

Sleep Hygiene Awareness: It's Relation to Sleep Quality among Medical Students in King Saud University, Riyadh, Saudi Arabia

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Abstract: ***Background/Objective:** Sleep hygiene is considered to be an effective method to treat sleep disturbances, especially among adolescents and young adults. This study aimed to find out the relationship of sleep hygiene awareness and its importance in overall sleep quality among medical students and to assess the prevalence of sleep disturbance among them. **Methods:** This was a cross-sectional study conducted in the College of Medicine, King Saud University during the period between April and July 2016. A total of 225 students participated in this study and were recruited by a convenience sampling method. Two validated questionnaires were used, Pittsburg Sleep Quality Index (PSQI); to assess sleep quality and the Sleep Beliefs Scale (SBS); to assess the awareness of students about sleep hygiene. Data were entered into, and analyzed by SPSS Version 20. **Results:** Overall, more than half of the participants 113(56.5%) had a poor sleep quality. Sixty one (30.5%) students got excellent score in sleep hygiene awareness and the rest of the participants (n = 139; 69.5%) scored poor/intermediate. Thirty five (57.4%) poor sleepers and 42.6% of good sleepers scored excellent in sleep hygiene awareness. **Conclusion:** This study showed a higher prevalence of sleep disturbance among medical students and no significant correlation between sleep hygiene awareness and good sleep quality which means that sleep hygiene awareness may not necessarily ensure a good sleep quality.*

Keywords: sleep hygiene awareness, sleep quality, medical students

1. Background

In Saudi Arabia, sleep medicine is undergoing a development stage, especially in researches that are conducted to find out the relationship between sleep quality and the reasons that cause sleep disturbances.

Systematic efforts are needed to take control of the identified barriers and challenges to the improvement of sleep medicine in Saudi Arabia⁽¹⁾. By conducting the present study, we would like to offer an added value to this area by focusing on research in one aspect of sleep medicine field, that is, studying the relationship between sleep hygiene awareness and sleep quality in a sample of medical students in King Saud University.

In recent years, there has been an increased interest and concern on poor sleep habit, which plays a major role in sleep disturbance. Sleep hygiene (SH) refers to a set of life behaviors that promote a good sleep quality. These habits are correlated with food stimuli, smoking, mental effort and also to the individuals' surrounding area during sleeping⁽²⁾.

Researches have proven multiple factors that lead to sleep disorders. Some factors are about organic illnesses while others are about mental ones. Also, there are factors about sleep habits which play a major role in insomnia⁽³⁾.

Sleep hygiene has become a common tool for health providers in the treatment of insomnia. It was found that taking healthy sleep habits seriously would be a strong support to treat chronic insomnia^(3, 4). Sleep hygiene has been reported to be functional in adolescents and young

adults, possibly because their sleep knowledge and practice are poor^(5, 6, 7).

University students undergo an important stage in their lives as most of them have irregular sleep. Moreover, some of them have negative habits that may affect their sleep quality. Also, some of them may not have a sufficient knowledge of the patterns of a proper healthy sleep. Students are known for insufficient and poor quality of sleep and for irregular sleep habits, such as sleeping less during the week and longer during the weekends^(8, 9, 10). Students seem to be unaware of the negative effects of sleep deprivation, such as its effects on psychological well-being⁽¹¹⁾ and academic performance^(12, 13).

The relationships between main features of good sleep hygiene in adolescents and its recognizable outcomes have not been studied in Saudi Arabia. Therefore, this study intends to explore this relationship and find out its importance in overall sleep quality. This study aimed to find out the relationship of sleep hygiene awareness and its importance in overall sleep quality among medical students and to know the prevalence of sleep disturbance among them. The hypothesis was that a better sleep hygiene awareness would yield a better sleep quality.

2. Methodology

Participants and procedures:

This study was approved by the Institutional Review Board (IRB) of the Medicine College in King Saud University (KSU) on Thursday, 4th June, 2015 (Research Project No. E-

15-1564).

Study participants in this cross-sectional study were recruited from students in the College of Medicine in KSU during the period between April and July 2016 . Only male students were included in all study years.

Convenience sampling technique was used with a confidence level of 95% and a margin of error of 6%. At α (level of significance) 0.05 with estimated percent of sleeping disturbance 0.7 (as in Abdulghani, Hamza M., et al. "Sleep disorder among medical students: relationship to their academic performance")⁽¹⁴⁾ the sample size should be at least 225.

Two validated questionnaires were used in this study that was distributed by volunteers to the students in their lecture rooms and to the attendant students at the primary care clinics in King Khalid University Hospital. The time that was needed to complete both questionnaires was approximately ten minutes after which, the volunteers collected the questionnaires.

Study instruments

The questionnaire consisted of three sections:

- 1) A brief introduction about the nature of research, ethical requirements for confidentiality and voluntary participation.
- 2) The Pittsburg Sleep Quality Index (PSQI), a self-rating questionnaire that assesses sleep quality and disturbances during the preceding month. This instrument comprises 19 individual items and yields an overall score ranging from 0 to 21. Participants who score higher than 5 are considered poor sleepers. It differentiates "poor" from "good" sleep by measuring seven domains: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction over the last month⁽¹⁵⁾.
- 3) The sleep belief scale (SBS), a 20-items reviewed version of the sleep hygiene awareness by Lacks and Rotert. The (SBS) revealed the awareness regarding the knowledge of the subject in relationship to the influence on sleep of drug consumption (alcohol, caffeine, nicotine, sleep medication), diurnal behaviors (physical exercise and naps), and activities and thoughts previous to sleep (eating, studying, relaxing, worries) recording positive, negative or neither effect on sleep⁽¹⁶⁾. Correct answering corresponds to a negative effect for all the items except numbers 5, 9, 15 and 19 (which have a positive effect). Correct answers were calculated as one point and incorrect ones (including all answers of neither effect) were calculated as zero. The possible scores range from 0 to 20, and the participants who got the score in the range of 0 - 5 were classified as having a poor awareness,

6 - 13 as having an intermediate, and 14 - 20 as having an excellent awareness. From the reliability study, average Cronbach's α was found to be 0.751. The data was collected and verified and then coded before entry. Statistical Package for Social Sciences (SPSS) software version 20.0.0 was used for data entry and analysis. Descriptive statistics (e.g. number, percentage) and analytical statistics using chi square tests (χ^2) were used to test for the difference between two categorical variables. P value less than 0.05 was considered to be statistically significant.

3. Results

Among the 225 respondents in the study, 18 students did not complete the PSQI survey and 7 students did not complete the SBS questionnaire. The results showed that 113 (56.5%) of the participants had a PSQI score higher than 5 which means that they had a poor sleep quality.

Table 1 shows the distribution of the respondents according to their sleep beliefs and PSQI scores. Sixty one (30.5%) participants got an excellent score in sleep hygiene awareness whereas; 139 (69.5%) students got intermediate/poor scores. However, 35 poor sleepers (57.4%) and 26 good sleepers (42.6%) had excellent sleep hygiene awareness. We found that there was no statistically significant relation between the sleep beliefs and the global PSQI since the P-value was more than 0.05.

Table 1: Distribution of the respondents according to their sleep beliefs and PSQI scores

		Global PSQI		Total	Chi-square P-value
		Good sleeper ≤ 5	Poor sleeper > 5		
Sleep beliefs	Poor	17 (44.7%)	21 (55.3%)	38 (100%)	0.979
	Intermediate	44 (43.6%)	57 (56.4%)	101 (100%)	
	Excellent	26 (42.6%)	35 (57.4%)	61 (100%)	
Total		87 (43.5%)	113 (56.5%)	200 (100%)	

Table 2 shows the distribution of the respondents according to various sleep disturbances. Forty two students (18.8%) had a problem of sleep latency three times or more a week followed by 28 students (12.6%) who had night time dysfunction (Waking up in the middle of the night or early morning). During the month preceding the survey, only 6 students (2.7%) reported using sleep medications once or more a week. Also, when we made assessment limited to a component item that measured self-report of poor sleep quality, only 61 students (27.6%) specifically stated that their sleep quality was fairly bad or very bad.

Table 2: The distribution of the respondents according to various sleep disturbances

During the past month, how often have you had trouble sleeping because you	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times week (3)
a. Cannot get to sleep within 30 minutes	69 (30.9%)	77 (34.5%)	35 (15.7%)	42 (18.8%)
b. Wake up in the middle of the night or early morning	100 (45%)	67 (30.2%)	27 (12.2%)	28 (12.6%)
c. Have to get up to use the bathroom	132 (59.5%)	57 (25.7%)	21 (9.5%)	12 (5.4%)
d. Cannot breathe comfortably	186 (83%)	28 (12.5%)	7 (3.1%)	3 (1.3%)
e. Cough or snore loudly	180 (81.1%)	31 (14%)	9 (4.1%)	2 (0.9%)
f. Feel too cold	155 (69.2%)	43 (19.2%)	21 (9.4%)	5 (2.2%)
g. Feel too hot	130 (58.6%)	62 (27.9%)	23 (10.4%)	7 (3.2%)
h. Have bad dreams	125 (56.3%)	70 (31.5%)	19 (8.6%)	8 (3.6%)
i. Have pain	187 (85%)	23 (10.5%)	7 (3.2%)	3 (1.4%)
j. Other reason(s), please describe, including how often you have had trouble sleeping because of this reason(s):	181 (80.8%)	22 (9.8%)	9 (4%)	12 (5.4%)
During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?	170 (77.6%)	41 (18.7%)	6 (2.7%)	2 (0.9%)
During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in the social	136 (61.5%)	65 (29.4%)	15 (6.8%)	5 (2.3%)
During the past month how much of a problem has it been for you to keep up the enthusiasm to get things done?	104 (48.8%)	71 (33.3%)	26 (12.2%)	12 (5.6%)
	Very good (0)	Fairly good (1)	Fairly bad (2)	Very bad (3)
During the past month, how would you rate your sleep quality overall?	46 (20.8%)	114 (51.6%)	49 (22.2%)	12 (5.4%)

Table 3 show the distribution of the respondents having a correct answers according to Sleep Belief Scale. Over two thirds of the participants (69.3%) had a good knowledge about the negative effects of drinking coffee or other substances with caffeine before sleeping. Moreover, about 67% of the participants were aware that taking a long nap during the day would affect sleep badly. The majority of the participants have chosen correct answers about positive

effects of going to bed and waking up always at the same hour (57.8%), diverting one's attention and relaxing before bedtime (53.3%), and sleeping in a quiet and dark room (79.1%). Of note, 69.8% of the students had a misconception about the effect of recovering lost sleep by sleeping for a long time.

Table 3: The distribution of respondents having correct answers according to Sleep Belief Scale

	number	%
1. Drinking alcohol in the evening (prohibited in Sharia)	122	54.2
2. Drinking coffee or other substances with caffeine after dinner	156	69.3
3. Doing intense physical exercise before going to bed	88	39.1
4. Taking a long nap during the day	151	67.1
5. Going to bed and waking up always at the same hour	130	57.8
6. Thinking about one's engagements for the next day before falling asleep	120	53.3
7. Using sleep medication regularly	104	46.2
8. Smoking before falling asleep	113	50.2
9. Diverting one's attention and relaxing before bedtime	120	53.3
10. Going to bed 2 h later than the habitual hour	106	47.1
11. Going to bed with an empty stomach	105	46.7
12. Using the bed for eating, calling on the phone, studying and other non- sleeping activities	108	48
13. Trying to fall asleep without having a sleep sensation	118	52.4
14. Studying or working intensely until late night	104	46.2
15. Getting up when it is difficult to fall asleep	61	27.1
16. Going to bed 2 h earlier than the habitual hour	86	38.2
17. Going to bed immediately after eating	119	52.9
18. Being worried about the impossibility of getting enough sleep	130	57.8
19. Sleeping in a quiet and dark room	178	79.1
20. Recovering lost sleep by sleeping for a long time	68	30.2

Table 4: Comparison of PSQI groups (≤ 5 and > 5) according to correct answers using independent samples T test

Global PSQI	N	Mean	Standard Deviation	T-test	p-value
≤ 5	90	10.289	5.115	0.300	0.764
> 5	117	10.077	4.980		

Table 4 shows the comparison of PSQI groups (≤ 5 and > 5) according to correct answers using independent samples T

test. The mean for PSQI ≤ 5 was 10.3 ± 5.1 whereas; the mean for PSQI > 5 was 10.1 ± 4.98 . However, the T test showed no statistically significant difference between the two groups (P value = 0.764).

4. Discussion

The results of this study revealed that poor quality of sleep was relatively high (56.5% of the students) and the mean

score of PSQI was 10.07(S.D 4.98) (See table 4). This result is consistent with the results of a previous study conducted among medical students at King Saud University in 2009⁽¹⁴⁾. This estimated score is also consistent with the average of poor pattern of sleep in Iran⁽¹⁷⁾ Hong Kong⁽¹⁸⁾, and Romania⁽¹⁹⁾.

Regarding the sleep hygiene awareness, the results of the present study revealed that the level of knowledge about sleep beliefs was moderate. The mean score of the respondents was 10.49 (S.D 4.64) (see table 5). These results are consistent with the level of awareness in studies in Ethiopia⁽²⁰⁾ and Hong Kong⁽¹⁸⁾ while it is not in accordance with the results of a study that measured the sleep hygiene awareness among students in Italy and Spain which revealed a good awareness⁽¹⁵⁾. Of note, the percentage of respondents having good knowledge about negative effects of drinking coffee or other substances is similar to those in a study conducted in Romania⁽¹⁹⁾. In contrast to the results of this study, most of the respondents of the study conducted in Italy and Spain could identify that sleep is impaired by recovering lost sleep by sleeping longer⁽¹⁵⁾.

The findings of this study regarding negative effects of using sleep medications regularly, studying in bed, smoking, and drinking alcohol in the evening were compatible with the results of a study conducted in Romania⁽¹⁹⁾, but incompatible with the results of studies conducted in the United States^(5, 21). One possible explanation is that, cultural factors may have affected the sleep hygiene awareness among different countries.

With regard to the association between sleep hygiene awareness and sleep quality, this study revealed no strong relation between them. Approximately half of the poor sleepers had an inadequate level of sleep hygiene awareness and, on the other hand, half of good sleepers had the same level of awareness.

5. Limitation of the Study

Some limitations of this study needs to be discussed to complete the understanding of the results. First, the sample of this survey was limited to male students and did not include female students because of the difficulty of reaching them and allocating our questionnaires (matter of accessibility). Indeed, their inclusion in the sample reinforces the knowledge of the probability of clear differences between both genders. Secondly, this study did not have a unique scale that could precisely measure healthy sleep habits among the participants. However, this study was only limited to measuring how some sleep habits would affect sleeping according to the participants' beliefs.

6. Conclusion

Within the limitations of this study, the percentage of students who has a poor sleep quality was relatively high as more than half of the participants (56.5%) suffered sleep disturbances. Moreover, the majority of the participants (almost two-thirds) scored unsatisfactory results (intermediate, poor) for the awareness of sleep hygiene. When comparing sleep quality to the sleep hygiene

awareness, no significant correlation was found.

Therefore, the awareness of sleep hygiene may not necessarily guarantee a good healthy sleep.

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8. Ethical Considerations

An ethical approval was taken from the Institutional Review Board, in King Khalid University Hospital after a proposal was submitted addressing all the aspects of the study which was reviewed by the ethical committee. An informed verbal consent was taken from every respondent with the explanation of the questionnaire and permission was granted before distribution of the questionnaire. Confidentiality of information collected from research participants was maintained and only the investigator had the access to identify the responses of individualsubjects.

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