

SLEEP PATTERNS AND EFFICIENCY AMONG STUDENTS IN A MEDICAL SCHOOL

Umema Zafar¹, Naila Hamid¹, Junaid Ahsan²

¹Department of Physiology, Khyber Medical College, Peshawar - Pakistan

²Department of Community Medicine, Gajju Khan Medical College, Swabi - Pakistan

ABSTRACT

Objective: To determine the sleep pattern of students as well as to calculate their sleep efficiency.

Material and Methods: The study was conducted in the Physiology Department of Khyber Medical College, Peshawar. First and Second Year MBBS students of Khyber Medical College were selected who were above 18 years age. Students were given a self designed questionnaire to fill and then their sleep efficiency (SE) was calculated using total time in bed (TIB) and total sleep time (TST).

Results: Total number of students inducted in the study was 115. Their average bedtime and wake up time were mid-night and 7.00 AM respectively. The average time in bed was documented as 10 hours. The Total Sleep Time reported was around 7 and a half hours. The average Sleep Efficiency of the students was computed to be 83.9%. Only 1.7% students used sleep-inducing medications, while caffeine consumption was 17%. Students' perception of their sleep quality and their work efficiency was good, on Likert scale.

Conclusions: The average sleep efficiency computed was good when compared to standards around the world. The sleep patterns including bedtime and wakeup time of majority of the students were healthy.

Keywords: Sleep; Medical students; Perception.

This article may be cited as: Zafar U, Hamid N, Ahsan J. Sleep patterns and efficiency among students in a medical school. *J Med Sci* 2018; 26: (3) 221-224.

INTRODUCTION

Poor Sleep quality is a wide spread issue in the current mechanized era¹. The prevalence of sleep problems is 32-57% in undergraduate medical students as documented by various studies using the Pittsburgh Sleep Quality Index (PSQI) questionnaire^{1,2}.

The Oxford dictionary defines sleep as "A condition of body and mind which typically recurs for several hours every night, in which the nervous system is inactive, the eyes closed, the postural muscles relaxed, and consciousness practically suspended³. Poor sleep quality also described as insomnia is characterized by difficulty in initiation and maintenance of sleep; it may also include several nocturnal awakenings and

disturbed overall quality of sleep⁴. One of the consequences of disturbed sleep patterns is Excessive Day-time Sleepiness (EDS), which leads to poor cognitive function. The prevalence of EDS is 20% in young adults in the United States⁵. EDS is described as the sleepiness during working hours when the person is expected to be awake⁶. According to another study EDS inflicts 5-15% of the population⁷.

Nocturnal awakening (NA) is another contributor of insomnia and according to a study the number one cause of NA is to use the bathroom 75.5% of times⁸. The main issue regarding NA is how to fall back to sleep once awakened, research is being conducted on this issue⁹. Insomnia leads to increased preponderance towards psychiatric disorders as well as road traffic accidents⁹. Increased incidence of insomnia has been reported among medical students in various studies conducted worldwide^{1,9,10}. One of the causes of insomnia is usage of caffeinated beverages at the wrong time¹¹. As a consequence people tend to resort to medications for sleep induction, of which sedatives and hypnotics are on the top⁷. Transient insomnia affects 80% of the population where as 15% of the population

Umema Zafar (Corresponding Author)
Demonstrator
Physiology Department, Khyber Medical College,
Peshawar.
Cell: +92-322-906-5940
Email: umema.com@gmail.com

Date Received: June 10, 2018
Date Revised: Aug 10, 2018
Date Accepted: Aug 20, 2018

suffer from chronic insomnia⁷. According to a study conducted in Shifa College of Medicine, female medical students' mean sleep time was less than that of males, this maybe an attribute of the social norms and prevalent trends, such as the load of household work and Family members on the women. In the same study, coffee and tea were the most popular choices for staying awake before the night of the exam¹².

Sleep constitutes one third of a healthy person's day. If this one third is disturbed, it adversely effects the remaining two third of a person's day. Understanding sleep patterns can help us solve issues such as insomnia. The aim of this study is to calculate the sleep efficiency among the medical students, to know the perception regarding their sleep quality and work efficiency. Moreover it also aims to judge the sleep patterns of the students as well as to find out the factors effecting sleep such as medicine usage. Sleep constitutes a major part of one's day, which is spent in inactivity, hence, being non productive. To know the sleep patterns and efficiency will aid us in understanding the routine of students, Knowing the routine and how time is managed is an important indicator of academic success and work efficiency.

MATERIAL AND METHODS

This study was conducted on 115 medical students of Khyber Medical College. The students of first and second year MBBS were selected between the ages of 18 and 23 years. One batch of second year and one of first year was selected out of convenience. Those students who were absent were excluded. This was done via convenience sampling. The study duration was from 1st August to 1st November 2017. A self-developed questionnaire was administered to the students, which contained both open and closed ended questions. The questions included demographic features (three questions), a question on perception of the medical students regarding their sleeping habits based on a five point Likert scale ranging from "very poor" to "perfect". Three questions were asked on total sleep time (TST), four on Time in bed (TIB) three questions on Nocturnal Awakenings (NA). Sleep Efficiency (SE) was then calculated from these questions. There was a question on time to go to bed and another on time to wake up. Furthermore, there were questions on medication and caffeine usage. The last question was asked about the students work/study efficiency based on a five point Likert scale from "very poor" to "perfect". The following formulas was used in defining SE: Sleep Efficiency (SE) = TST/TIB × 100¹³. Total Sleep time (TST) = night time sleep duration+ daytime nap duration – duration of nocturnal awakenings Time in Bed (TIB) = TST+ time

spent in bed before sleep+ time in bed before getting up^{12,14,13}. The above mentioned variables were analyzed using SPSS version 20. Frequencies, means and standard deviations were determined. The formulas were then applied manually. Pearson correlation was also determined. And the references were managed using Mendeley version^{1,17,10}.

RESULTS

The questionnaire was distributed among 130 students out of which 115 answered. There were 54 (47%) females and 61 (53%) males. The students living in hostel were 67 (58%), home-based were 48 (42%). The students went to bed between 8:00 pm and 3:00 am. Majority (20.7%) went to bed by midnight, followed by 14.7% at 1 am and 13.8% at 11 pm. The average wake up time was 7:00 am of 30% of the students, followed by 6:00 am by 22.7% students. About 10 % woke up at 7:30am and 5:00 am respectively. All the students woke up between 4:00 am and 8:30 am.

The average SE was 83.9% with a standard deviation of 14.6. The mean TST was 7 hours and 40 minutes, with a standard deviation of 1 hour 50 minutes. Minimum TST that the students documented was 3 hours and the maximum was 15 hours. The average time that a student spends in bed either sleeping or doing other activities is round about 10 hours. Out of 115 students only two (1.7%) reported using medication for sleep induction. Tea/coffee was consumed out of habit, by 20 (17%) of students, at night. The correlation between SE and the actual perception of students regarding their sleep quality came out to be weak, p<0.05. The correlation between SE and the perception of work/study efficiency of students was 0.185, which is also very weak, p<0.05. An average of 84 (72.4%) students felt sleepy during the day while the rest 31 (26.7%) did not.

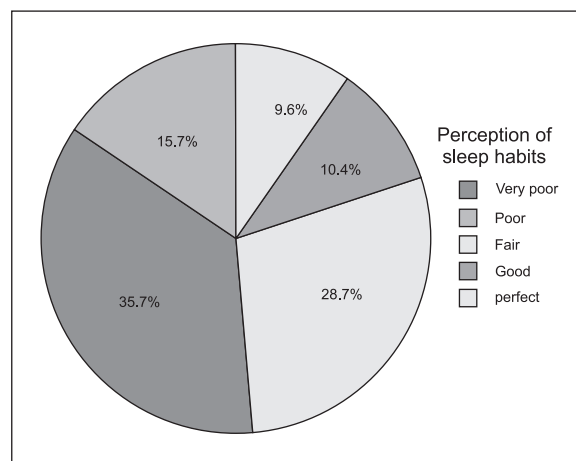


Figure 1: Perception of sleep habits

Sleep patterns and efficiency among students in a medical school

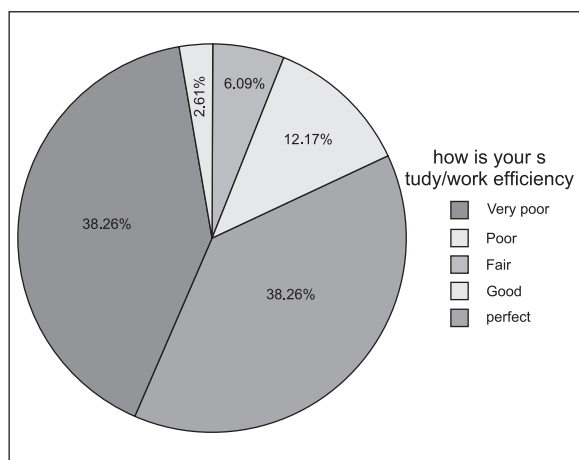


Figure 2: study/work efficiency

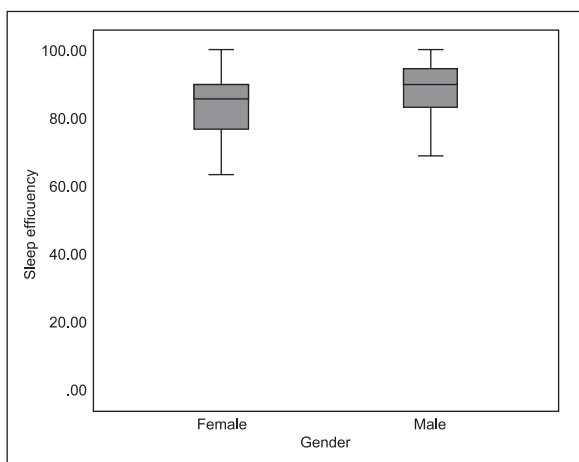


Figure 3: Gender based sleep efficiency

DISCUSSION

In this study the average sleep efficiency of students was calculated as 83.9%, which is good. 85-90% SE is considered to be very good¹⁵. The standard TST that a person needs each day is around 7.5 hours or 450 minutes¹⁶. According to the results of the present study the average TST including day-time napping was 7.6 +/- 1.8 hours, this is better than the average sleep time of medical students of King Saud University, Riyadh, Saudi Arabia, which was 5.9 +/- 1.6 hours¹⁷. According to another article, sleep time of medical students fluctuates throughout the year, depending upon whether it is exam time or an assignment is due the next day. (18) So TST also depends on the system of education prevalent in the medical school whether modular or annual. It also depends on the amount of strictness regarding the grades and attendance of students, as well as the innate ambition of the students to do well. It was also seen in this study that the average amount of time a student spends in bed either sleeping, reading, using the mobile or any other activity was found to be

10 hours. The minimum was 3 hours, and maximum was 15 hours in bed. But these students were found to be few. Both these extremes lead to deranged sleep patterns. According to a study conducted in Faisalabad, Pakistan, sleep duration is a significant predictor of psychological stress¹⁹.

The average bed time was midnight and wakeup time of students was 7:00am in this study. According to data extracted from 18,500 students using Jawbone over 1.4 million nights at 137 schools, the average bedtime of students was 11:54PM²⁰. Another study conducted in Karachi showed that 72% of the students went to bed after midnight¹. In this study, half the subjects were hostel dwelling and half were day scholars. But there was no particular pattern seen pinpointing any particular sleep, differences in any of these categories. Moreover, only 1.7% of the students used medication for sleep induction; hence its trend here in KPK is rare. 17% of the students used caffeinated drinks at night out of habit. But no significant relation was found between these drinks and disturbed sleep patterns.

According to 35.7% of students, their sleep efficiency was good and 28.7% said it was fair. The correlation between sleep efficiency and the actual perception of students regarding the quality of their sleeping habits was poor, which showed the lack of awareness among students about, what actually is an efficient sleep. 40.87% students reported good work/study efficiency whereas, 38.26% reported average or fair efficiency. Moreover, the correlation between the perception of work and study efficiency and the actual sleep efficiency was poor. Which showed that no matter how much sleep the medical students had, according to them, they managed to complete their day's tasks.

When it came to gender, sleep efficiency of males was slightly higher than females. This could have been attribute of the social obligations of our society, which demands different roles from males and females like house hold tasks from ladies¹. In the present study Excessive Daytime Sleepiness was reported by 72.4% of the students. According to a study conducted in Prince Sattam Bin Abdulaziz University on 161 students the prevalence of EDS was 37.8%. There was no link found between EDS and academic performance²¹. Another study conducted in Malaysia on 799 students showed the prevalence of EDS to be 35.5% based on Epworth Sleepiness Scale (ESS)²². This shows that the average EDS in Khyber Medical College students, was much higher than average in other parts of the world. The limitations of this study included reporters' bias. It's difficult to recall sleep timings on daily basis, the subjects could only provide an average estimation.

CONCLUSION

Sleep efficiency of students of KMC is good and in comparison to females it is higher in males. Majority of students reported their Sleep Efficiency and work efficiency as good. This most probably is a misperception, and it might have been due to lack of knowledge about the true nature of these terminologies.

REFERENCES

- Anwer A, Zahid S, Surani A, Ali S, Mubeen M, Khan RH. Sleep quality among medical students of Karachi, Pakistan. *J Pakistan Med Assoc.* 2015;65:380.
- Giri P, Baviskar M, Phalke D. Study of sleep habits and sleep problems among medical students of pravara institute of medical sciences loni, Western maharashtra, India. *Ann Med Health Sci Res.* 2013;3:51-4.
- Sleep - definition [Internet]. Oxford Dictionaries. 2017 [cited 2017 Sep 1]. Available from: <https://en.oxforddictionaries.com/definition/sleep>
- Sexton CE, Storsve AB, Walhovd KB, Johansen-Berg H, Fjell AM. Poor sleep quality is associated with increased cortical atrophy in community-dwelling adults. *Neurology.* 2014;83:967-73.
- Pagel JF. Excessive Daytime Sleepiness. *Am Fam Physician.* 2009;79:391-6.
- Kim J, Cho S-J, Kim W-J, Yang KI, Yun C-H, Chu MK. Excessive daytime sleepiness is associated with an exacerbation of migraine: A population-based study. *J Headache Pain.* 2016;17:62.
- Pagel JF, Parnes BL. Medications for the Treatment of Sleep Disorders: An Overview. *Prim Care Companion J Clin Psychiatry.* 2001;3:118-25.
- Krakow B, Romero E, Ulibarri VA, Kikta2 S. Prospective Assessment of Nocturnal Awakenings in a Case Series of Treatment-Seeking Chronic Insomnia. *Sleep.* 2012;35:1685-92.
- Nojomi M, Bandi MFG, Siyamak Kaffashi. Sleep Pattern in Medical Students and Residents. *Arch Iran Med.* 2009;12:542-9.
- Azad MC, Fraser K, Rumana N, Faris A. Sleep Disturbances among Medical Students : A Global Perspective. *J Clin Sleep Med.* 2015;11:69-74.
- Ellis JG, Perlis ML, Bastien CH, Gardani M, Espie CA. The Natural History of Insomnia: Acute Insomnia and First-onset Depression. *Sleep.* 2014;37:97-106.
- Kazim M, Abrar A. Sleep patterns and academic performance in students of a medical college in Pakistan. *KUST Med J.* 2011;3:57-60.
- Reed DL, Sacco WP. Measuring Sleep Efficiency : What Should the Denominator Be ? 2016;12:263-6.
- Saeed Z, Hasan Z, Atif M. Sleep patterns of medical students ; their relationship with academic performance: A cross sectional survey. *Prof Med J.* 2015;22:919-23.
- Breus MJ. Calculating Your Perfect Bedtime and Sleep Efficiency | The Oz Blog [Internet]. 2013 [cited 2017 Oct 21]. Available from: <http://blog.doctoroz.com/oz-experts/calculating-your-perfect-bedtime-and-sleep-efficiency>
- How Much Sleep Is Enough? - NHLBI, NIH [Internet]. 2017 [cited 2017 Oct 21]. Available from: <https://www.nhlbi.nih.gov/health/health-topics/topics/sdd/howmuch>
- Bahammam A, Al-Khairy O, Al-Taweel A. Sleep habits and patterns among medical students. *Neurosci.* 2005;10:159-62.
- Mulligan M. Sleep, Memory, and Medical Students | Clinical Correlations [Internet]. clinical correlations. 2009 [cited 2017 Oct 25]. Available from: <http://www.clinicalcorrelations.org/?p=1894>
- Khawar R, Maryam R, Sultana A, Saeed S, Khawar MU. Sleep Quality and Psychological Distress Among University Students.pdf. *J Pakistan Psychiatr Soc.* 2017;14(2):36-8.
- Coren MJ. Most students at top colleges have the same sleep pattern [Internet]. 2016. Available from: <https://qz.com/674854/students-at-top-colleges-all-seem-to-have-the-same-sleeping-pattern/>
- Al-Zahrani JM, Aldossari KK, Abdulmajeed I, Al-Ghamdi SH, Al-Shamrani AM, Al-Qahtani NS. Daytime Sleepiness and Academic Performance among Medical Students. *Heal Sci J.* 2016;10:13.
- Zailinawati A, Teng C, Chung Y, Teow T, PN Lee, Jagmohni K. Daytime sleepiness and sleep quality among Malaysian medical students. *Med J Malaysia.* 2009;64:108-10.

CONFLICT OF INTEREST: Authors declare no conflict of interest

GRANT SUPPORT AND FINANCIAL DISCLOSURE NIL

AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

- Zafar U::** Design of work, Data interpretation and final approval.
Hamid N: Main idea and planning the work.
Ahsan J: Drafting the work.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.