

Sleep Quality among Students of the Faculty of Medicine in Jazan University, Saudi Arabia

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Abstract: Recently the quality of sleep among various segments of populations has become a focus of continuous research and investigations, medical students as specialized group among students are generally suffering from poor quality of sleep. The objective of the current study was to determine the prevalence and factors associated with poor sleep quality among medical students at Jazan University. Across sectional survey conducted among students of faculty of medicine, Jazan University. The study targeted random sample of 400 students. Self-administered questionnaire was used for data collection. Sleep perception was measured using the Pittsburgh Sleep Quality Index (PSQI) for assessing sleep quality. SPSS software program was utilized for data analysis. The study revealed that 35.6% of students reported good sleep quality while the students with poor sleep quality were 64.4% with confidence interval (59 - 69%). The mean of number of hours slept each night by males were 5.15 compared with 4.77 for females (P-value=0.040). Regarding the subjective sleep quality the majority of the students 75.2% reported good sleep quality, while those with of poor sleep quality were only 24.8% of them. Income and gender were the main factors associated significantly with sleep quality (P. Value = 0.015 and 0.020 respectively). The result of our study suggested a high prevalence of a poor sleep quality among medical students of Jazan University according to PSQI. Subjective sleep quality on the other hand showed that students think that they had a good sleep quality. This result calls for more research about sleep quality among medical students. Regulating the activities and behaviors to allow enough time to sleep can improve the quality of sleep among university students.

Key words: Sleep Quality • Pittsburgh Sleep Quality Index • Subjective Sleep

INTRODUCTION

It is well known that proper sleep provides reparative and restorative bodily functions [1]. Recently the quality of sleep among various segments of populations has become a focus of continuous research and investigations. Many studies have demonstrated the issue of poor quality of sleep among students generally [2-5]. Medical students as specialized group among students generally are suffering from poor quality of sleep; this is may be due the rigorous training program [6]. Huge amount of literature suggested that medical students experience a high level of stress during their undergraduate course of study [7-11]. Poor sleep quality

impairs academic performance [2, 12] and is associated with an increased risk of psychological morbidity and burnout [13]. Furthermore, irregular sleep schedules [13], psychoactive substance use [14], fatigue [15] and co-morbid physical or psychological conditions [16, 17] are associated with poor sleep quality. Recent evidence for the predisposing risk of adverse childhood experiences on sleep quality has been reported [18].

In Saudi Arabia there has been expansion in the higher education and numbers of medical students are increasing. Moreover in KSA research on sleep quality among medical students are scanty. The aims of the present study were to determine the prevalence of poor sleep quality among medical students,

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- To study the different factors correlated with poor sleep quality among studied population and
- To come out with recommendations that improves the quality of sleep among medical students.

MATERIALS AND METHODS

Study Design and Population: Observational cross-sectional study targeted students of faculty of Medicine of both gender males and females.

Study Place: This study was conducted in the Faculty of Medicine, Jazan University located in the city of Jazan which accommodates students from all provinces and villages of the region.

Sample Size and Design: A representative random sample of 400 students was determined on the following bases: anticipated population proportion (p) of the sample was estimated to be 50% because this is the safest choice for (p) since the sample size required is largest when $P=50\%$ and no prior knowledge about the prevalence about sleep quality among the studies population, 95% confidence level $z = 1.96$ and 5% error. Further the study utilized stratified random sampling to reach students in all levels of the faculty of medicine.

Methods of Data Collection: Data were collected using self-administered questionnaire filled by all sample groups. The study questionnaire was composed of two parts:

Socio-Demographic Questionnaire: A socio-demographic questionnaire was designed by the authors to elicit variables like age, gender, history of chronic physical illness, frequency of psychoactive substance use and concurrent use of sleep medication with dichotomous 'yes-no' responses, academic performance and some other family variables.

PSQI-Questionnaire: The PSQI is a standard measurement to differentiate "poor" from "good" sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction over the last month [19]. The questionnaire was designed to collect a range of information relating to the quality and sleep disorders. It included three Parts; I included closed questions about the problems faced by

the student during sleep as cold and heat, cough, snoring and waking up to go to the bathroom. Part II: contained question to assess the quality of sleep and some other problems that may cause Old disorder in sleep and Part III: The question of respect to the student participates in the same room or same bed for old problems noticed during sleep.

Data Management and Analysis: Data collected was reviewed on a daily base. Data entry process was conducted concurrently with data collection in the Faculty of Medicine. SPSS ver. 17 was used for data entry and analysis. Statistical analysis involved frequencies distribution, analysis of PSQI (PSQI greater than 5 was considered as a poor sleep). Also associations between poor sleep and some selected variables were evaluated using chi-square test. *P*. Value less than 0.05 was considered significant.

Ethical Considerations: The study was approved by the faculty of medicine, Jazan University. As any medical research, participants were given the right to refuse completing the questionnaire. Also participant's privacy was respected and data collected will only be used for scientific purposes.

RESULTS

Number of medical students who agreed to participate in the survey was 340 (85%) of the planned sample with 120 (35.3%) males and 220 (64.7%) females. Table 1 shows background characteristics of medical students in Jazan University. According to the table the marital status of student was distributed as follows: 5% were married, 93.5% were single, 1.2% divorced and only 0.3% widowed. Regarding the student age groups, 42.3% of them were 17-20 years, 51.7% were 21-23 years and 5.9% belonged to the age group 24-26. The distribution of students according to class level showed that 20.6% of them in first class, 19.4% in 3rd class, 25.6% in 5th class, 19.4% in 7th class, 7.9% in 9th class and 7.1% in 11th class. Cumulative Grade Points Average showed that 0.5% were in the range (1-1.9) points, 11.5% between (2-2.9), 47.8% between (3-3.9) and 39.2% of them between (4-5) points. The number of students living with their parents were the majority 85.0%, 1.2% lived with their mothers, 3.8% with their fathers, 3.5% with their relative, 2.1% with their colleagues, 2.9% with their husbands/wives and 1.5% alone.

Table 1: Background Characteristics of the Investigated Students

Characteristics	Frequency	%
Gender of student		
Male	120	35.3
Female	220	64.7
Age of student		
17-20	144	42.3
21-23	176	51.7
24-26	20	5.9
Marital Status of student		
Married	17	5.0
Single	318	93.5
Divorced	4	1.2
Widowed	1	0.3
Student Class		
1	70	20.6
3	66	19.4
5	87	25.6
7	66	19.4
9	27	7.9
11	24	7.1
Cumulative Grade Points Average		
1-1.9	1	.5
2-2.9	23	11.5
3-3.9	95	47.8
4-5	78	39.2
With Whom Do You Live?		
Parents	289	85.0
Mother	4	1.2
Father	13	3.8
Relative	12	3.5
Collogues	7	2.1
Husband/Wife	10	2.9
Alone	5	1.5
Family Monthly Income		
Low (less than 1500)	6	2.4
Moderate (1500-10.000)	99	40.3
High (more than 10.000)	141	57.2
Mode of living		
Rural	93	27.4
Urban	247	72.6
Do you suffer any disease		
Yes	25	7.4
No	315	92.6

Table (2) shows statistics of some selected sleep related indicators. According to the table the mean of number of hours slept each night by males were 5.15 compared with 4.77 for females (significant difference at P-value=0.040). According to the table there was significant difference between males and females regarding age of students and minutes to fall sleep (P-value 0.000 and 0.032 respectively).

Table 3 shows the prevalence of sleep quality among studied population. 35.6% of students reported good sleep quality, while the percentage of male and females with poor sleep quality was 64.4% with confidence interval (59 - 69%).

Table 4 illustrates the subjective sleep quality (student's perception about their sleep quality). According to the table the majority of the students 75.2% argued that they are of good sleep quality, while those who reported poor sleep quality were 24.8%.

Table 5 shows the association between PSQI and some selected variables. Good sleep quality prevalence ranged from 30.3 to 55.6 for the different class levels (no significant difference between different levels, P-value= .204). According to the gender, the poor sleep quality prevalence for male was 55.8% and for females was 69.1%, (significant difference at 5%, Pvalue = .015). According to age the prevalence of poor sleep quality among student, less than 20 years was 67.4%, from 21-23 was 63.6% and 24-26 was 50% (Also no significant difference between age groups, P-value = .300). According to income, the prevalence of poor sleep quality among students with low income was 53.5%, medium income 66% and high income was 70.9% (Significant difference between different income categorizes at P-value= .020). According to marital status the prevalence of poor sleep quality among married was 58.8%, single 64.5%, divorced 75% and widowed 100% (P. value = .806). According to mode of living, the prevalence of poor sleep quality in rural area was 62% and in urban area was 65.3% (P-value=.565). According to CGPA no significant difference was observed between the prevalence of poor sleep quality among the studied students.

Table 2: Statistics For Some Selected Indicators

Variable	Male		Female		Total		P. Value
	Median	Mean	Median	Mean	Median	Mean	
Age of students	22.00	21.72	20.00	20.30	21.00	20.80	0.000
Cumulative Grade Points Average (CGPA)	3.700	3.67	3.73	3.69	3.71	3.68	0.829
Min. to fall sleep	30.00	34.86	30.00	43.22	30.00	40.27	0.032
No. of hours slept each night	5.00	5.15	5.00	4.77	5.00	4.91	0.040

Table 3: Prevalence of Sleep Quality among Studied Population According To PSQI

Sleep Quality	Male	Female	%	95% C.I
Good	53 (44.2)	68 (30.9)	121(35.6)	
Poor	67 (55.8)	152 (69.1)	219 (64.4)	(59 - 69)

Table 4: Prevalence of Subjective Sleep Quality among Students

Sleep Quality	Male	Female	%
Good	89 (74.2)	166 (75.8)	255 (75.2)
Poor	31 (25.8)	53 (24.2)	84 (24.8)
Total	120	219	339 (100)

Table 5: Association between PSQI and some selected indicators.

Characteristics		Good- Quality Count (%)	Poor - Quality Count (%)	P-value
				0.204
Student Class	1st	23 (32.9)	47 (67.1)	
	3ed	20 (30.3)	46 (69.7)	
	5th	31 (35.6)	56 (64.4)	
	7th	21 (31.8)	45 (68.2)	
	9th	15 (55.6)	12 (44.4)	
	11th	11 (45.8)	13 (54.2)	
Gender of Student	male	53 (44.2)	67 (55.8)	0.015
	Female	68 (30.9)	152 (69.1)	
Age group	Less than 20 Years	47 (32.6)	97 (67.4)	0.300
	21-23 Years	64 (36.4)	112 (63.6)	
	24-26 Years	10 (50)	10 (50)	
Income	Low income level	46 (46.5)	53 (53.5)	0.020
	Medium level	34 (34)	66 (66)	
	High Income Level	41 (29.1)	100 (70.9)	
Marital Status of student	Married	7 (41.2)	10 (58.8)	0.806
	Single	113 (35.5)	205 (64.5)	
	Divorced	1 (25)	3 (75)	
	Widowed	0 (0)	1 (100)	
Mode of Living	Rural	35 (38)	57 (62)	0.565
	Urban	86 (34.7)	162 (65.3)	
CGPA	Fail	1 (100)	0 (0)	0.276
	Pass	8 (36.4)	14 (63.6)	
	Good	25 (27.8)	65 (72.2)	
	Excellent	29 (37.2)	49 (62.8)	

Table 6: Sleep Efficiency among the Studied Population

Characteristics		More than 85%	75-84%	65-74%	Less than 65
		Count %	Count %	Count %	Count %
Student Class	1st	56(80.0)	9(12.9)	3(4.3)	2(2.9)
	3rd	47(71.2)	13(19.7)	2 (3.0)	4(6.1)
	5th	52 (60.5)	27(31.4)	3 (3.5)	4 (4.7)
	7th	38 (57.6)	17(25.8)	6 (9.1)	5 (7.6)
	9th	24 (88.9)	3 (11.1)	0 (0)	0 (0)
	11th	16 (66.7)	5 (20.8)	3 (12.5)	0 (0)
Gender of Student	male	94 (78.3)	19 (15.8)	4 (3.3)	3 (2.5)
	Female	139 (63.5)	55 (25.1)	13 (5.9)	12 (5.5)
Age group	Less than 20 Years	100 (69.4)	32 (22.2)	6 (4.2)	6 (4.2)
	21-23 Years	121 (69.1)	37 (21.1)	8 (4.6)	9 (5.1)
	24-26 Years	12 (60.0)	5(25.0)	3(15.0)	0 (0)
Marital Status of student	Married	11(64.7)	5 (29.4)	1 (5.9)	0 (0)
	Single	219(69.1)	67(21.1)	16 (5.0)	15 (4.7)
	Divorced	3 (75.0)	1 (25.0)	0 (0)	0 (0)
	Widowed	0 (0)	1 (100.0)	0 (5.0)	0 (0)

Table 6 presents the sleep efficiency among medical students, according to the table the highest sleep efficiency (Greater than 85%) was found among students in the 9th level (88.9%) followed by 80.0% for students at the first level. According to the gender, 78.3% of male were with sleep efficiency greater than 85% compared with 63.5% for female, those students with sleep efficiency less than 65% were 2.5% of males and 5.5% of females. Regarding age groups 69% of students were less than 20 years and between 21-23 years the sleep efficiency was greater than 85%. According to the marital status 64.7% of married students were of sleep efficiency greater than 85%, compared with 69.1% of single, 75% for divorced.

DISCUSSION

The study revealed that sizable proportion (64.4%) of students reported poor quality sleep but studies elsewhere reported poor sleep quality within the ranges (10-60%) [19-21].

Although the study reported high prevalence of poor sleep quality among the studied students using PSQI, subjective sleep showed that the students think that their sleep quality is good. The presence of a chronic disease and stress are the prime reasons for poor sleep quality among medical students as reported by the students themselves. This is similar to studies conducted in other countries [22-25].

This study has some limitations. First, generalization of our results would be difficult, since we conducted this study at a single medical faculty. Second, our study design did not allow for inferences on cause and effect, the use of cross-sectional study design alone is not enough for such conclusions.

CONCLUSION

The results of our study suggested a high prevalence of a poor sleep quality among medical students in Jazan University according to PSQI. Subjective sleep quality on the other hand showed that students think that they had a good sleep quality. The results of this paper call for more in-depth research on sleep quality among medical students. Finally, we recommend regulating of student's activities and behaviors to allow enough time for sleep in order to increase the quality of sleep. Also decreasing the stress in the daily life by relaxing the mind and activation of time management programs are important strategies for increasing sleep efficiency.

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REFERENCES

1. Pilcher, J.J. and E.S. Ott, 1998. The relationships between sleep and measures of health and well-being in college students: A repeated measures approach. *Behav. Med.*, 23: 170-177. Make references like this style.
2. James, B.O., J.O. Omoaregba and O.O. Igberase, 2011. Prevalence and correlates of poor sleep quality among medical students at a Nigerian university. *Ann Nigerian Med.*, 5: 1-5.
3. Adeosun, S.O., S.O. Asa, O.O. Babalola and M.A. Akanmu, 2008. Effects of night reading on daytime sleepiness sleep quality and academic performance of undergraduate pharmacy students in Nigeria. *Sleep Biol. Rhythms*, 6: 91-4.
4. Orzech, K.M., Salafsky, B. David, Hamilton and Lee Ann, 2011. The state of sleep among college students at a large public university. (Report)' *Journal of American College Health*, 59(7): 612(8).
5. Hatami, K., B. Shokrollahi and N. Haidari, 2013. The Effect of Aerobic Activities on Depression and Anxiety Symptoms and Sleep Disturbances of Female Students *Middle-East J. Sci. Res.*, 14(2): 284-287, DOI: 10.5829/idosi.mejsr.2013.14.2.7242.
6. Veldi, M., A. Aluoja and V. Vasar, 2005. Sleep quality and more common sleep-related problems in medical students. *Sleep Med.*, 6: 269-75.
7. Rosal, M.C., I.S. Ockene, J.K. Ockene, S.V. Barrett, Y. Ma and J.R. Hebert, 1997. A longitudinal study of students' depression at one medical college. *Acad Med.*, 72: 542-6.
8. Stewart, S.M., T.H. Lam, C.L. Betson, C.M. Wong and A.M.P. Wong, 1999. A prospective analysis of stress and academic performance in the first two years of medical school. *Med Educ.*, 33: 243-50.

9. Sani, M., M.S. Mahfouz, I. Bani, A.H. Alsomily, D. Alagi, N.Y. Alsomily, F.M. Madkhaly, R. Madkhali, A.A.M. Hakami, A. Hakami, A.L. Shaqraa Shaabi, S. Ebrahim, S.H. Mashiakhi and Ageel B. Asiri, 2012. Prevalence of stress among medical students in Jizan University, Kingdom of Saudi Arabia. *Gulf Medical Journal*, 1(1): 19-25.
10. Eswi, A.S., S. Radi and H. Youssri, 2013. Stress/Stressors as Perceived by Baccalaureate Saudi Nursing Students *Middle-East J. Sci. Res.*, 14 (2): 193-202, 2013. (: 10.5829/idosi.mejsr.2013.14.2.734)
11. Styles, W.M., 1993. Stress in undergraduate medical education: 'the mask of relaxed brilliance'. *Br J. Gen. Pract.*, 43: 46-7.
12. Rodrigues, R.N., C.A. Viegas, E. Abreu, AA Silva and P. Tavares, 2002. Daytime sleepiness and academic performance in medical students. *ArqNeuropsiquiatr*, 60: 6-11.
13. Kang, J.H. and S.C. Chen, 2009. Effects of an irregular bedtime schedule on sleep quality, daytime sleepiness and fatigue among university students in Taiwan. *BMC Public Health*, 9: 248.
14. Lund, H.G., B.D. Reider, A.B. Whiting and J.R. Pritchard, 2010. Sleep patterns and predictors of disturbed sleep in a large population of college students. *J. Adolesc Health*, 46: 124-32.
15. Owens, J.A., 2001. Sleep loss and fatigue in medical training. *Curr Opin Pulm Med.*, 7: 411-8.
16. Ebrahimi, A.A., M. Ghalebani, M. Salehi and K. Alavi, 2009. A comparative study of the components of sleep quality in medical out-patients. *Int. J. Psychiatry Clin Pract.*, 13: 184-7.
17. Eller, T., A. Aluoja, V. Vasar and M. Veldi, 2006. Symptoms of anxiety and depression in Estonian medical students with sleep problems. *Depress Anxiety*, 23: 250-6.
18. Koskenvuo, K., H. Hublin, M. Partinen, T. Paunio and M. Koskenvuo, 2010. Childhood adversities and quality of sleep in adulthood: A population-based study of 26,000 Finns. *Sleep Med.*, 11: 17-22.
19. Buysse, D.J., C.F. Reynolds, T.H. Monk, S.R. Berman and D.J. Kupfer, 1989. The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Res.*, 28: 193-213.
20. Johns, M.W., 1991. A new method for measuring daytime sleepiness: The Epworth sleepiness scale. *Sleep*; 14: 540-5. [PUBMED]
21. Adewole, O.O., H. Adeyemo, F. Ayeni, E.A. Anteyi, Z.O. Ajuwon, G.E. Erhabor and T.T. Adewole, 2008. Prevalence and correlates of snoring among adults in Nigeria. *Afr Health Sci.*, 8(2): 108-13 [PubMed].
22. Sweileh, W.M., I.A. Ali, A.F. Sawalha, A.S. Abu-Taha, S.H. Zyoud and S.W. Al-Jabi, 2011. Sleep habits and sleep problems among Palestinian students. *Child Adolesc Psychiatry Ment Health*, 5(1): 25. [PubMed].
23. Zailinawati, A.H., C.L. Teng, Y.C. Chung, T.L. Teow, P.N. Lee and K.S. Jagmohani, 2009. Daytime sleepiness and sleep quality among Malaysian medical students. *Med J. Malaysia*, 64: 108-10. [PubMed].
24. Medeiros, A.L.D., D.B.F. Mendes, P.F. Lima and J.F. Araujo, 2001. The Relationships between Sleep-Wake Cycle and Academic Performance in Medical Students, *Biological Rhythm Research*, 32: 263-270., DOI:10.1076/brhm.32.2.263.1359, pp: 263-270.
25. Carney, C.E., J.D. Edinger, B. Meyer, L. Lindman and T. Istre, 2006. Daily activities and sleep quality in college students. *ChronobiolInt.*, 23(3): 623-37.