

Original Research Article

A study to assess the role of gender in sleep quality among medical students of Andaman and Nicobar Islands

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Received: 13 February 2023; Accepted: 18 May 2023; Published: 27 May 2023.

Abstract: The study aimed to investigate the impact of sleep on daily activities, academic performance, and various factors influencing sleep quality. The Pittsburgh Sleep Quality Index (PSQI) scale was used to collect data from 171 randomly selected medical students. Descriptive and inferential statistical analyses were performed to analyze the data. Results revealed that 40.9% of the study subjects had poor sleep quality, while 59.1% had good sleep quality. No significant association was found between sleep quality and socio-demographic factors or habits. However, statistically significant associations were observed between sleep quality and academic performance indicators, such as feeling of not doing enough, unsatisfactory results, and failing in exams. The study emphasizes the importance of adequate sleep for medical students given their demanding academic and professional roles and suggests that poor sleep quality can negatively impact academic performance. The prevalence of poor sleep quality among medical students may vary across countries due to differences in sample methods, academic stress levels, and social environments. Overall, the findings highlight the need to address sleep-related issues among medical students to improve their well-being and academic success. Further research is required to better understand the complex relationship between sleep quality, gender, socio-demographic factors, and psychological variables.

Keywords: Sleep impact; Sleep quality; Academic performance; Medical students; Prevalence of poor sleep quality.

1. Introduction

A person's pleasure with their sleep experience is determined by, how well they fall asleep, stay asleep, get enough sleep, and wake up feeling rested. Every person's general health and wellness depend on sleep, which is a basic human requirement that is influenced by, a variety of elements, including physical, mental, and environmental influences [1].

According to epidemiological data, insufficient sleep and insufficient sleep length are linked to early death and a number of harmful health effects, including obesity, migraines, immune system suppression and cardiovascular illnesses. Lack of sleep may have a variety of harmful impacts on a person's physiology, including weariness and drowsiness during the day. Also, it has an impact on pupils' attention, working memory, long-term memory, and decision-making abilities [2,3].

This clearly illustrates the value of, getting a good night's sleep and how it affects everyday productivity and focus, both of which have a positive influence on academic success. The majority of people have trouble sleeping, and one-third of adults say, they experience some kind of insomnia. The incidence of insomnia, among primary care patients, was found to be 32.6% in ten different countries, and statistics from additional nations, generally support this finding [4,5].

One subgroup of the general population that appears to be particularly vulnerable to sleep problems is medical students, possibly as a result of their prolonged and intense study schedules, clinical responsibilities that include, overnight on-call shifts, emotionally taxing jobs, and lifestyle choices.

As sleep is crucial for memory consolidation, several studies have found that, insufficient sleep has a deleterious influence on cognitive function and academic achievement. It is thought that the synaptic connections that are active during wakeful periods of time, strengthen during sleep, aiding in the consolidation of memory, even if the precise mechanism behind this function is yet unknown. Together with this influence of sleep on memory, lack of sleep has also been connected to, impaired attention and cognitive abilities [6,7].

Consequently, sleep is essential for the development of memory, concentration, and cognitive abilities, all of which are essential, for achieving scholastic success. Sleep deprivation has an adverse influence on, emotional intelligence in addition to academic performance, making it difficult to empathise with patients and coworkers [8].

Stress associated to exams, coffee use, how often you exercise, and mobile phone usage are all frequent factors that impact how well, students sleep. According to certain research, medical students' stress levels considerably rise around test times, which results in poor sleep and may negatively impact examination performance. College students who eat two or more stimulant beverages had worse sleep quality than those who consume just one, therefore the amount of caffeine ingested can be utilised as a predictor, of poor sleep quality. According to studies, regular exercise increases the length, quality, and effectiveness of sleep. Many research studies have shown a connection between, medical students' mobile phones and social media usage and their sleep habits [9,10].

Gender is one of the non-modifiable elements that is thought to be important, because several studies show that, women have sleep disorders at a higher rate than men. The impact of gender in sleep quality has been compounded, nevertheless, by the increased frequency of emotional disorders in females and other socioeconomic inequalities. Sleep disruption is regarded as one of the primary symptoms of clinical anxiety and depressive disorders because of the well-established link between affective disorders and sleep problems [11].

Nevertheless, it is not apparent if the gender difference in sleep quality may be attributable to females' greater incidence of depression or other socioeconomic disadvantages or whether it is because males and females have biologically different sleep physiologies [10,11].

To choose the right strategy to employ, to address the underlying reason of the gender difference in sleep quality, it is necessary to determine if it is solely due to modifiable variables (such as depression) in predisposed people, or whether it is a biological issue. Consequently, more investigation is required, to determine whether, the connection between gender and sleep issues and socio-demographic or psychological variables is real.

2. Materials and Methods

The Present Cross-sectional study, was conducted by, the Department of Anatomy, at Andaman and Nicobar Islands Institute of Medical Sciences, Port Blair from December 2021 to December 2022.

A total of 171 study subjects were randomly selected, from the Medical College, for the purpose of the study, after meeting the inclusion and exclusion criteria.

2.1. Inclusion Criteria

Aged more than 18 years. A student, bound by the prescribed curriculum, as laid down by MCI/NMC. Should be an Under graduate medical Student of Revised Medical Curriculum (2019 Batch onwards). Comprehends the English Language. Who gives consent.

2.2. Exclusion Criteria

Who are already suffering from insomnia. Who are suffering from a mental illness.

Based on the inclusion criteria, a total of 171 students were randomly selected by lottery method and the data was collected about the assessment of sleep quality and its gender wise distribution in medical students, by interview technique and by the principal investigator, using the Pittsburgh Sleep Quality Index (PSQI) Scale.

The PSQI was developed in 1988, by Buysse and his colleagues, to create a standardized measure, designed to gather consistent information, about the subjective nature of peoples' sleep habits and provide a clear index, that both clinicians and patients can use. The Pittsburgh Sleep Quality Index (PSQI) is a self-report questionnaire, that assesses sleep quality over a 1-month time interval [12].

Table 1. Distribution of study subjects based on social profile and screen time usage

		Frequency	Percent
Gender	Female	119	69.6
	Male	52	30.4
Year of study	First	53	31.0
	Second	27	15.8
	Third	44	25.7
	Fourth	47	27.5
Screen time	2-4 hrs	51	29.8
	4-6 hrs	68	39.8
	6-8 hrs	37	21.6
	>8 hrs	15	8.8

Consisting of 19 items, the PSQI measures several different aspects of sleep, offering seven component scores and one composite score. The component scores consist of, subjective sleep quality, sleep latency (i.e., how long it takes to fall asleep), sleep duration, habitual sleep efficiency (i.e., the percentage of time in bed that one is asleep), sleep disturbances, use of sleeping medication and daytime dysfunction.

Each item is weighted on a 0-3 interval scale. The global PSQI score is then calculated by totalling the seven component scores, providing an overall score ranging from 0 to 21, where lower scores denote, a healthier sleep quality.

The data was entered in Microsoft Excel. Both descriptive and inference statistical analysis were used, to analyze the data. Data was analyzed using the SPSS statistical program (IBM SPSS statistics 20). Chi square test was applied and P value less than 0.05, is considered as significant.

3. Results

A total of 171 study subjects were interviewed for the purpose of the study and analysed.

In the present study, [Table 1] majority of the study subjects were females - 69.6% and 30.4% of them were male study subjects. Among the study subjects, 31% of them were first year, 15.8% of them were in second year, 25.7% of them in third year and 27.5% of them in final year. The usage of screen time per day was estimated and found that 29.8% of them had 2-4 hours of usage time, 39.8% of them had 4-6 hours, 21.6% of them had 6-8 hours and 8.8% of them had more than 8 hours of screen usage time, per day.

In the above [Table 2], the responses of the study subjects showing the impact of sleep, on their daily activities and academic performance is seen.

In the Present study [Table 3] 40.9% of the study subjects had poor sleep quality and 59.1% of them had good sleep quality.

[Table 4] On applying the statistical test, to assess the association between Sleep quality and the socio demographic Profile, it was found to be statistically insignificant, with all the variables. Even the association between the Habits and the Sleep Quality was found to be statistically insignificant, with all the variables.

[Table 5] On analysing the academic performance with the sleep quality, the feel of 'not doing enough' effort for studies, not getting the results which are satisfactory and failing in the exams, were found to be statistically significant with the quality of the sleep of the study subjects.

4. Discussion

Getting enough sleep can enhance mood, reduce stress, strengthen the immune system, and sharpen thinking and memory. To maintain adequate sleep quality, young adults need to sleep between 7 and 9 hours per night. According to studies, sleep is essential because, it improves and stabilises cognitive abilities and preserves physical health, both of which, are required for medical students, to successfully digest, vast quantities of complicated knowledge.

According to a global assessment, sleep disorders impact a significant fraction of medical students, affecting 41% of participants in Iran, 70% of participants in Hong Kong, and 90% of participants in China [13]. According to studies, 50 to 70 million Americans experience persistent sleep difficulties [14]. A healthy

Table 2. Distribution of study subjects based on the habits and academic performance

		Frequency	Percent
Medications	Yes	18	10.5
	No	153	91.5
Illness	Yes	19	11.1
	No	152	88.9
Recreational drug	Yes	18	10.5
	No	153	89.5
Tea/coffee	Yes	105	61.4
	No	66	38.6
Addictive habit/behaviour	Yes	28	16.4
	No	143	83.6
Peers	Yes	109	63.7
	No	62	36.3
Academic tasks	Yes	142	83.0
	No	29	17.0
Not doing enough	Yes	134	78.4
	No	37	21.6
Result are not satisfactory	Yes	98	57.3
	No	73	42.7
Regretful about having chosen MBBS	Yes	41	24.0
	No	130	76.0
Failing in your exams	Yes	138	80.7
	No	33	19.3

Table 3. Distribution of study subjects based on the sleep quality

Sleep quality	Frequency	Percent
Poor	70	40.9
Good	101	59.1

Table 4. Association of Sleep quality with the social profile and the Habits of the study subjects

		Sleep quality		Total	P value(chi square p value)
		Poor	Good		
Gender	Female	45	74	119	0.209
	Male	25	27	52	
Year of study	First	20	33	53	0.199
	Second	11	16	27	
	Third	14	30	44	
	Fourth	25	22	47	
Screentime	2-4 hrs	22	29	51	0.920
	4-6 hrs	27	41	68	
	6-8 hrs	14	23	37	
	>8 hrs	7	8	15	
Medication	Yes	9	9	18	0.409
	No	61	92	153	
Illness	Yes	9	10	19	0.545
	No	61	91	152	
Recreational drug	Yes	9	9	18	0.408
	No	61	92	153	
Tea/coffee	Yes	45	60	105	0.519
	No	25	41	66	
Addictive habit/behaviour	Yes	14	14	28	0.286
	No	56	87	143	

Table 5. Association of Sleep quality with the Academic Performance

		Sleep quality		Total	P value(chi square p value)
		Poor	Good		
Peers	Yes	49	60	109	0.156
	No	21	41	62	
Academic tasks	Yes	62	80	142	0.109
	No	8	21	29	
Not doing enough	Yes	64	70	134	0.001*
	No	6	31	37	
Result are not satisfactory	Yes	48	50	98	0.013*
	No	22	51	73	
Regretful about having chosen MBBS	Yes	21	20	41	0.125
	No	49	81	130	
Failing in your exams	Yes	63	75	138	0.010*
	No	7	26	33	

sleep schedule promotes the brain's optimal operation, which helps people learn more and understand new ideas. University students struggle with this issue because of the relatively high academic load [15].

Medical students are prone to stress because of their highly demanding professional roles and academic requirements. Several studies have demonstrated that, university-level students from different countries, like 24% from the United Kingdom, 30% in Korea, and 49% in Taiwan, slept less than 7 hours per night [16–18]. The academic performance of many students is affected by their inadequate sleeping habits, which is not much realized by students. Studies in developing countries revealed, that 32.5-76% of medical students, suffer from poor sleep quality [19].

In the present study, the proportion of the study subjects with poor sleep, was found to be 40.9% of the study subjects. The findings of our study was found to be comparable and similar to the study done by, Paudel K *et al.*, [20] where 38.2% of them had poor sleep quality and also in the study done by Sundas N *et al.*, [21] in Nepal with 44.3% of medical students suffering from poor quality of sleep. In another study done in Central India [22], poor sleep quality was seen in 32.5% of the medical students. Surani A A *et al.*, [23] study in Pakistan also reported, the poor quality of sleep in 39.5% of medical students. Our study findings were found to be much lesser than the study findings of Mirghani H O *et al.*, [24] done in Sudan where, poor sleep quality was 61.4% in medical students and in the study done by Almojali AI *et al.*, [19] in Saudi Arabia, the poor sleep quality was seen in 76% of medical students.

The longer duration of medical education (5.5 years), which is longer than any other undergraduate programme in India, may be the cause of the higher prevalence of poor sleep quality among medical students. Poor sleep habits, may have been made worse by the fact that, medical students are more susceptible to academic stress and have less free time than students in other fields. The variance between the nations may be caused by, variations in sample methods, medical school years, and social environment exposure.

In the current study, it was found that medical students' sleep quality was influenced by their academic performance. Poor sleep quality was more likely to occur, when first-year students failed their internal exam or their previous board exam. In the studies done by Almojali A I *et al.*, [19] in Saudi Arabia, Li Y *et al.*, [25] in China and Lemma S *et al.*, [26] in Ethiopia, all opined, similar to our study findings. Furthermore, sleep disturbed students are usually unaware that sleep deprivation can negatively impact their examination preparation, performance and impair their ability to complete the task too.

The predominant role of emotional disorders and socioeconomic inequalities is assigned to, the gender difference in sleep issues, indicating that these may be the route factors via which, the gender difference in bad sleep is manifested. Due to the poor sleep quality, the gender difference in our research was determined to be statistically insignificant. In the study done by Fatima Y *et al.*, [27] Gender difference in sleep quality remained significant, even after controlling sociodemographic and lifestyle factors as well as depression; although, after controlling these covariates, the effect of gender on sleep quality was slightly attenuated.

Female predisposition for poor sleep quality is perhaps driven by, the gender-based differences in the biology of sleep or some other variable we failed to include in our analysis (eg, family history of poor sleep) and is further aggravated by, higher affective disorders in females [28].

5. Conclusion

In conclusion, poor sleep quality is a major problem among young adults, as more than half of the study subjects were found to have poor sleep quality, with even higher prevalence rates for female subjects. It should be noted that gender difference in sleep quality and sleep problems could not be solely attributed to the higher prevalence of affective disorders in females or socio-economic disparities. The differential impact of some lifestyle and sociodemographic factors on poor sleep quality, requires further confirmation from longitudinal studies, to help in understanding the direction of association and implementation of effective intervention strategies.

Author Contributions: All authors contributed equally to the writing of this paper. All authors read and approved the final manuscript.

Conflicts of Interest: "The authors declare no conflict of interests."

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