Original Article

Prevalence of daytime sleepiness and its impact on academic performane amongst the university students

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Objective: To evaluate the prevalence of excessive daytime sleepiness amongst university students and its impact on their academic achievement.

Methodology: This cross-sectional study was carried out on 255 university students (2nd, 3rd, & 4th-year MBBS) selected by a stratified systemic random sample during January-February 2020. A questionnaire was used to collect data regarding socio-demographic variables, a reliable and validated Epworth Sleepiness Scale was included to measure the Excessive daytime sleepiness and the academic achievement was assessed by GPA (grade point average).

Results: Out of 255 students, Excessive daytime sleepiness (EDS) was observed in 105(41.2%) medical students, and also a statistically significant increase in female subjects 79(51.7%). There was a notable positive significant association (p=0.006) between the EDS and poor academic achievements among students.

Conclusion: Sleep disorders are widely observed among medical students, especially in female students. There was a statistically significant association between EDS and poor academic achievement. There is need for proper sleep hygiene. (Rawal Med J 202;45:959-962).

Keywords: Daytime sleepiness, impact, sleep hygiene.

INTRODUCTION

Man is the only mammal that voluntarily delays sleep.[1] Lack of sleep can increase the risk that could affect ability to drive, and other health problems.[2,3] Excessive daytime sleepiness EDS) is said to uncontrollable dosing off and drowsiness during the day, leading to an inability to remain alert and caution in the performance of important daily activities.[4] Adults sleeping over 9 hours are considered to have excessive sleep or long amounts of sleep, while normal sleep requirement for adults of age 18-60 years is 7 and more hours.[5,6] EDS can occur in large proportions due to poor quality of sleep and can directly affect the behavior and job performance of individuals.[7,8] It is necessary to find signs of poor sleep quality, and how to improve it.[9]

Medical students have burden of education, and strict medical training results develop sleep impairment and can lead to physical and psychological illness.[10] In a study from UK, 24% of university students had difficulty in sleep.[11] Saudi Arabian medical students showed prevalence of EDS of 36.6%.[12] Nigerian university showed 32.5% sleep deprivation among medical students,[13] Malaysia had 35.5% and India 25.5% EDS.[14,15]

A report from Pakistan showed 39.5% of poor sleepers among medical students and showed no significant association with academic achievement.[16] Many other studies showed no significant relation with academic performance.[17,18] Medical students who suffered poor sleep qualities were related to low academic progress.[19] In adolescence, marked changes occur in sleep along with getting up earlier, go to bed later, inadequate sleep, irregular sleep pattern, and high daytime sleepiness.[20] Few studies were conducted in our regions, especially the prevalence of daytime sleepiness and its impact on academic achievement. This study aimed to evaluate the prevalence of EDS amongst medical students and its impact on their academic achievement.

METHODOLOGY

This cross-sectional epidemiological study was conducted at SMBB Medical University, Larkana Pakistan, from January-February 2020. 255

students from the 2nd, 3rd and 4th year MBBS batches with 85 students from each batch were selected. Ethical approval was obtained from the ethical committee of the University. In the study, 3 batches were participating, each batch comprises about 250 subjects, thereafter the total subject (N) = 750, and assuming the prevalence rate 40%, so the sample size (η) was calculated according to formula, [21] $SSh = Z^2 * (p) * (1-p) \div C^2$, $SSh = 1.962*(0.4)*(1-0.4) \div 0.05^2$, SSη=368.793

All the subjects filled their questionnaire at their respective lecture hall. The questionnaire consisted of 03 portions. First section contained socio-demographics characteristics (age, gender, batch year, residency, sleeping hours, tea or coffee habits, smoking habits, mid-day napping, study hours, and daily exercise) and other variables. In the 2nd section, Epworth sleeping scale (ESS) was used to evaluate EDS. All 08 items total score between 0-24, the respondent cut-off of score 10 or above will consider having excessive daytime sleepiness.

In the study, the 3rd portion contains the academic achievement of students was assessed by the Grade point average (4.0 scale). The GPA was tested by each subject, was multiplied with the no: of credit hours of the same subject, and divided this amount according to the whole no: of credit hours and the resulting average was converted to 4.0 scale, and students those who obtained 03 or above up to 04 scores were considered as good GPA /good academic performance, and students considered poor GPA/ poor academic performance when scored below the 3.0 score.

Statistical Analysis: Statistical Analysis was performed using SPSS 16. A chi-square test was applied. P<0.05 was regarded as a significant.

RESULTS

The study had 255 participants. Mean age was 20.9255±1.618 years. There were 136(53.3%) females and 119(46.7%) male (Table 1). ESS scores 150(58.8%) were observed among medical students, while the abnormal ESS Score or excessive daytime sleepiness (EDS) 105(41.2%) have seemed among the students based on an ESS score of >10 (Fig.).

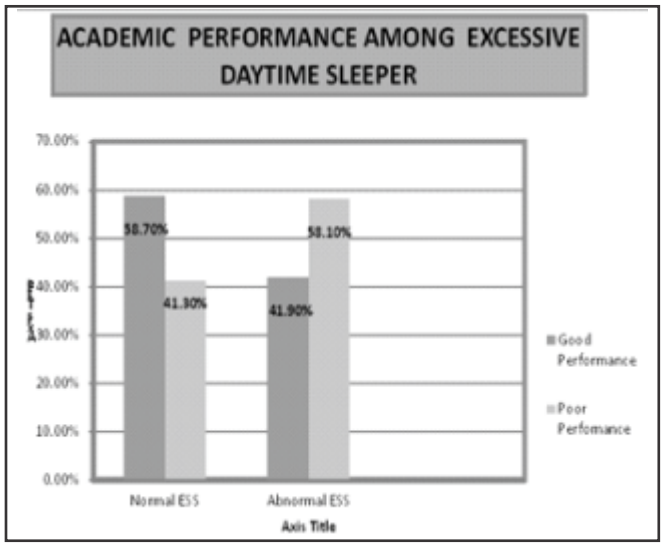
Table 1. Demographic characteristics and other variables.

Variable	Number (%)
Age	
18-20 Years	117(45.9%)
≥ 21 Years	138(54.1%)
Gender	
Male	119(46.7%)
Female	136(53.3%)
ESS Score	
Normal ESS score	150(58.8%)
Abnormal ESS score (Excessive DTS)	105(41.2%)
GPA Score	
Good Performance	132(51.2%)
Poor Performance	123(48.2%)
Residency	
Home (Non Hostler)	101(39.5%)
Hostler	154(60.4%)
Mid day naps	
Yes	191(74.9%)
No	64(25.1%)
Sleeping hours	
< 04 Hours	28(11.0%)
4-6 Hours	47(18.4%)
6-8 Hours	134(52.5%)
≥ 8 Hours	46(18.0%)
Tea history	
Yes	128(50.0%)
No	127(49.8%)
Smoking	
Yes	34(13.3%)
No	221(86.6%)
Exercise	
Yes	42(16.5%)
No	213(83.5%)

Table 2. Analysis of ESS score with other study variables.

Study Variable	Normal ESS score	Abnormal ESS score	Total (n)%	P-Value
Age				
18-20 Years	64(61.0%)	41(39.0%)	105(100%)	0.044
≥ 21 Years	74(49.3%)	76(50.7%)	150(100%)	
Gender				
Male	65(61.9%)	40(38.1%)	105(100%)	0.017
Female	71(47.3%)	79(51.7%)	150(100%)	
Academic Batch				
2nd Year MBBS	59(393%)	26(24.8%)	85(100%)	0.028
3rd Year MBBS	42(28.0%)	59(39.3%)	85(100%)	
4th Year MBBS	49(32.7%)	36(34.3%)	85(100%)	
Academic performance				
Good Perform:	88(58.7%)	44(41.9%)	132(100%)	0.006
Poor Perform:	62(41.3%)	61(58.1%)	123(100%)	
Residency				
Home (Non Host	58(38.7%)	43(41.0%)	101(100%)	0.406
Hostler	92(61.3%)	62(59.0%)	154(100%)	
Mid day naps				
Yes	105(70.0%)	86(81.9%)	191(100)	0.021
No	45(30.0%)	19(18.1%)	64(100%)	
Sleeping hours				
< 04 Hours	18(64.3%)	18(17.1%)	28(100%)	0.092
4-6 Hours	17(36.2%)	16(15.2%)	47(100%)	
6-8 Hours	54(40.3%)	80(59.7%)	134(100%)	
≥ 8 Hours	20(43.5%)	26(56.5%)	46(100%)	
Tea history				
Yes	67(44.7%)	61(58.1%)	128(100%)	0.024
No	83(55.3%)	44(41.9%)	127(100)	
Smoking				
Yes	15(10.0%)	19(18.1%)	34(100%)	0.047
No	135(90.0%)	86(81.9%)	221(100)	
Exercise				
Yes	27(18.0%)	15(14.3%)	42(100%)	0.271
No	123(82.0%)	90(86.7%)	213(100)	

Fig. Academic performance among daytime sleepers.



Academic performance showed good GPA 132(51.8%) while poor GPA 123(48.2%) and also, the subjects daily sleeping hours 6-8h, 134(52.5%) subject were reported highest in numbers, while sleep less than 4h, seemed low participation 28(11.0%). A significant statistical association was observed among the ESS score and other variables like age (p=0.044), gender (0.017), academic batch (p=0.028), midday naps (p=0.021), tea habit (0.024), and smoking (0.047). Moreover, no significant association was observed between excessive daytime sleepiness and sleeping hours (p=0.092), residence (p=0.406), and regular exercise (0.271) (Table 2).

DISCUSSION

Poor sleep hygiene can be associated with poor sleep quality as well as increase daytime sleepiness.[23] Sleep is an essential component of physical and mental health.[24] In current study, high prevalence of daytime sleep preponderance in female students were observed. EDS showed a significant association with low academic performance among students. A high prevalence of daytime sleep preponderance in female students was observed.

EDS showed low academic performance among students. In a Saudi Arabian study, 161 medical students participated and the prevalence of EDS was 36.6%.[13] In another Saudi study had prevalence of 37.8% and a Malaysian study was conducted on 799 medical students, showed EDS of 35.5%.[14] Pakistani study that was conducted among 504 medical students observed 39.5% excessive/ abnormal day time sleepiness.[16]

Our study showed the significant association of EDS subjects secured low GPA (poor academic performance), such relation has seemed the same in KSA and Pakistani studies conducted among medical students.[12,16] The study revealed an analysis of gender-wise significant association with EDS, and more poor sleep was observed in female subjects.[16,17] Sleep deprivation can be due to poor sleep behavior. Those behaviors that improve the quantity and quality of sleep are called sleep hygiene.[3]

CONCLUSION

Our study has shown that excessive daytime sleepiness is the most common amongst university medical students, more so in females, which can lead to poor academic performance.

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REFERENCES

1. 25 Facts about Sleep. Sleep Foundation. Available from: https://www.sleepfoundation.org/articles/25-random-facts-about-sleep.
2. Sleep disorders - Symptoms and causes - Mayo Clinic. Available from: https://www.mayoclinic.org/diseases-conditions/sleep-disorders/symptoms-causes/syc-20354018.
3. Brick CA, Seely DL, Palermo TM. Association between sleep hygiene and sleep quality in medical students. Behav Sleep Med 2010;8:113-21.
4. Johns MW. A new method for measuring daytime sleepiness: the Epworth Sleepiness Scale. Sleep 1991;14:540-45.
5. Over sleeping: the effect & health risks of sleeping too much. 2020. https://amerisleep.com/blog/oversleeping-the-health-effects/.
6. ICD-10 code for sleep disorder ICD-10 monitor. 2020 https ://www.icd10monitor.com/icd-10-codes-for-sleep-disorders
7. Sierra JC, Jiménez-Navarro C, Martín-Ortiz JD. Quality of sleep in university students: importance of sleep hygiene. Rev Psiquiatr Salud 2002;25:35-43.
8. Bonnet MH, Arand DL. We are chronically sleep deprived. Sleep 1995;18:908-11.
9. How to Determine if You Need Better Sleep - Sleep Foundation [Internet]. Sleep Foundation. 2020. Available from:https://www.sleepfoundation.org/articles/5-signs-your-sleep-quality -poor-and-how-fix.
10. Sahraian A, Javadopur A, Shiraz E. Sleep disruption and its correlation to psychological distress among medical students. Med J 2010;11:12-7
11. Webb E, Ashton CH, Kelly P, Kamali F. Alcohol and drug use in UK university students. Lancet 1996;348:922-25.
12. Abdulghani HM, Alrowais NA, Bin-Saad NS, Al-Subaie NM, Haji AM, Alhaqwi AI Sleep disorder among medical students: relationship to their academic performance. Med Teach 2012;34:37-41.
13. James BO, Omoaregba JO, Igberase OO. Prevalence and correlates of poor sleep quality among medical students at a Nigerian university. Ann Nigerian Med 2011;5:1.
14. Zailinawati AH, Teng CL, Chung YC, Teow TL, Lee PN, Jagmohni KS. Daytime sleepiness and sleep quality among Malaysian medical students. Med J Malaysia 2009;64:108-110.
15. Rajendran D, Vinod PB, Karthika M, Prathibha MT. Excessive daytime sleepiness in medical students. J Evolution Med Dent Sci 2018;7:747-50.
16. Surani AA, Zahid S, Surani A, Ali S, Mubeen M, Khan RH. Sleep quality among medical students of Karachi, Pakistan. J Pak Med Assoc 2015;65:380-2.
17. El Hangouche AJ, Jniene A, Aboudrar S, Errguig L, Rkain H, Cherti M, et al. Relationship between poor quality sleep, excessive daytime sleepiness and low academic performance in medical students. Adv Med EducPract 2018;9:631-8.
18. Al-Zahrani JM, Aldossari KK, Abdulmajeed I, Al-Ghamdi SH, Al-Shamrani AM, Al-Qahtani NS. Daytime sleepiness and academic performance among Arab medical students. J Thorac Dis 2016;8:6.
19. Veldi M, Aluoja A, Vasar V. Sleep quality and more common sleep-related problems in medical students. Sleep Med 2005;6:269-75
20. Liu X, Zhao Z, Jia C, Buysse DJ. Sleep patterns and problems among Chinese adolescents. Pediatrics 2008;121:1165-73
21. Bill-Godden W: Sample size determination for finite populations. 2004. http://www.williamgodden.com/samplesizeformula.p
22. Bahammam AS, Al-Khairy OK, Al-Taweel AA. Sleep habits and patterns among medical students. Neurosciences 2005;10:159-62.
23. Kaur G, Singh A. Sleep Hygiene, sleep quality and excessive daytime sleepiness among Indian college students. J Sleep Med Disord 2017;4:1076.
24. Lowe CJ, Safati A, Hall PA. The neurocognitive consequences of sleep restriction: a meta-analytic review. Neurosci Biobehav Rev 2017;80:586-604.