.8%)	198 (43.9%)	0.000*
To some extent	107 (45%)	55 (25.8%)	162 (35.9%)	
Times of un-refreshing sleep				
Never	149 (62.6%)	53 (24.9%)	202 (44.8%)	
1-2 /month	53 (22.3%)	52 (24.4%)	105 (23.3%)	
1-2/week	27 (11.3%)	76 (35.7%)	103 (22.8%)	0.000*
Daily	9 (3.8%)	32 (15%)	41 (9.1%)	
Sleep satisfaction				
Satisfied	95 (39.9%)	38 (17.8%)	133 (29.5%)	
Not satisfied	30 (12.6%)	79 (36.9%)	109 (24.2%)	
To some extent (satisfied)	62 (26.1%)	38 (17.8%)	100 (22.2%)	
To some extent (not satisfied)	51 (21.4%)	58 (27.2%)	109 (24.2%)	0.000*
Nightmares				
Never or ≤ once/ week	136 (57.1%)	114 (53.5%)	250 (55.5%)	
≥ twice /week	108 (42.9%)	99 (46.5%)	201 (44.6%)	0.440
Sleep apnea				
Never	220 (92.4%)	141(66.2%)	361 (80%)	
< 1time /week	116 (6.7%)	38 (17.8%)	54 (12%)	0.000*
Twice /week	1 (0.4%)	26 (12.2%)	27 (6%)	
≥ 3 times/ week	1 (0.4%)	8 (3.8%)	9 (2%)	
Leg restless				
Never	171 (71.8%)	72 (33.8%)	243 (53.9%)	
< 1time /week	50 (21%)	66 (31%)	115 (25.7%)	0.000*
Twice /week	12 (5%)	47 (22.1%)	59 (13.1%)	
≥ 3 times/ week	5 (2.1%)	28 (13.1%)	33 (7.3%)	

*Statistically significant (Pearson's Chi square test)

Assessing the impact of sleep quality on healthcare students, a notably larger proportion within the poor sleeper's category indicated that their sleep disturbance affected their daily routines and social activities (22.9%), compared to the corresponding figure of 16.8% in the group of good sleepers who experienced a similar effect. Approximately 60.1% of individuals in the poor sleeper group experienced a sense of depression as a result of inadequate sleep, contrasting with 38.2% in the group with good sleep quality. Others also noted this effect, with a notably higher percentage in the poor sleeper group compared to the good sleeper group (15.5% versus 3.8%). Another significant effect of poor sleep quality was being late for class many times per month due to getting up late (16.9% versus 12.2%). Approximately 13.1% of those experiencing poor sleep quality reported attention deficits throughout the day, impacting both their learning and social relationships, in contrast to the 3.8% observed in the other group. A diminished sense of enthusiasm proved to be a more pronounced issue in the poor sleep quality group, significantly affecting their learning and social activities (Table 4).

Table 4: Effect of sleep quality on daily life and activities of health care students

Factors	Good Sleepers (N=238) N (%)	Poor Sleepers (N=213) N (%)	Total (N=451) N (%)	p Value
Participation in routine and social activities				
□ Affects activity	40 (16.8%)	47 (22.9%)	87 (19.3%)	
□ Affects to some extent	104 (43.7%)	106 (49.8%)	210 (46.6%)	0.035*
□ Never affect	94 (39.5%)	60 (28.2%)	154 (34.1%)	
Depressed mood due to sleep problems				
□ Yes	91 (38.2%)	128 (60.1%)	219 (48.6%)	0.000*
□ No	147 (61.8%)	85 (39.9%)	232 (51.4%)	
Others observe your inactive sleepy behaviour				
□ Never observe	103 (33.3%)	63 (29.6%)	166 (36.8%)	
□ some observe	120 (50.4%)	107 (50.2%)	227 (50.3%)	
□ Many observe	9 (3.8%)	33 (15.5%)	42 (9.3%)	0.000*
□ All observe	6 (2.5%)	10 (4.7%)	16 (3.5%)	
Attendance late to class due to sleep problems				
□ Yes	29 (12.2%)	36 (16.9%)	65 (14.4%)	
□ To some extent	100 (42%)	71 (33.3%)	171 (37.9%)	0.114
□ Never	109 (45.8%)	106 (49.8%)	125 (47.7%)	
Attention deficit during the day				
□ Never	159 (66.8%)	78 (36.6%)	237 (52.5%)	0.000*
□ < /week	59 (24.8%)	61 (28.6%)	120 (26.6%)	
□ Twice /week	11 (4.6%)	46 (21.6%)	57 (12.6%)	
□ ≥ 3 times/ week	9 (3.8%)	28 (13.1%)	37 (8.2%)	
Loss Enthusiasm				
□ No problem	87 (36.6%)	52 (24.4%)	139 (30.8%)	
□ Slight loss	100 (42%)	71 (33.3%)	171 (37.9%)	0.000*
□ To some extent loss	24 (10.1%)	26 (12.2%)	50 (11.1%)	
□ Yes, it's a problem	27 (11.3%)	64 (30%)	91 (20.2%)	

*Statistically significant (Pearson's Chi square test)

DISCUSSION

A research project was undertaken within a private medical school with the aim of examining the problem of inadequate sleep quality among students. This issue was identified as a primary factor contributing to students' struggles with maintaining focus during lectures, punctuality issues, and high rates of absenteeism. The study analysed the sleeping patterns of 451 individuals. The study involved the use of the PSQI questionnaire, revealing that 47.2% of the medical school students surveyed were affected by poor sleep quality. These findings were in line with results from other countries, demonstrating the prevalence of insomnia among university students, such as in Hong Kong (7) (57.5%) and Lithuania (8) (59.4%). The current study's outcomes were consistent with those reported in the United States in 2010 (9), revealing that medical students had significantly worse sleep quality than healthy adults, with 50.9% of the participants scoring as poor sleepers according to the PSQI. In contrast, a lower prevalence of poor sleep quality was reported in a Chinese study (10) (19%) and in Brazil (11) (28.2%) when using the PSQI questionnaire. The research article investigates sleeping patterns among healthcare students, shedding light on various factors affecting sleep quality. Gender distribution indicated a balanced representation of males and females in both "Good Sleepers" and "Poor Sleepers" categories. Residence location seemed not to significantly impact sleep quality, with approximately 50% of individuals residing in rural areas in both groups. Notably, academic progression appeared to play a role in sleep quality, in terms of college students' grades, a study revealed that third year students had the highest PSQI scores, indicating poor sleep quality, while postgraduate students had the lowest mean scores, indicating good sleep quality. These findings align with a study by Brick and colleagues in 2010, which also highlighted those students in lower academic years had poorer sleep quality compared to those in higher years (9). This can possibly be attributed to the extensive academic program

during the initial three years of study, which focuses on teaching fundamental medical subjects like anatomy, physiology, pathology, and pharmacology. This curriculum is designed to help students acclimate to the field of medical science, in conjunction with practical clinical experience. The choice of department or field of study also influenced sleep quality, with Medical and Physiotherapy students having the highest percentage of "Good Sleepers" and Allied health science, Nursing and dental students having the highest percentage of "Poor Sleepers."

Family problems, learning difficulties, and examination-related stress emerged as significant factors negatively impacting sleep quality. Additionally, caffeine consumption, leg restlessness, and daytime activities were closely associated with sleep quality. Poor sleep quality was linked to a depressed mood, observed inactive behaviour, and attention deficits during the day. This study found that sleep disorders such as sleep apnea and leg restless were more prevalent in individuals who have poor sleep quality. Pasha et al (12), in their research on medical students in Pakistan, noted that sleep disturbances like sleep apnea and un-refreshing sleep were more common among these students. When it comes to the impact of poor sleep quality on their daily lives and social activities, it significantly affected the activities of 19.3% and had some degree of influence on 46.6% of poor sleepers, with a noticeable effect on their overall mood. This effect was more prominent in poor sleepers compared to those with good sleep quality, and it is a cause for concern. This research underscores the multifaceted nature of sleep quality among healthcare students, highlighting the influence of various factors, including academic progression, department of study, family issues, and lifestyle choices. These findings can be valuable for developing strategies to improve sleep quality in similar educational settings, ultimately benefiting the emotional well-being, daily functioning, and overall experiences of students.

CONCLUSION

In conclusion, this study of healthcare students in a private medical college revealed that a significant portion of the participants experienced poor sleep quality, with various factors contributing to this issue. Third-year students were more affected, likely due to increased academic workload and stress. Poor sleep quality negatively impacted students' daily lives, affecting their participation in routine and social activities, mood, attention span, punctuality, and enthusiasm for their studies. The study emphasizes the importance of addressing sleep-related problems among healthcare students to improve their academic performance and overall well-being. Strategies such as time management and stress reduction techniques should be considered to promote healthier sleep habits. Overall, this research underscores the need for proactive interventions to support the sleep patterns and quality of life of healthcare students, helping them become more motivated, focused, and healthier professionals in the future.

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Conflicts of interest

There are no conflicts of interest

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