Original Article

Association between duration of sleep and Epworth score in male medical students

Mahvash Khan, Umar Ali Khan, Humaira Zafar, Anjum Syed

Departments of Physiology, Rawal Institute of Health Sciences, and
Al Nafees Medical College, Islamabad, Pakistan.

Objective: To assess daytime sleepiness in the male medical students aged 18-25 years and to relate their Epworth score with their mean duration of sleep.

Methodology: This randomized cross sectional study was conducted in the Department of Physiology, Islamic International Medical College, Rawalpindi, Pakistan from March 1, 2010 to March 1, 2011 on 56 male medical students aged 18-25 years. A standardized english language questionnaire consisting of 29 questions was completed including lifestyle factors and sleep habits. The open ended items consisted of sleep duration, number of awakenings at night and duration of exercise. There was choice for questions that best described their situation like dream remembering, mode of awakening and morning tiredness. In order to assess daytime sleepiness the Epworth sleepiness scale was applied.

Results: The degree of daytime sleepiness increased with the decrease in mean duration of sleep. The mean Epworth score of mean duration of sleep of 415±74.606 min was 4 (p=0.000). In adult male students with mean duration of sleep of 400.38±62.179 min, the mean Epworth score was 7 (p=0.000). Those with mean duration of sleep of 371.67±79.791min, the mean Epworth score was 12 (p=0.000).

Conclusion: In the adult age group, degree of daytime sleepiness was significantly negatively related to their night time sleep duration. (Rawal Med J 2014;39: 369-371).

Key words: Adults, daytime sleepiness, Epworth score.

INTRODUCTION

Sleep is considered a natural periodic state of rest for the brain, mind, and body.[1] Excessive day time sleepiness is highly prevalent in the adult age group.[2] Sleepy adolescents have significantly lower levels of academic performance, increased school tardiness, and lower graduation rates than other students.[3] Excessive daytime sleepiness is also related to reduced cognitive function and compromised professional performance of physicians.[4] Sleep deprivation is probably the most common cause of excessive daytime sleepiness. Symptoms of sleep deprivation can occur after only one night of sleep loss and persons who are chronically sleep deprived are often unaware of their increasing cognitive and performance deficits.[5,6]

There is no doubt that having enough sleep improves one's mood and makes one feel less stressed.[5] Studies have shown that students who have normal night sleep perform considerably better than the sleep-deprived students.[7,8] Sufficient sleep is correlated with both normal physical and mental functions, thus improving learning skills.[9] In Pakistan, literature is lacking regarding sleep behavior and the prevalence of day-time sleepiness in medical students. The aim of this study was to assess the prevalence and degree of daytime sleepiness and to determine the relationship with sleep duration and to educate the medical students about it's negative impact on their performance.

METHODOLOGY

This randomized cross sectional study was conducted in the Department of Physiology, Islamic International Medical College and Railway General Hospital Rawalpindi, Pakistan from March 1, 2010 to March 1, 2011. Ethical approval was obtained

from the Ethical Review Board of Riphah International University, Islamabad and Written Informed consent was obtained. A total of 56 young males, 28 from each of first and final year MBBS students were included in the study. The ages of the students were 18-25 years. The students with known psychiatric illness or on medication like sedatives, hypnotics, antidepressants, anxiolytics or steroids were excluded from the study.

All participants completed a well established english language questionnaire. The questions consisted of three parts; first part contained consent form, the second part included Epworth sleepiness scale and the third part was questionnaire. Any query raised by any student was explained there and then by the investigator and the filled proforma was collected within two hours on the same day.

The Epworth daytime sleepiness scale (ESS) covers eight different situations of everyday life activities. Students were asked to answer the overall ESS components. The ESS score (range 020) is an indication of the tendency to fall asleep in those situations and subjects were given a scale to choose the most appropriate number for dozing (short periods of sleep) for each situation.

Zero=would never doze; One=slight chance of dozing; Two=moderate chance of dozing; Three=high chance of dozing. The scores of different situations were added up to get a single added result. The final score was given a particular category as follows: Normal ES: from 0 to 6; Limited ES: from 7 to 9; Mild ES: from 10 to14; Moderate ES: from 15 to 20; Severe ES: over 20. The total night time sleep duration was calculated from the information contained in the third part of the questionnaire. Statistical Analysis was done by using SPSS version16.0. Mean values were compared using paired samples T-test. Limit of significance was set at $p<0.05$.

RESULTS

In each age group, none of the students lie in the category of moderate and severe daytime sleepiness. Most of the students in each age group lie in the category of normal (60%) or limited Epworth score (28%) (Table 1). Overall only 12 % of the students show mild daytime sleepiness.

Table 1. Epworth Score of students.

Age Groups	Epworth Score									
	0-6		7-9		10-14		15-20		>20	
	N	%	n	%	n	%	n	%	n	%
18-19	13	61.9	7	33.3	1	4.7	0	0	0	0
>19-20	04	80%	1	20	0	0	0	0	0	0
>20-21	1	100	0	0	0	0	0	0	0	0
>21-22	4	57.1	0	0	3	42.8	0	0	0	0
>22-23	5	35.7	7	50	2	14.2	0	0	0	0
>23-24	5	71.4	1	14.2	1	14.2	0	0	0	0
>24-25	1	100	0	0	0	0	0	0	0	0

There was a gradual increase in the Epworth score with decrease in the mean duration of night sleep (Table 2).

Table 2. Relation between Epworth Score and mean duration of sleep.

Epworth Score	Mean Duration of sleep ±SD (minutes)	P value
0-6	415±74.606 (7hrs)	0.000
7-9	400.38±62.179 (6.5hrs)	0.000
10-14	371.67±79.791(6hrs)	0.000
15-20	-	-
>20	-	-

DISCUSSION

About 20 percent of adults in the United States report a level of daytime sleepiness sufficient to interfere with daily activities.[10] Because of the steady rise in work needs, sleep insufficiency has become a global phenomenon.[11] It has been shown that young adults need an average total sleep time (TST) of 7.5 h on weeknights and a bit more, that is, 8.5 h during weekend nights.[12] Our study showed that TST of the participants was 6.5 h, which is short as compared with several other studies of young adults.[12] The extent of sleep is strongly associated with academic performance.[8] Lack of sleep can induce decreased cognitive performance, decreased thinking and concentration.[13]

The present study revealed that the TST among our college students was lower than that in Western countries but similar to other developing countries. Students are often unaware that their sleep deprivation (which is usually self-inflicted) and can cause them serious problems. It has been reported that sleepiness in the students is associated with

increased incidence of negative mood states.[14] Sleep habits survey on high school students showed that students having less than 6 hr 45 min night sleep had increased incidence of daytime sleepiness and behavior problems.[15] Similar results were seen in our study.

Asian adolescents' bedtimes were later than peers from North America and Europe, resulting in less TST on school nights and a tendency for higher rates of daytime sleepiness.[16] Another study showed that adolescents from Asian countries sleep 40-60 min less each night than Americans, and 60-120 min less than Europeans.[17] The students should be educated about the importance of proper night sleep. They should know the negative impact of daytime sleepiness on their academic performance. They should be discouraged regarding watching movies, working on computers till late night. There is a crucial necessity for a nationwide study on sleep behaviors among 'Pakistani' people.

CONCLUSION

The degree of daytime sleepiness increased with the decrease in the duration of night sleep. Only 12% of the students whose mean duration of night sleep was less than 6.5 h had mild daytime sleepiness.

Author Contributions:
Conception and design: Mahvash Khan, Umar Ali Khan
Collection and assembly of data: Mahvash Khan, Umar Ali Khan
Analysis and interpretation of the data: Mahvash Khan, Umar Ali Khan, Humaira Zafar
Drafting of the article: Mahvash Khan, Umar Ali Khan, Humaira Zafar, Anjum Syed
Critical revision of the article for important intellectual content: Humaira Zafar, Anjum Syed
Statistical expertise: Mahvash Khan, Umar Ali Khan
Final approval and guarantor of the article: Mahvash Khan
Corresponding author email: Dr. Mahvash Khan, E-mail: mahvashkhan8@gmail.com
Conflict of Interest: None declared
Rec. Date: Apr 17, 2014 Accept Date: Aug 3, 2014

REFERENCES

1. Meerlo P, Sgoifo A, Suchecki D. Restricted and disrupted sleep: effects on autonomic function, neuroendocrine stress systems and stress responsivity. Sleep Med Rev 2008;12:197-210.
2. Friedman N, Pagel JF, Pandi-Perumal SR. Determinants and measurements of daytime sleepiness. Primary Care Sleep Medicine: A Practical Guide. Totowa, N.J.: Humana Press; 2007:6182.
3. Chen I, Vorona R, Chiu R, Ware JC. A survey of subjective sleepiness and consequences in attending physicians. Behav Sleep Med 2008;6:1-15.
4. DongenVH, Maislin G, Mullington JM, Dinges DF. The cumulative cost of additional wakefulness: dose-response effects on neurobehavioral functions and sleep physiology from chronic sleep restriction and total sleep deprivation Sleep. 2003;26:117-26.
5. Pagel JF, Pandi-Perumal SR. Sleep disorders in primary care: evidence-based clinical practice. Primary Care Sleep Medicine: A Practical Guide. Totowa, N.J.: Humana Press; 2007:114.
6. Akerstedt T, Knutsson A, Westerholm P, Theorell T, Alfredsson L, Kecklund G. Sleep disturbances, work stress and work hours: a cross-sectional study. J Psychosom Res 2002;53:741-8.
7. 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.
8. Lowry M, Dean K, Manders K. The link between sleep quantity and academic performance for the college student. Sentience 2010;3:16-9.
9. Riemann D, Voderholzer U. Primary insomnia: a risk factor to develop depression? J Affect Disord 2003;76:255-9.
10. Johnson EO. Sleep in America: 2000. Results from the National Sleep Foundation's 2000 Omnibus sleep poll. Washington, DC: The National Sleep Foundation; 2000. Retrieved on 28th October 2008.
11. Van Leeuwen WM, Hublin C, Sallinen M, Härmä M, Hirvonen A, Porkka-Heiskanen T. Prolonged sleep restriction affects glucose metabolism in healthy young men. Int J Endocrinol 2010;2010:108641-7.
12. Buboltz WC, Jr, Brown F, Soper B. Sleep habits and patterns of college students: a preliminary study. J Am Coll Health 2001;50:131-5.
13. Scott JP, McNaughton LR, Polman RC. Effects of sleep deprivation and exercise on cognitive, motor performance and mood. PhysiolBehav 2006;87:396-408.
14. Jean-Louis G, Von Gizycki H, Zizi F, Nunes J. Mood states and sleepiness in college students: influences of age, sex, habitual sleep, and substance use. Percept Mot Skills1998;87:507-12.
15. Wolfson AR, Carskadon MA. Sleep schedules and daytime functioning in adolescents. Child Dev 1998;69:875-87.
16. Gradisar M, Gardner G, Dohnt H. Recent worldwide sleep patterns and problems during adolescence: a review and meta-analysis of age, region, and sleep. Sleep Med 2011;12:110-8.
17. Olds T, Blunden S, Petkov J, Forchino F. The relationships between sex, age, geography and time in bed in adolescents: a meta-analysis of data from 23 countries. Sleep Med Rev 2010;14:371-8.