Original Article

Correlation between sleep habits and academic performance in medical students of Majmaah University, Kingdom of Saudi Arabia

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Objective: To assess the correlation between sleep habits and academic performance in Medical students of Majmaah University, KSA.

Methodology: First to fifth year MBBS students of Majmaah University were selected by convenient sampling technique. Participants were provided sleep analysis, and academic performance questionnaires. Based on students' responses, a mix of two types of sleep habits students were identified. Group A (n=183) was categorized as bad sleep habit group and Group B (n=67) as good sleep habit group. Both groups responded to their academic performance questionnaire. Teaching faculty were also inquired for the students' performance and their feedback was recorded as good, average or below average. The data were analysed by SPSS version 23 applying chi square test to analyse the qualitative data.

Results: Statistical comparison between groups A & B showed a significant difference in their academic performance. Thirty-eight percent of group A had not cleared their previous module exams, as compared to only 1.5% of group B students. While 91% of group A, lost alertness during the late hours of academic activity, only 51% of Group B reported to be in attentive. The comparison of faculty feedback was also significantly better for good sleep habits group.

Conclusion: It was concluded that there is a positive association of sleep quality with academic performance in medical students. (Rawal Med J 202;45:201-205).

Keywords: Academic performance, medical students, sleep.

INTRODUCTION

Sleep is a physiological process, which serves very important functions including growth and repair, restoration of energy and consolidation of memory. Sleep disturbance causes a negative influence and can lead to impaired memory, behavioural and cognitive disturbance.[1] Cognitive competences are vital for higher education.[2] Sleep disorders/ inadequacies are amongst the most common health complaints in young adults, more so amongst students.[3] Different sleep patterns in students such as excessive media usage, have significantly lead to poor sleep quality and related sleep problems.[4] Leaving home, attending tough class routines, facing new social milieus are said to be related with increased levels of stress, which can lead to major, and lasting sleep effects.[5] Research has shown a relationship between stress and its negative effect on sleep.[5] Medical students among all general population are more vulnerable to suffer from sleep problems, due to their tough routine, extensive studies and long academic hours.[6] This poor sleep and decreased daytime alertness is one of the causes of poor academic performance in them.[7]

In Middle East countries, there is a higher percentage of poor sleep quality in the adolescent age group as compared to other countries.[8] There is a significant association of sleep habits and academic performance of the students.[9] Students who are short sleepers (6 or less sleeping hours) had significantly low grades while the students with adequate sleep of (8 hours or more) were found to score good GPA. This could be due to inability of short sleepers to focus and concentrate on their studies.[10] The current study aimed to assess the correlation between sleep habits and academic performance in medical students of Majmaah University, KSA.

METHODOLOGY

In this cross sectional observational study, self-report sleep questionnaire and academic performance questionnaire were distributed to the

students of Majmaah University, after informed consent from participants. All willing students of year 1-5 year MBBS were included in the study, through convenient sampling. Students suffering from sleep apnea, asthma, skin disorders or any significant medical condition were excluded from the study. The study was approved by University Research Dean.

Individual items responses regarding sleep duration and quality were scored from 0-2, and item scores were totalled. A total of 0 represents poor sleep and a score of 10 good sleep. Based on students' responses, a mix of two types of sleep habits were identified. The students were segregated into two groups depending on their sleep score; Group A comprised of students with sleep score of less than or equal to 5 (bad sleep habit group), and Group B of students with sleep score of above 5 (good sleep habit group). Group A comprised of 183, while group B of 67 students. Students' academic performance was also inquired and recorded. The faculty were also inquired for the students' performance and their subjective feedback was recorded as good, average or below average. For every student three faculty members were inquired. (The majority response i.e. 2/3 or > was considered as final.

Statistical Analysis: The data collected was entered in to SPSS version 23, and statistically analysed. Chi square test was applied for analysing the difference of responses between the two sleep groups A &B. A p <0.05 was taken as significant.

RESULTS

Out of 250 students, Group – A consisted of 183 students' and Group-B 67 students. Both group students were inquired if they could follow their planed schedule of studies effectively, have cleared all their previous modules, find themselves alert during the late hour academic activities, scored above 70% in all previous modules and finally did their attendance percentage reached the minimum requirement of 75%. There was statistically significant difference of responses between the two sleep habit groups. (Table 1). The good sleep habit students, Group B exhibited more effective following of planned schedules of studies (Fig. 1). However, bad sleep habits students, Group A showed significantly bad performance as compared to good sleep student B, where 38% of group A had not cleared their previous module examinations, as compared to only 1.5% of group B students. Rest of the academic parameters were also significantly different for the A and B groups. (Fig. 2)

We recorded that 91% of group A-students lost alertness during the late hours of academic activity, as compared to only 51 % of Group B students. It was also recorded that of the group A students, 74% could not score above 70% in their module assessments while this percentage was only 12% for the group B students (p<0.05). Percentage attendance for both groups however was above the mandatory level of 75%, with no statistical difference.

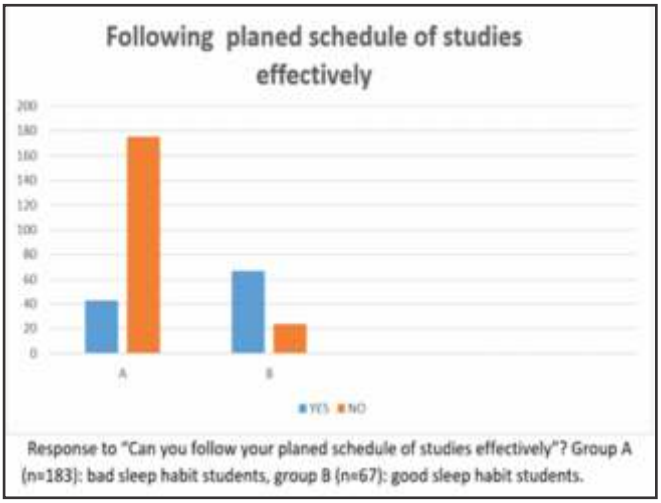
Table 1. Chi square test Comparing sleep habits of students with their academic performances.

QUESTIONS	GROUP	YES	NO	p value
Can you follow your planed schedule of studies effectively	**A**	8	175	≤0.05
	B	43	24	
Have you cleared all your previous modules?	**A**	113	70	≤0.05
	B	66	1	
Do you find yourself alert during the late hour classes / labs?	**A**	17	166	≤0.05
	B	30	37	
Have you scored above 70% in all your modules	**A**	47	136	≤0.000
	B	59	8	
Students regularity (as percentage attendance)	**A**	183	Nil	NA
	B	67		

Table 2. Chi square test Comparing sleep habits of students with faculty feedback regarding their academic performance

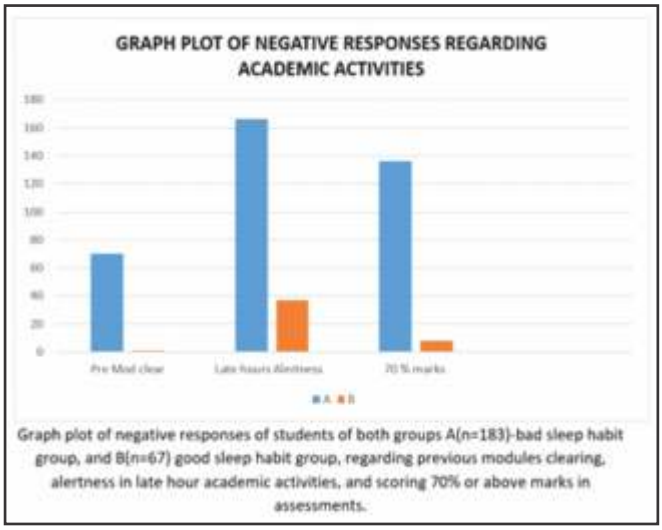
Faculty feedback	Group A	GROUP B	p value
Average	17	43	0.000
Good	137	24	
Below average	39	0	

Fig. 1. Following planned studies.



Response to "Can you follow your planed schedule of studies effectively"? Group A (n=183): bad sleep habit students, group B (n=67): good sleep habit students.

Fig. 2. Negative responses regarding academic activities.



Graph plot of negative responses of students of both groups A(n=183)-bad sleep habit group, and B(n=67) good sleep habit group, regarding previous modules clearing, alertness in late hour academic activities, and scoring 70% or above marks in assessments.

Students' response for sleep habits were not disclosed to the faculty. The comparison of faculty feedback was significantly better for good sleep habits group (Table 2). Whereas, 9% students of (bad sleep) group A were rated average and 21% as below average, 64% of group B (good sleep habit students) were rated average and none as below average in the group B.

DISCUSSION

Psychological stress is a known inciting factor for insomnia and has a bidirectional association with poor sleep quality.[11] However, due to shortage of uniform and standard tools to collect data on adolescent sleep, there is still inadequate scientific work to establish the effects of sleep habits on students' academic performance.[12] Recent studies establish an association of sleep duration and quality with academic and cognitive performance in adolescents.[13] The results of our study suggest a significant association between bad sleep habits and adverse academic performances.

Regarding the ability to follow the scheduled academic activities, good sleep habit group B, had a significantly better response as compared to group A students. Time management has significant and positive impact on academic performance at higher education.[14] Inability to cope is a documented stressor for medical student.[15] This stress not only impacts students' performance but can also lead to other conditions further hampering academic performances.[16]

Adequate sleep is vital for feeling alert and exhibiting peak performance and students taking adequate sleep perform better on memory and motor tasks than the sleep-deprived students.[17] Researchers have reported that poor quality sleep can result in inattentiveness, which leads to poor performance.[18] In our study, a significant association was observed between students' alertness and academic performance. These findings are similar to previous reports where adequate sleep was positively associated with student GPA.[19]

Assessment is a significant force for students learning. Assessment, to the outside world is an indicator of students' and institutions' quality.[20] Bad sleep group student in our study, reported failure to clear all the end module examinations and also not being able to meet the benchmark of 70%, in the summative assessments. Whereas the good sleep group students, had a statistically significant different response from group A. Our results, therefore indicate a positive association of sleep and academic performance of the student.

Our study showed no statistical difference, both maintaining attendance percentage at 75 or above. This could have been a result of the administrative policy of setting a minimum of 75% as a requirement to take final module exams. Eisen et al showed that class attendance was not associated with improved academic performance.[21] Laird-Fick et al emphasized that the relationship between

classroom attendance and academic performance has not been established.[22]

In our study, faculty feedback was also recorded for the academic performance. Feedback can be used as a trigger for high-quality learning and to promote growth and professional development of learners.[23] The teachers rating for average performance was in favour of good sleep habit students. The good performers were however found as high as 75% in the bad sleep group students as compared to 39% of good sleep students. This could be a result of teacher bias or a consequence of subjectivity of the matter. The disparity in sample size of two groups is one of the limitations of the study.

CONCLUSION

There is an association of sleep quality with academic performance in adolescent medical students. It is suggested that with the changing life styles, social demands and personal needs of the youth, delaying the start timings of universities may improve the sleep time and quality of students' academic performance. In addition, proper counselling be given to students, referring to their academic demands and personal lifestyle modifications.

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REFERENCES

1. Curcio G, Ferrara M, Genarro LD. Sleep loss, learning capacity and academic performance. Sleep Med Rev 2006;10:323–37.
2. Ahrberg K, Dresler M, Niedermaier S, Steiger A, Genzel L. The interaction between sleep quality and academic performance. J Psychiatric Res 2012;46:1618-22.
3. Yang CM, Wu CH, Hsieh MH, Liu MH, Lu FH. 2003. Coping with sleep disturbances among young adults: a survey of first-year college students in Taiwan. Behav Med 2003;29:133–8.
4. Tavernier R, Willoughby T. Sleep problems: predictor or outcome of media use among emerging adults at university? J Sleep Res 2014;23:389–96.
5. Folkman S. 2013. Stress: appraisal and coping. In: Gellman, M., Turner, J.R. (Eds.), Encyclopedia of Behavioral Medicine. Springer, New York.
6. Azad MC, Fraser K, Rumana N, Abdullah AF. Sleep Disturbances among Medical Students: A Global Perspective. J Clinical Sleep Med 2015;11:69-74.
7. El Hangouche AJ, Jniene A, Aboudrar S, Errguig L, Rkain H, Cherti M, et al. Relationship between poor quality sleep, excessive daytime sleepiness and low academic performance in medical students. Adv Med Educ Pract 2018;9:631-8.
8. Merdad RA, Merdad LA, Nassif RA, El-Derwi D, Wali SO. Sleep habits in adolescents of Saudi Arabia; distinct patterns and extreme sleep schedules. Sleep Med 2014 ;15:1370-8.
9. Mirghani HO, Mohammed OS, Almurtadha YM, Ahmed MS. Good sleep quality is associated with better academic performance among Sudanese medical students. BMC Res Notes 2015;8:706.
10. Nihayah M, Ismarulyusda I, Syarif HL, Nur Zakiah MS, Baharudin O, Fadzil MH. Sleeping Hours and Academic Achievements: A Study among Biomedical Science Students. Procedia Social Behav Sci 2011;18:617–21.
11. D. Suchecki RB, Machado PA. Tiba, Stress-induced sleep rebound: adaptive behavior and possible mechanisms. Sleep Sci 2009;2:151–60.
12. Ziporyn TD, Malow BA, Oakes K, Wahlstrom KL. Self-report surveys of student sleep and well-being: a review of use in the context of school start times. Sleep Health 2017;3:498-507.
13. Adelantado-Renau M, Beltran-Valls MR, Migueles JH, Artero EG, Legaz-Arrese A, et al. Associations between objectively measured and self reported sleep with academic and cognitive performance in adolescents: DADOS study. J Sleep Res 2019;28(4):e12811. doi: 10.1111/jsr.12811.
14. Wasan SYA, Lujain AA, Aisha TMH, Amal MS, Shagra AJ, Zainab AA. The Effect of Time Management on Academic Performance among Students of Jazan University. Egyptian J Hosp Med 2017;69:3042-9.
15. Shaikh B, Kahloon A, Kazmi M. Students, Stress and Coping Strategies: A Case of Pakistani Medical School. Educ Health 2004;17:346-53.
16. Bedoya-Lau FN, Matos LJ, Zelaya EC. Academic stress levels, psychosomatic manifestations and coping skills in medical students from a private university of Lima in the year 2012. Rev Neuropsiquiatr 2014;77:262–6.
17. College students: getting enough sleep is vital to academic success - American Academy of Sleep Medicine – Association for Sleep Clinicians and Researchers [Internet]. 2017 [cited 25 October 2019]. Available from: htt ps://aasm.org/college-students-getting-enough-sleep-is-vital-to-academic-success
18. Owens JA, Weiss MR. Insufficient sleep in adolescents:

causes and consequences. Minerva Pediatr 2017;69:326-36.
19. Zeek ML, Savoie MJ, Song M. Sleep Duration and Academic Performance Among Student Pharmacists. Am J Pharm Educ 2015;79:63.
20. Sinead MO, Pauline J. Summative and Formative Assessment in Medicine: The Experience of an Anaesthesia Trainee. Int J Higher Educ 2015;4:198-206.
21. Eisen DB, Schupp CW, Isseroff RR. Does class attendance matter? Results from a second-year medical school dermatology cohort study. Int J Dermatol 2015;54:807-16.
22. Laird-Fick HS, Solomon DJ, Parker CJ, Wang L. Attendance, engagement and performance in a medical school curriculum: early findings from competency-based progress testing in a new medical school curriculum. Peer J 2018;6:e5283.
23. Ramani S, Krackov SK. Twelve tips for giving feedback effectively in the clinical environment. Med Teach 2012;34:787-9.
24. Glicksman E. AAMC | Unconscious Bias in Academic Medicine: Overcoming the Prejudices We Don't Know We Have [Internet]. Concierge Medicine Today. 2018 [cited 25 October 2019]. Available from: https://conciergemedicinetoday.org/2018/09/29/aamc-unconscious-bias-in-academic-medicine-overcoming-the-prejudices-we-dont-know-we-have