



## SLEEP PATTERNS; AMONG MEDICAL AND NON-MEDICAL STUDENTS OF UNIVERSITY OF LAHORE, 2010-11

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**ABSTRACT... Background:** College students experience a number of sleep problems, which impact academic performance, health, and mood<sup>1</sup>. University students are exposed to pressures due to academic demands. **Objectives:** To determine the prevalence of sleep disorders among college students and look into their sleep patterns and life style. **Design:** A cross-sectional study. **Material & Method:** Sample was comprised of 141 medical and non-medical students. **Place and Period of Study:** The study was conducted at University of Lahore and period spanned from Dec 2010 to April 2011. **Results:** The age ranged 18 to 26, with 42.6 to 57.4 Male-female ratios. Both groups were almost similar in use of sleeping pills (medical: 97.2, non-medical: 82.2%). They differed in percentages for studying academic books, listening MP 3 player and late night parties/hangouts, wherein medical students outnumbered non-medical students almost by half. Both groups differed in their usual time to sleep, medical students who sleep later than 12 pm was higher (66.2%), compared to 46.6% non-medical. In taking day naps (medical: 70.6%, non-medical: 37.0%), awakening due to noise often (medical: 41.2%, non-medical: 30.1%), nightmares during sleep often (medical: 23.5%, non-medical: 19.5%) and sometimes (medical: 44.1%, non-medical: 30.1%), difficulty in falling sleep sometimes (medical: 50.0%, non-medical: 32.9%), feel sleepiness in the class often (medical: 45.6%, non-medical: 28.8%), feel tired or sleepiness during the day (medical: 36.7%, non-medical: 23.4%). Both groups also differ regarding worry about "sleep disturbance to some extent". (medical:51.4%, non-medical:35.6%). **Conclusions:** Our study found that medical students had more disturbed sleep patterns than the comparing group including delaying sleep time at night, awakening due to noise, experiencing nightmares, difficulty in falling sleep, feeling sleepiness in the class and during the day.

**Key words:** Sleep disorders, sleep patterns, university students, lifestyle of students

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### INTRODUCTION

College students experience a number of sleep problems, which may impact academic performance, health, and mood<sup>1</sup>. A common sleep problem among college students is sleep deprivation and resulting excessive daytime sleepiness. Unable to fall asleep earlier in the evening, young adults cannot get enough sleep if they must get up early. In addition, sleep may be voluntarily sacrificed due to social factors or involuntarily curtailed because of living in a noisy residence hall or apartment<sup>2</sup>.

Some studies have shown that sleep disturbances are found more frequently among women than men<sup>3</sup>, some studies have shown a positive relationship between smoking a sleep disturbance and same was true of the relationship between drinking and sleep disturbance<sup>5,6</sup>.

The consequences of sleep problems, whether due to insufficient sleep or an untreated sleep disorder can be serious. Sleep problems have been associated with deficits in attention and academic performance<sup>7</sup>, drowsy driving<sup>8</sup>, risk-

taking behavior<sup>9</sup>, impaired relationships<sup>10</sup>, and poor health<sup>11</sup>. Excessive daytime sleepiness due to sleep deficiency was associated with increased risks for accidents, decreased productivity and difficulties in interpersonal relationships<sup>12</sup>. It was reported that insomnia caused problems such as impaired concentration, impaired memory and decreased ability to accomplish daily tasks<sup>13</sup>.

University students are exposed to a lot of pressure due to academic demands. Moreover, the sleep-wake cycle of the students is characterized by insufficient sleep duration, delayed sleep onset and occurrence of napping episodes during the day.

Thus, deprivation of sleep has enormous effects on society as well as individuals. For example, it was reported that annual social costs of daytime sleepiness due to various problems were estimated to be \$15 billion in the United States<sup>14</sup>.

The prevalence of sleep disorders in college students has not been established. It is not known whether reported sleepiness among college students is simply due to insufficient sleep or whether it might be secondary to an undiagnosed sleep disorder. Although reported sleep disorders in adults tend to increase with age<sup>15</sup>. In addition, sleep patterns or disorders among college

students may vary by gender or race/cultural affiliation<sup>16</sup>.

Over a decade, a rapid diffusion of computers and proliferation of audio and video gadgets and late night video-gaming zones among people and especially among students has occurred. Development of these new media has been changing culture and lifestyles of young adults including university students. Due to these cultural changes, sleep patterns of young adults tend to become irregular and many of them experience sleep deficiency, which could have detrimental effects on daytime activities including study<sup>17</sup>.

The purpose of the present study was to determine the prevalence of sleep disorders among college students and look into sleep patterns of university students in association with their life style.

### Objectives

1. To determine the prevalence of sleep disorders among medical and non-medical students of University of Lahore
2. To study their association with socio-demographic characteristic, health-related behaviors and perceived health status.

Study Variables	
Independent Variables	Dependent Variables
Age Sex Type of Course Parents' Occupation Parents' Education Parents' Income Residential Background Residential Type: Smoking Use of Drugs Coffee intake Physical exercise Activities done after 9 pm Perceived Health Status Early university timings	<b>Sleep patterns</b> Usual time to sleep Wake-up time Day-time naps Nocturnal awakening Wake-up from sleep due to noise Experiencing nightmares Difficulty in falling asleep Use of sleeping pills Drinking tea or coffee late in the evening Sleep satisfaction Fall asleep in class Feeling tiredness or sleepiness during the day Cognitive and motor behavior Effect of academic progress

## MATERIALS AND METHODS

### Study Population

The study population was comprised of all the students enrolled at the time of study at the University of Lahore (UOL). The UOL has two campuses situated at Riawind Road, Lahore. It comprises of 9723 students studying various medical and non-medical courses.

### Study sample and Sampling Method

The study sample was comprised of 141 medical and non-medical students of University Medical College of University of Lahore. Non-medical students belong to Lahore Business School, Institute of Molecular Biology & Bio-technology, and faculty of Pharmacy and faculty of Computer Sciences of the same university. The sample was not representative of the study population. The

	Frequency	%age
<b>Sex</b>		
Male	60	42.6
Female	81	57.4
<b>Father's Occupation</b>		
Business	83	58.9
Government Employee	17	12.1
Medicine & allied	15	10.6
Engineering	11	7.8
Agriculture	7	5.0
Lawyer	4	2.1
Industry	2	2.1
Overseas	2	2.1
<b>Mother's Occupation</b>		
Home makers	124	87.9
Teachers	10	7.0
Government Employee	6	4.2
Banker	1	0.7
<b>Father's education</b>		
Illiterate	5	3.5
Under-matriculation	23	16.3
Matriculation	2	1.4
Graduation	65	46.1
Post-graduation	35	24.1
Missing values	12	8.5
<b>Mother's education</b>		
Illiterate	16	11.3
Under-matriculation	43	30.5
Matriculation	1	0.7
Graduation	42	29.8
Post-graduation	17	12.1
Missing values	21	14.9

sample was determined by using non-probability convenience sampling technique.

### Data Collection Instrument

Data was collected by using semi-structured questionnaire comprising of open and closed-ended questions covering all study variables.

### Analysis

Data was entered on SPSS version 11 and frequencies and percentages of various characteristics were determined.

## RESULTS

The respondents of this study comprised of 141 medical and non-medical students of University Medical College of University of Lahore. Non-medical students belong to Lahore Business School, Institute of Molecular Biology & Bio-technology, and faculty of Pharmacy and faculty of Computer Sciences of the same university. Of them 68 students (48.2%) belonged to University Medical College, whereas 30.5% belonged to LBS, 13.5% to Faculty of Pharmacy, 6.4% to IMBB and 1.4% to Faculty of Computer Science. Over-all 68 students (48.2%) were medical and 73 (51.3%) were non-medical students.

Structured interviews were conducted on them during the month of September, 2011. The questionnaire comprised of closed-ended questions on socio-demographic, life style, sleep patterns characteristics of medical and non-students.

The age range of respondents of the study was 18 to 26, belonging to above-said faculties of UOL. Majority of students (87.2%) were 20 to 23 of age. Male-female ratio of the respondents was 42.6 to 57.4. The fathers' occupation of majority of respondents (58.9%) was business. The mothers of majority of respondents were home-makers. The fathers of majority of respondents (70%) were graduate or post-graduate. The respondents whose mothers were graduate or post-graduate were 42%. Only 18% of respondents said that monthly income of their parents was more than Rs: 100,000. 32% of respondents did not disclose the

income of their parents or did not know about it. Two-thirds of respondents were of urban background and 58% of respondents were living with their parents.

<b>Parent's Income</b>		
< 50,000	29	20.6
51,000 to 10,0000	41	29.1
>10,0000	26	18.4
Not fixed	1	0.7
Missing values	44	31.2
<b>Residential Background</b>		
Urban	105	74.5
Rural	36	25.5
<b>Residential Type</b>		
Living with parents	83	58.1
Living with relatives	15	10.6
Living in hostel	38	27.0
Living in own residence but not with parents	5	3.5
<b>Table-I. Socio- Demographic characteristics (N=141)</b>		

### Life Styles

Table-II compares the life style characteristics of the respondents belonging to medical and non-medical faculties. The prevalence of smoking among them was 10.3% and 13.7% respectively. Regarding number of cigarettes in a day more non-medical students smoked than medical ones.

Use of drugs for recreation was reported by two (2) of 73 non-medical students, whereas none of medical students took drug for recreational purposes. The drugs used by non-medical students were alcohol, bhang and ecstasy (MDMA: 3, 4-Methylenedioxymethamphetamine). Intake of coffee was found similar in two groups (medical students: 61.8%, non-medical students: 60.3%).

Likewise majority of respondents in both groups reported in almost similar percentages that they exercised irregularly, rarely or never. Both groups were found almost similar in use of sleeping pills (medical: 97.2, non-medical: 82.2%) and in use of coffee/tea late in the evening (medical: 47.0, non-medical: 46.6%).

	<b>Medical (N=68)</b>	<b>Non-medical (N=73)</b>
<b>Smoking</b>		
Yes	7 (10.3%)	10 (13.7%)
No	57 (83.8%)	56 (76.7%)
No answer	4 (5.9%)	7 (9.6%)
<b>Number of cigarettes daily</b>		
1-10	4	1
11-20	3	5
>20	Nil	4
<b>Use of drugs for recreation</b>		
Yes	Nil	2
No	62	59
No answer	6	12
<b>Intake of Coffee</b>		
Yes	42 (61.8%)	44 (60.3%)
No	23(33.8%)	27 (37.0%)
No answer	3(4.4%)	2 (2.7%)
<b>Number of cups of coffee</b>		
1-2	19	18
3 or more	18	17
Occasionally	5	9
<b>Exercise</b>		
Regularly	9 (13.3%)	9 (12.3%)
Irregularly	29 (42.7%)	29 (39.7%)
Never or rarely	28 (41.1%)	32 (43.8%)
No answer	2 (2.9%)	3 (4.2%)
<b>Use of sleeping pills</b>		
Often	1(1.4%)	6(8.2%)
Sometimes	1 (1.4%)	7(9.6%)
Rare/never	66 (97.2%)	60(82.2%)
<b>Use of coffee/tea late in the evening</b>		
Yes	32 (47.0%)	34(46.6%)
No	36 (53.0%)	39(53.4%)
<b>Table-II. Life styles (N=141)</b>		

### Activities after 9 pm

Table-III compares the medical and non-medical students about the activities they are indulged in after 9 pm. The respondents in both groups

	Medical (N=68)	Non-medical (N=73)
Watching TV	36 (52.9%)	40 (54.8%)
Text messaging	35 (51.4%)	40 (54.8%)
Online computer use	37 (54.4%)	35 (47.9%)
Studying academic books	41 (60.3%)	31 (42.5%)
Listening MP 3player	28 (41.2%)	16 (21.9%)
Talking on phone	19 (27.9%)	19 (26.0%)
Studying non-academic books	18 (26.5%)	18 (24.6%)
DVD/Video watching	17 (25.0%)	15 (20.5%)
Computer games	11 (16.1%)	11 (15.0%)
Late night visits	11 (16.1%)	12 (16.4%)
Late night parties/hangouts	11 (16.1%)	6 (8.2%)

**Table-III. Respondents' activities after 9 pm (N=141)**

reported various activities including watching TV, text messaging, talking on phone, studying non-academic books, computer games and late night visits in almost similar percentages. However they differed in percentages as regards to studying academic books, listening MP 3 player and late night parties or hangouts, wherein medical students outnumbered non-medical students almost by half.

### Sleep Patterns

Table-IV shows the comparison of sleep patterns between the two groups of medical and non-medical students. Both groups differed in their usual time to sleep, wherein percentage of medical students who sleep later than 12 pm was found higher than that of other group. (medical:66.2%, non-medical: 46.6%), in taking day naps (medical: 70.6%, non-medical: 37.0%), awakening due to noise often (medical: 41.2%, non-medical: 30.1%), nightmares during sleep often (medical: 23.5%, non-medical: 19.5%) and sometimes (medical: 44.1%, non-medical: 30.1%), difficulty in falling sleep sometimes (medical: 50.0%, non-medical: 32.9%), feel sleepiness in the class often (medical: 45.6%, non-medical: 28.8%), feel tired or sleepiness during the

day (medical: 36.7%, non-medical: 23.4%).

Both groups also differ regarding worry about "sleep disturbance to some extent". (medical:51.4%, non-medical:35.6%). On the questions of sleep satisfaction across the scale from excellent to poor, both groups reported similar responses. Perceived health status was reported "good" in similar percentages (medical: 50.0%, non-medical: 49.3), but more medical students perceived their health "bad" as compared to non-medical students (medical: 8.8%, non-medical: 4.1%).

### Effects of sleep patterns on cognitive and motor behavior

Table V shows the comparison effects of sleep patterns on cognitive and motor behavior between the two groups of medical and non-medical students. Effect on getting up of sleep was found similar in both groups. Effect of sleep patterns was found different between the two groups on participation in class by respondents wherein medical students reported that they had less effect on their class participation (medical: 27.9%, non-medical: 45.2%). Whereas in execution of on social activities (medical: 48.5%, non-medical:

	Medical (N=68)	Non-medical (N=73)
<b>Usual time to sleep</b>		
Earlier than 10 pm	2 (2.9%)	6 (8.2%)
Between 10pm to 12pm	21 (30.9%)	33(45.2%)
Later than 12 pm	45 (66.2%)	34(46.6%)
<b>Day naps</b>		
Yes	48 (70.6%)	27(37.0%)
No	20 (29.4%)	46(63.0%)
<b>Awakening due to noise</b>		
Often	28 (41.2%)	22 (30.1%)
Sometimes	20(29.4%)	29(39.8%)
Rarely	20(29.4%)	22(30.1%)
<b>Nightmares during sleep</b>		
Often	16 (23.5%)	14(19.2%)
Sometimes	30 (44.1%)	22(30.1%)
Rare/never	22 (32.3%)	37 (50.7%)
<b>Difficulty in falling asleep</b>		
Often	14 (20.6%)	14(19.2%)
Sometimes	34(50.0%)	24(32.9%)
Rare/never	20(29.4%)	35(47.9%)
<b>Falling asleep in the class</b>		
Often	25 (36.7%)	12(16.4%)
Sometimes	14 (20.5%)	21(28.8%)
Rarely	9 (13.3%)	13(17.8%)
Never	20(29.5%)	27(37.0%)
<b>Feel sleepiness in the class</b>		
Often	31(45.6%)	21(28.8%)
Sometimes	29 (42.6%)	26(35.6%)
Rarely	5 (7.3%)	14(19.2%)
Never	3 (4.4%)	12(16.4%)
<b>Feel tired or sleepiness during the day</b>		
Often	25(36.7%)	17(23.4%)
Sometimes	30(44.2%)	38(52.0%)
Rarely	10(14.7%)	10(13.6%)
Never	3(4.4%)	8(11.0%)
<b>Worried about sleep disturbance</b>		
Very much	17(25.0%)	19(26.0%)
To some extent	35(51.4%)	26(35.6%)
Not at all	16(23.5%)	28(38.4%)
<b>Sleep satisfaction</b>		
Excellent	14 (20.5%)	13(17.8%)
Good	30 (44.1%)	35(47.9%)
Fair	18 (26.4%)	20(27.4%)
Poor	6 (8.0%)	5(6.8%)
<b>Perceived Health Status</b>		
Good	34(50.0%)	36 (49.3%)
Fair	28(41.2%)	34 (46.6%)
Bad	6(8.8%)	3 (4.1%)

Table-IV. Sleep Patterns (N=141)



	Medical (N=68)	Non-medical (N=73)
<b>Effect on Social Activities</b>		
Often	33 (48.5%)	29(39.7%)
Sometimes	21(30.9%)	25(34.2%)
Rarely/Never	14(20.6%)	19(26.1%)
<b>Getting up of sleep</b>		
Often	23(33.8%)	23(31.5%)
Sometimes	26(38.2%)	26(35.6%)
Rarely/Never	19(27.9%)	24(32.9%)
<b>Participation in Class</b>		
Often	19(27.9%)	33(45.2%)
Sometimes	27(39.7%)	21(28.8%)
Rarely/ Never	22(32.3%)	19(26.0%)
<b>Routine Activities</b>		
Often	30(44.1%)	28(38.4%)
Sometimes	16(23.5%)	23(31.5%)
Rarely/Never	22(32.3%)	22(30.1%)
<b>Effect on Academics</b>		
Yes	45(66.2%)	42(57.5%)
No	23(33.8%)	31(42.5%)

**Table-V. Effect of sleep patterns on cognitive and motor behavior (N=141)**

39.7%) and routine activities (medical: 44.1%, non-medical: 38.5%) and on academics (medical: 66.2%, non-medical: 57.5%) more medical students reported the effect of sleep patterns than non-medical students.

**Effect of university timings on sleep patterns**

On the question of effect of university timing on sleep patterns, more medical students reported that university timings had an effect on their sleep patterns often (medical: 51.5%, non-medical: 34.2%). On the other hand non-medical students reported that university timing had never or rarely had an effect on their sleep patterns (medical: 26.4%, non-medical: 39.7%).

**DISCUSSION & CONCLUSION**

Good and satisfied sleep is not only pivotal in sound bodily health but also a primary requisite for social and cognitive activities. Sleep has an important role for students as it has a relevant facilitating role in learning and memory processes<sup>18</sup>. On the contrary, sleep deprivation impairs these functions<sup>19</sup>. Medical students who

	Medical (N=68)	Non-medical (N=73)
<b>Effect of sleep patterns on university timings</b>		
Often	35 (51.5%)	25(34.2%)
Sometimes	15 (22.1%)	29(39.7%)
Rarely/Never	18(26.4%)	

**Table-VI. Effect of university timings on sleep Patterns (N=141)**

suffer from sleep deprivation run a major risk of compromising their health but also are prone to commit medical errors in the care of patients. This study was designed on the assumption that medical students are at greater risk of sleep disorders than the students enrolled in other disciplines. In this regard our study is the first study focused on comparison of sleep patterns between non-medical and non-medical students.

Our study determined the socio-demographic and life style characteristics, activities done at night time and sleep patterns and their effects.

Our study found that medical students had more disturbed sleep patterns than the comparing group including delaying sleep time at night, awakening due to noise, experiencing nightmares, difficulty in falling sleep, feeling sleepiness in the class and during the day. This can be explained by their hectic and excessive academic commitments as they are shown by their morning and evening educational and clinical assignments and their studying academic books late into night. But sleep satisfaction and perceived health status was reported in almost similar percentages.

Our study showed no difference between the medical and non-medical students regarding smoking, use of recreational drugs, intake of coffee, use of sleeping pills, doing exercise and other activities done at night. Hence differentials in sleep patterns between the two groups may not be associated with the life styles of the respondents.

Regarding day naps which were found frequently taken by medical students and effect of university timing on sleep patterns may not be explained on the basis of their academic schedule as medical students' timings start earlier than non-medical students and most of the disciplines other than medical start around noon and continue into the late evening.

### Recommendations

1. Physical exercise has proven and a highly efficient role in regulating the body functions and has positive effect of health sleep. The majority respondents in both groups rarely or irregularly do exercise. This study recommends to university authorities to establish gym and exercise clubs and promote sports among the students.
2. This study recommends that medical students be made aware of the benefits of sleep hygiene and regular seminars and

workshops should be held on this issue to motivate the students to structure their routines in such manner that their sleep duration is not affected by their academic commitments.

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*“Failure is not fatal,  
but failure to change might be.”*

*John Wooden*