ORIGINAL ARTICLE

# Sleep Disturbance and Daytime Sleepiness among Undergraduate Medical Students in Islamabad: A Single-Institution Cross-Sectional Study

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**ABSTRACT**

**Objective**: To determine the prevalence of poor sleep quality and daytime sleepiness among undergraduate medical students and to explore the association between the two scores. Additionally, to compare the sleep quality and daytime sleepiness across gender and academic levels, and identify key factors associated with poor sleep quality and daytime sleepiness, including BMI, screen time, smoking, and exercise.

**Study Design**: Cross-sectional study.

**Place and Duration of Study**: The study was conducted at the Department of Community Medicine, HBS Medical and Dental College, Islamabad, Pakistan from 26th April 2024 to 30th January 2025.

**Methods**: A total of 330 undergraduate students were included in the study. A stratified random sampling technique was employed. The data collection in this study consisted of a questionnaire developed through a comprehensive review of relevant literature. The initial pool of items was derived by examining widely cited theoretical frameworks and empirical studies on sleep disturbances and sleep quality. The questionnaire underwent an expert review, and a pilot test was subsequently conducted with a sample of 20 participants to refine the wording, assess item clarity, and determine internal consistency. Data were collected through a self-administered questionnaire in English, which was entered, managed, and analyzed using SPSS version 25.

**Results**: Among 330 undergraduate medical students, 64.2% were females, and the mean age was 21.47±1.776 years. The majority of medical students (71.5%) had poor sleep quality, with a mean poor sleep score of 6.73±3.328. Daytime sleepiness was prevalent among 41.5% of medical students, with a mean of 9.17±3.838. A statistically significant association was found between sleep disturbance and daytime sleepiness ($P \leq 0.001$).

**Conclusion**: The study concluded that both sleep disturbance and daytime sleepiness were observed among medical college undergraduate students, but sleep disturbance was more prevalent than daytime sleepiness. A significant association was found between sleep quality and daytime sleepiness, with gender and academic year identified as associated factors.

**Keywords**: *Daytime Sleepiness, Medical College, Sleep Disturbance, Undergraduate Students*.

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## Introduction

Sleep is one of the essential components of physical as well as mental health.[1] Healthy sleep duration among normal adults is mostly between 7 and 9 hours. Although napping for <30 minutes daily improves learning by promoting alertness, daytime sleepiness disturbs the learning of students and their overall health status.[1,2] It is a sleepiness condition and enhanced falling asleep related to tiredness, as well as loss of mental alertness when an individual is supposed to be awake.[2] Lack of sleep and manifestations associated with sleep disturbances are often overlooked and poorly recognized.[3]

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Sleep disturbances are prevalent in the contemporary world; about one-third of adults describe some insomnia. Medical students comprise a particularly more susceptible population than the non-medical students, as well as the general population. It is the outcome of several factors that contribute to stress, and some of them comprise excessive academic load, extended study sessions, crammed schedules, peer pressure, examination stress, high expectations of parents, and a highly competitive environment.[4] Among medical college students, sleep problems range from 19-90% worldwide.[5] The sleep disturbance symptoms are different. Most sleep disturbances comprise: sleeplessness at night, tiredness, continuous sneezing or snoring throughout sleep, involuntary sleeping spells or sleep attacks, lack of muscle function, and inability to move, for example, sleepwalking and prolonged daytime sleepiness.[6]

Daytime sleepiness is the uncontrolled dozing off and drowsiness during the day, causing an inability to remain cautious and alert while performing daily activities. Daytime sleepiness can lead to limitations in reaction time & vigilance, subjective fatigue, cognitive functioning, work tasks & driving, logical reasoning, memory recall, and workload.[7] It is more prevalent among medical students. Almost 50% of students report daytime sleepiness.[8] Daytime sleepiness and being un attentive in undergraduate medical college students may be due to several associated factors, for example, stress caused by learning environment & personal issues, feelings of anxiety & depression, habits such as drinking alcohol & smoking, overdrinking caffeine, and a sedentary lifestyle. Other factors that could influence medical college students regarding daytime sleepiness are sociodemographic factors, namely age, gender, BMI, year of study, parents' occupation & marital status, and others.[9] Several cognitive and neurobehavioral effects of sleepiness have also been recognized, specifically with memory, learning, concentration, decision making, and enhanced risk taking. Also, inadequate sleep impacts academic performance, which has been noticed by a significant majority (82%) of undergraduate medical students. Besides stress, sleep issues are ranked by medical students as an important factor that negatively affects their educational performance.[10]

Sleep disturbance in medical college students is becoming an increasingly serious problem worldwide. However, very few studies are available in Pakistan that can help determine the prevalence of sleep disturbance among medical students. Therefore, conducting a study to assess sleep disturbance and daytime sleepiness among medical college undergraduate students in Islamabad is pertinent.

The study aims to assess the prevalence and interrelationship of poor sleep quality and daytime sleepiness more than usual among undergraduate medical students, and to evaluate the influence of demographic and lifestyle factors such as gender, academic level, BMI, screen time, smoking, and exercise on sleep health Medical students face demanding academic challenges leading to sleep deprivation, which may impair cognitive functions, learning efficacy, and mental health. Despite its importance, research on the prevalence and contributing factors of poor sleep quality and daytime sleepiness in undergraduate medical students, as well as comparisons based on gender and academic year, remains limited. By addressing these gaps, this research will provide data-driven insights to guide institutional policies and interventions aimed at improving student well-being.

## Methods

It was a cross-sectional study conducted at the Department of Community Medicine in which 330 undergraduate students from the HBS Medical and Dental College, Islamabad, Pakistan, were included. A stratified random sampling technique was used. The study duration was 10 months from 26th April 2024 to 30th January 2025, following the acquisition of ethical approval from the Ethical Review Committee of the college vide letter no: HBS/IRB/12/24 held on 24th March 2024. After obtaining informed consent, students were asked to complete the questionnaire. The data collection tool employed in this study is a self-constructed questionnaire, developed through a comprehensive review of relevant literature. The initial pool of items was derived by examining widely cited theoretical frameworks and empirical studies on sleep

disturbances and sleep quality.[4-13] Where existing instruments did not fully align with the objectives of this research or the specific context and population under study, items were either adapted or newly formulated. The questionnaire underwent an expert review, and a pilot test was subsequently conducted with a sample of 20 participants to refine the wording, assess item clarity, and determine internal consistency.

The adaptation and integration of items from multiple existing questionnaires were essential due to the unique contextual characteristics of the educational environment in Pakistan. Existing standardized instruments, while validated in high-income or Western educational settings, often fail to adequately capture the curricular content, teaching styles, and student learning contexts prevalent in low- and middle-income countries (LMICs) such as Pakistan. In particular, the local higher education system accommodates students from diverse secondary educational backgrounds, resulting in systemic differences in academic preparedness, language proficiency, and learning strategies. These variations necessitate the modification of existing instruments to better align with the local educational and socio-cultural context. Diversity in educational systems impacts sleep quality among medical students by creating unequal academic pressures. Students from traditional, exam-heavy systems often face long study hours and higher stress, leading to sleep deprivation. Language barriers and differences in educational background can increase study time and anxiety, while competitive environments may trigger impostor syndrome and poor sleep. Unequal access to resources, such as quiet study spaces or mental health support, further exacerbates the issue.

The participant's baseline characteristics were recorded in the first part of the questionnaire, followed by sleep quality and sleep disturbance-specific questions. The questionnaire comprised students' information (such as age, gender, academic year, residence, BMI, smoking, exercise, screen time, self-reported burnout, internet addiction, sleep disturbance, and daytime sleepiness). The Data was collected through a proforma, which was entered and analyzed using SPSS version 25.0. For quantitative variables such as age, BMI, exercise, screen time, Sleep quality scores and day time sleepiness were scored, mean±SD were calculated, and for qualitative variables such as gender, academic year, residence, smoking, frequency, and percentages were calculated. Data for both quantitative and qualitative variables was presented in tables and graphs. The chi-square test was used to estimate the association between sleep disturbance and daytime sleepiness. *P*-value <0.05 was considered significant.

## Results

Among 330 undergraduate medical students, 212 (64.2%) were females, the mean age was 21.47±1.776 years, 237 (71.8%) were day scholars, 306 (92.7%) were non-smokers, and 234 (70.9%) had normal BMI (18.5 to 24.9). Among these medical students, 151 (45.8%) were light active (30 to 90 exercise), the majority 327 (97.0%) had screen time moderate to very high (3-6 hours or more), 237 (71.9%) students usually gone to bed at night during last month between 12:00 to 03:00 am, more than half 212 (64.2%) of medical students had <7 hours of actual sleep. The result shows that the mean

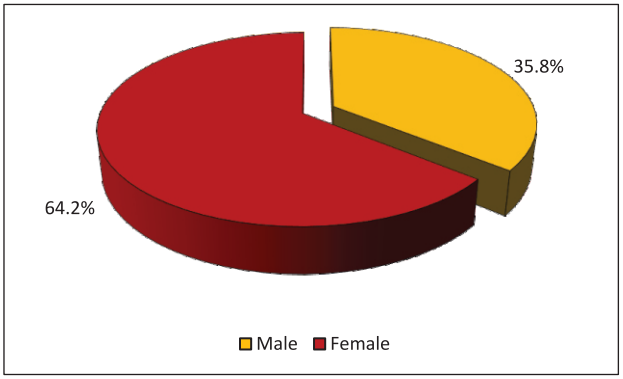


**Fig.1: Gender of students**

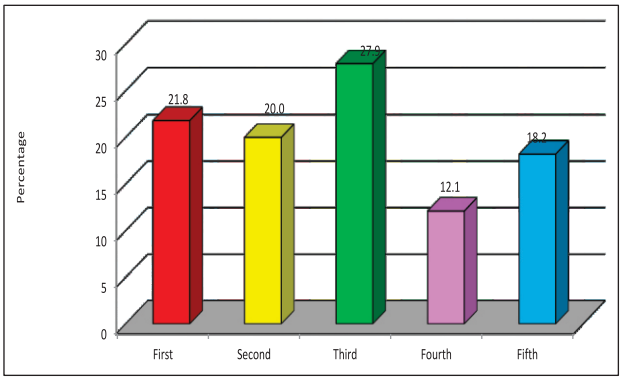


**Fig.2: Respondent participation by academic year**

**Table-1: Student's information**

| | Frequency | Percentage |
|---|---|---|
| Gender | | |
| Male | 118 | 35.8 |
| Female | 212 | 64.2 |
| Total | 330 | 100.0 |
| Age (years) | | |
| 18-20 | 102 | 30.9 |
| >20 | 228 | 69.1 |
| Total | 330 | 100.0 |
| Mean±SD | 21.47±1.776 | |
| Academic year | | |
| First year | 72 | 21.8 |
| Second year | 66 | 20.0 |
| Third year | 92 | 27.9 |
| Fourth year | 40 | 12.1 |
| Fifth year | 60 | 18.2 |
| Total | 330 | 100.0 |
| Residence | | |
| Hostelite | 93 | 28.2 |
| Day Scholar | 237 | 71.8 |
| Total | 330 | 100.0 |
| Smoking | | |
| Smoker | 24 | 7.3 |
| Non-smoker | 306 | 92.7 |
| Total | 330 | 100.0 |
| BMI | | |
| <18.5 (Underweight) | 42 | 12.7 |
| 18.5 to 24.9 (Normal) | 234 | 70.9 |
| 25 to 29.9 (Overweight) | 46 | 13.9 |
| Above 30 (Obese) | 8 | 2.5 |
| Total | 330 | 100.0 |
| Exercise (min. per week) | | |
| Sedentary (< 30) | 114 | 34.5 |
| Light active (30 to 90) | 151 | 45.8 |
| Moderate (90 to 150) | 42 | 12.7 |
| Extremely active (> 300) | 23 | 7.0 |
| Total | 330 | 100.0 |
| Screen time (hrs. per day) | | |
| Low (< 3) | 10 | 3.0 |
| Moderate (3 to 4) | 117 | 35.5 |
| High (5 to 6) | 92 | 27.9 |
| Very high (> 6) | 111 | 33.6 |
| Total | 330 | 100.0 |
| Self-reported burnout | | |
| Yes | 101 | 30.6 |
| No | 229 | 59.4 |

| | | |
|---|---|---|
| Internet Addiction | | |
| Yes | 56 | 17 |
| No | 274 | 83 |
| Bed time at night? (AM/PM)* | | |
| 09:00-11.59 pm | 79 | 23.9 |
| 12:00-03:00 am | 237 | 71.9 |
| 03:01-06:00 am | 14 | 4.2 |
| Total | 330 | 100.0 |
| Time (in minutes) to fall asleep (Minutes)* | | |
| <30 | 292 | 88.5 |
| >30 | 38 | 11.5 |
| Total | 330 | 100.0 |
| Getting up in the morning? (AM)* | | |
| 03:00-06:00 am | 129 | 39.1 |
| 06.01-09.00 am | 187 | 56.7 |
| 09.01-11:59 am | 14 | 4.2 |
| Total | 330 | 100.0 |
| Actual sleep at night (in hours)* | | |
| <7 Hours | 212 | 64.2 |
| >7 Hours | 118 | 35.8 |
| Total | 330 | 100.0 |
| Sleep Quality Scoring | | |
| Good (0-4) | 94 | 28.5 |
| Poor (5-21) | 236 | 71.5 |
| Total | 330 | 100.0 |
| Mean±SD | 6.73±3.328 | |
| Daytime sleepiness | | |
| Normal (0-10) | 193 | 58.5 |
| Abnormal (11-24) | 137 | 41.5 |
| Total | 330 | 100.0 |
| Mean±SD | 9.17±3.838 | |

**Past 60 days*

**Table-2: Association between Sleep Quality and Daytime Sleepiness**

| Sleep Quality | Daytime Sleepiness | | Total | *Chi-square* value | *P*-value |
|---|---|---|---|---|---|
| | Normal | Abnormal | | | |
| Good | 90 (27.3%) | 4 (1.2%) | 94 (28.5%) | | |
| Poor | 103 (31.2%) | 133 (40.3%) | 236 (71.5%) | 75.156 | 0.001 |
| Total | 193 (58.5%) | 137 (41.5%) | 330 (100.0%) | | |

Pittsburgh Sleep Quality Index score was 6.73±3.328, and the daytime sleepiness was 9.17±3.838. (Table-1).

Among 94 medical students with good sleep quality, 90 (95.7%) reported no daytime sleepiness, and 4 (4.3%) experienced daytime sleepiness. Among 236 medical students with poor sleep quality, 103 (43.4%) had no daytime sleepiness, and 133 (56.6%) had daytime sleepiness. (Table-2).

Table-3 compared sleep quality and daytime sleepiness with associated factors. Significant results ($P < 0.05$) were found for both genders, across all academic years, for non-smokers, normal weight, overweight, obese, sedentary lifestyle, light active, moderate active, low screen time, moderate screen time, and high screen time. Results did not show association ($P > 0.05$) with smokers, underweight, extremely active, and very high screen time.

**Table-3: Comparison of sleep quality and daytime sleepiness with associated factors**

| Key Factors | Sleep Quality | Daytime Sleepiness | | | | Total | | *Chi-Square* value | *P*-value |
|---|---|---|---|---|---|---|---|---|---|
| | | Normal | | Abnormal | | | | | |
| | | Freq. | %age | Freq. | %age | Freq. | %age | | |
| Gender | | | | | | | | | |
| | Good | 32 | 9.7 | 2 | 0.6 | 34 | 10.3 | | |
| Male | Poor | 40 | 12.1 | 44 | 13.3 | 84 | 25.5 | 22.000 | 0.000 |
| | Total | 72 | 21.8 | 46 | 13.9 | 118 | 35.8 | | |
| | Good | 58 | 17.6 | 2 | 0.6 | 60 | 18.2 | | |
| Female | Poor | 63 | 19.1 | 89 | 27.0 | 152 | 46.1 | 53.541 | 0.000 |
| | Total | 121 | 36.7 | 91 | 27.6 | 212 | 64.2 | | |
| Academic year | | | | | | | | | |
| | Good | 36 | 10.9 | 2 | 0.6 | 38 | 11.5 | | |
| First year | Poor | 16 | 4.8 | 18 | 5.5 | 34 | 10.3 | 20.333 | 0.000 |
| | Total | 52 | 15.8 | 20 | 6.1 | 72 | 21.8 | | |
| | Good | 8 | 2.4 | 0 | 0.0 | 8 | 2.4 | | |
| Second year | Poor | 23 | 7.0 | 35 | 10.6 | 58 | 17.6 | 10.278 | 0.001 |
| | Total | 31 | 9.4 | 35 | 10.6 | 66 | 20.0 | | |
| | Good | 24 | 7.3 | 2 | 0.6 | 26 | 7.9 | | |
| Third year | Poor | 28 | 8.5 | 38 | 11.5 | 66 | 20.0 | 18.887 | 0.000 |
| | Total | 52 | 15.8 | 40 | 12.1 | 92 | 27.9 | | |
| | Good | 8 | 2.4 | 0 | 0.0 | 8 | 2.4 | | |
| Fourth year | Poor | 16 | 4.8 | 16 | 4.8 | 32 | 9.7 | 6.667 | 0.010 |
| | Total | 24 | 7.3 | 16 | 4.8 | 40 | 12.1 | | |
| | Good | 14 | 4.2 | 0 | 0.0 | 14 | 4.2 | | |
| Fifth year | Poor | 20 | 6.1 | 26 | 7.9 | 46 | 13.9 | 13.964 | 0.000 |
| | Total | 34 | 10.3 | 26 | 7.9 | 60 | 18.2 | | |
| Smoking | | | | | | | | | |
| | Good | 2 | 0.6 | 0 | 0.0 | 2 | 0.6 | | |
| Smoker | Poor | 8 | 2.4 | 14 | 4.2 | 22 | 6.7 | 3.055 | 0.163 |
| | Total | 10 | 3.0 | 14 | 4.2 | 24 | 7.3 | | |
| | Good | 88 | 26.7 | 4 | 1.2 | 92 | 27.9 | | |
| Non-smoker | Poor | 95 | 28.8 | 119 | 36.1 | 214 | 64.8 | 70.326 | 0.000 |
| | Total | 183 | 55.5 | 123 | 55.5 | 306 | 92.7 | | |
| BMI | | | | | | | | | |
| <18.5 (Underweight) | Good | 7 | 2.1 | 2 | 0.6 | 9 | 2.7 | | |
| | Poor | 15 | 4.5 | 18 | 5.5 | 33 | 10.0 | 2.962 | 0.088 |
| | Total | 22 | 6.7 | 20 | 6.1 | 42 | 12.7 | | |
| 18.5 to 24.9 (Normal) | Good | 70 | 21.2 | 2 | 0.6 | 72 | 21.8 | | |
| | Poor | 71 | 21.5 | 91 | 27.6 | 162 | 49.1 | 59.342 | 0.000 |
| | Total | 141 | 42.7 | 93 | 28.2 | 234 | 70.9 | | |
| 25 to 29.9 (Overweight) | Good | 11 | 3.3 | 0 | 0.0 | 11 | 3.3 | | |
| | Poor | 17 | 5.2 | 18 | 5.5 | 35 | 10.6 | 9.294 | 0.002 |
| | Total | 28 | 8.5 | 18 | 5.5 | 46 | 13.9 | | |
| Above 30 (Obese) | Good | 2 | 0.6 | 0 | 0.0 | 2 | 0.6 | | |
| | Poor | 0 | 0.0 | 6 | 1.8 | 6 | 1.8 | 8.000 | 0.036 |
| | Total | 2 | 0.6 | 6 | 1.8 | 8 | 2.4 | | |
| Exercise (min. per week) | | | | | | | | | |
| | Good | 28 | 8.5 | 0 | 0.0 | 28 | 8.5 | | |
| Sedentary (< 30) | Poor | 45 | 13.6 | 41 | 12.4 | 86 | 26.1 | 20.846 | 0.000 |
| | Total | 73 | 22.1 | 41 | 12.4 | 114 | 34.5 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Light active (30 to 90) | Good | 48 | 14.5 | 2 | 0.6 | 50 | 15.2 | | |
| | Poor | 36 | 10.9 | 65 | 19.7 | 101 | 30.6 | 49.358 | 0.000 |
| | Total | 84 | 25.5 | 67 | 20.3 | 151 | 45.8 | | |
| Moderate (90 to 150) | Good | 8 | 2.4 | 0 | 0.0 | 8 | 2.4 | | |
| | Poor | 14 | 4.2 | 20 | 6.1 | 34 | 10.3 | 8.984 | 0.003 |
| | Total | 22 | 6.7 | 20 | 6.1 | 42 | 12.7 | | |
| Extremely active (> 300) | Good | 6 | 1.8 | 2 | 0.6 | 8 | 2.4 | 1.028 | 0.290 |
| | Poor | 8 | 2.4 | 7 | 2.1 | 15 | 4.5 | | |
| | Total | 14 | 4.2 | 9 | 2.7 | 23 | 7.0 | | |
| Screen time (hrs. per day) | | | | | | | | | |
| Low (< 3) | Good | 4 | 1.2 | 0 | 0.0 | 4 | 1.2 | | |
| | Poor | 2 | 0.6 | 4 | 1.2 | 6 | 1.8 | 4.444 | 0.071 |
| | Total | 6 | 1.8 | 4 | 1.2 | 10 | 3.0 | | |
| Moderate (3 to 4) | Good | 35 | 10.6 | 2 | 0.6 | 37 | 11.2 | | |
| | Poor | 43 | 13.0 | 37 | 11.2 | 80 | 24.2 | 18.993 | 0.000 |
| | Total | 78 | 23.6 | 39 | 11.8 | 117 | 35.5 | | |
| High (5 to 6) | Good | 25 | 7.6 | 0 | 0.0 | 25 | 7.6 | | |
| | Poor | 30 | 9.1 | 37 | 11.2 | 67 | 20.3 | 23.094 | 0.000 |
| | Total | 55 | 16.7 | 37 | 11.2 | 92 | 27.9 | | |
| Very high (> 6) | Good | 26 | 7.9 | 2 | 0.6 | 28 | 8.5 | | |
| | Poor | 28 | 8.5 | 55 | 16.7 | 83 | 25.2 | 29.295 | 0.000 |
| | Total | 54 | 16.4 | 57 | 17.3 | 111 | 33.6 | | |

## Discussion

Sleep disturbances are prevalent in the contemporary world; about one-third of adults describe a sleep disorders. The medical students comprise a particularly more susceptible population than the non-medical students. Sleep disturbance and daytime sleepiness are widespread among medical college students, which leads to an inability to remain cautious and alert while performing their daily activities. Therefore, the current study was carried out to assess the sleep disturbance and daytime sleepiness among medical college undergraduate students. To acquire an appropriate outcome, 330 medical students were included in the study, and it was found that the majority of students were females (64.2%) and 35.8% were males. A study conducted by Al Shammari et al. (2020) also showed comparable results that the majority of students were females (63.3%) while 36.7% were male students.[14] The results of our study highlighted that the mean age of the students was 21.47±1.776 years, while a study done by Abdullah and fellows (2023) also showed comparable results and confirmed that the mean age of medical students was 22.76+2.64 years.[15]

A study revealed that among medical students, 21.8% were in their first year, 20.0% in their second year, 27.9% in their third year, and 12.1% in their fourth year, while 18.2% of students were in their fifth year. But a study undertaken by Zafar et al. (2020) indicated that among medical students, 24.2% were in first year, 36.2% in second year, 30.9% in third year, 6.0% in fourth year, and 2.7% of students were in final year.[16]

In our study, the majority of medical students (71.8%) were day scholars while only 28.2% were hostellers. But a study performed by Sameer and companions (2020) exhibited a different scenario and reported that the majority of medical students (63.9%) were residing in hostels and 36.1% were day scholars.[10]

Smoking is an unhealthy habit that exacerbates the health of people and increases the risk of several diseases. However, it was encouraging to know that a significant majority of medical students (92.7%) were non-smokers, while only 7.3% were smokers. A study done by Zafar et al. (2020) also showed better results, but our results are better than their study, in which they reported that the majority of medical students (83.2%) were non-smokers and 16.8% were smokers.[16] The findings of our study also showed that a significant portion (70.9%) of medical students had

a normal weight, and only 2.5% were obese. But a study undertaken by Yassin et al. (2020) reported that 9.4% of medical students were obese.[17]

The advantages of exercise cannot be underestimated as it keeps people healthy and prevents cardiovascular diseases, and reduces the risk of chronic diseases. The findings of our study showed that 34.5% of medical students had a sedentary lifestyle. In comparison, 45.8% were light active, 12.7% were moderately active, and 7.0% of students were extremely active. A study carried out by Gemnani et al. (2020) showed that a significant majority (83.5%) of medical students had no exercise.[1] The findings of our study further showed that the majority of medical students had screen time moderate to very high (3-6 hours or more), usually went to bed at night between 12:00 and 03:00, and required <30 minutes to fall asleep each night during the last month. In our study, more than half (64.2%) of medical students had <7 hours while 35.8% had >7 hours of actual sleep. Similar results were reported by a study conducted by Sameer and colleagues (2020), who also elucidated that 64.6% of medical students had <7 hours and 35.4% had >7 hours of actual sleep.[10] Another study performed by Ibrahim et al. (2024) also showed comparable results that 62.7% of medical students had <7 hours and 37.3% had >7 hours of actual sleep.[18]

During the study, sleep quality and daytime sleepiness were assessed, and it was found that according to the sleep quality score, the majority of medical students (71.5%) had poor sleep quality. Almost comparable results were reported by a study performed by Zafar et al. (2020), who asserted that 69.8% of medical students had sleep disturbance.[16] The findings of another study undertaken by Bokhari et al. (2020) showed that sleep disturbance was prevalent among 60.4% of medical students.[19] Another study by Desai et al. (2023) highlighted that a significant majority (91.0%) of medical students had sleep disturbance.[3] Similarly, in our study, daytime sleepiness was prevalent among 41.5% of medical students. Several studies carried out by different authors showed comparable results. Gemnani et al. (2020) reported that the prevalence of daytime sleepiness among medical studies was 41.2%. A study performed by Sobri et al. elucidated that daytime was prevalent among 42.7% of medical students.[9] But a study conducted by Zafar et al. (2020) exhibited a different scenario where daytime sleepiness was observed among 72.5% of medical students.[16] A study carried out by Isac et al. (2020) indicated that daytime sleepiness was prevalent among 57.4% of medical students.[7]

When the association between sleep quality and daytime sleepiness was assessed, the study revealed a significant correlation ($P \leq 0.001$). The result of a similar survey conducted by Maithani et al. (2024) also confirmed that there was a significant association between daytime sleepiness and sleep quality ($P \leq 0.001$).[20]

Study also compared the sleep quality and daytime sleepiness with associated factors and significant results ($P<0.05$) were found regarding both genders, all academic years, non-smokers, normal weight, overweight, obese, sedentary lifestyle, light active, moderate active, screen time low, moderate and high while insignificant results ($P>0.05$) regarding smokers, underweight, extremely active, screen time very high. A study done by Souza et al. (2024) reported that there was insignificant association ($P>0.05$) of daytime sleepiness with gender and BMI.[21] Anuradha et al. confirmed in their study that according to there was insignificant association ($P>0.05$) of sleep quality with gender, year of study, smoking and exercise.[5] A study performed by Javaid et al. showed an association of quality of sleep and disturbances with different variables. It confirmed a significant association ($P<0.05$) regarding gender and academic year.[4]

This study has several limitations that should be considered. It was conducted at a single educational institution, which may limit the generalizability of the findings, as the sample may not represent the broader population of individuals. Additionally, the small sample size reduces the statistical power of the analysis, increasing the risk of overlooking significant differences and limiting the ability to control for potential confounding variables. The cross-sectional design further restricts the interpretation of the results, as it captures data at only one point in time, making it impossible to assess causal relationships. Future research involving larger, more diverse populations across multiple institutions and using

longitudinal designs is recommended to strengthen and validate these findings.

## Conclusion

The study assessed sleep disturbance and daytime sleepiness among undergraduate students at a medical college. The study found that both sleep disturbance and daytime sleepiness were observed among undergraduate medical college students, with sleep disturbance being more prevalent than daytime sleepiness. A significant association was found between sleep quality and daytime sleepiness, with gender and academic year identified as associated factors. Further studies on a larger scale are needed to explore this topic.

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**Author Contributions**

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**FAZ:** Conception and design of the work, data acquisition, curation, and statistical analysis
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