

Sleep Efficiency and Its Determinants: A Cross Sectional Study among Medical Students

Vidya V. Patil¹, Manu A. S.², Yallappa Reddy H.M.³

^{1,2}Associate Professor, Department of Community Medicine, S S Institute of Medical Sciences and Research Centre, Davangere, Karnataka, India

³Associate Professor, Department of General Medicine, S S Institute of Medical Sciences and Research Centre, Davangere, Karnataka, India

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Corresponding author: Dr. Vidya V. Patil

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Abstract

Background: Sleep is a physiological process and is essential to life. Worldwide over 60% of the population suffer from poor sleep quality. It is strongly related to psychological and physical health and other measures of well-being. In the last few years, there has been a growing attention to sleep and sleeplessness-related problems. This interest is mainly due to the recognition that sleepiness and fatigue are becoming endemic in the population.

Objective: To determine the degrees of sleep efficiency and factors related to it among medical students.

Methodology: A cross sectional questionnaire based study was conducted among medical students during February to April 2023. Medical students who were present on the day of filling the questionnaire and gave written consent were included in the study. A pretested questionnaire related to socio-demographic details and sleep pattern was used.

Statistical analysis: The data was entered in excel sheet and represented in frequencies, percentages and graphs.

Results: A total of 521 students were included in the study. A total of 71% of the students reported poor to moderate sleep efficiency (30% poor & 41% moderate). Excessive screen was the highest reported factor for the decrease in sleep efficiency.

Conclusion: Higher proportion of medical students have poor to moderate sleep efficiency with factors like high screen time, academic procrastination, excessive intake of coffee.

Keywords: Sleep Efficiency, Determinants, Sleep Disturbances, Medical Students.

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Introduction

Sleep is a physiological process and is essential to life. Worldwide over 60% of the population suffer from poor sleep quality. It is strongly related to psychological and physical health and other measures of well-being. [1] Poor sleep has been categorized as the 3rd most common hindrance among college students. Sleep can be considered as a maintenance and repair period of the body during which the metabolites that have accumulated throughout the day are cleared, and mental stress and anxiety are relieved. Hence it goes without saying that anything that disturbs the sleep pattern impairs these protective and repair functions, and leads to physical as well as mental manifestations [2]. It has been related to lack of attention span, decreased academic performance, disturbed social interpersonal relationships [3] Sleep disturbances is a distressing and disabling condition that affects many people, and can effect on quality of work and education of medical students and residents. In the

last few years, there has been a growing attention to sleep and sleeplessness-related problems. This interest is mainly due to the recognition that sleepiness and fatigue are becoming endemic in the population. University students report significantly worse sleep quality than the general population. [4] Low quality of sleep has a negative impact on academic success and also can create behavioural and emotional problems can have a negative impact on emotional status, can increase the habit of consuming alcohol and smoking habits. It has also been found that, there is a link between sleep quality and psychological wellbeing; more psychological diseases are observed among university students with low sleep quality. [5] Skipping breakfast, higher tendency towards internet addiction, stress, poor social interactions were also associated with low quality of sleep. Screen exposure, especially near bedtime, directly leads to poor sleep quality. [6] Sleep deprivation

negatively affects cognitive functions [7] and can also lead to depression, stress, and anxiety [8,9]. With this background this cross sectional study was conducted among medical students to learn about the sleeping behaviour and factors related to it.

Objective: To determine the grades of sleep efficiency and its determinants among medical students.

Material and Methods

This cross-sectional study was conducted during February to April 2023 after the Institutional Ethical committee approval. The study proforma was distributed to first, second, third, and final-year undergraduates through a questionnaire at the end of the lecture class. Students were explicitly briefed on the study's purpose, confidentiality, and the voluntary aspect of participation, allowing withdrawal at any time. Those who gave their consent were the study subjects. A proforma is created with the following sections: (a) Participant consent and General Information, (b) Question related to sleep pattern and problems. Operational definition of Sleep Efficiency: ratio of total sleep

time (TST) to time in bed (TIB) (multiplied by 100 to yield a percentage). [10]

Inclusion Criteria

1. 1st, 2nd, 3rd, 4th year medical students of a private medical college in central Karnataka.
2. Students who give voluntary consent.

Exclusion Criteria

1. Those who are not giving voluntary consent
2. Those who are on psychiatric interventions.

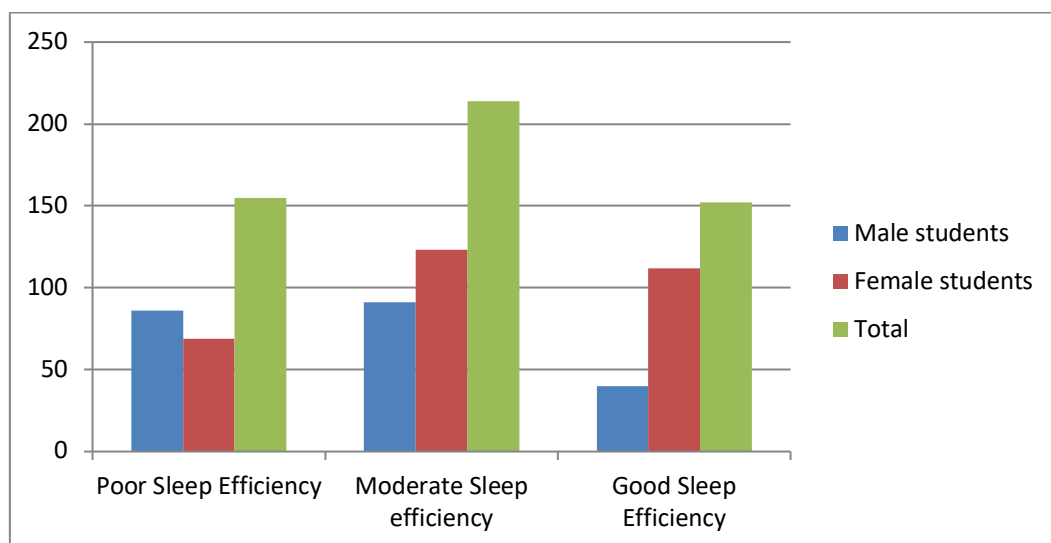
Statistical Analysis: The data was analysed using Microsoft Excel. Descriptive analysis like proportion, percentages, graphical representation was used for reporting socio demographic data and distribution of sleep pattern and sleep problems among the study subjects.

Results

Table 1: A total of 521 students participated in the study. 70% of the students were in the age group 18 -21 years, around 56% of them were female students, majority of the study participants were staying at hostel.

Table 1: Socio-demographic details of the study participants

Age	Category	No (%)
Age	18-21	365(70)
	22-25	156(30)
Gender	Male	227(44)
	Female	294(56)
Place of stay	Hostel	399(77)
	Day Scholar	122(23)
Year of degree	1 st	160(31)
	2 nd	136(26)
	3 rd	132(25)
	4 th	93(18)
Total		521(100)



Graph 1: Grades of Sleep Efficiency among male and female students

Table 2: Determinants of sleep problems or sleep disturbances

Characteristics	Poor-sleep efficiency	Moderate-sleep efficiency	Good-sleep efficiency	Total
Excessive coffee intake	89(34)	108(41)	64(25)	261(100)
Smoking	24(52)	12(26)	10(22)	46(100)
Alcohol	52(72)	10(14)	10(14)	72(100)
Physical Inactivity	102(44)	86(37)	45(19)	233(100)
Excessive screen time	137(35)	170(43)	89(22)	396(100)
Perceived exam anxiety	86(46)	43(23)	56(30)	185(100)
Subjective academic procrastination	94(32)	112(38)	89(30)	295(100)
Academic low performance	51(28)	87(48)	44(24)	182(100)
Low mood	34(38)	44(48)	12(13)	90(100)
Decreased concentration	67(41)	88(54)	07(4)	162(100)
Daytime sleeping	36(40)	43(47)	12(13)	91(100)
Decreased social well being	22(56)	10(26)	07(18)	39(100)
Headache	12(38)	08(25)	12(28)	32(100)
Fatigue	37(54)	20(29)	12(17)	69(100)

*multiple choices

Table 3: The above table describes that the major consequences or determinants of a disturbed sleep is excessive screen time, physical inactivity, excessive caffeine intake and procrastination in academic related activities. The proportion of these determinants is more in the poor to moderate sleep efficiency category. Other significant factors include day time sleepiness, low mood decreased concentration and decreased social well-being.

Discussion:

In the light of this research we can infer that more than half of the students have poor to moderate sleep efficiency, where our results are in accordance with past researches done on the subject. Similar studies reported poor sleep quality. In a similar research in US it was observed that 71% of the students have sleep disturbances. [11] Around 56% of the students have low or poor sleep in a research conducted by Karatay and colleagues. Similar research among university students has low quality of sleep. [12] According to Karatay et al., [12] Sari et al., [13] Vail-smith et al., [14] students who smoke have lower sleep quality and affects sleep quality negatively. Shcao et al., [15] showed that caffeine containing drinks also harms the sleep quality. Our study also showed the similar results.

The results of a research reported that 66% of the participants had poor sleep quality, among them 73% of them were males and 60% of them were females, which is similar to our results. [12] A study done in South India revealed around 48% of professional college students had excessive daytime sleepiness. 55% of the students had poor quality of sleep. Few studies are in the favour of our results, poor sleep is most commonly associated with oversleeping on weekends, abusing caffeine, alcohol and other drugs. Poor sleep quality may also be associated with negative academic performance [16]. It also negatively

affects attention, working memory, and other cognitive functions [17]. Various studies have also reported an association of poor sleep quality with depression and anxiety [18]. A study conducted among 4915 college students reported that students whose screen time is > 2hours/day had poorer sleep quality (Odds ratio:1.32) [19] In another it reported the mean screen time for participants with poor sleep quality was 152.63 while for those with good sleep quality was 137.67,13 Our study also highlights excessive use of smartphone usage especially during bed time which decreases the sleep latency and duration thus reducing the sleep efficiency. Female had significantly higher prevalence of low physical activity and poor sleep quality. In the same study high physical activity was negatively associated with anxiety, depression and poor sleep quality. It also concluded that physical activity is an efficient remedy and preventable measure for poor sleep. [20] Excessive smartphone use is positively correlated with impulsivity, poor sleep quality, and bedtime procrastination. [21] It was also reported from a study that smartphone addiction was positively related to academic procrastination and bed time procrastination which decreases the sleep efficiency as was reported in our study. [22]

Conclusion and Recommendation: Higher proportion of medical students have poor to moderate sleep efficiency with factors like high screen time, academic procrastination, excessive intake of coffee. Our findings highlight the necessity of curbing excessive smartphone usage as well as to explore the remedies to help students improve their sleep efficiency.

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