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

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

<table>
<thead>
<tr>
<th>Faculty feedback</th>
<th>Group A</th>
<th>GROUP B</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>17</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>137</td>
<td>24</td>
<td>0.000</td>
</tr>
<tr>
<td>Below average</td>
<td>39</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Chi square test Comparing sleep habits of students with faculty feedback regarding their academic performance
Psychological stress is a known inciting factor for insomnia and has a bidirectional association with poor sleep quality. 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. Recent studies establish an association of sleep duration and quality with academic and cognitive performance in adolescents. 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. Inability to cope is a documented stressor for medical student. This stress not only impacts students' performance but can also lead to other conditions further hampering academic performances.

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. Researchers have reported that poor quality sleep can result in inattentiveness, which leads to poor performance. 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. Assessment is a significant force for students learning. Assessment, to the outside world is an indicator of students' and institutions' quality. 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. Laird-Fick et al emphasized that the relationship between

DISCUSSION
Psychological stress is a known inciting factor for insomnia and has a bidirectional association with poor sleep quality. 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. Recent studies establish an association of sleep duration and quality with academic and cognitive performance in adolescents. 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. Inability to cope is a documented stressor for medical student. This stress not only impacts students' performance but can also lead to other conditions further hampering academic performances. 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. Researchers have reported that poor quality sleep can result in inattentiveness, which leads to poor performance. 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. Assessment is a significant force for students learning. Assessment, to the outside world is an indicator of students' and institutions' quality. 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. Laird-Fick et al emphasized that the relationship between
CORRELATION BETWEEN SLEEP HABITS AND ACADEMIC PERFORMANCE IN MEDICAL STUDENTS

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
18. Owens JA, Weiss MR. Insufficient sleep in adolescents: