

## Sleep quality among University students in the UAE

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### ABSTRACT

**Objectives:** Identify the factors affecting quality of sleep, and assess the impact of low quality sleep on the daily activities of students.

**Materials and Methods:** A descriptive, cross-sectional survey was done, using self-administered questionnaires. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Data was collected, sleep quality was determined, and then data was analyzed using SPSS v.17 software.

**Results** This study included 290 university students of different majors aged 17-29 years. Analysis of sleep perception revealed that 67.2% of students suffered from poor sleep. Non-smokers showed a better sleeping quality (25%) than smokers (75%). Of the students who never missed any class 62% had a good sleep pattern. Non-users of social networking, such as Facebook, MSN, and twitter, had a better sleep quality than users. Poor sleep quality was strongly associated with higher anxiety level ( $p < 0.001$ ), and more morning classes missed ( $p < 0.014$ ).

**Conclusion:** Most university students suffer from poor sleep quality which is directly influencing their behavior and anxiety levels.

**Key words:** sleep, sleep quality, university students

### INTRODUCTION

University life is accompanied by many new stressful challenges, with increased freedom, self-responsibility, disorganized lifestyle, variable schedules, repeated deadlines, dormitory living, and social and academic obligations. In order to be able to cope with these challenges, students voluntarily alter their sleeping habits.

It accounts for one of the basic twenty four hours (circadian) rhythms, and can be seen in all species, including mammals, reptiles<sup>1</sup>. Sleep is the period in which the basic metabolic rate decreases, soft tissue and muscles are relaxed and revitalized, and the brain is able to process things that have been learned during the day<sup>2</sup>.

Harvard Women's Health Watch states there are six reasons for getting enough sleep, namely for improved learning and memory, maintenance of metabolism and weight, increased safety, enhanced mood, cardiovascular health and boosting up the immune system<sup>3</sup>.

Prolonged periods of time with deprivation of sleep can lead to negative changes such as hallucinations, poor mental clarity, and often provoked disease, or even death. Many studies have directly correlated the majority of car accidents with lack of sleep<sup>2</sup>.

Students' poor sleep habits and consequent poor sleep quality can have many mental, as well as physiological consequences. Students who spend their night getting one to two hours of less sleep have a tendency to accumulate a "sleep debt" which leads to excessive daytime sleepiness<sup>4,5</sup>. Deprivation of sleep to less than six to seven hours per day can lead to serious impairment of cognitive and psychomotor function (reduces concentration, memory and thinking strategies), daytime dysfunction, increased incidence of sleep related accidents<sup>5-7</sup>, and diminished academic performance, often resulting in poor grades<sup>5,8,9</sup>.

It was noticed that students experiencing sleep deprivation try to avoid

more difficult tasks<sup>10</sup>. Also, they often are not aware that the difficulties they are having academically can be directly related to their poor sleep quality<sup>11</sup> and might get depressed about someone with a lower cognitive ability scoring better on a test than them, due to the fact that the latter had a better night's sleep. This would explain the commonly heard comment, "I can't understand why I did so badly, I spent all the previous day studying"<sup>11,12</sup>.

The poor academic performance in students having poor sleep quality could be connected to loss of REM sleep. Students who sleep less than eight hours per night miss some of the last two hours of REM sleep. Those two hours of REM sleep tend to be the most important for further processing of newly learned material<sup>13-15</sup>. Therefore, if students experience sleep deprivation (with decreased REM sleep), irregular sleep schedules, or poor sleep quality, the rate at which they learn new material will be reduced<sup>13</sup>. However, even if students sleep eight hours per night, if they shift their sleep/wake cycle by two hours, they may experience difficulty concentrating<sup>16</sup>. Students meeting the criteria for delayed sleep phase disorder have been shown to have significantly lower grades, greater feelings of drowsiness, and more irritability compared to students without this sleeping disorder<sup>16</sup>. Chronic shifting of the sleep/wake cycle has also been associated with feelings of depression, reduced affability, and increased irritability. Students who report excessive daytime sleepiness also disclose more frequent use of marijuana and alcohol and may potentially have a greater tendency to abuse caffeine and nicotine<sup>4,16</sup>.

Sleep deprivation can have serious side effects on different processes in our body, including endocrine, immunologic, metabolic and cardiovascular. The extents of these effects depend on how severe the sleep deprivation is<sup>5,17</sup>.

When sleep is restricted to four hours per night in healthy young adults, abnormal endocrine responses (increased evening cortisol levels, increased sympathetic activation, decreased

thyrotropin activity, and decreased glucose tolerance) and altered secretory patterns of appetite-regulating hormones (decreased leptin and increased ghrelin secretion) are observed. The latter effect is likely to increase appetite, which may promote weight gain and obesity<sup>5</sup>.

Chronic sleep deprivation has also been associated with alteration of immune system function, the potential consequences being increased susceptibility to illness due to impaired host defenses<sup>15</sup> and activation of systemic inflammatory immune responses involved in the pathogenesis of insulin resistance and cardiovascular disease<sup>5</sup>.

With respect to the latter, epidemiological studies have shown an increase in cardiovascular events in subjects averaging  $\leq 5$  or  $\leq 7$  hours of sleep per night<sup>15</sup>. Other studies on the effects of insomnia have also shown that it can be an affective predictor of hypertension in adult males<sup>8</sup>, and CAD mortality in middle-aged individuals<sup>18</sup>. A high incidence of diabetes has also been observed in middle-aged males with sleep complaints or short-duration sleep<sup>19</sup>.

In addition, further studies of the effect of insomnia have established a link between poor sleep and risk for the development of mood changes, anxiety, suicidal tendencies, and substance abuse in young adults<sup>20-22</sup>.

It is well known that sleep quality has neurobehavioral and physiological consequences that might affect students' health, well-being, and academic functioning positively or negatively. Therefore, the aim of the present study is to assess the different factors which affect the quality of sleep in students and correlate the effect of poor sleep quality with the performances and behaviors of related to students.

## **MATERIALS AND METHODS**

A cross sectional survey was done among 290 university students of different majors in American University of Sharjah and Gulf Medical University, Ajman in the UAE from September 2011 to March 2012

Data was collected using a

standardized, pre-tested questionnaire. Sleep quality was assessed by the Pittsburgh Sleep Quality Index (PSQI). The PSQI is a reliable instrument to quantify sleep quality during the previous month. It consists of 19 self-rated questions and five questions related by the bed partner or roommate (if one is available).

Only self-rated questions are included in the scoring. The 19 self-rated items are combined to form seven "component" scores, each of which has a range of 0-3 points. In all cases "0" indicates no difficulty, while a score of "3" indicates severe difficulty.

The sum of scores for these seven component yields one global score, with a range of 0-21 points, "0" indicating no difficulty and "21" indicating severe difficulties in all areas.

The seven components of the PSQI are standardized versions of areas routinely assessed in clinical interviews of patients with sleep/wake complaints.

These components are: Subjective sleep qualities, Sleep onset latency, Sleep duration, Habitual sleep efficiency, Sleep disturbances, Use of sleeping medication, Daytime dysfunction.

The questionnaire included demographic characteristics which include age, gender, weight and height,

study major. Subjects were asked to estimate their weight and height to determine their body mass index (BMI). Questions about smoking, stimulant drink, exercise, and social networking too were asked. Questions were also asked on the consequences of sleep deprivation such as missing morning classes due to oversleep, having a car 'near' accident due to not sleeping well, and feeling anxious due to not sleeping well.

Data was collected after the approval from the Research Ethics Committee of the Gulf Medical University. Verbal consent was taken from the students before filling up the questionnaire. Data was analyzed using the SPSS-19. 'Chi-square' test was done to examine differences between categorized variables and 't-test' was done to compare the mean scores.

## RESULTS

The study subjects comprised 298 participants of whom 64% were females, 36% males. The ages ranged from seventeen to twenty nine years.

Table 1 shows that there is no significant difference between males and female in their Sleep Quality. Nevertheless, both the genders had many individuals with sleeping problems.

Table 1. Sleep Quality among different universities, age groups, and gender

	Good sleep		Poor sleep		Total		p valve
	No.	%	No.	%	No.	%	
UNIVERSITY							
GMU	38.0	31.1	84.0	68.9	122.0	100.0	NS
AUS	57.0	33.9	111.0	66.1	168.0	100.0	
GENDER							
Male	36.0	34.3	69.0	65.7	105.0	100.0	
Female	59.0	31.9	126.0	68.1	185.0	100.0	NS
AGE							
19 and younger	26.0	33.8	51.0	66.2	77.0	100.0	
20-23	48.0	28.7	119.0	71.3	167.0	100.0	
24 and older	21.0	45.7	25.0	54.3	46.0	100.0	NS
Total	95.0	32.8	195.0	67.2	290.0	100.0	

Table 2. Sleep quality in the study subjects

Sleep Quality	Frequency	Percent
Good sleep	95	32.8
Bad sleep	195	67.2
Total	290	100.0

Table 3. Sleep Quality among smokers and duration of social networking

Variables	Good Sleep Quality		Bad Sleep Quality		p Value
	No	%	No	%	
SMOKING	N=289				
Yes	15	25.4	74.6	79	NS
No	44	34.3	65.7	151	
Total	94	32.5	67.5	195	
SOCIAL NETWORKING	N=290				
None	7	50.0	50.0	7	NS
<30 minutes	25	30.1	69.9	58	
1-2 hours	28	28.0	72.0	72	
>2 hours	35	37.6	62.4	58	
Total	95	32.8	67.2	195	
STIMULANT DRINKING	N=288				
Yes	46	28.6	71.4	47	NS
No	115	37.0	63.0	80	
Total	93	32.3	67.7	195	

Students above 24 years of age seem to have the least sleeping disturbances. More people within the 20-23 age groups suffer from sleep disturbances than in the other age groups, while it is almost equal between the two genders among teenagers.

Overall the sleep quality for the entire group was bad, as seen in Table 2. Although there was a higher percentage of smokers having sleeping disturbances when compared to non-smokers, the results were not significant.

There is a noticeable increase in the percentage of users of social networking sites and energy drink users having sleep

disturbances. However the result is not statistically significant.

Table 4 shows that most of the students who never missed any morning classes, or never slept during classes have significantly good sleep quality.

A significant proportion of students who have had bad sleep quality felt anxious during the day (Chi square test  $p \leq 0.001$ ).

## DISCUSSION

The purpose of our study was to assess the sleep quality among university students in the UAE, as well as finding the factors that might influence it. Besides that, we looked briefly at the consequences that

Table 4. Sleep Quality among students with classes missed, sleeping during classes, car accidents, feeling anxious

	Good Sleep Quality		Bad Sleep Quality		P value
	No.	%	No.	%	
Classes Missed	N=286				
None	58	61.7	80	41.7	
1-2	15	16.0	55	28.6	
3-5	10	10.6	26	13.5	<0.05
>5	11	11.7	31	16.1	
Total	94	100	192	100	
Classes Slept in	N=286				
Yes	27	29.0	84	43.8	<0.05
No	66	71.0	108	56.3	
Total	93	100	192	100	
Car Accidents	N=283				
Yes	10	10.8	36	16.3	NS
No	83	89.2	154	81.1	
Total	93	100	190	100	
Feeling Anxious	N=284				
Yes	32	34.8	121	63.0	≤0.001
No	60	65.2	71	37.0	
Total	92	100	192	100	

poor sleep quality might lead to.

Our study was conducted on university student. 105 males and 185 females voluntarily participated in the study. It was found that 67% of the students actually suffer from sleep disturbances and poor sleep quality. This correlates with two studies done in Taiwan and the US, which showed that most college students suffer from sleep disturbances. However, factors chosen did not show any significance to establish a connection leading to the poor sleep quality<sup>23,24</sup>.

Gender difference was not significant although previous studies show that women reported more sleep disturbances than men<sup>6</sup>. Different age groups did not really show any significance, although the group of students older than 24 years of age had the better sleep quality than the other two groups (28% compared to 34% and 48%).

Previous studies show that smoking alters the normal sleeping pattern and

causes poor sleep quality<sup>25</sup>. Our study also showed that non-smokers had a better sleep quality (25%) than smokers (75%), but this did not have a strong significance.

Non-users of social networking, such as Facebook, msn, and twitter, had a better sleep quality than users. However, those using social networking for 0.5-2 hours a day had the best sleep quality among the groups, but the result again cannot be taken into consideration due to the non-significant p value.

It was interesting to find out the effects of poor sleep quality among students on their activities during the day. When the students were asked about the number of classes missed during the previous month due to lack of sleep, we found that 62% of the students who never missed any class had a good sleeping pattern, while only 11% of them missed more than 5 classes. Conversely, 58% of students who have sleep disturbances missed 1 or more class in the previous

month. This result was quite significant ( $p < 0.05$ ).

Moreover, most of the students who slept during classes were found have bad sleep quality. 29% of students with good sleep quality slept during the class, compared with 42% of those with bad sleep quality. Again, this result showed high significance ( $p < 0.05$ ).

One of the results with great significance ( $p \leq 0.001$ ) was feeling anxious during the day due to sleeping disturbances. Only 35% of students having good sleep quality suffered from anxiety, while on the other hand it was 63% for students having poor sleep quality. This shows that a good night's sleep has a great impact on feeling comfortable during the day, and decreases anxiety levels.

## CONCLUSION

Most of the students have bad sleep quality, regardless of age, gender, and major studied. Significant results were not established among the factors leading to bad sleep quality. Smoking, exercise or stimulant drinking did not seem to have an influence on sleep quality. On the other hand, poor sleepers missed more morning classes and felt more anxious during the day. The results can be used by academic counselors, and by the students themselves, in order to have better sleep patterns, and to improve their daily activities. Further research could be conducted to assess other factors which might influence sleep quality, especially behavioral and lifestyle factors.

## REFERENCES

- Ropper H Allan, Samuels A Martin. Sleep and its abnormalities. Adams and Victor's Neurology. Boston;2009 March.
- Clifford MS and Applebee AG .Sleep Disorders. In, Feldman D. Mitchell, Christensen F. John(eds). Behavioral Medicine: A Guide For Clinical Practice, LANGE CURRENT Series, 3<sup>rd</sup> edition. New York: McGraw-Hill; 2007.
- Nicholson CR. Importance of Sleep: Six reasons not to scrimp on sleep. Health.harvard.edu (internet). Harvard Health Online Journal. Available from: URL: [http://www.health.harvard.edu/press\\_releases/importance\\_of\\_sleep\\_and\\_health](http://www.health.harvard.edu/press_releases/importance_of_sleep_and_health). [Accessed on 2006 January]
- Voelker R. Stress, sleep loss, and substance abuse create potent recipe for college depression. The Journal of the American Medical Association 2004;291:2177-2179.
- Teter CJ, McCabe Se, LaGrange K, et al. Illicit use of specific prescription stimulants among college students: prevalence, motives, and routes of administration. National Institutes of Health, pharmacotherapy 2006;26:1501-1510.
- Banks S, Dinges DF. Behavioral and physiological consequences of sleep restriction. Journal of Clinical Sleep Medicine 2007;3:519-528.
- Brown FC, Buboltz WC Jr, Soper B. Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. Journal of Behavioral Medicine 2002;28:33-38.
- Smith S, Carrington M, Trinder J. Subjective and predicted sleepiness while driving in young adults. Accident analysis and prevention journal 2005;37:1066-1073.
- Tsai LL, Li SP. Sleep patterns in college students. Gender and grade differences. Journal of Psychosomatic Research 2004;56:231-237.
- Trockel MT, Barnes MD, Egget DL. Health-related variables and academic performance among first-year college students: implications for sleep and other behaviors The Journal of American College Health 2000;49:125-131.
- Engle-Friedman M, Riela S, Golan R, et al. The effect of sleep loss on next day effort. Journal of Sleep Research 2003;12:113-124.
- Pilcher JJ, Walters AS. How sleep deprivation affects psychological variables related to college students' cognitive performance The Journal of American College Health 1997;46:121-126.
- Buboltz WC Jr, Brown F, Soper B. Sleep habits and patterns of college students: a preliminary study. The Journal of American College Health 2001;50:131-135.
- Smith C. Sleep states and memory processes in humans: procedural versus declarative memory systems. Sleep Med Rev 2001;5:491-506.
- Smith C, Lapp L. Increases in number of REMS and REM density in humans following an intensive learning period. Sleep 1991;14:325-330.
- Smith CT, Nixon MR, Nader RS. Post training increases in REM sleep intensity implicate REM sleep in memory processing and provide a biological marker of learning potential. Journal of Experimental Psychology :LearnMem 2004;11:714-719.

17. Buboltz WC Jr, Soper B, Brown F, et al. Treatment approaches for sleep difficulties in college students. *Counselling Psychology Quarterly* 2002;15:229-237.
18. Suka M, Yoshida K, Sugimori H. Persistent insomnia is a predictor of hypertension in Japanese male workers. *Journal of Occupational Health* 2003;45:344-350.
19. Mallon L, Broman JE, Hetta J. Sleep complaints predict coronary artery disease mortality in males: a 12-year follow-up study of a middle-aged Swedish population. *Journal of Internal Medicine* 2002;251:207-216.
20. Mallon L, Broman JE, Hetta J. High incidence of diabetes in men with sleep complaints or short sleep duration: a 12-year follow-up study of a middle-aged population. *Diabetes Care journal* 2005;28:2762-2767.
21. Ford DE, Kamerow DB. Epidemiologic study of sleep disturbances and psychiatric disorders. an opportunity for prevention. *The Journal of the American Medical Association* 1989;262:1479-1484.
22. Breslau N, Roth T, Rosenthal L, et al. Sleep disturbance and psychiatric disorders: a longitudinal epidemiological study of young adults. *Biological Psychiatry Journal* 1996;39:411-418.
23. Daniel J. Taylor, Adam D. Sleep patterns in college students: Gender and grade differences. *Journal of Psychosomatic Research* 2004;56(2):231-237.
24. Buboltz CW, Brown F, Soper B. Sleep Habits & Patterns of College Students. *Journal of American College Health* 2001;50(3):131-135.
25. Mesquita G, Ferreira S, Rossini S, et al. Effects of Tobacco and Alcohol Consumption on Sleep Quality of University Students. *Neurobiologia Journal*.2011;74(1):19-27.