



“SLEEP DISORDER AMONG STUDENTS OF A HEALTH UNIVERSITY: RELATIONSHIP TO THEIR ACADEMIC PERFORMANCE”.

Psychiatry

Dr. Arun Kumar Pandey MD (Psychiatry), Professor, Department of Psychiatry, BPS Government Medical College, Khanpur Kalan, Sonapat, Haryana, India

Dr. Nivedita Pandey* MD (Anatomy), Associate Professor, Department of Anatomy, NC Medical College, Israna, Haryana, India *Corresponding Author

ABSTRACT

Background: Health University students are exposed to a significant level of pressure due to academic demands. Their sleep pattern is characterized by insufficient sleep duration, delayed sleep onset, and occurrence of napping episodes during the day.

Objective: To examine the effects of sleep on the academic performance of students.

Methods: This is a cross-sectional self-administered questionnaire-based study. The participants were medical students, dental students and nursing students. The Pittsburgh Sleep Quality Index (PSQI) was used to identify sleep disorder and grade point average was recorded for academic performance.

Results: When compared between the three streams, there was statistically significant difference on PSQI between the MBBS vs. B.Sc. Nursing students (0.032) and BDS vs. B.Sc. Nursing students (0.011). Also PSQI was statistically significant (less than 0.05) for all passed students (n=127) and the failed students (n=24).

Conclusion: Passing students has better sleep related parameters than failed students.

KEYWORDS

Academic performance, sleep quality, student, PSQI

Introduction

The sleep-wake cycle, is influenced by physiological functions, school and work schedules, and many other factors. A healthy sleep-wake cycle is essential for productive output. Sleepiness may have a significant adverse effect on general health and quality of life.¹ In medical students the sleep-wake cycle is characterized by insufficient sleep duration, delayed sleep onset, and occurrence of napping episodes during the day.² A high correlation has been demonstrated between sleep duration and performance in some activities as well as subjective alertness.³ Psychiatric disorders, psychosocial stress, and dysfunctions such as decreased work efficiency and learning disability have also been demonstrated due to alertness.^{1,4}

Sleep disorders in the general population has been estimated to range from 22% to 65%.^{1,5} Bad or unsatisfactory sleep quality occurred in 7% and insomnia symptoms in 28% of medical students.^{6,7} Studies have shown that insomnia may be an early marker of psychiatric disorders such as depression and anxiety as well as sleep disturbances leading to psychiatric disorders.⁸ Similar findings were observed among medical students.⁹ Sleep pattern is related to psychological, clinical, and social aspects. The medical student is one group that is at an increased risk for sleep deprivation.¹⁰ Sleep deprivation has been found to affect cognitive function in medical students and nurses. On the other hand, there is a positive relationship between adequate sleep and physical, social and general health and life satisfaction and deprivation.^{4,11,12}

Johns et al. was one of the first to study the relationship between sleep habits and academic performance of medical students.¹³ Relatively few studies have investigated sleep habits and patterns among undergraduate medical students as a specific group and the relationship with the students' academic achievement, and cognitive function.¹⁴ Some studies have concentrated specifically on postgraduate medical residents.^{15,16} There is no data with this regard related to this part of Nepal, hence this study was undertaken to find out the prevalence of sleep disorder among medical students, and to look for any association between sleep disorder and their academic performance.

Participants and methods

A self-administrated questionnaire for sociodemographic data was developed and was distributed to the students [M.B.B.S., B.D.S. and B.Sc. Nursing] of a Health University in Eastern Nepal. The participation was voluntary and the consent was taken before the study. Academic performance was assessed by students' passing or failing. The study was approved by the Institutional Ethical Review Board.

The Pittsburgh Sleep Quality Index (PSQI) is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval. Nineteen individual items generate seven

"component" scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The sum of scores for these seven components yields one global score.

Results

The socio-demographic profile of the students is shown in table 1.

Table 1. SOCIO-DEMOGRAPHIC PROFILE OF STUDENTS

Age	Faculty	Mean	SD	Min	Max
	All (n=151)	22.91	1.313	21	29
	MBBS (n=91)	23.03	1.251	21	29
	BDS (n=40)	23.125	15.39	21	28
	B.Sc.-Nsg. (n=20)	21.9	0.308	21	22
INCOME (1. ≤ Rs. 15,000 pm 2. Rs. 15001 pm - 29,999 pm & 3. ≥ Rs. 30,000 pm)	All (n=151)	1.65	0.685	1	3
	MBBS (n=91)	1.9	0.553	1	3
	BDS (n=40)	1.55	0.638	1	3
	B.Sc.-Nsg. (n=20)	1.9	0.553	1	3
Number of Family Members	All (n=151)	3.01	1.291	1	10
	MBBS (n=91)	2.65	0.861	1	5
	BDS (n=40)	3.625	1.778	2	10
	B.Sc.-Nsg. (n=20)	3.45	1.234	2	6
Birth Order	All (n=151)	2.77	0.927	1	4
	MBBS (n=91)	2.55	0.898	1	4
	BDS (n=40)	3.15	0.83	2	4
	B.Sc.-Nsg. (n=20)	3	0.973	2	4

In the table 2, score of response on PSQI for sleep evaluation is given. For all students mean was 4.32, for MBBS students 4.37, for BDS students 4.775 i.e. the worst and B.Sc. Nursing students 3.15 i.e. the best. When compared between the three streams (Table 3) there was statistically significant difference on PSQI between the MBBS vs. B.Sc. Nsg. (0.032) was found and BDS vs. B.Sc. Nsg. (0.011).

Table 2: Score on Pittsburgh Sleep Quality Index (PSQI)

Sleep	Stream	N	Mean	SD	Min	Max
	All	151	4.32	2.331	0	13
	MBBS	91	4.37	2.204	1	11
	BDS	40	4.775	2.782	0	13
	Nursing	20	3.15	1.424	1	6

Table 3: SCORE COMPARED ON PITTSBURGH SLEEP QUALITY INDEX (PSQI)

Sleep	Stream	Compared With	Mean Difference	Significance	Low Ci	High Ci
	MBBS	BDS	-0.4	0.358	-1.26	0.46
		NUR	1.22	0.032	0.1	2.34
	BDS	MBBS	0.4	0.358	-0.46	1.26
		NUR	1.63	0.011	0.38	2.87
	NUR	MBBS	-1.22	0.032	-2.34	-0.1
		BDS	-1.63	0.011	-2.87	-0.38

From Table 4 for PSQI statistically significant difference (Less than 0.01) for all passed students (n=127) and the failed students (n=24). So, it can be concluded that passing students has better sleep related parameters than failed students.

Table 4: PSQI SCORE OF ALL STUDENTS

Sleep	Category	N	Mean	Sd	Significance	Lower Ci	Upper Ci
	PASS	127	3.83	1.822	< 0.01	-3.989	-2.191
	FAIL	24	6.92	2.977			

Discussion

To our knowledge, this is the first study conducted in Nepal which investigates the relationship between sleep disturbances of medical students and their academic performance. Our study showed that sleep influenced the academic performance, which was also shown by other studies.^{12,17} These sleep disturbances can be associated with minor psychiatric disorders in medical students.¹⁸ Sleep needs to be improved as it can enhance cognition and academic performance.¹⁹ Many studies have revealed that sleep deprivation¹⁹ was a common finding in the academic life, of medical students.^{12,20,21}

The association between sleep disturbances and academic performance among medical students has not been investigated thoroughly. An earlier study and a more recent study showed that sleep disturbance was associated with poor academic performance.^{12,13} Our study showed a significant relationship between academic performance and sleep disturbance. This finding favors other studies where academic performance was affected by sleep disorders in medical students.^{12,13} In this study, several factors were associated with sleeping disorders among medical students such as sleeping deprivation and mid-day napping. Other studies demonstrated these risk factors for sleep disturbances in addition to socioeconomic status, life habits, and psychological factors.^{10,21}

Sleep quality is also influenced by patient load, administrative environment, and work stress.^{22,23} Those factors were not evaluated in this study. As of inadequate sleep, the brain does not have an opportunity to restore to full performance potential. The relationship between sleep disturbance and the demographic variables of age, income, number of family member and birth order was investigated.

This is a small sample size study. As in most observational studies about sleep, sleep disturbances were based only on subjective assessment by the respondent. It is possible that respondents forgot some of the episodes due to stress, insomnia, persistent sleep disturbance. In addition, although subjective and objective sleep assessments appear to measure different phenomena, previous studies have shown that there is an imperfect, but strong, relation between subjective evaluation of sleep and objective polysomnograph measurements. Finally, the relationship of academic performance with sleep disturbances was totally based on a pass and fail, which can be affected due to other causes too.

Conclusion

Significant association was noted with sleep disturbance and academic performance in this study on three groups of health University students. All college students should be educated about the importance of maintaining good sleep habits because this population tends to develop poor sleep habits that lead to sleep deprivation, poor sleep quality, and insomnia.

We recommend further investigation on the subject to look into the sleep disturbance and its relation with academic performance in medical students because of insufficient data on this regard.

Conflict of Interest: None declared.

References

- Jewett ME, Dijk DJ, Kronauer RE, Dinges DF. Dose-response relationship between sleep duration and human psychomotor vigilance and subjective alertness. *Sleep*. 1999;22:171-9.
- Buboltz WC, Brown F, Soper B. Sleep habits and patterns of college students: a preliminary study. *J Am Coll Health*. 2001;50:131-5.
- Ravid S, Afek I, Suraiya S, Shahar E, Pillar G. Sleep disturbances are associated with reduced school achievements in first-grade pupils. *Dev Neuropsychol*. 2009;34:574-87.
- Eliasson AH, Lettieri CJ. Early to bed, early to rise! Sleep habits and academic performance in college students. *Sleep Breath*. 2010;14:71-5.
- Veldi M, Aluoja A, Vasar V. Sleep quality and more common sleep-related problems in medical students. *Sleep Med*. 2005;6:269-75.
- Roth T, Ancoli-Israel S. Daytime consequences and correlates of insomnia in the United States: results of the 1991 National Sleep Foundation Survey. II. *Sleep*. 1999;22 Suppl 2:S354-8.
- Foley DJ, Monjan AA, Brown SL, Simonsick EM, Wallace RB, Blazer DG. Sleep complaints among elderly persons: an epidemiologic study of three communities. *Sleep*. 1995 p. 425-32.
- Eller T, Aluoja A, Vasar V, Veldi M. Symptoms of anxiety and depression in Estonian medical students with sleep problems. *Depress Anxiety*. 2006;23:250-6.
- Rosal MC, Ockene IS, Ockene JK, Barrett S V, Ma Y, Hebert JR. A longitudinal study of students' depression at one medical school. *Acad Med*. 1997;72:542-6.
- Maria Paz Loayza H, Ponte TS, Carvalho CG, Pedrotti MR, Nunes P V, Souza CM, et al. Association between mental health screening by self-report questionnaire and insomnia in medical students. *Arq Neuropsiquiatr*. 2001;59:180-5.
- Parkerson GR, Broadhead WE, Tse CK. The health status and life satisfaction of first-year medical students. *Acad Med*. 1990;65:586-8.
- Rodrigues RND, Viegas CAA, Abreu E Silva AAA, Tavares P. Daytime sleepiness and academic performance in medical students. *Arq Neuropsiquiatr*. 2002;60:6-11.
- Johns MW, Dudley HA, Masterton JP. The sleep habits, personality and academic performance of medical students. *Med Educ*. 1976;10:158-62.
- Peters BR, Joireman J, Ridgway RL. Individual differences in the consideration of future consequences scale correlate with sleep habits, sleep quality, and GPA in university students. *Psychol Rep*. 2005;96:817-24.
- Daugherty SR, Baldwin DC. Sleep deprivation in senior medical students and first-year residents. *Acad Med*. 1996;71:S93-5.
- Halbach MM, Spann CO, Egan G. Effect of sleep deprivation on medical resident and student cognitive function: A prospective study. *Am J Obstet Gynecol*. 2003;188:1198-201.
- Johns M, Hocking B. Daytime sleepiness and sleep habits of Australian workers. *Sleep*. 1997;20:844-9.
- Hidalgo MP, Caumo W. Sleep disturbances associated with minor psychiatric disorders in medical students. *NeuroSci*. 2002;23:35-9.
- Curcio G, Ferrara M, De Gennaro L. Sleep loss, learning capacity and academic performance. *Sleep Medicine Reviews*. 2006. p. 323-37.
- Bahammam AS, Al-Khairy OK, Al-Taweel AA. Sleep habits and patterns among medical students. *Neurosciences*. 2005;10:159-62.
- Ninama NJ, Jaydeep K. Sleep wake pattern analysis. *NHL Journal of Medical Sciences* 2012;1(1):32-6.
- Joshi K, Mishra D, Dubey H, et al. Sleep pattern and insomnia among medical students. Effect of gender and dysfunctional beliefs and attitude about sleep. *Sonologie* 2015;19(3):205-11.
- Amin HS, Almazroua IS, Alsahlan AS, Alrishan MA, Elmourad HM, Alotaibi MM et al. Effect of sleep deprivation on the attitude and performance of medical students, Riyadh, Saudi Arabia. *Int J Med Sci Public Health* 2016;5: 575-580