Section: Community Medicine

Original Research Article

SLEEP QUALITY AND SLEEP DEPRIVATION AMONG MEDICAL STUDENTS OF SOUTH TAMIL NADU

Gopal Muthukrishnan[1], Krishnaprasad C[2], Suresh Balan K U[3]

[1]*Associate Professor, Department of Community Medicine, Kanyakumari Govt. Medical College, India.*
[2]*Assistant Professor, Department of Community Medicine, Kanyakumari Govt. Medical College, India.*
[3]*Professor, Department of Community Medicine, Kanyakumari Govt. Medical College, India.*

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Corresponding Author:
Dr. Gopal Muthukrishnan,
Associate Professor, Department of Community Medicine, Kanyakumari Govt. Medical College, India.
Email: kmcgopal2001@gmail.com

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ABSTRACT

Background: Health is a state of complete physical, mental and social wellbeing. The quantity and quality of sleep have a special influence in the achievement of good health in all age group. The Medical field is a very demanding profession necessitating the student to participate in full to even achieve the minimum. The academic achievement, the alertness to one's surrounding and the mental integrity of the medical students depends largely on a good sleep pattern, that ensures the student to be prepared for the next day's task. The underachievement of medical students irrespective of good school performance warrants a thorough understanding of their sleep pattern and the various determinants influencing it. **Objective:** The study aims to estimate the prevalence of sleep quality problems among undergraduate medical students and identify their associated sociodemographic risk factors.

Materials and Methods: A cross sectional survey was conducted with 213 undergraduate medical students aged 17 to 25 yrs in a government medical college in Kanyakumari district. The data was collected using structured questionnaire that included sociodemographic and behavioural information and the Pittsburgh Sleep Quality Index (PSQI). The participants were categorised into two groups based on their average sleep duration into sleep deprived (<6hrs) and normal sleep (6-8 hrs). the association between sleep patterns, health symptoms and sociodemographic variables were analysed using descriptive statistics and correlation analysis.

Results: 47.4% of the medical students had sleep deprivation, with an average sleep duration was 6.14 hrs (SD= 1.15). There was higher percentage of sleep deprivation among female students (50.8%). The off-campus resident had more sleep deprivation (63.6%).

Conclusion: sleep deprivation is highly prevalent among medical students and showing significant association with gender and living environment

Keywords: Sleep deprivation, medical students, Pittsburgh sleep quality index, well being.

INTRODUCTION

The sleep is a natural phenomenon which is influenced by the physical and physiological condition of the human body. It is a vital ingredient of human well being. The personal and professional demands of the medical students force them to have a compromised sleep pattern than non-medical students.[1] Studies show that a significant proportion of medical students experience chronic sleep deprivation that alters their emotional stability,[2]

There are several risk factors in medical students like academic expectation, peer pressure, long study hours that contribute to sleep deprivation.[3] These factors lead to increased anxiety, stress and leads to different patterns of unhealthy sleep hygiene. The long-term sleep deprivation if uninterrupted, lead on to increase chance of cardiovascular diseases, obesity, metabolic syndrome, and mental health issues. The need for robust working memory, attention span and reaction time for medical students is jeopardised by sleep deprivation.

In spite of the growing awareness on the need for good sleep hygiene, there is limited research focussing on the medical students encounter with sleep loss, particularly in developing countries. The purpose of the study was to address the gap created by analysing the sleep pattern, prevalence of sleep deprivation and its associated factors among medical students. Indirectly the study findings aim to contribute to the improvement of student well being.

MATERIALS AND METHODS

Study design and Sample

A cross-sectional survey was conducted among medical students of government medical college in Kanyakumari district using the systematic random sampling technique. A total of 213 medical students were recruited in the study. The students ranged from 2nd year MBBS to intern students. The participation in the study was voluntary and informed consent was obtained from the participants before administering the questionnaire, after ensuring confidentiality. The data on sleep quality was collected using the Pittsburg sleep quality index (PSQI) standard questionnaire.[4] The study was conducted after getting prior permission from the Institute ethics committee. The final sample size was arrived using the formula $\frac{z^2pq}{d^2}$.

Data Collection

The data collection tool was divided into three parts. The first part gathered the sociodemographic details like age, sex, year of study, resident. The second part was the 19-item self-reported PSQI questionnaire, generating the sleep quality score ranging from 0 to 21. The higher the PQSI score, poorer is the sleep quality. Any values greater than five are recorded as poor sleep quality.[4] The third part consisted of questions on symptoms of headache, feeling of stress, anxiety and any counter mechanism adopted.

Data analysis

The summary statistics were done using descriptive statistics. The categorical variables were presented as proportions and percentages. Their association with sleep deprivation were done using the chi square test. A $p<0.05$ was considered significant. Mean scores were calculated for PSQI components. The analysis was performed using SPSS software trial version.

Objective

To assess the prevalence of sleep deprivation among medical students.

To evaluate the severity of poor sleep quality among medical students using the Pittsburgh Sleep Quality Index (PSQI) scale.

To determine the association between sociodemographic variables and poor sleep quality among medical students.

RESULTS

A total of 213 medical students participated in the study. 81% of students belonged to the age group of 17 to 22 yrs. Out of the 213 medical students, 118 (55.4%) were girls. With regard to residents, 87% students stayed on-campus hostel, 5% students with their parents and 17 students stayed off-campus stay homes. The mean sleep duration was 6.14 hrs per night (SD 1.15). Using the standard classification of normal sleep duration (6–8 hours per night), 112 students (52.6%) were categorized as having normal sleep patterns, while 101 students (47.4%) were classified as sleep-deprived, reporting less than 6 hours of sleep per night. A small subset of participants (n = 9, 4.2%) reported sleeping more than 8 hours. Among the 118 female students, 58 (49.2%) exhibited normal sleep patterns, while 60 (50.8%) were classified as sleep-deprived. In comparison, among the 95 male students, 54 (56.8%) reported normal sleep duration, and 41 (43.2%) were sleep-deprived.

Among the 185 students residing in on-campus hostels, 95 (51.4%) reported normal sleep patterns, while 90 (48.6%) were classified as sleep-deprived. Of the 17 students living off-campus, 6 (36.4%) had normal sleep, and 11 (63.6%) were sleep-deprived. Among the 11 students residing with parents or family, 8 (76.5%) exhibited normal sleep patterns, whereas 3 (23.5%) were sleep-deprived. A total of 95 students (44.6%) reported experiencing physical symptoms such as headaches and nausea "sometimes," while 78 students (36.6%) reported experiencing these symptoms "rarely." A weak negative correlation was observed between sleep duration and the frequency of physical symptoms (r = –0.12), suggesting that students with shorter sleep durations tended to report physical complaints more frequently.

In response to the questions on coping mechanism adopted for mitigate sleep deprivation, 61.5 % of the participants had tried some of the methods available, yet 59% of those who used them still had sleep deprivation.

Table 1: Sociodemographic and behavioural distribution of study participants (N=213)

Characteristics	Variables	Frequency (%)
Age (yrs)	17-22	172 (81)
	>22	41 (19)
Gender	Boys	113 (44.6)
	Girls	118 (55.4)
Residence	On-campus hostel	185 (87)
	Off-campus stay home	17 (7)
	With parents	11 (5)
Duration of sleep	< 6hrs	101 (47.4)
	≥ 6hrs	112 (52.6)

Coping mechanism (N=101)	Yes	131 (61.5)
	No	82 (38.5)

Table 2: Distribution of Sleep Deprivation by Gender (N=213)

Gender	Sleep Deprived	Not Sleep Deprived	Total (%)
Male	41 (40.6)	54 (48.2)	95
Female	60 (59.4)	58 (51.8)	118
Total	101	112	213

The chi square value is 1.24, which was not statistically significant at $p<0.05$.

Table 3: Distribution of Sleep deprivation by residents (N=213)

Resident	Sleep deprived (%)	No sleep deprived (%)	Total
On campus hostel	90 (86.5)	95 (87.2)	185
with parents	3 (2.9)	8 (7.3)	11
Off campus hostel	11 (10.6)	6 (5.5)	17
	104	109	213

The chi-square statistic is 3.7632. The p-value is .15235. The result is not significant at $p < .05$.

Table 4: Distribution of study participants self-perception sleep quality ratings

Parameter	Rating	Percentage (%)
Stay asleep without waking in the night	Very poor Poor Fair Good	3.8 10.8 33.5 51.9
Satisfaction with current sleep pattern	Very poor Poor Fair Good	8 22.6 41.6 27.8
Feeling of sleepy during the working day	Never Rarely Sometimes often	28.4 12.8 56.9 1.9
Waking up refreshed in the morning	Never Rarely Sometimes often	9.5 19.9 41.5 29.1

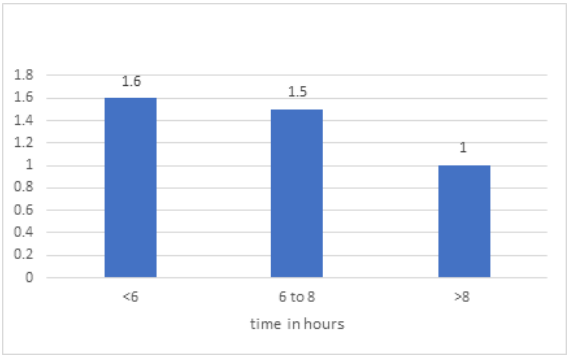

Figure 1: Average Physical Symptoms by Sleep Duration

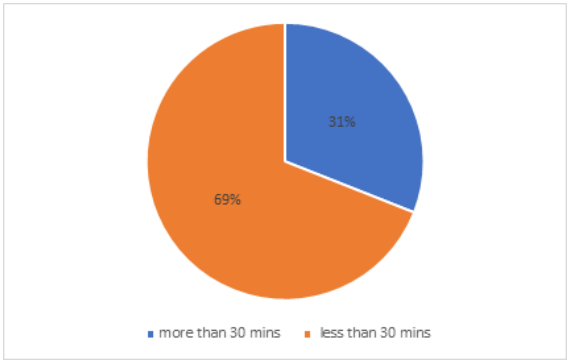

Figure 3: Distribution of Study Participants by Time Taken to Fall Asleep

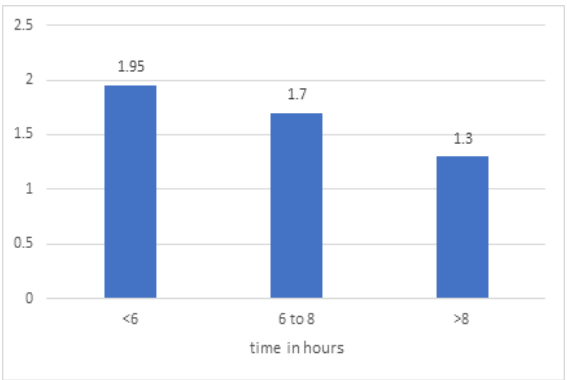

Figure 2: Average Mental Symptoms by Sleep Duration

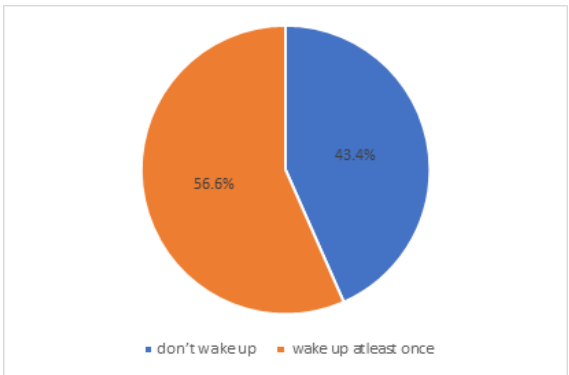

Figure 4: Distribution of Study Participants by Night time Awakening Status

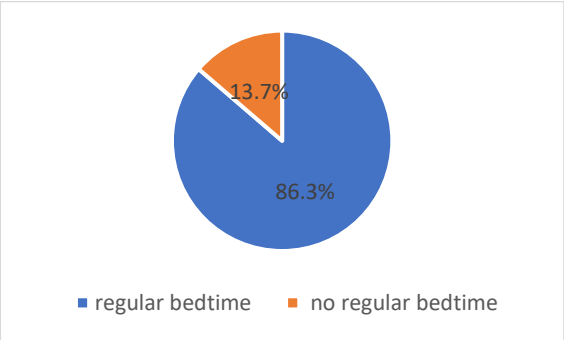

Figure 5: Distribution of Study Participants by Regularity of Bedtime and Wake Time

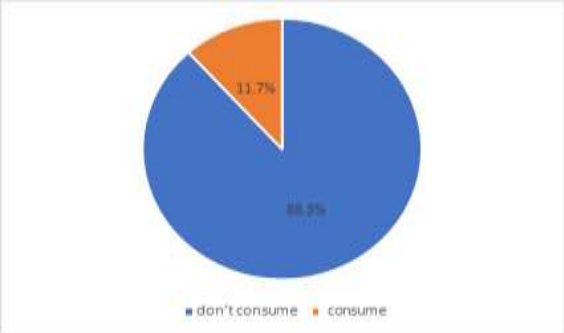

Figure 6: Distribution of study participants by caffeine or beverage consumption before bedtime

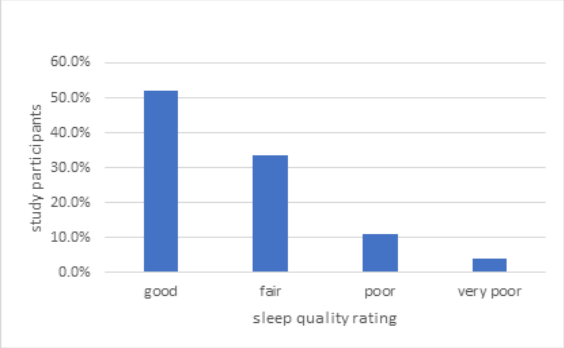

Figure 7: Sleep quality rating among study participants

DISCUSSION

The findings of the study highlight the prevalence of sleep deprivation among medical students, with nearly half of the participants (47.4%) reporting less than 6 hrs continuous sleep per night. These findings were more than the study done by Pan Ding et al. in medical university of eastern China, which showed a prevalence of 19.4%.[5] The average sleep duration among study participants was 6.14 hrs, which was similar to the findings of only 6.5 hrs [95%CI 6.24; 6.64] in the meta-analysis of the valid research articles by Mohammed A Binjabr et al.[6]

The gender-based analysis revealed that female medical students (50.85%) were slightly more affected with sleep deprivation than their male colleagues probably due to higher level of physical and physiologic stress and anxiety. It was consistent with the multicentric study done in Brazil by Bruno Perotta et al.[7] It could also reflect on the gender differences in coping mechanism and stress management. The finding was reflected also in the Indian study participants done in undergraduate medical students in Belgaum, North Karnataka done by Kanyadi SR et al., which had an adjusted Odds ratio of 2.381.[8]

Living residence emerged as a significant factor influencing sleep patterns. The students living with their parents had better sleep quality, with 76.47% reporting normal sleep in comparison to 63.64% of those living off-campus stay houses were sleep deprived. The results suggest that the social and environment benefit provided by staying with family may mitigate some of the stressors. The on-campus living posed challenge to sleep in nearly 50% of the participants probably due to communal living environment, noise, shared facilities and academic peer pressure. The findings were consistent with the comparative study done by Ajesh et al.[9]

In the study done by Stipe Vidovic et al. on sleep deprivation effect on mental health in medical students of Croatia has found the prevalence of anxiety to be 45.3% in them.[10] The overall prevalence of poor sleep quality in that study was 67.9% which was similar to the present study, probably due to altered emotional and cognitive function. In the present study, 31% of the study participants had increased sleep latency of more than 30 mins, which was close (27.9%) to the study done by Mengjia Jin et al. in medical students of eastern China.[11]

The study showed increased prevalence of physical health symptoms and poor attention among sleep deprived medical students, although the findings were not statistically significant. The findings were consistent with the study done by Jamunarani Srirangaramasamy et al. in medical students of Tamil Nadu.[12] Despite the use of coping strategies practiced by study participants for sleep deprivation, 59% of them still reported poor sleep quality. The finding was similar to the study done by Fahad Abdulaziz Alrashed et al. in medical students of Saudi Arabia, that showed selected coping strategies only are not sufficient.[13]

Limitations

The cross-sectional design limited to one institution retards the ability of the study to establish causality and generalisability. Additionally, over reliance on self-reported data introduces the possibility of reporting bias, which must be compared with more objective measures such as polysomnography. Future research must explore the specific nuances of medical students work ethics, academic and examination pressures that could shine more light on the barriers of sleep.

CONCLUSION

Sleep deprivation are common occurrences among medical students especially the girl students staying at off-campus stay homes. The poor sleep quality in

medical students invariably will affect their physical, mental and academic performance in the long run. There is an urgent need to monitor the students for sleep deprivation through NMC mentorship program, balancing of leisure and study time through emphasis on sports and group talk and by supporting their desire to achieve more.

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