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The Effect of Sleeping Pattern on the Academic Performance of Undergraduate Medical Students at Ajman University of Science and Technology

Hala Hamed, Amani Miskey, Razan Alkurd, Zena Ghazal, Razan Sami, Nageed Abduljaleel, and Moayad Shahwan*

College of Pharmacy and Health Sciences, Ajman University of Science and Technology, Ajman, United Arab Emirates

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*For Correspondence

Moyad Jamal Shahwan, assistant professor, College of Pharmacy and Health Sciences, Ajman University of Science and Technology, P.O. Box 346 Ajman, United Arab Emirates, Tel: +971-6-7056249.

E-mail: moyadshahwan@yahoo.com

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ABSTRACT

Sleeping is a natural repetitive state of rest for the mind and body which is essential to life. Sufficient sleep is extremely important for one's mental and physical health. But sleep loss is a remarkable problem in modern society. The objective of this study was designed to encourage students to seek healthier sleep habits, by using academic success as indicator. It was a cross sectional study conducted among different studying levels of AUST undergraduate medical students during February 2015 to April 2015. Inclusive of all 200 registered medical students was selected for this study. A standard questionnaire that contained questions on demography, sleep habits, academic performance and ideal sleep was used to collect data. Out of 200 students, 190 were responded, giving a response rate of 95% where 74% were female and 19% resided in-campus. Including weekdays and weekends averagely, 48% respondents slept for 6-8 hours, 22% for <6 hrs and 30% slept for >8 hrs. An average of 35% respondents had in-frequent day-nap, 23% frequent and 19% had no day-nap at all. Respondents who slept >6 hrs were observed to have significantly higher academic performance. It is concluded that, people need to understand the role of sleep and have to take adequate sleep of 6-8 hours per day for health and wellbeing.

INTRODUCTION

Sleeping is a natural repetitive state of rest for the mind and body which is essential to life. Sleep isn't exactly a time when your body and brain shut off. While you rest, your brain stays busy, overseeing a wide variety of biological maintenance that keeps your body running in top condition, preparing you for the day ahead. The sleep-wake cycle, is driven by a circadian timing system which is influenced by some factors such as physiological function, school and work schedules, and many others^[1]. Most healthy adults need between seven and a half to nine hours of sleep per night to function at their best. Sleep serves several different functions such as growth and repair, learning or memory consolidation and restorative processes and all these occur throughout the brain and body^[2-4]. Cognitive functions related to academic such as memory consolidation, learning, decision making and critical thinking are all related with adequate sleep^[5]. Sleep deprivation and symptoms related to sleep disorders have not only been ignored but also inadequately understood. Sleep loss is in fact one of the most striking problems of modern society^[6] and sleep deprivation is a common finding in students' academic life. A study with a healthy sample showed that sleepiness may have a substantial adverse influence on general health and quality of life^[7]. Sleep deprivation can be harmful to students. The sleep-wake cycle of medical students is characterized by insufficient sleep duration, delayed sleep onset, and occurrence of napping episodes during the day^[8,9]. Studies have also demonstrated that insomnia may cause psychiatric disorders, psychosocial stress, and dysfunctions such as decreased work efficiency and learning disability^[7,10].

Sleep is clearly an important aspect of successful academic and personal life in college, yet very little attention has been given to finding an appropriate sleeping pattern. In UAE, there are not many research have been undertaken in the context of sleep pattern and academic performance among the medical students. This study was designed to discover a relationship between a healthy sleeping schedule and academic success in the undergraduates of Ajman university medical students (dentistry & pharmacy students) so that we may be able to encourage medical students to seek healthier sleep habits, by using academic success as motivation.

METHOD AND TECHNIQUES

This was a cross sectional study conducted on different studying levels of AUST undergraduate medical student's during February 2015 to April 2015. the study group was selected by universal sampling technique, inclusive of registered medical students, and selected 200 (140 F, 50 M) A questionnaire was developed for data collection that contains questions on demography, sleep habits including total sleep hours, daytime nap etc, and during weekdays and during weekends. Their perception on ideal sleep duration required for good academic performance was also recorded .Academic performance was assessed by the cumulative grade point average (CGPA) of medical students from different levels. The CGPA was calculated to a 4 scale. Consent was taken from participants to participate. Each participant was

Table 1. Number (n) and percent (%) distribution of gender and residency of the respondents, n=190.

	Variable	Numbers(n)	Percentage (%)
Gender	Female	140	74
	Male	50	26
Residency	In campus	36	19
	Out campus	154	81

Asked to answer the questions in hardware copy containing 7 questions. All answers were kept confidential. The data was the compiled and analyzed using Microsoft Excel 2010.

RESULTS

Out of 200 medical students, 190 were responded, giving the response rate of 95%. **Table 1** showed the demographic data of the participants. Male participants were 26% whereas female were 74% which is in keeping with the student distribution of the institution. Among the participants, 19% resided in college hostel or in-campus and 81% resided out-campus. **Table 2** showed the sleep duration pattern in weekdays and weekends. On weekdays, 37% respondents slept <6 hours, 55% slept for 6-8 hrs and 8% slept >8 hrs.

Table 2. Distribution of respondents based on duration of sleep during weekdays and weekends.

Sleep duration (hours)	Weekdays N (%)	Weekends N (%)
<6	70 (37)	14 (7)
6-8	104 (55)	78 (41)
>8	16 (8)	98 (52)

Meanwhile, on weekends 7% of them slept <6 hrs, 41% slept for 6-8 hours and 52% slept >8 hrs.

Table 3 showed the afternoon sleep in weekdays and weekends. A total of 19% respondents did not take afternoon snooze at all, 35% reported infrequent nap and 40% reported frequent day napping during weekdays. On weekends

Table 3. Respondents with day napping habits.

Afternoon nap	Numbers (n)	Percentage (%)
Never	36	19%
Infrequent (1-2 times per week)	66	35%
Frequent (almost every day)	77	40%
weekends	11	6%

6% respondents frequently took day nap.

Table 4 revealed the relationship between sleep duration and CGPA. It is revealed that in weekdays, there was no significant difference in the CGPA score between respondent with sleep <6 hrs and respondent with sleep 6-8 hours and between respondents with sleep 6-8 hours and respondent with sleep >8 hrs. For weekends also, there was no significant difference of CGPA score between respondent with sleep <6 hours and respondent with sleep 6-8 hours ($p=0.195$) and more than 8 hours ($p=0.53$). Also, there was no significant difference between respondent sleep 6-8 hours and more than 8 hours ($p=0.175$). **Table 5** showed the relationship between day napping and CGPA.

Table 4. Relationship between sleep duration and mean CGPA \pm SD.

Sleep duration		CGPA
		Mean \pm SD
weekdays	<6 hours	3.032 \pm 0.688
	6-8 hours	3.095 \pm 0.686
	>8 hours	3.055 \pm 0.684
weekends	<6 hours	3.046 \pm 0.687
	6-8 hours	3.153 \pm 0.686
	>8 hours	3.265 \pm 0.686

Table 5. Relationship between day napping and CGPA \pm SD.

Day napping	CGPA
	Mean \pm SD
Never	3.065 \pm 0.689
Infrequent(1-2 times per week)	3.068 \pm 0.685
Frequent(almost every day)	3.045 \pm 0.686

During weekdays, no significant difference was found between respondent with never had day napping and with had infrequent ($p=0.983$), and frequent day napping ($p=0.682$); also there was no significant difference between respondent with infrequent day napping and respondent with frequent day napping ($p=0.632$).

Table 6 revealed the student's perception about ideal sleep duration for better academic performance. Sixty three percent respondents reported that 6-8 hours' sleep is necessary for better academic performance.

Table 6. Students' perception on necessary sleep duration for better academic performance.

Necessary sleep duration for better academic performance	Response N (%)
<6	27 (14%)
6-8	119 (63%)
>8	44 (23%)
Total	190 (100%)

DISCUSSION

Optimized sleep pattern improves the Neuro-cognitive and academic performance of students ^[4]. But sleep deprivation is a common finding in students' academic life. The sleep-wake cycle of medical students is characterized by insufficient sleep duration, delayed sleep onset, and occurrence of napping episodes during the day ^[8,9]. Majority of the respondents in our study were female and resided outside the campus (**Table 1**) where 37% of them had sleep duration of <6 hours and only 16% students had sleep >8 hours during the week days (**Table 2**). In general, most of the respondents slept between 6-8 hours; however, there was an increment of respondents who slept >8 hrs from 4% on weekdays to 52% on weekends (**Table 2**). This is most probably due to the lack of time spent for sleeping in weekdays as the respondents being busy with assignments and other academic related requirements. Hence, the students tend to sleep more in weekends to compensate their lack of sleep. The college life style and the hostel environment also influences in the sleep pattern on the students.

Sleep deprivation actually can cause day time sleepiness and reduced level of attention affecting performance. Poor sleep also affects performance by increasing depression, decreasing motivation and compromising health ^[11,12]. Forty percent and 6% respondents in this study found to have frequent day napping in weekdays and weekends respectively (**Table 3**). The present study indicated that the respondents with sleep <6 hours during weekend have significantly lower CGPA compared to the respondent with sleep 6-8 hours and >8 hours (**Table 4**). Significant difference was observed between sleep duration of <6 hours and 6-8 hours ($p=0.033$) and between <6 hours and >8 hours in weekends with academic performance in terms of CGPA (**Table 4**).

However, it was also not significant during weekdays. This finding is similar to Curcio ^[4] who reported that a poor sleep in quality, quantity, sleep loss and sleep deprivation showed to have relationship with academic performance. A similar finding reported by Wolfson and Carskadon ^[13] stated that student with higher grades reported to had more total sleep and reduced weekend delays of sleep than students with lower grades. Meanwhile, Carskadon, Fallone and Wolfson ^[14-16] reported that a poor sleeping habit, with an increased sleep fragmentation, later bedtimes and early awakenings, usually tend to have a decreased academic performance and a reduced neurobehavioral functioning. However there are different studies that showed that no firm relationship was found between the sleep duration and academic performance ^[11]. Day napping did not show any significant role in academic performance in our study (**Table 5**). Regarding the student perception of duration of ideal sleep for better academic result, 63% student opined that 6-8 hours' sleep is necessary for better academic result (**Table 6**).

But in reality, less than 60% students slept 6-8 hours both in weekdays and weekends (**Table 2**). In our study, more students

found to go bed lately during weekdays (**Table 2**) which is inconsistent with the study done by Bahammam ^[17] where it was observed that bed time was delayed in weekends.

Delayed bed times in weekends could be the expression of the college life style and influence of hostel life. Even it could be related with circadian rhythm disorders in the form of delayed sleep phase syndrome marked by significant delays in sleep/wake cycles which is common among college students ^[18]. Sufficient sleep is important for one's mental and physical health ^[11]. Insufficient sleep is a cause emotional shakiness, memory loss, day time sleepiness and decreased concentration ^[11,12]. Necessities of sleep differ from person to person but 6-8 hours of sleep is considered normal for an adult ^[11].

CONCLUSION

Sleep is extremely important for healthiness and it plays an important role in learning processes and improvement of our memory. Sleep loss is one of the most remarkable problems in modern society. Not getting enough sleep is a cause of poor academic performance. To achieve a better academic performance, an adequate sleep of 6-8 hours per day is essential.

Students and educators need to understand the role of sleep for improvement of their academic performance. Educators should give importance for counseling their students about the importance of adequate sleep for better academic achievement and healthier more balanced lifestyle.

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