SLEEP PATTERNS AND ACADEMIC PERFORMANCE IN STUDENTS OF A MEDICAL COLLEGE IN PAKISTAN

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ABSTRACT

Objectives: *To determine the various sleep patterns in medical students appearing in various ongoing professional exams of Shifa Medical College and to find out relationship between number of hours of sleep before an examination with academic performance in relevant exam.*

Material and Methods: *This cross sectional survey was conducted at Shifa College of Medicine, Islamabad from 1-31 January, 2011. All students who had given an examination in one month period were identified through Student Affairs section of the college. Data was collected on a questionnaire and was analyzed in SPSS 17.0.*

Results: *Out of 195 students, 189 (96.9%) participated in study. Mean sleep of students in routine was 7.30 $\pm$1.66 hours and before exam was 4.74 $\pm$ 2.57 hours. Students felt refreshed after a mean sleep of 8.99$\pm$3.31 hours. Females slept on average less than males. About 84.3% (86/102) of the passed students and 81.6% (71/89) failed students slept for < 7 hours. One hundred and twenty (63.5%) participants felt that their performance was not affected by sleep. Coffee and tea were popular student choices for staying awake before an exam. Most students (n= 184, 97.4%) did not take any medication to sleep at the night of the exam.*

Conclusion: *Majority of the students had reduced sleep in exam days and its reason was found to be studying late and no firm relationship was found between sleep at night before paper and academic performance. Further studies are recommended to find out any relationship between the two entities.*

Key Words: *Sleep Pattern, Academic Performance, Medical Students.*

INTRODUCTION

Adequate amount of sleep is important for one's mental and physical health, for cognitive restitution, processing, learning and memory consolidation[1-3]. Sleep requirements vary from person to person but 7-8 hours of sleep in adults is considered normal. It has been reported that inadequate sleep can cause emotional instability, memory loss, day time sleepiness and decreased concentration[4]. Various researches have been conducted all over the word on this issue so far which shows that sleep deprivation affects the academic performance of student and may also cause mood dysregulation, increased dissatisfaction in day time functioning, obesity and decrease in cognitive functions[2,5-7]. A similar study done in Pakistan, on pediatric medicine residents also revealed the fact that continuous work with decreased sleep results in deterioration of cognitive and behavioral status[4].

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There have been various reasons for decreased sleep in adolescents including watching TV and using the internet[4]. A study done in a Pakistani medical university showed that 58.9 percent of the adolescents slept less than 8 hours a day and the most common cause of sleep deprivation was watching television and listening to music[8]. Stress, in adolescents, is also a very important contributing factor in inability to sleep at night[9]. Another trend seen among students is consumption of caffeine, pain killers, substance abuse and smoking at night to keep them awake. This greatly contributes to sleeplessness at night among students and affects their academic performances adversely[10-12]. The College students are at a greater risk of developing sleeping disorders and this can adversely affect their academic performance[13,14]. A study carried out in University of Colorado School of medicine suggested that sleep disturbances negatively affect student performances at different ages and educational levels[15]. A similar study done in China demonstrated that a large number of college students had sleeping difficulties[16].

To the best of our knowledge, no studies on sleep patterns and their association with the academic performance have been carried out on medical students in Pakistan. This study was carried out with the objectives to determine the various sleep patterns in medical students appearing in various ongoing professional exams of Shifa Medical College and to find out relationship be-

tween number of hours of sleep before an examination with academic performance in relevant exam.

MATERIAL AND METHODS

This observational, cross sectional survey was conducted at Shifa College of Medicine, Islamabad from 1st January to 31th January, 2011. Total duration of study was one month and it included all those students of the college who were appearing in various ongoing professional exams of MBBS. These students were identified through Student Affairs Section by obtaining a list of the students' roll numbers. Total of 195 male and female students were interviewed at the end of each exam on the same day. Response of students was noted on a specially designed questionnaire and convenient sampling method was used to collect the data. Informed consent was taken and the study was duly approved by the institutional review board of the college. Students at the end of their exam were asked to mark the appropriate column regarding their sleep patterns including average number of hours of sleep they took routinely, number of hours of sleep at the night before paper, number of hours of sleep resulting in refreshed mood before the present exam, whether the students took any substance to keep themselves awake before exam, whether they felt that their performance was affected by inadequate sleep, if they had taken any medication to help them sleep, whether they had studied adequately for the exam and mention the reasons of late night sleeping if any. Study also included evaluation of the performance of the students in their respective exams after declaration of their result. The data was analyzed in SPSS (version 17.0). Descriptive statistics were obtained in response to each question.

RESULTS

Out of 195 students, 189 students replied while 6 did not respond with a response rate of 96.9%. Mean age of the participants was 20.22 ± 1.41 years. Out of the studied students, 86(45.5%) were males and 103(54.5%) were females with male to female ratio of 1:1.19. The mean number of hours students slept before an exam was 4.74 ± 2.57. Females slept less than males 4.71 ± 1.82 hours compared to 4.77 ± 3.27 hours. The rest of the sleep characteristics are summarized in Table I.

SLEEP CHARACTERISTICS

Variable	Gender	Mean $\pm$ Std. dev
Sleep before examination (hours)	Male	4.77 ± 3.27
	Female	4.71 ± 1.82
Normal sleep (Hours)	Male	7.38 ± 1.86
	Female	7.22 ± 1.37
Sleep after which feel fresh (hours)	Male	9.28 ± 3.47
	Female	8.75 ± 3.16

Table I

After the declaration of the results of exam, 102 (54%) of the students passed the exams and 87 (46%) students failed. Out of 102 passed students, 86 (84.3%) of the students slept for < 7 hours while out of 87 failed students 71 (81.6%) students slept the same number of hours. Majority 28(84.8%) of those who obtained top grades (A, B) were those who slept < 7 hours. However, those who obtained the lower grades (C, U) also slept the same number of hours. Tables 1- 3 summarize these results.

RELATIONSHIP BETWEEN NUMBER OF HOURS OF SLEEP BEFORE AN EXAMINATION AND THE GRADE OBTAINED IN EXAM

Number of hours slept before an examination	Grade				
	A	B	C	U	Total
0-2	1	5	10	19	35
2.5-4.5	2	6	24	25	57
5-7	4	10	24	27	65
7.5-9.5	0	4	9	12	25
10-12	0	1	2	4	7
Total	7	26	69	87	189

A = > 80% B = > 70% C = > 60% U (fail) = < 60%

Table II

RELATIONSHIP BETWEEN SLEEP BEFORE AN EXAM AND ACADEMIC PERFORMANCE

Sleep before an exam (hours)	Pass (%)	Fail (%)
0-2	16(45.7)	19(54.3)
2.5-4.5	32(56.1)	25(43.9)
5-7	38(58.5)	27(41.5)
7.5-9.5	13(52)	12(48)
10-12	3(42.9)	4(57.1)

Table III

Similarly, 69(36.5%) participants felt that their performance was affected by sleep while 120(63.5) felt that it was not. Majority 99(52.4%) of the students who slept late at night before the exam expressed that studying was the cause of sleeping late while the response of the rest of the students in this respect is shown in Table IV.

It was found that 90(47.6%) participants stayed awake without the use of any substance while 29(15.3%) each took tea and coffee respectively for this purpose. The rest of the students used the substances mentioned in Table V.

REASONS FOR STAYING UP LATE BEFORE THE EXAM

Variable	Frequency	Percentage
Slept early	40	21.2
Stress	31	16.4
Studying	99	52.4
Watching television	11	5.8
Others	8	4.2

Others= Internet (3), texting (2), playing video games (2), talking on the phone (1)

Table IV

SUBSTANCES USED BY THE STUDENTS TO KEEP AWAKE BEFORE THE EXAMINATION

Variable	Frequency	Percentage
Nothing	90	47.6
Coffee	29	15.3
Tea	29	15.3
Energy Drink	9	4.8
Paracetamol + caffeine[17]	2	1.1
Soft Drink	2	1.1
Milk	1	0.5
Coffee and tea	6	3.2
Coffee and energy drink	5	2.6
Coffee and soft drink	3	1.6
Coffee and cigarette	1	0.5
Tea and energy drink	2	1.1
Tea and chocolate	1	0.5
Tea and cigarette	1	0.5
Energy drink and soft drink	2	1.1
Energy drink and cigarette	1	0.5
Energy drink, coffee and tea	1	0.5
Energy drink, coffee and soft drink	1	0.5
Energy drink, tea and cigarette	1	0.5
Coffee, energy drink, tea and cigarette	2	1.1

Table V

Less than 3% (5 students) had taken medication to sleep the night before the exam. In addition, it was found that 90(47.6%) students felt that they had studied adequately for the exam.

DISCUSSION

Sleep is extremely important for ones mental and physical health. Even though enough sleep is necessary for cognitive function and memory consolidation, it did not seem to have any effect on the academic performance contrary to what other studies have shown[3,11,18]. Our study showed that students who obtained good grade (A, B) were those who slept for < 7 hours but the majority who failed, were also mostly those who slept less. However, a similar study done in USA showed that students who had struggling grades (C's D's / F's) were those who slept significantly less than those who scored A and B grades (p < 0.001)[18]. According to our study student slept an average of only 4.74 hours before the exam and females slept less (4.71+1.82 hours) as compared to males (4.77+3.27 hours). This was similar to a cross sectional study done in São Paulo, which showed that boys slept about 420 minutes per night while the girls slept 390 minutes. However this disturbance in the sleep cycle did not show any significant effect on their academic performance[4].

To stay awake before the examination, the students used a variety of substances ranging from tea, coffee, energy drinks, soft drinks, cigarettes to Paracetemol + caffeine. Majority of these substances contained caffeine and the students were well aware of this fact. According to a study carried out among students of Nigeria, 14.9% of students used substances like antibiotics, analgesics and other drugs to stay up at night and study[12]. Another study, done in Bergen showed that caffeine increased sleeplessness and nocturnal worry[13].

Also, it is possible that the students did not study adequately for the exam as 52.4% of them felt that they had not although 45% of them did pass the examination. Of the 7 participants who got the top grade (A), 3 were those who said they had not studied adequately. Less than 3% students took medication to help them sleep the night before the exam which does not seem to play a significant role in causing drowsiness during the exam. However a study done in Netherland showed that such medication is related to decreased alertness (p<0.0001) and decreased mental activation (p <0.03)[19].

LIMITATIONS

The findings of this study are contrary to most of the other studies done abroad, so it should be interpreted with care and cannot be generalized. Since students from different academic years were evaluated in the study it may have affected the results obtained. The study was conducted in only one medical college and it is possible that results may differ when compared to other medical colleges since the working environment is unique to ev-

ery medical college. The sample size may also have been inadequate to assess the topic under study. Furthermore, this study may not be able to accurately assess how a student performs in the long run as it only addresses the academic result obtained from one exam.

CONCLUSION

Majority of the students had reduced sleep in exam days and its reason was found to be studying late. Although this study did not find any link between sleep and academic performance, large scale studies following academic results for a longer period of time are recommended to find if similar results are obtained. Thus, this will act as a pilot study for future studies on this subject.

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