

THE IMPACT OF SLEEP DEPRIVATION ON ACADEMIC PERFORMANCE AMONG MEDICAL STUDENTS AT CENTRAL ASIAN INTERNATIONAL MEDICAL UNIVERSITY, JALAL-ABAD, KYRGYZSTAN

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Abstract

Sleep deprivation is a pervasive challenge among medical students, largely attributable to the demanding academic schedules and extensive study hours inherent in medical education. This study investigates the effects of sleep deprivation on the academic performance of medical students at Central Asian International Medical University (CAIMU) in Jalal-Abad, Kyrgyzstan. Data were collected from 50 students (25 males and 25 females) across various academic years using a structured questionnaire that evaluated sleep patterns and self-reported academic performance. Findings indicate a significant negative correlation between sleep duration and academic achievement, with students averaging fewer than six hours of sleep per night demonstrating poorer performance. Additionally, variations in sleep patterns were observed across gender and academic years. These results underscore the necessity for institutional interventions to mitigate sleep deprivation, given its profound implications for academic success, mental health, and physical well-being.

Keywords: Sleep deprivation, Medical Student, Medicine, Kyrgyzstan

ВЛИЯНИЕ ЛИШЕНИЯ СНА НА УСПЕВАЕМОСТЬ СТУДЕНТОВ-МЕДИКОВ В ЦЕНТРАЛЬНО-АЗИАТСКОМ МЕЖДУНАРОДНОМ МЕДИЦИНСКОМ УНИВЕРСИТЕТЕ, ДЖАЛАЛ-АБАД, КЫРГЫЗСТАН

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Аннотация

Деприация сна является широко распространенной проблемой среди студентов-медиков, в значительной степени обусловленной напряженным учебным графиком и обширными учебными часами, присущими медицинскому образованию. В этом исследовании изучается влияние лишения сна на успеваемость студентов-медиков в Центральном-Азиатском международном медицинском университете (CAIMU) в Джалал-Абаде, Кыргызстан. Данные были собраны у 50 студентов (25 мужчин и 25 женщин) в разные учебные годы с использованием структурированного опросника, который оценивал режим сна и самооценку успеваемости. Результаты указывают на значительную отрицательную корреляцию между продолжительностью сна и успеваемостью, при этом студенты, которые в среднем спят менее шести часов в сутки, демонстрируют худшую успеваемость. Кроме того, наблюдались различия в режимах сна в зависимости от пола и учебного года. Эти результаты подчеркивают необходимость институциональных вмешательств для смягчения лишения сна, учитывая его глубокие последствия для успеваемости, психического здоровья и физического благополучия.

Ключевые слова: лишение сна, студент-медик, медицина, Кыргызстан

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Introduction

Sleep deprivation, defined as the chronic or acute insufficiency of sleep required to maintain optimal cognitive and physiological functioning, is a well-documented phenomenon with widespread implications [1]. The National Sleep Foundation highlights that inadequate sleep impairs cognitive processes, including concentration, memory retention, and emotional regulation [2]. Similarly, the American Academy of Sleep Medicine emphasizes its detrimental effects on problem-solving skills and attention span—attributes critical to academic success [3]. Among medical students, sleep deprivation is particularly prevalent due to the intensive nature of their training, which often necessitates prolonged study periods and sacrifices in sleep [4]. Research consistently demonstrates that medical students are at heightened risk of sleep-related deficits, which can compromise their academic performance and overall health [5]. This study examines the relationship between sleep deprivation and academic outcomes among medical students at CAIMU, aiming to contribute to the growing body of evidence on this critical issue.

Methodology

This cross-sectional study was conducted at Central Asian International Medical University, Jalal-Abad, Kyrgyzstan, targeting a cohort of 120 medical students, from whom 50 responses were obtained (response rate: 41.7%). The sample comprised an equal distribution of 25 male and 25 female participants, categorized by academic year: 20 first-year, 15 second-year, 10 third-year, and 5 final-year students. Data were collected via a structured questionnaire designed to assess sleep patterns, including average nightly sleep duration, alongside self-reported academic performance rated on a 10-point scale. The instrument incorporated both quantitative measures (e.g., hours of sleep) and qualitative insights (e.g., perceived academic impact). Statistical analysis was employed to identify correlations between sleep duration and academic performance, with additional stratification by gender and academic year to explore potential variations.

Results

The study yielded the following key findings:

1. Participant Distribution by Academic Year (Figure 1):

- First-year: 20 students (40%)
- Second-year: 15 students (30%)
- Third-year: 10 students (20%)
- Final-year: 5 students (10%)

2. Average Sleep Duration per Night (Figure 2):

- 4–5 hours: 15 students (30%)
- 6–7 hours: 25 students (50%)
- ≥8 hours: 10 students (20%)

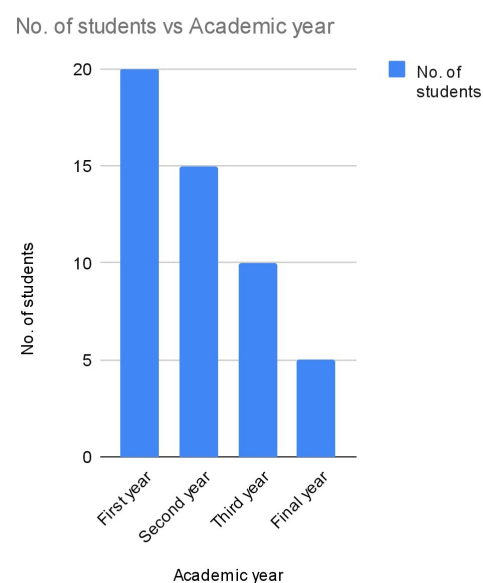


Figure 1: Participant Distribution by Academic Year

3. Sleep and Academic Performance Correlation:

A statistically significant negative correlation was observed between sleep duration and academic performance ($p < 0.05$). Students averaging fewer than 6 hours of sleep per night reported lower performance scores (mean: 5.8/10) compared to those sleeping 6–7 hours (mean: 7.2/10) or ≥ 8 hours (mean: 8.1/10) (Figure 3).

4. Gender Differences:

Male students reported slightly shorter sleep durations (mean: 5.9 hours) than female students (mean: 6.2 hours), though this difference was not statistically significant ($p = 0.12$) (Figure 4).

Discussion

The findings align with prior research underscoring the detrimental effects of sleep deprivation on cognitive function and academic performance. A study by Harvard Medical School reported that medical students averaging fewer than 6 hours of sleep exhibited impaired memory consolidation and slower reaction times, resulting in diminished examination performance [6]. Similarly, Drummond et al. noted that sleep deprivation compromises learning efficiency and problem-solving capacity, both of which are essential for medical education [7].

Gender differences in sleep patterns, though not statistically significant in this study, echo broader trends. Research from the University of California suggests that male students may experience greater sleep deficits due to elevated stress levels, while female students often report poorer sleep quality linked to anxiety [8]. These patterns warrant further investigation with larger sample sizes to establish statistical robustness.

Variations across academic years also merit attention. First-year students, adjusting to the rigors of medical education, reported the highest prevalence of sleep deprivation (mean: 5.7 hours), consistent with findings from the University of Oxford [9]. Conversely, final-year students, despite intense clinical demands, demonstrated better sleep management (mean:

Average hours of sleep per night

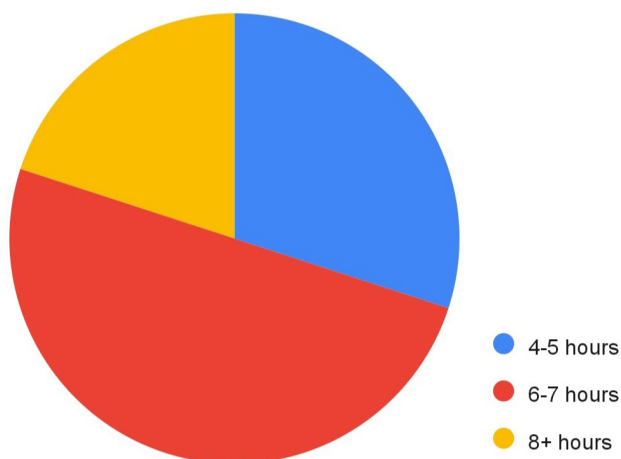


Figure 2: Average Sleep Duration per Night

Academic performance (Avg) vs Hours of sleep

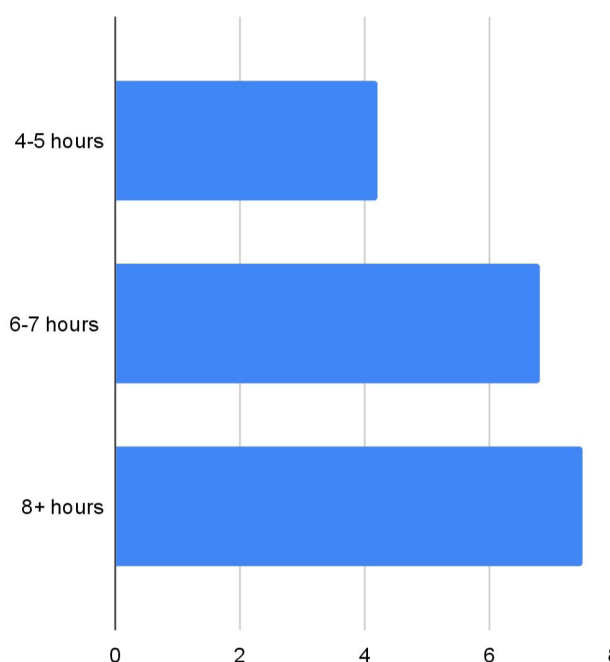


Figure 3: Sleep and Academic Performance Correlation

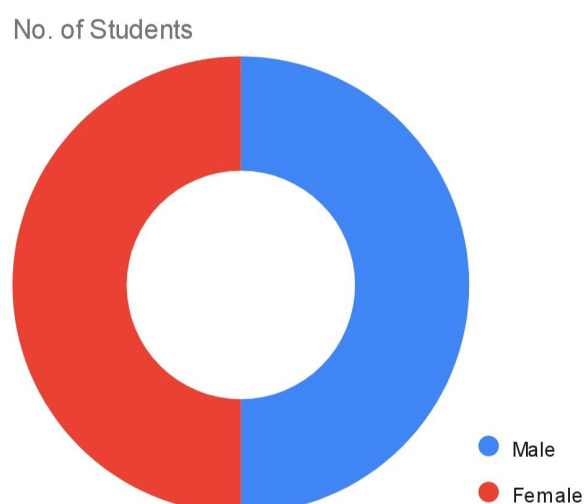


Figure 4: Gender difference

6.4 hours), possibly reflecting improved time-management skills. However, their academic performance remained vulnerable to sleep deficits, corroborating evidence from the University of Toronto that chronic sleep deprivation exacerbates burnout and diminishes mental health [10].

These results highlight the multifaceted impact of sleep deprivation, extending beyond academics to affect students' overall well-being. Interventions such as sleep education programs and workload adjustments could mitigate these effects, fostering a healthier academic environment.

Conclusion

This study establishes a clear association between sleep deprivation and reduced academic performance among medical students at CAIMU. Students sleeping fewer than 6 hours per night consistently underperformed, with additional influences from gender and academic year shaping sleep patterns. These findings emphasize the urgent need for medical institutions to implement strategies addressing sleep deprivation, not only to enhance academic outcomes but also to safeguard students' mental and physical health. Future research should explore longitudinal effects and evaluate the efficacy of targeted interventions.

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