

## Assessment of Insomnia and Sleep Quality among Medical Students-Benghazi University. A Cross Sectional Study

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### Abstract

**Introduction:** Academic pressure and its associated stress are responsible for disturbances in the circadian cycle of the students, Medical students have a stressful academic career, so it is important to identify those students with sleep issues, extent of issues and factors contributing to it.

**Materials and Methods:** An observational, cross-sectional study conducted anonymously and voluntarily with undergraduate fourth and fifth year medical students at faculty of medicine, Benghazi university. 150 students were assessed using the Pittsburgh Sleep Quality Index (PSQI).

**Results:** 150 medical students were participated in the study, 95 (63.3%) were females and 55 (36.7%) were males. The sample's mean age was  $26.1 \pm 1.1$  years (range = 23 - 30 years). More than half the sample (52.7%) were sleeping alone, 44.7% were sharing a room with a roommate, and 2.7% were married. The calculated means of total PSQI, nocturnal sleep duration, and sleep latency were  $7.04 \pm 3.47$  hours,  $6.23 \pm 1.51$  hours,  $38.7 \pm 39.1$  minutes, respectively. The average wake-up time and the average bedtime were  $7.45 \pm 1.5$  and  $4.49 \pm 7.06$  respectively. 115 (76.67%) students were poor sleeper and the prevalence of poor sleep quality was slightly higher among females than males (76.8%) and (74.4%) respectively with  $p = 0.004$ . Younger students were about two and half times more prone to have poor sleep quality compared to older participants (OR = 2.4; 95% CI: 1.62 - 3.55).

**Conclusion:** Poor sleep quality is common among our medical students. It established that most medical students have a poor sleep quality, which could be related to their sleep habits. This study highlights a strong need for integrating sleep hygiene education for young students, to improve their sleeping practices and consequent physical and mental health.

**Keywords:** Insomnia; Sleep Quality; Benghazi University

### Introduction

Sleep medicine is an important medical discipline [1] which has gained a considerable attention nowadays [2]. Poor sleep quality is considered one of the most striking public health problems. The rates of poor sleep quality is increasing in both developing and modern societies [3,4]. It was estimated that the prevalence of sleep disorders among the general population ranged from 22% - 65% [5,6].

Sleep deprivation may have grave health consequences; resulting in increasing disease morbidity and mortality. It was postulated

that sleep deprivation may be associated with defect in the immune function and may be implicated in the pathogenesis of psychological problems and metabolic problems (diabetes mellitus, metabolic syndrome and obesity) [7].

Academic pressure and its associated stress are responsible for disturbances in the circadian cycle of the students [8]. Research has repeatedly given evidence that medical students have more severe sleep impairment than students of other fields [9]. The factors responsible include longer study duration, harder syllabi, exam stress, clinical duties which include overnight on-call duties, and

emotional challenges and exhaustion associated with witnessing human misery [10,11]. Medical students have a stressful academic career, so it is important to identify those students with sleep issues, extent of issues and factors contributing to it [12].

**Materials and Methods**

An observational, cross-sectional study conducted anonymously and voluntarily with undergraduate fourth and fifth year medical students at faculty of medicine, Benghazi university. The study duration was from Jan till Apr 2019. Students of both genders, with 183 students were invited, out of which students responded. There were 23 incomplete responses which were excluded. Remaining 150 responses were included in the study, A structured questionnaire (Pittsburgh Sleep Quality Index (PSQI)) [13]. that comprised A standardized, anonymous, confidential, self-administered data collection sheet was used. PSQI is an efficient measure of the quality and pattern of sleep. It assesses sleep quality on seven components-subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Its scores range from minimum zero to maximum 21. The combined score of all seven components is termed as “global score of PSQI” [14].

Global PSQI score  $\geq 5$  signifies “poor sleep quality” [13] and indicates that the individual has difficulties in at least two components or moderate difficulties in more than three components. whereas a score of less than 5 was indicative of good overall sleep quality [15]. The PSQI has internal consistency and a reliability coefficient (Cronbach’s alpha) of 0.83 for its seven components [16].

The SPSS for Windows, version 17.0 (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) was used to enter and analyze the data. Demographic data were categorized to calculate frequencies and percentages and all components of PSQI were categorized as mentioned by Smyth [14].

**Ethical considerations**

The study was complied with standards of “Helsinki declaration”. Administrative approvals and participants’ informed written consents were taken.

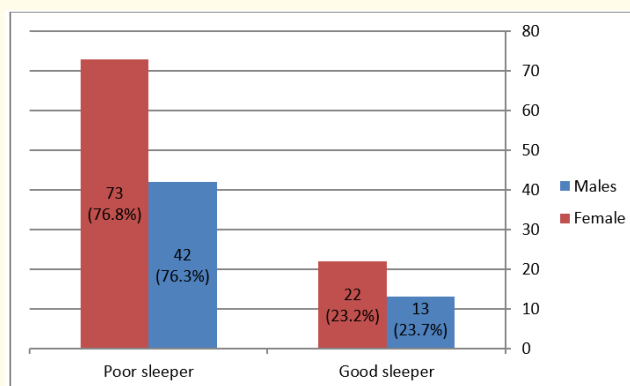
**Results**

150 medical students were participated in the study, 95 (63.3%) were females and 55 (36.7%) were males. The sample’s mean age was  $26.1 \pm 1.1$  years (range = 23 - 30 years). More than half the sample (52.7%) were sleeping alone, 44.7% were sharing a room with a roommate and 2.7% were married (Table 1). A summary of demographic characteristics is shown in graph 1.

The calculated means of total PSQI, nocturnal sleep duration, and sleep latency were  $7.04 \pm 3.47$  hours,  $6.23 \pm 1.51$  hours,  $38.7 \pm$

	Good sleeper	Poor sleeper	Total
Partner	1	3	4
Roommate	18	49	67
Alone	16	63	79
Total	35	115	150

**Table 1:** Partner \* global Cross tabulation crowding index (p-0.893).



**Graph 1:** Gender related sleep quality.

39.1 minutes, respectively. The average wake-up time and the average bedtime were  $7.45 \pm 1.5$  and  $4.49 \pm 7.06$  respectively.

115 (76.67%) students were poor sleeper and the prevalence of poor sleep quality was slightly higher among females than males (76.8%) and (74.4%) respectively with  $p = 0.004$ . Younger students were about two and half times more prone to have poor sleep quality compared to older participants (OR = 2.4; 95% CI: 1.62 - 3.55).

Scores of the seven components of PSQI questionnaire in addition to pattern of the sleep disturbances are shown in table 2.

Component	Number (Percent)
<b>Subjective sleep quality</b>	
Very good	36 (24%)
Fairly good	55 (36.7%)
Fairly bad	37 (24.7%)
Very bad	22 (14.7%)
<b>Sleep latency</b>	
$\leq 15$ min	52 (34.7%)
16 to 30 min	45 (30.0%)
31 to 60 min	40 (26.7%)
> 60 min	13 (8.7%)
<b>Sleep duration</b>	
> 7h	45 (30.0%)
6 to 7h	37 (24.7%)

5 to 6h	33 (22.0%)
< 5h	35 (23.3%)
<b>Habitual sleep efficiency</b>	
> 85	121 (80.7%)
75 to 84	20 (13.3%)
65 to 74	6 (4.0%)
< 65	3 (2.0%)
<b>Sleep disturbances</b>	
Not during the past month	17 (11.3%)
Less than once a week	110 (73.3%)
Once or twice a week	21 (14.0%)
Three or more times a week	2 (1.3%)
<b>Use of sleeping medication</b>	
Not during the past month	126 (84.0%)
Less than once a week	8 (5.3%)
Once or twice a week	9 (6.0%)
Three or more times a week	7 (4.7%)
<b>Daytime dysfunction</b>	
Not during the past month	36 (24.0%)
Less than once a week	53 (35.3%)
Once or twice a week	38 (25.3%)
Three or more times a week	23 (15.3%)

Insomnia effect (trouble being awake while driving, social events)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No problem at all	44	29.3	29.3	29.3
	Only a very slight problem	38	25.3	25.3	54.7
	Somewhat a problem	39	26.0	26.0	80.7
	A very big problem	29	19.3	19.3	100.0
	Total	150	100.0	100.0	

Sleep disturbance pattern				
	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
Cannot getup sleep within 30 minutes	59 (39.3%)	30 (20%)	21(14%)	40 (26.7%)
Wakeup in the middle of the night or early morning	58 (38.7%)	30 (20%)	21 (14%)	41 (27.3%)
Have to getup to use bathroom	76 (50.7%)	39 (26%)	13 (8.7%)	22 (14.7%)
Can't breath comfortably	103 (68.7%)	17 (11.3%)	18 (12%)	11 (7.3%)
Cough or snore loudly	104 (69.3%)	21 (14%)	13 (8.7%)	12 (8%)
Feel too cold	103 (68.7%)	25 (16.7%)	25 (8%)	10 (6.7%)
Feel too hot	92 (61.3%)	23 (15.3%)	18 (12%)	17 (11.4%)
Had bad dreams	73 (48.7%)	36 (24%)	20 (13.3%)	21 (14%)
	142 (94.7%)	7 (4.7%)	1 (0.7%)	0 (0.0%)

**Table 2:** Results for the Pittsburgh Sleep Quality Index components as a function of the number and proportion.

## Discussion

Studying medicine at undergraduate level is highly-demanding. Physical and psychological well-being of medical students is essential for learning, adaptation, and mastering their roles as future doctors. Their own health and their attitudes towards healthy lifestyles will substantially influence their future practice [17]. Learning and memory processing is greatly influenced by adequate sleep. In students, sleep-impaired sleep quality can damage academic performance [18] and cause emotional exhaustion and burnout. Burnout, in return, further aggravates sleep disturbances among medical students [19].

Our results revealed presence of high prevalence of poor sleep quality on the PSQI, (76.67%) among medical students. This may be attributed to multiple activities and stresses facing medical students, which may necessitate excessive study during night.

The prevalence of insomnia in the present study was in congruence with cross-sectional studies report in Tripoli-Libya by Tahir, *et al.* [20] in their review of 201 medical students at Feb. 2010 before the Libyan evolution war, as majority of students (92%) reported poor sleep satisfaction with quality and duration of sleep hours.

This rate coincides with other studies from Egypt (61.6%) [21], Pakistan (77%) [22] and Spain (79.3%) [23]. Such high rates of poor sleep among medical students from different countries requires great concerns for dealing with stresses facing medical students. This can be improved through counseling and regular education to improve behavior and lifestyle.

On the other hand, lower prevalence is reported among most studies conducted in Brazil (28.15%) [24], Mexico [25] and India [26]. A Chinese study reported 19.15% of medical students with poor sleep quality on the PSQI [27]. However, in Europe, a Lithuanian study revealed poor sleep quality in 40% of the medical students, as measured by the PSQI [28]. In Africa the prevalence in Nigeria (32.5%) [29] and Ethiopia (55%) [30].

The prevalence of poor sleep varies among the studies possibly because of difference in measurement tools, culture, socio-demographic variables, and personality traits of medical students. Furthermore, the prevalence of poor sleep quality is higher in medical students than in the general population and other students.

Most studies found no gender-based differences in the results [25,27]. Few studies have reported gender-based differences in the results of sleep quality; higher number of males were involved in an Indian study [26] whereas higher number of females were involved in a Brazilian study [24]. In the present study, we observed

poor sleep quality among the female subjects (76.8% vs. 76.3%,  $p = 0.004$ ). The cause behind gender difference in sleep quality remains unobvious. However, this may be attributed to higher prevalence of psychologic problems as anxiety and depression among females compared to males, and the association between these problems and sleep disturbance [31].

The average sleep duration of our study group was  $6.23 \pm 1.51$  hours. This result is similar to the results in quite a few studies from different parts of the world with average sleeping hours around six hours per day. One study in Ethiopia revealed mean sleep duration of less than six hours by 44% of students [30]. In studies in Pakistan [32], Palestine [33] and Saudi Arabia [34]. The mean total sleep time was also reported as six hours. In a study in India, majority of the medical students slept between six and seven hours [26]. It is well known that medical course places critical demands on student's time and these finding point to the fact that this time is etched out from the student's sleeping hours around 60% of students reported a very good or good sleep quality. In addition, 80% of students scored 85% or more in the sleep efficiency component, which indicates very good sleep efficiency. This contradictory finding of poor measured sleep quality coupled with good subjective sleep was also reported in other studies, including a study in Saudi Arabia [34] and Ethiopia [30] which reported a good or very good subjective sleep quality by a majority of students, while a high percentage (55.8%) had high PSQI scores indicating poor sleep quality. These findings indicate that there is habitual acceptance of any sleep as good sleep by medical students.

Sleep onset latency i.e. time taken to fall asleep after going to bed. Normal sleep onset latency should be within 15 - 20 minutes. Shorter as well as longer sleep onset latency indicates poor sleep [35]. In the present study, sleep onset latency within 15 minutes was reported by 34.7% of students.

In the present study, daytime dysfunction was reported by 35.3% of the participants, who had difficulty staying awake during the day at least once a week. This is consistent with the literature, although there are variations across studies in the proportion of medical students reporting daytime sleepiness: 31% [36]; 42.1% [37] and 63% [38].

Frequent use of sleeping medication was identified in 16% of the participants in the present study, this proportion is same as that found in a study involving medical students in Saudi Arabia, which identified that 17% of those students used drugs for sleep induction; this fact indicates the need for early intervention programs targeting poor lifestyle habits [39].

The study has its limitations too. It was only done in one institute and cannot be generalized. It did not take into consideration

reasons predisposing to impaired sleep and also did not take into account the consequences of disturbed sleep. We propose prospective studies to assess the consequences of sleep deprivation on the psychological and physical health of these students. We also propose controlled trials to evaluate whether adequate sleep actually improves the psycho-social health and academic performance among medical students. Another major limitation is that all components of sleep quality that were assessed are subjective and rely on the respondent's self-assessment.

### Conclusion

Poor sleep quality is common among our medical students. It established that most medical students have a poor sleep quality, which could be related to their sleep habits. This study highlights a strong need for integrating sleep hygiene education for young students, to improve their sleeping practices and consequent physical and mental health.

### Conflict of Interest

None.

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