Adapting to the Pace: Sleep, Caffeine, and Physical Activity Trends in the First Semester of Medical Education

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INTRODUCTION

We hypothesized that first-year medical students would trend towards unhealthy behaviors over the course of their first semester regarding sleep, caffeine, and physical activity.

A healthy lifestyle for medical students can include a balanced diet, adequate sleep, regular physical activity, stress management, avoidance of tobacco and excessive alcohol, and engagement with social support systems [1,2,3,4].

Despite this understanding, research indicates that medical students' healthy habits often deteriorate over the course of their education [5,6]. Prior studies have explored these changes, with some focusing on the impact of the COVID-19 pandemic, and others using cross-sectional designs to capture only brief snapshots of student life. However, little is known about how these lifestyle changes emerge during the critical adjustment period of the first semester of medical school. Additionally, there is a lack of research on caffeine use among medical students, particularly within this early transitional phase.

This study aimed to address these gaps by investigating changes in sleep duration, caffeine consumption, and physical activity habits in first-year medical students from matriculation to the end of their first semester.

METHODS

We created one cross-sectional survey to track changes in lifestyle behaviors of the students.

11 multiple choice questions covering caffeine intake, sleep duration, sleep aid use, seeking medical care, physical activity levels, and satisfaction with lifestyle habits over the last 5 months were sent via Email to 85 first-year medical students at Wmed. The survey was online via RedCap. Participation was voluntary and anonymous. 51 students completed both the pre- and post-surveys. The data was deidentified before analysis with Shapiro-Wilk tests and Wilcoxon Signed-Rank tests. This study was designated as exempt through protocol WMed-2024-1152.

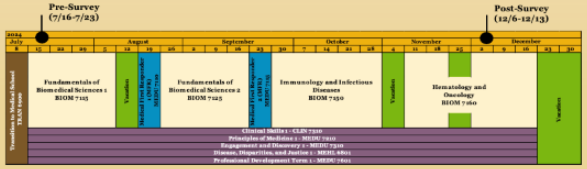

Figure 1: Survey dissemination schedule.

RESULTS

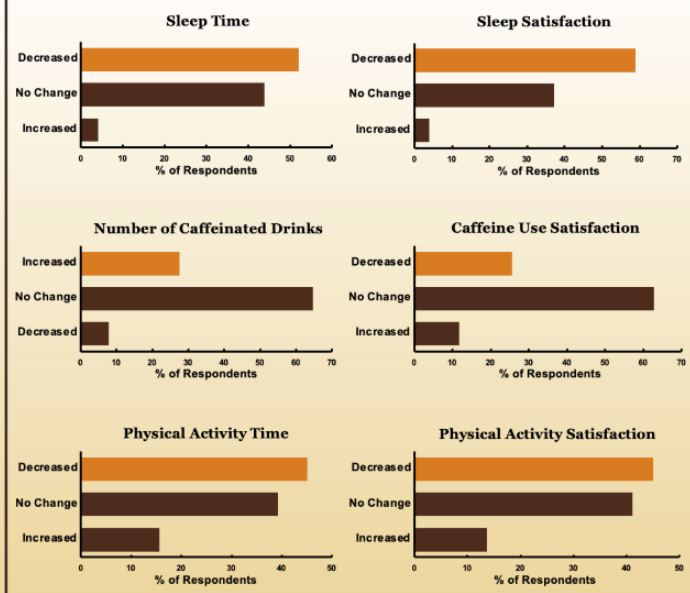

Figure 2: Healthy lifestyle habits decline as early as one semester into medical school. Students reported fewer hours of sleep after one semester of medical school (p<.0001). Students reported lower satisfaction with sleep habits after one semester of medical school (p<.0001). Students reported more daily caffeine use after one semester of medical school (p=.0067). Students reported lower satisfaction with caffeine use habits after one semester of medical school (p=.0342). Students reported less time spent per week on physical activity after one semester in medical school (p=.0033). Students reported lower satisfaction with physical activity habits after one semester of medical school (p=.0009).

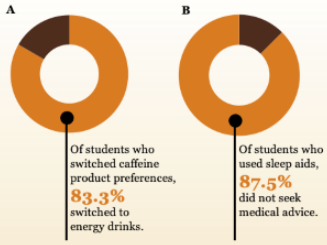

Figure 3: First semester medical students demonstrate unhealthy trends related to caffeine product and sleep aid use. (A) 6 respondents switched caffeine product preferences over the first semester of medical school. Of those who switched, 5 switched to energy drinks. (B) 8 respondents started taking sleep aids one semester into medical school. Of those who started, 7 did not seek medical advice about this decision. Although neither of these metrics reached statistical significance, there was a trend of behavioral change toward unhealthy practices.

CONCLUSION

Sleep duration and satisfaction decreased significantly.
Caffeine intake increased and caffeine satisfaction decreased significantly.
Physical activity levels and satisfaction decreased significantly.

The results confirmed our hypothesis that medical students increase unhealthy behaviors starting in their first semester. We aim to explore long-term consequences on the healthcare system attributable to early development of these unhealthy behaviors.

- Sleep deprivation impairs cognitive function by affecting attention, executive function, and decision-making, leading to increased impulsivity, slower processing, and impaired clinical reasoning [7].
- Lack of physical activity contributes to higher levels of psychological distress, including depression, anxiety, and burnout, which can impair cognitive function and clinical performance [2]. Additionally, inactive medical students are less likely to effectively counsel patients on proper exercise habits [8].
- Excessive caffeine consumption in medical students increases stress, anxiety, and sleep disturbances, which increases depersonalization and impairs clinical performance [9, 10].

These factors contribute to a higher risk of diagnostic errors, increased medical mistakes, and reduced empathy, ultimately compromising patient care. Future research warrants tracking these metrics over the entirety of the students' time in medical school, as well as investigating wellness interventions to improve these habits in medical students. Limitations of this study may include small sample size, recall bias, and the ceiling effect.

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