

SLEEP QUALITY OF MEDICAL STUDENTS DURING UNIVERSITY YEARS

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Studying at medical universities involves a high academic workload, frequent movement between clinics, and, in some cases, employment in medical institutions. These factors may impair cognitive function and contribute to the development of anxiety, sleep disturbances, and daytime sleepiness. This study aimed to assess the prevalence and severity of sleep disorders among medical university students in a megalopolis. We used the Epworth Sleepiness Scale (ESS) and the Spiegel Morningness–Eveningness Questionnaire (MOS-SS) to anonymously survey 1,627 students (1,329 females and 298 males) from all years and faculties at St. Petersburg Pediatric Medical University. It was found that 86.7% of students feel daytime sleepiness of varying severity, and it is much more common in females (96.0%) than in males (45.2%; $p = 0.0000$). Various sleep-quality disturbances were identified in 94.5% of students; girls had them more often (99.6%) than boys (71.9%; $p < 0.0000$). We found a moderate positive correlation between daytime sleepiness and sleep disorder severity ($r = 0.45$; $p < 0.05$). The study findings substantiate the need for preventive measures aimed at improving sleep quality and adjusting academic workload, as well as for specialist consultations in cases of severe sleep disorders.

Keywords: sleep, sleep disorders, drowsiness, students, healthcare workers

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Compliance with ethical standards: the study was approved by the Ethics Committee at St. Petersburg State Pediatric Medical University (Minutes No. 60/16 of October 24, 2025). Participation in the survey was voluntary and confidential.

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КАЧЕСТВО СНА ОБУЧАЮЩЕЙСЯ МОЛОДЕЖИ В ПЕРИОД ОСВОЕНИЯ МЕДИЦИНСКОЙ СПЕЦИАЛЬНОСТИ

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Обучение в медицинских вузах сопряжено с высокой интенсивностью академической нагрузки, территориальным перемещением между клиническими базами, в ряде случаев — работой в медицинских учреждениях, что может снижать когнитивные способности, потенцировать развитие тревожности, нарушения ночного сна и дневной сонливости. Целью исследования было оценить распространенность и выраженность нарушений сна у обучающихся медицинского вуза в мегаполисе. С помощью опросников Эпворта (ESS) и Шпигеля (MOS-SS) проведено анонимное тестирование 1627 студентов (1329 девушек и 298 юношей), обучающихся на всех курсах и факультетах Санкт-Петербургского педиатрического медицинского университета. Установлено, что у 86,7% студентов имеет место дневная сонливость различной степени выраженности, причем у девушек она встречается значительно чаще (96,0%), чем у лиц мужского пола (45,2%; $p = 0,0000$). Различные нарушения качества ночного сна отмечены у 94,5% студентов, при этом снижение качества сна у девушек регистрировали чаще (99,6%), чем у юношей (71,9%; $p = 0,0000$). Выявлена умеренная прямая корреляционная связь между уровнем дневной сонливости и выраженностью нарушений сна ($r = 0,45$; $p < 0,05$). Результаты исследования обосновывают необходимость проведения направленных на улучшение качества сна, корректировку режима учебной нагрузки профилактических мероприятий и консультации специалистов при выраженных нарушениях сна.

Ключевые слова: сон, нарушения сна, сонливость, студенты, медицинские работники

Вклад авторов: О. В. Лисовский — концепция и дизайн исследования; К. Е. Моисеева — подбор материалов и методов, редактирование текста; В. Л. Грицинская — написание текста статьи; И. А. Лисица — координация исследования, сбор данных литературы; Д. Г. Валиахметова — анализ и интерпретация данных; С. Ю. Ускова — статистическая обработка материала; П. Д. Щечкалева — подготовка анкет, сбор данных; А. Д. Станчу — создание базы данных; все авторы — утверждение окончательного варианта статьи, ответственность за целостность всех частей статьи.

Соблюдение этических стандартов: исследование одобрено локальным этическим комитетом при Санкт-Петербургском государственном педиатрическом медицинском университете (протокол № 60/16 от 24 октября 2025 г.). Участие в опросе было добровольным и предполагало соблюдение конфиденциальности.

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Sleep is a fundamental physiological process that enables the recovery of cognitive capabilities, supports memory consolidation, and promotes emotional stability and the regulation of bodily systems [1]. In recent years, many researchers in Russia and internationally have investigated the impact of sleep quality

on young people's ability to learn professional skills. It has been established that the persistent misalignment of an individual's chronotype and the externally imposed wakefulness schedules with chronic sleep deprivation lead to social desynchronization and an increased risk of health disorders [2, 3]. It has also been

found that sleep problems are more common among women, heavy smokers and consumers of large doses of caffeinated beverages, people intensively using digital gadgets before bedtime and in the evening, and persons exhibiting symptoms of anxiety and depression [4–6].

Medical students are at increased risk of developing sleep disorders. That said, quality sleep is especially important for them because of the inherently high academic workload, clinical practice tasks, and night shifts, which potentiate chronic sleep deficiency and cause drowsiness during the day. Sleep disorders directly affect learning effectiveness by hindering attention, slowing information processing and decision-making, and generally impairing quality of life [7, 8]. Between 40.6% and 77% of clinical students in Southeast Asia and Latin America have been found to have poor Pittsburgh Sleep Quality Index (PSQI) scores, and 90% reported daytime sleepiness [9–12]. In Kyrgyzstan, 72% of medical students had sleep problems that reduced concentration and memory capacity [13]. Sleep problems were experienced by 60% of medical students in Egypt [14]. Russian researchers have also identified difficulties with falling asleep, frequent night awakenings, and daytime sleepiness in a significant part of medical students [15–19].

Given the relevance of the above, we conducted a study to assess the prevalence and severity of sleep disorders among medical university students in a megalopolis.

METHODS

This cross-sectional sociological study involved 1,627 students (1,329 females and 298 males) and was conducted by researchers from the Department of General Medical Practice at St. Petersburg State Pediatric Medical University. The study took place in the middle of the semester; it had no relation to exams and tests. The researchers enrolled students from all faculties, years 1 through 6; the mean age of participants was 20.3 ± 1.3 years. They were invited to confidentially complete a survey created using Yandex Forms that incorporated the Epworth Sleepiness Scale (ESS) and the Spiegel Medical Outcomes Study Sleep Scale (MOS-SS)

[1]. ESS is a diagnostic tool enabling subjective assessment of excessive daytime sleepiness, which can be non-existent (0–8 points), mild (9–12 points), moderate (13–17 points), and severe (≥ 18 points). MOS-SS covers the time of falling asleep, the duration of sleep, the frequency of awakenings and condition after them, and overall satisfaction with sleep. A score of 22 points or less indicated a sleep disorder, mild (12–22 points) or severe (≤ 11 points).

After discarding incorrectly filled out surveys we exported the data to an MS Office Excel spreadsheet (Microsoft; USA). SPSS Statistics 23.0 (IBM; USA) was used for the main stage of processing. The Kolmogorov–Smirnov test was applied to assess normality of distribution of quantitative data. Categorical variables are reported as percentages with corresponding 95% confidence intervals (95% CI) Pearson's chi-square (χ^2) test was used for intergroup comparison. The direction and strength of the relationship between quantitative variables were assessed using Spearman's rank correlation coefficient (applied for not normally distributed data). The differences were considered statistically significant at $p < 0.05$.

RESULTS

According to the ESS, most participants — 86.7 [85.9–87.5]% — experienced daytime sleepiness of varying intensity: mild in 21.9 [20.8–22.7]% of respondents, moderate in 28.5 [27.4–29.6]%, and severe in 36.3 [35.1–37.5]%. Only one in seven study participants got enough sleep at night. More than half of the young men did not feel drowsy during the day (54.8 [51.9–57.7] %); one in three reported mild sleepiness (30.1 [27.7–32.5]%). Significant drowsiness was established in 13.0 [11.1–14.9] % of male participants. The condition was severe in 2.1 [1.3–2.9] % of male students, and it significantly impaired their performance. Among the girls, only 4.0 [3.6–4.5] % did not experience daytime sleepiness, which is significantly less than in the male part of the sample ($p < 0.001$; $\chi^2 = 546.5$). Female respondents were less likely to feel mildly sleepy during the day (20.0 [18.9–21.1]%; $p < 0.001$; $\chi^2 = 14.5$), but more prone to moderate (31.9% [30.6–33.2]%; $p < 0.001$; $\chi^2 = 56.5$)

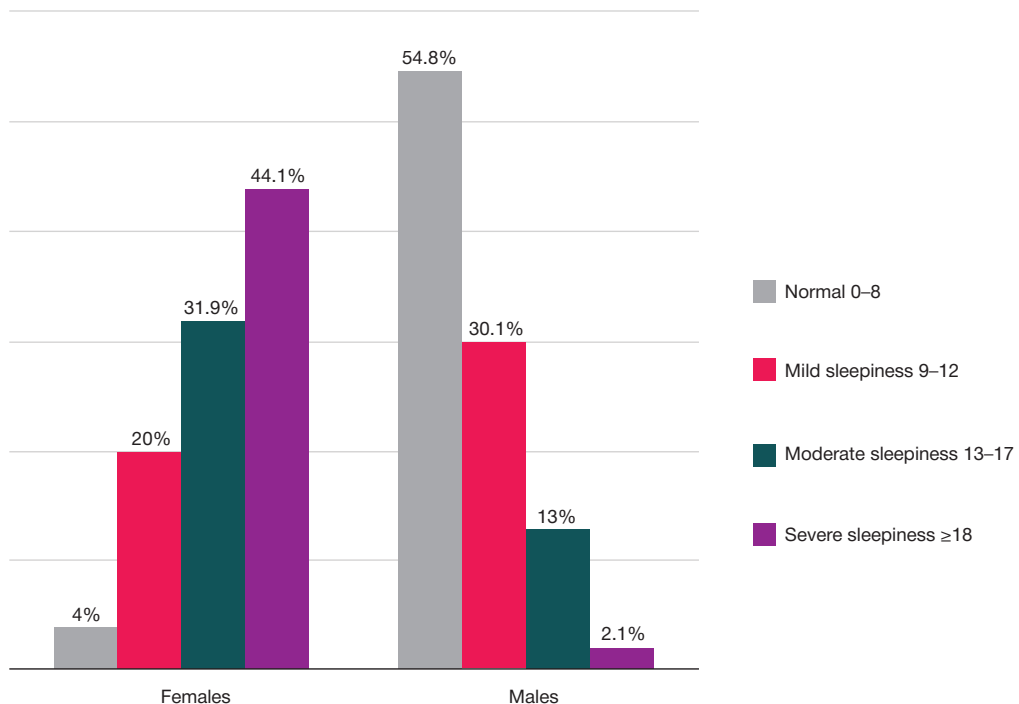


Fig. 1. Daytime sleepiness registered with ESS

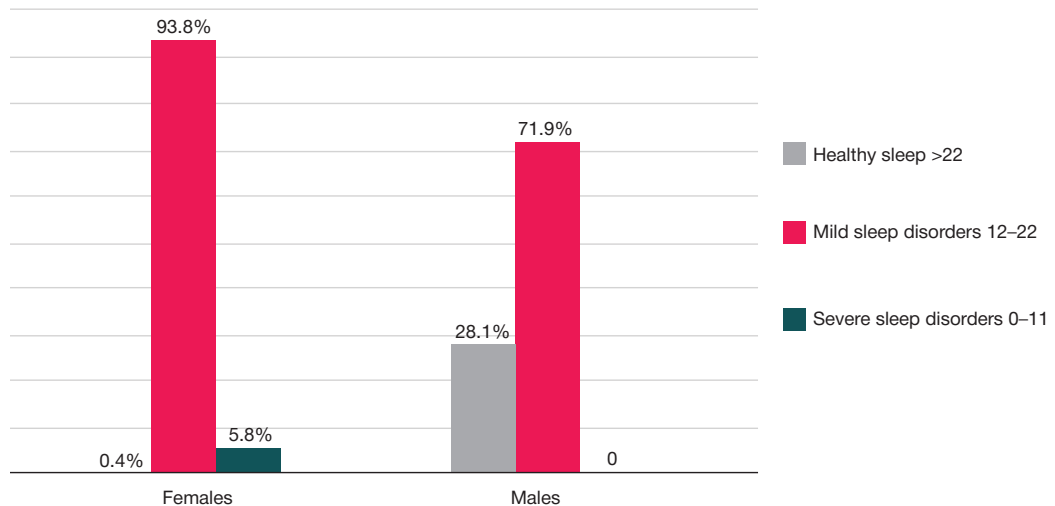


Fig. 2. Sleep quality registered with Spiegel MOS-SS

and severe drowsiness (44.1 [42.7–45.6] %; $p < 0.001$; $\chi^2 = 312.1$) (Fig. 1).

Spiegel MOS-SS revealed that only 5.5 [4.9–6.1]% of students enjoyed healthy sleep, while 89.7 [89.0–90.4]% of them suffered from moderate, and 4.8 [4.2–5.4]% — from severe sleep disorders. Healthy sleep was more common among boys than girls: 28.1 [25.5–30.7]% versus 0.4 [0.2–0.6]% ($p = 0.001$; $\chi^2 = 10.2$). Female respondents mentioned moderate sleep disorders more often (93.8 [93.2–94.5]%) than male ones (71.9 [69.3–74.5]%, $p < 0.001$; $\chi^2 = 128.5$). Severe sleep disturbances were recorded only in girls — their share in the sample was 5.8 [5.2–6.4]% (Fig. 2).

Correlation analysis showed a moderate positive relationship between daytime sleepiness and the severity of sleep disorders ($r = 0.45$; $p < 0.05$). This indicates that students' daytime sleepiness increases as their sleep quality deteriorates.

DISCUSSION

There are numerous studies that investigate sleep duration and quality among medical students [2, 4, 8]. In this work, we found high rates of moderate and severe drowsiness (up to 31.9% and 44.1%, respectively), with an overall sleepiness level of 86.7% (all components).

Our findings are consistent with the opinions of several researchers who note increased drowsiness in up to 90% of students, which allows considering it as a significant factor affecting academic performance and health [3, 10, 11, 20]. Medical students often have to balance study, work, and personal life, which can lead to insufficient sleep [21–23]. Most authors highlight increased daytime sleepiness and decreased nighttime sleep duration among students [5, 13, 24].

Sleep disorders were established in 94.5% of the respondents, predominantly females [25]. Both the general patterns of daytime sleepiness formation and the constitutional features of students with sleep disorders have been identified [7, 26]. It has been

shown that individuals with an evening chronotype are more susceptible to sleep disorders because they are less well adapted to attending morning classes [2].

We conducted this study during the semester, before the exams, which suggests that the identified changes are not related to acute stress, but reflect chronic fatigue, sleep and rest disorders, as well as an imbalanced academic load. Students with higher academic performance are more likely to sacrifice sleep, experiencing significant discomfort and drowsiness during the day [4, 17].

Impaired sleep quality and increased daytime sleepiness may entail reduced attention and worsened cognitive functions as well as an increased risk of emotional burnout [27, 28]. This is especially important for medical students, as it can negatively affect not only academic performance, but also future professional activities. Without remedial measures, chronic sleep disorders and persistent daytime sleepiness are an increased risk factor for psychosomatic diseases [3].

CONCLUSIONS

The Epworth Sleepiness Scale and the Spiegel Morningness–Eveningness Questionnaire are reliable tools for detecting sleep disorders and excessive daytime sleepiness among medical students across all years.

The established relationship between deteriorating sleep quality and increasing daytime sleepiness indicates the development of chronic fatigue and a decline in students' adaptive capacity.

Sleep disorders affect more than 86% of students, highlighting the need for regular monitoring of sleep and psycho-emotional well-being, along with programs to prevent overwork and improve daily routines.

Measures to improve sleep hygiene and establish a well-structured academic schedule will enhance students' mastery of the core curriculum, preserve their quality of life, and support the health of future healthcare professionals.

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