

The Relationship between Sleep Patterns and Academic Performance among Medical Students at King Saud Bin Abdulaziz University for Health Sciences

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ABSTRACT

Background: the relationship between the sleep pattern and the academic performance among medical students is not well addressed in the literature. This study aimed to assess the association between sleep pattern and academic performance among medical students at King Saud Bin Abdulaziz University for Medical Sciences.

Methods: this descriptive cross-sectional study was conducted on male medical students at King Saud Bin Abdulaziz University for Health Sciences at Riyadh, Saudi Arabia. They were included and the Exclusion criteria were students in Basic sciences phase and preparatory phase. The questionnaire was obtained from Groninger Sleep Quality Questionnaire and it was distributed through official university email. Responding rate was 25.7% (n=166) out of 645 students whom were included. SPSS was used to manage and analyze the data.

Results: the majority of students (27.1%) who showed adequate sleep had GPA of between 3.5 and 4.49 which was referred to good academic performance. 0.6% of those who showed adequate sleep score less than 2.5 GPA. On the other hand, 22.9% of the students showed inadequate sleep score GPA of between 3.5 and 4.49. **Conclusions:** our results showed that sleep quantity and quality doesn't play significant roles in academic performance of students. Nevertheless, students should adopt a healthy sleep pattern.

Keywords: sleep pattern, academic performance, sleep quality, sleep quantity.

Disclosure

Ethical approval was granted by the ethical review board of King Fahad Medical city ,Riyadh city , KSA.

INTRODUCTION

Sleep is defined as "a state that is characterized by changes in brain wave activity, breathing, heart rate, body temperature and other physiological functions" ⁽¹⁾. Sleep deprivation leads to sleepiness during daytime, which may contribute to medical errors, road traffic accidents and decrease in academic performance ⁽²⁾.

In addition, lack of sleep might result in irritability, impatience, inability to focus and moodiness. Sleep helps the brain to process memory and learning by a mechanism called memory consolidation ⁽³⁾. Excessive daytime sleepiness has negative consequences on cognition and behavior ⁽⁴⁾.

Sleep duration varies across ages and is dependent on the individual's general health, mental status and physiological alterations ⁽⁵⁾. The average sleep duration among adults ranged between 7.5 and 9 hours per night. This sleep period was optimal in order to restore normal physiological and psychological functions of the body ⁽⁶⁾. In the context of medical students, the daily schedule is full of academic lectures, hospital activities and emotional events such as dealing with patients who are suffering or dying. Research

findings have shown that excessive daytime sleepiness (EDS) among the

population of medical students is 93.2% ^(7,8).

Furthermore, sleep pattern of medical students is characterized by inadequate sleep duration, late sleep onset and napping during school day ^(9,10). Studies found that female students are affected by sleep disorders more than males ^(11,12).

A cross-sectional study was done at King Saud University College of Medicine. The research concluded that poor academic performance of medical students was associated with reduced amount of sleep at night ⁽³⁾. Undergraduate students of psychology at multiple universities in USA participated in a cross-sectional study was published in 2001. They found that overall low grade point average is highly found with short sleepers ⁽¹³⁾.

At the University of Minnesota, a study found a strong positive correlation between GPA and quantity of sleep per night ⁽¹⁴⁾. At 2012, medical students in University of Munich, Pittsburgh sleep quality index was used to evaluate sleep quality. A study demonstrated that test performance may be impacted by poor sleep quality ⁽¹⁵⁾.

Another cross-sectional study was conducted by Grant MacEwan College in Edmonton. The authors described used the Epworth Sleepiness Scale and Pittsburgh Sleep Quality Index. They found that students of introductory psychology with poor quality of sleep perform poorer with regards to academic performance than students who have better sleep quality ⁽¹⁶⁾. A study was done in college of allied health science of Kebangsaan University in Malaysia.

The study reported that academic achievements is not impacted by sleep duration hours and also showed that male sex has higher GPA than female (3.52 : 3.27) ⁽¹⁷⁾.

In suburban Maryland intermediate and high school students participated in a cross-sectional study. The results of this study displayed no correlation between sleep duration hours and academic performance ⁽¹⁸⁾.

Medical students of University of Tartu in Estonia reported that they have daytime sleepiness because they are complaining of sleep disorders and working while studying ⁽¹⁹⁾. They added that sleep has been found to be of the least priority of most individuals especially students. In poor sleepers, the risk of failing one or more years at school was doubled than normal sleepers. Sleep pattern of medical students was characterized by inadequate sleep duration, late sleep onset and napping during school day. The daily schedule is full of academic lectures, hospital activities and emotional events.

METHODS

This descriptive cross-sectional study used a self-administered questionnaire which was administered to male medical students at King Saud bin Abdulaziz University for health sciences in Riyadh, Saudi Arabia. All male medical students in batches (10,11,12,13) at King Saud Bin Abdulaziz University for health sciences in Riyadh, Saudi Arabia were included. Students in Basic Sciences phase and preparatory phase were excluded because they still in pre-med phase. Assuming that 50% they have sleeping disorders with margin of error 6% and confidence level 95%, required sample size is 189 students. Calculations was done using Raosoft calculator. The total population in the designated batches was 645 students, Batch 10 (109 students) , batch 11 (118 students), batch 12 (192 students) , batch 13 (226 students) .

The questionnaire was formulated with 22 questions. The questionnaire is divided into three parts. The part A is student characteristics and academic performance (GPA) which included four

questions. Student characteristic represented as age, batch , stream(I or II). Academic performance was measured by one question about the GPA which included four choices; poor below 2.49 , average 2.5 to 3.49 , good 3.5 to 4.49 , Excellent (above 4.5)}, part B included 3 questions estimated the quantity of sleep which Indicates the amount of sleep, in terms of numerical data , part C included 15 questions assessing the quality of sleep which was adapted from the Groninger Sleep Quality Questionnaire5.

This part with response choices of TRUE or FALSE, measuring the student's sleep quality. All items were scored true / false. The first question does not count for the total score. One point if answer was 'true': questions 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, 15 . One point if answer was 'false': questions 8, 10, 12 . scoring depend on total score of these questions . Score less than or equal 7 points, indicated adequate sleep.

Score more than or equal 8 points, indicated inadequate sleep.

By using Google forms, the questionnaire was utilized and posted online and send it to students by student's university e-mail. To fill the questionnaire a consent was obtained in the first page that all answers were completely confidentially. The questionnaire was limited to one response only so each student can answer the questions one time only and to prevent missing data every question was mandatory filled.

Data analysis

All data collection sheets were entered and coded in SPSS.20 program. Categorical data were presented as frequencies and percentages. While, numerical data was presented as mean and SD. Pearson Correlation was used to compare between the academic performance and sleep pattern.

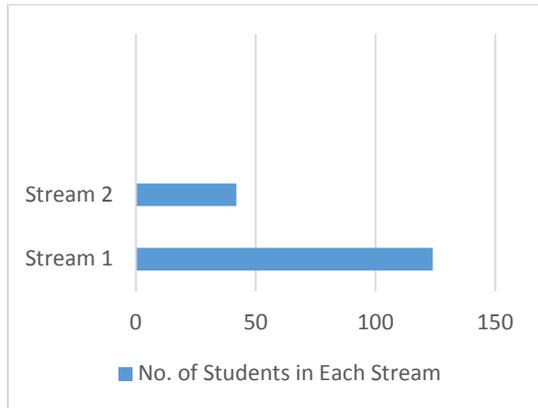
RESULTS

The responding participants were 25.8% (N=166) out of the calculated sample size (189), the mean age was 22.8 y (SD 2.7 y). The mean of average sleep hours per nights was 5.7 h (SD 1.4h). The demographics data of the students were shown in **table 1**.

Table 1: showing the demographics data of the students

	N	Percent
Batch 10	31	18.7
Batch 11	43	25.9
Batch 12	26	15.7
Batch 13	66	39.8
Total	166	100%

The participation in this study varied between the streams and as shown in **graph 1** most of students were assigned to stream 1= 74.7% (N= 124).



Graph 1: number of students in each stream

Most students 49% (N= 45) had GPA between 3.5 and 4.49 which was referred to as good academic performance. A 1% (N=1) of those indicated adequate sleep score less than 2.5 GPA.

On the other hand, 51.4% (N= 38) of the students indicated inadequate sleep score GPA between 3.5 and 4.49 – Good academic performance. This indicated that students with adequate sleep perform academically equal to those who labeled as inadequate sleep (**Table 2**).

Table 2: distribution of student’s GBA

	Poor Below 2.5	Average 2.49 to 3.49	Good 3.5 and 4.49	Excellent Above 4.5
Inadequate sleep	0 0.0%	3 4.1 %	38 51.3%	33 44.6%
Adequate sleep	1 1%	2 2.1%	45 49%	44 74.8%

Sleep nights per week was insignificantly related to academic performance ($P > 0.01$ level of significance). The weak negative correlation value of - 0.032 indicated that more student who had fewer sleep nights per week didn’t affect their academic performance (**Table 3**). Pearson correlation between the student’s GPA and total sleep score in **table 3** showed weak negative insignificant correlation. Looking for the other items of the questionnaire and its relationship with the student’s GPA indicated absence of strong connection between GPA and sleep quality and quantity.

Table 3: Pearson correlation between the student’s GPA and total sleep

		GPA
GPA	Pearson Correlation	1
	Sig. (2-tailed)	
	N	166
Average nights/week	Pearson Correlation	-.032
Less than five h	Sig. (2-tailed)	.684
	N	166
Total Sleep score	Pearson Correlation	-.016
	Sig. (2-tailed)	.837
	N	166

DISCUSSION

The result of this study showed that both quantity and quality of sleep were insignificantly related to academic performance. This indicated that academic performance may be due to some other factors like the personalities, time management, concentration and attendance of the students.

A study supported these results was done in the college of Allied Health Science of Kebangsaan University in Malaysia; that study reported that academic achievements were not impacted by sleep duration hours ⁽⁶⁾.

that no correlation was detected between sleep quality and academic performance among students , they also demonstrated no correlation between sleep quality and academic performance among students ⁽⁷⁾.

CONCLUSION

The findings of this study indicated that sleep quantity and quality did not play significant roles in academic achievement of students. Thus, students should adopt a healthy sleep pattern to enhance their academic performance.

RECOMMENDATIONS

Further researches are needed on more specific sleep behavior. The sample size may not only be for the medical students only, but all other collage students as well.

LIMITATIONS

GPA only is not reflecting the academic performance, while it is included class attendance, class participation, clinical round attendance and extra-curriculum activities. Assessment of GPA may be done objectively in order to overcome any source of error.

COMPETING INTERESTS

The authors have declared no conflict of interest.

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