



Original Article

Sleep Patterns and Disorders among University Students in Lebanon

Shafika Assaad (PhD)^a, Christy Costanian (MSc)^{b*}, Georges Haddad (MD)^c, Fida Tannous (MSc)^d

^a Department of Biology-Neuroscience, Faculty of Sciences, Lebanese University, Beirut, Lebanon

^b Department of Epidemiology and Population Health, Faculty of Health Sciences, American University of Beirut, Beirut, Lebanon

^c Department of Psychiatry, La Croix Hospital, Beirut, Lebanon

^d Department of Biology, Faculty of Sciences, Beirut Arab University, Beirut, Lebanon

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* Correspondence

Christy Costanian (MSc)

Tel: +961 3 413794

E-mail: christycostanian@gmail.com

ABSTRACT

Background: Insufficient sleep is a significant public health issue with adverse medical consequences. Sleep disturbances are common among university students and have an effect on this group's overall health and functioning. The aim of this study was to investigate sleep habits and disorders in a population of university students across Lebanon.

Methods: This was a cross-sectional study carried out in 2012 among 735 students aged 18-25 years old, enrolled at six universities across Lebanon. The Pittsburg Sleep Quality Index (PSQI) was used to assess sleep quality and habits.

Results: Less than half of the total study population (47.3%) were good sleepers (PSQI<5). Upon bivariate analysis, males experienced more sleep difficulties than females (57.8% vs. 40.8%). The majority (60%) of males vs. 40% of females had trouble performing daily activities more than once per week ($P=0.02$). Results of the multivariate analysis revealed that reporting poor sleep quality was strongly associated with daytime dysfunction and sleep-enhancing medication use especially more than once per week.

Conclusions: This is the first study to describe the nature of sleep problems among university students in Lebanon. This study suggests that sleep problems among Lebanese college students were common and such problems may interfere with daily performance. Findings from this study have important implications for programs intended to improve academic performance by targeting sleep habits of students.

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Introduction

A lack of sufficient sleep and poor sleep quality are major public health issues worldwide with adverse health consequences. It is recommended that adolescents (10–17 years old) sleep for 8.5–9.5 hours per night and those persons ≥ 18 years of age obtain 7–9 hours of sleep per night¹. Yet a significant proportion of college students do not follow these guidelines by sleeping < 6 hours per night. Lack of sleep has an effect on the endocrine, immune, and nervous systems and is associated with an increased risk of cardiovascular factors including obesity, diabetes, impaired glucose tolerance, and hypertension². Moreover, insufficient sleep is important in influencing body weight regulation and metabolism³. Sufficient sleep plays a role in improving memory and has been implicated with good scholastic attainment^{4,5}. A cross-sectional survey conducted among Chilean college students found a positive correlation between adequate sleep duration and self-rated happiness and quality of life, respectively⁶. Furthermore, insufficient sleep has been linked with poor academic performance, substance use, mood disorders, and physical inactivity⁷. Additionally, short sleep duration may lead to frequent medication use and al-

cohol consumption to aid sleep as well as stimulant use to increase daytime alertness⁸.

Sleep disorders among university students is an important topic for investigation⁹. However, few studies, focusing on this group of individuals, have been conducted. However, most studies focus on young children, adolescents, older adults or on a certain category of patients¹⁰. Today's university students experience great psychological pressure due to the changing career market and an increased job competition¹¹. Such stress and anxiety can cause sleep problems. In fact, a significant number of university students' sleep quality and quantity might be altered after enrollment². Studies examining sleep patterns and behavior conducted in the Middle East and North Africa (MENA) region remain scarce, limited to specific populations and small in sample size¹³. For example, Suleiman and colleagues¹⁴ reported poor sleep quality as being highly prevalent among nursing students in Jordan. Another study by Sweileh and colleagues¹⁵ reported that sleep problems were common among 400 Palestinian undergraduate students and were comparable to European counterparts.

Sleep disturbances among university students in Lebanon have received minimal attention and little is known about the nature of the sleep habits and difficulties in this population. For the purpose of this study, sleep problems or disturbances were defined as any difficulty in falling asleep or failure to maintain sleep due to noise, nocturnal eating or snoring. Sleep habits were defined as behavior pertaining to time to bed, time to rise, duration of night sleep and consumption of sleeping pills¹⁶.

The aim of this cross-sectional study was to describe and assess sleep patterns and sleep quality among university students in Lebanon, a small, middle-income country of the MENA region.

Methods

Study Setting and Sample

This cross-sectional study was conducted at six major universities in Greater Beirut and its suburbs, between June and December 2012 (n=1000, 73.5% response rate). Participants were chosen from five major private universities, the faculties of which were located in a single campus, and from six randomly selected faculties from the (public) Lebanese University, each within its own campus. A total of 1000 undergraduate students were randomly selected, with 735 (410 males and 325 females) participating in this survey.

The inclusion criteria were: men and women 18-25 years old, and enrolled as a current student in the bachelors program at each of the respective universities. Students who had respiratory problems such as sleep apnea, those with incomplete information on sleep quality, those below age 18 or above age 25 as well as pregnant, lactating females were excluded from the study. Participants were recruited through direct contact with one of the investigators at the university campus at the beginning of the semester prior to final exams and the end-of-semester work load after distribution of flyers.

After screening for inclusion and exclusion criteria, the subjects were invited to participate in the study. The questionnaire required less than 10 min to fill out. Proportionate random samples were selected based on the number of students in each university/faculty, and participants were asked to complete a self-administered anonymous questionnaire, which detailed characteristics on age, gender, and sleep quality, the outcome of interest. This research was reviewed and approved by the institutional review board.

Data Collection and Variable Specification

A self-administered questionnaire was used to collect information for this study. The questionnaire ascertained demographic information including age and sex. Sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI), a 19-item self-reported questionnaire that evaluates sleep quality within the past month. The PSQI, a retrospective tool is comprised of seven components that assess sleep habits and these included: sleep duration (in hours), sleep disturbance, sleep latency, estimates of habitual sleep efficiency, use of sleep-enhancing medication, daytime dysfunction due to sleepiness, and overall perceived sleep quality^{16,17}. Participants rate nine aspects of their sleep so that six specific component scores (e.g., sleep latency), as well as a summary global Sleep Quality Index (SQI), can be calculated.

The sample was divided into good or poor sleepers according to the SQI of the PSQI (a score of ≥ 5 points was categorized as poor). Previous studies have documented the reliability and validity of the PSQI for detecting sleep disturbances¹⁷.

Each sleep component could be given a score ranging from 0 to 3, with 3 referring to the greatest disturbance¹⁶⁻¹⁷. Subsequently, these scores are summed to yield a global sleep quality score (range 0 to 21) with higher scores indicating poor sleep quality in the last month. Participants with a global score ≥ 5 were classified as poor sleepers. Those with a score < 5 were classified as good sleepers. This classification is consistent with prior studies of college students¹⁸. In accordance with PSQI sleep quality subscales, subjective sleep efficiency, sleep latency, sleep medication use, and daytime dysfunction due to sleepiness, a dichotomous variable of optimal and suboptimal sleep quality was computed. Specific categories were sleep latency (≥ 30 versus < 30 minutes); estimates of poor sleep efficiency such as daytime dysfunction due to sleepiness (\geq once per week versus $<$ once a week); and sleep medication use during the past month (\geq once per week versus $<$ once a week).

Statistical Analysis

Frequency distributions of sleep quality and other components of sleep among study participants were examined. Characteristics were summarized using means and standard deviations for continuous variables and counts and percentages for categorical variables. Chi-square test and Student's *t*-test were used to determine bivariate differences for categorical and continuous variables, respectively. The distributions of PSQI scores among male and female students, as well as the sex-specific prevalence of poor sleep quality were also estimated according to the PSQI classification. Prevalence estimates and risk of suboptimal dichotomous sleep quality subscales were also obtained. Multivariable logistic regression estimated the odds ratios (OR) and 95% confidence intervals (95% CI) for the associations between reporting poor sleep quality and having a poor PSQI score in unadjusted and adjusted models. All analyses were performed using SPSS Statistical Software for Windows (IBM SPSS Version 18, Chicago, Illinois, USA). All reported *P* values are two-sided and deemed statistically significant at $\alpha=0.05$.

Results

A total of 735, out of approximately 1000 students were recruited. Approximately 56% of the 735 participants were male and the overall mean age was 20.6 ± 1.8 years. Table 1 depicts the patterns of sleep quality and quantity in the overall study sample. The average sleep latency (the amount of time that it takes to fall asleep, measured in minutes) was 24.64 ± 1.1 minutes among respondents. The average duration of sleep reported by students was 6.67 ± 1.67 hours. Less than half of the total study population (47.3%) were good sleepers (PSQI <5). Around 42% of participants could not fall asleep within 30 minutes of going to bed during the last past month and those also scored poorly on the PSQI scale. Over a quarter of the students surveyed had not experienced bad dreams as a sign of sleep disturbance while sleeping more than once per week. Around 30% of participants experienced a lack of enthusiasm more than once per week, and 28% had trouble staying awake while driving, eating, and

engaging in social activity more than once per week, as indicators of daytime dysfunction.

Table 2 summarizes the distribution of PSQI sleep components subscales for male and female students, respectively. The mean sleep latency in males was 19.78 ± 4.32 minutes, whereas in females, the mean was 21.23 ± 1.64

minutes ($P=0.001$), while the mean sleep duration in males was 7.75 ± 1.64 minutes, whereas in females, the mean was 8.51 ± 1.52 minutes ($P=0.001$) (results not shown). More than 50% of students (53.2%) reported being poor sleepers, with males experiencing more sleep difficulties than females (57.8% vs. 42.2%).

Table 1: Sleep quality patterns in the overall study sample (n=735)

Rating Variables	0		1		2		3	
	N	%	N	%	N	%	N	%
Sleep Quality								
A priori grouping ^a	136	18.5	347	47.3	175	23.8	77	9.9
Sleep Efficiency^b								
Cannot get to sleep within 30 min	282	38.4	146	19.9	132	18.0	173	23.5
Wake up in middle of night or early morning	231	31.4	142	19.3	172	23.4	190	25.9
Have to get up to use the bathroom	342	46.5	194	26.4	117	15.9	81	11.0
Cannot breathe comfortably	469	63.8	105	14.3	87	11.8	74	10.1
Cough or snore loudly	466	63.4	99	13.5	65	8.8	105	14.3
Sleep Disturbances^b								
Feel too cold	419	57.0	198	26.9	75	10.2	43	5.9
Feel too hot	314	42.7	197	26.8	117	15.9	107	14.6
Had Bad dreams	248	33.7	243	33.1	174	23.7	70	9.5
Had Pain	456	62.0	159	21.6	71	9.7	49	6.7
Daytime Dysfunction^b								
Problem keeping up enthusiasm to get things done	213	29.0	299	40.7	162	22.0	61	8.3
Trouble staying awake while driving, eating, engaging in social activity	289	39.3	239	32.5	151	20.5	56	7.6
Sleep Medication (How often do you take medication to help you sleep?)	420	58.8	223	22.6	57	13.9	35	4.7

^a 0: very good; 1: fairly good; 2: fairly bad; 3: very bad

^b 0: not during past month; 1: less than once a week; 2: once or twice a week; 3: three or more times a week

With regards to sleep behavior, over 50% of males in our study woke up in the middle of the night or very early morning ($P=0.042$), and this trend was also seen in females at 46%. The majority of males (67.3%) reported that they coughed or snored loudly more than once per week while almost 33% of females reported similar issues ($P<0.001$). More males than females experienced disturbances in the form of feeling too hot (63.3% vs. 37.6%) and feeling pain (55.6% vs. 44.4%) more than once a week while asleep and this was statistically significant ($P<0.001$) (Table 2). On the other hand, more females than males reported feeling too cold (55.5% vs. 44.5%) and having bad dreams (53% vs. 47%) more than once a week while asleep, and these results proved also to be statistically significant ($P<0.001$). Over half of males in this study population vs. 48.4% of females reported troubles with maintaining enthusiasm more than once per week ($P=0.013$), also 60% of males and 40% of females had trouble performing daily activities more than once per week ($P=0.024$). Almost 60% of males and 41.3% of females reported taking sleeping medications more than once per week.

We evaluated the odds of poor sleep quality as determined by the PSQI score according to participants' demographic and other sleep characteristics. Results of the multivariate logistic regression of the association between a poor PSQI score and other variables are shown in Table 3. All of the variables that were shown to be statistically significant in the bivariate analysis were included in the multivariate model. There was no major difference between the unadjusted, age and gender adjusted and adjusted models. Daytime dysfunction, sleep quality and sleep medication remained statistically significant in both bivariate and multivariate analysis throughout the study. Although this result was not statistically significant, compared with males, females were less likely to be poor sleepers OR=0.67 (95% CI: 0.42, 1.05; $P=0.821$) in the fully adjusted model. As an indicator of sleep distur-

ance, those who felt too hot more than once per week while asleep were 1.3 times more likely to score poorly on the sleep score OR=1.29 (95% CI: 1.04, 3.40; $P=0.035$), than those who did never felt hot. Moreover, those who had experienced pain more than once per week were almost 2 times more likely to be classified as poor sleepers OR=2.34 (95% CI: 1.03, 4.85; $P=0.024$). In terms of daytime dysfunction, students who had trouble maintaining enthusiasm for more than once in the past month were almost 3 times more likely to score as poor sleepers compared with those who reported having no trouble OR=2.50 (95% CI: 2.08, 4.54; $P=0.001$). Furthermore, those who had trouble performing daily activities more than once per week were significantly more likely to be poor sleepers than their counterparts OR=9.09 (95% CI: 4.76, 12.3; $P=0.001$).

Finally, students who often take sleep-enhancing medication, were significantly more likely to be scored as poor sleepers, with those who take medications less than once per week having almost 7 times the odds of having a poor PSQI score OR=6.50 (95% CI: 2.9, 14.5; $P=0.002$), and those who take medications once or more per week having 14 times the odds of scoring poorly in the PSQI OR=14.1 (95% CI: 3.1, 15.6; $P=0.001$), compared to those who do not take sleep-enhancing medications.

Discussion

This study aimed to describe the sleep habits and sleep problems among university students in Lebanon. More than half of the students surveyed reported being poor sleepers, with males significantly experiencing more sleep difficulties than females. Findings of this study indicate that around 42% of participants could not fall asleep within 30 minutes of going to bed during the last past month. Results of the multivariate analysis revealed that students who often took sleep-enhancing medication were significantly more likely to

be scored as poor sleepers with those who take medications once at least once per week had 14 times the odds of being scored as poor sleepers.

Table 2: Association between sleep quality, habits and problems with gender in the sample (n=735)

Variable	Male		Female		P value
	n	%	n	%	
Sleep Quality					0.057
Good	84	62.2	51	37.8	
Average	178	51.4	168	48.6	
Poor	145	57.8	106	42.2	
Sleep Efficiency					0.813
<i>Cannot get to sleep within 30 min</i>					
Not within past month	163	57.8	119	42.2	
Less than once per week	79	54.1	67	45.9	
≥Once per week	165	54.3	138	45.7	
<i>Wake up in middle of night or early morning</i>					0.042
Not within past month	146	63.2	85	36.8	
Less than once per week	77	54.2	65	45.8	
≥Once per week	184	51.4	175	48.6	
<i>Have to wake up to use the bathroom</i>					0.064
Not within past month	194	56.9	147	43.1	
Less than once per week	103	53.1	91	46.9	
≥Once per week	110	57.9	86	42.1	
<i>Cannot breathe comfortably</i>					0.281
Not within past month	259	55.5	208	44.5	
Less than once per week	66	62.9	39	64.0	
≥Once per week	82	51.1	78	48.9	
<i>Cough or snore loudly</i>					0.001
Not within past month	234	50.3	231	49.7	
Less than once per week	60	61.2	38	38.8	
≥Once per week	113	67.3	56	32.7	
Sleep Disturbances					0.001
<i>Feel too cold</i>					
Not within past month	259	62.0	159	38.0	
Less than once per week	97	49.2	100	50.8	
≥Once per week	51	44.5	66	55.5	
<i>Feel too hot</i>					0.003
Not within past month	171	54.6	142	45.4	
Less than once per week	95	48.5	101	51.5	
≥Once per week	141	63.6	82	36.4	
<i>Had Bad dreams</i>					0.021
Not within past month	150	60.7	97	39.3	
Less than once per week	142	58.4	101	41.6	
≥Once per week	115	47.0	127	53.0	
<i>Had Pain</i>					0.001
Not within past month	279	61.5	175	38.5	
Less than once per week	63	39.6	96	60.4	
≥Once per week	65	55.6	54	44.4	
Daytime Dysfunction					0.013
<i>Trouble maintaining enthusiasm</i>					
Not within past month	117	55.5	94	44.5	
Less than once per week	175	58.7	123	41.3	
≥Once per week	115	51.6	108	48.4	
<i>Trouble performing daily activities</i>					0.024
Not within past month	165	57.3	123	42.7	
Less than once per week	120	50.4	118	49.6	
≥Once per week	122	59.2	84	40.8	
<i>When do you usually wake up?</i>					0.044
Before 6 am	68	65.4	36	34.6	
Between 6-8 am	238	55.6	190	44.4	
After 8 am	99	50.3	98	49.7	
Sleep Medication					0.113
Never	311	53.8	267	46.2	
<once per week	52	65.8	27	34.2	
≥once per week	44	58.7	31	41.3	
PSQI SCORE					0.026
Poor Sleepers	231	59.2	159	40.8	
Good Sleepers	176	51.5	166	48.5	

Sleep patterns and habits

Our study revealed that the average duration of night sleep among Lebanese university students was 6.67 ± 1.6 hours. A similar study among Palestinian undergraduate students by Sweileh and colleagues reported an average duration of sleep of 6.4 ± 1.1 hours¹⁵. This result was also comparable with a study among Korean college students who had a sleeping duration of 6.7 ± 1.3 hours¹⁹. Our results showed that 42% of the participants needed more than 30 minutes to fall asleep. Our results were consistent with the National Sleep Foundation's that indicates sleep difficulties. Data from this study was similar to that obtained by studies among college students in USA where more than 40% of the American student population have difficulty falling asleep or have night waking²⁰. Studies conducted across various countries demonstrated that many college students are at risk for developing sleep disorders, and those at risk may also have a poor academic performance. In fact, sleep timing was strongly associated with academic performance than total sleep time and other pertinent factors²¹.

Sleep problems and the role of stress

Complaints about sleep problems are common among university students in this study for around 53% of students evaluated their sleep quality as satisfactory or poor. An explanation for this finding might lie in the role of stress as a most significant risk factor in sleep quality as previously shown²². Perceived stress can serve as a predisposing, precipitating, and perpetuating factor for sleep difficulties in this special group of the population. First, the college lifestyle encompasses events and situations that enhance stress-related sleeping difficulties (e.g. erratic schedules, high-stress periods like midterm and final exams). Second, university students may be more susceptible to arousal-related sleep difficulties because of ongoing changes and maturation in the neuroendocrine system.

The Hypothalamic-Pituitary-Adrenal (HPA) axis is still developing during adolescence and continues to develop in late adolescence. As a result, cortisol secretion at perisleep onset increases²³. This neuroendocrine hyperactivity could play a role in both the hyper arousal observed in delayed sleep onset as well as increasing anxiety and depression²⁴. Third, college students may have not developed yet sufficient coping strategies for handling stressful events, and therefore may tend to internalize, ruminate, and worry more²⁵. Thus, biological factors could predispose stress-induced sleep difficulties, while stressful events common in this population trigger more instances of sleep disturbances, and rumination and worry can perpetuate the sleep difficulty.

Gender differences in sleep quality

More males in our study were poor sleepers compared with females. A likely explanation for the poor sleep quality among males might be attributed to the effect of testosterone. Testosterone levels have been shown to reduce time slept and induce sleep apnea²⁶. Our results showed that sleepiness during the day was common in Lebanese college students. Most students in our study experienced daytime sleepiness with more than half reported having trouble performing daily activities and maintaining enthusiasm due to a lack of sleep at least once per week. Lower prevalence rate of daytime sleepiness was reported among adults in Europe.

In four European countries, 23% of young adults reported having daytime naps²⁷.

The role of sleep enhancing medications

The vast majority of students in our study rarely used medication to enhance sleep. This rate is very similar to that reported from other countries in the region²⁸. However, our results demonstrated that students who took sleeping pills within the last week were significantly more likely to identify as poor sleepers. The tendency for older adolescents and

young adults to self-medicate sleep-wakefulness causes alarm self-administration of over the counter (OTC) medication in an older adolescent population has been found to be related with psychological distress. Sleep-medication use results in its users entering the vicious cycle of the stimulant-sedation loop, whereby caffeine and other stimulants will be consumed to repel daytime sleepiness resulting from sedation, and the subsequent use of depressants to oppose the stimulants' effects²⁹.

Table 3: Association between various indicators of sleep quality and a poor PSQI Score (n=735) using unadjusted odds ratio (UAOR) and adjusted odds ratio (AOR)

Characteristics	UAOR OR	95% CI	AOR ^a	95% CI	AOR ^b	95% CI
Age						
<20 years	1.00		1.00		1.00	
20-23 years	1.87	1.08,3.26	1.67	1.05,2.34	1.57	0.96,3.42
>23 years	1.22	0.90,1.66	1.38	0.86,2.77	1.36	0.54,2.32
Gender						
Male	1.00		1.00		1.00	
Female	0.73	0.54,0.97	0.48	0.67,1.23	0.67	0.42,1.05
Sleep Efficiency						
<i>Wake up in middle of night or early morning</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	2.26	1.47,3.47	3.09	1.34,3.42	3.22	1.68,6.91
≥Once per week	4.19	2.95,5.96	4.11	2.67,5.68	4.36	2.43,7.83
<i>Cough or snore loudly</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	1.93	1.24,3.03	1.78	0.98,2.45	1.26	0.66,2.39
≥Once per week	2.29	1.59,3.31	1.03	0.87,1.23	0.83	0.44,1.56
Sleep Disturbances						
<i>Feel too cold</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	1.76	1.25,2.49	1.25	0.781,3.4	1.08	0.63,1.87
≥Once per week	2.08	1.36,3.17	1.67	0.98,2.48	1.26	0.66,2.39
<i>Feel too hot</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	1.67	1.15,2.36	1.56	1.23,3.42	1.25	1.05,2.34
≥Once per week	2.52	1.09,3.45	1.34	1.03,2.34	1.29	1.04,3.40
<i>Had Bad dreams</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	2.76	1.23,2.51	2.46	1.11,2.56	1.07	0.86,1.87
≥Once per week	2.91	2.03,4.21	1.76	0.98,1.34	1.56	0.46,2.84
<i>Had Pain</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	1.78	1.24,2.57	1.34	1.25,2.78	1.24	0.98,2.35
≥Once per week	5.35	3.20,8.75	3.42	2.09,4.04	2.34	1.03,4.85
Daytime Dysfunction						
<i>Trouble maintaining enthusiasm</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	7.69	5.00,12.5	4.17	3.00,11.1	2.56	2.56,4.76
≥Once per week	4.54	3.00,6.67	2.77	2.22,5.79	2.50	2.08-4.54
<i>Trouble performing daily activities</i>						
Not within past month	1.00		1.00		1.00	
Less than once per week	4.54	2.94,7.14	3.57	1.81,6.67	2.70	1.75-3.44
≥Once per week	14.3	9.09,16.6	4.76	3.53,7.85	9.09	4.76,12.3
Sleep Medication						
Never	1.00		1.00		1.00	
<Once per week	7.03	3.72,13.3	6.89	2.35,10.6	6.50	2.90,14.5
≥Once per week	16.5	3.65,17.1	15.32	4.89,18.0	14.1	3.07,15.6

^a Adjusted for age and gender

^b Adjusted for all variables listed in the table

Limitations

The findings of this study are considered in light of the following limitations. Because of the cross-sectional nature of the study, the temporality of certain associations cannot be established with confidence. This survey may be limited by underreporting of sleep problems as social desirability bias may have affected students' responses, as this was a relatively educated population that may be mostly aware of

proper sleep hygiene. Furthermore, this study reported sleep patterns and problems within the past month which might not be consistent with students' general sleep behavior, also the period of the semester in which this study was conducted might have affected students' sleep quality. Other limitations include the fact that the questionnaire was self-reported and no sleep diary was included which may have affected the accuracy of our results. Furthermore, other factors affecting sleep such as Body Mass Index (BMI), level of studies,

amount of physical activity, place of residence, overcrowded homes, sharing the room with other students, watching TV and internet use were not included in this survey. The inclusion of such potential confounders could have resulted in a lengthy questionnaire which might have had an effect on the students' willingness to participate.

Strengths

Despite of the caveats above, this epidemiological study is among the first to determine the prevalence of sleep problems and to examine sleep behavior and patterns among this group of participants in Lebanon. Most universities included in the study are located in Beirut, which comprises more than 50% of university students in Lebanon, and are believed to reflect the varied religious and socioeconomic diversity of all university students in Lebanon. Therefore, the relatively large and representative sample size allows for the generalizability of our results to the university student population. Furthermore, the assessment of sleep quality was done using the PSQI which is a valid, reliable and widely used instrument that has been also translated into Arabic³⁰. Lastly, it is important to note that Lebanon has continuously been facing insecurity and political conflict, and these factors do not seem to be present in countries where other studies have been conducted and such contextual factors are expected to have an adverse effect on sleep quality. Sleep problems may confer vulnerability to longer-term distress in the presence of ongoing political violence and other environmental stressors, and so any intervention program targeting sleep quality in such a setting as this should be tailored to the needs of the population.

Conclusions

Sleep problems among Lebanese college students were common and such problems may interfere with daily performance, such as driving and academics. These findings highlight a growing need for professionals to focus on the quality as well the quantity of sleep when promoting physical and mental wellbeing among young adults. Findings from this study highlight the need for formulating awareness programs intended to improve academic performance by targeting sleep habits among university students, as troubled sleep and chronic insomnia are associated with substantial decrements in the quality of life. More descriptive studies with large sample sizes are needed to fully explore the factors related to students' sleep behavior in Lebanon. Future studies that include objective measurement of sleep and multiple sleep latency testing are needed as those would add to the understanding of the scope and dimensions of sleeping patterns and disorders in this population.

Conflict of interest statement

The authors declare that have no competing interests.

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