



ASSESSING ALTERED SLEEP PATTERNS AMONG MEDICAL STUDENTS

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ABSTRACT

Sleep related problems are common amongst young adults who are enrolled in professional colleges, especially among medicos. Vast syllabi demand more time which either directly or indirectly has an impact on sleeping habits. Hence, it is planned to evaluate the sleep pattern and its effects among medical students. The aim of this study is to assess sleep deprivation of medical students and its impact on their academic performance and health. The objective of this study is to study the sleep pattern among medical students, and to analyze the causes and effects of sleep deprivation based on a given questionnaire. Study Centre: Tertiary teaching institute. Study population: 4 group of 400 medical students in 4 batches (each 100) A-I MBBS; B-II MBBS; C-III MBBS; D-IV MBBS. Study material: Questionnaire containing 20 close ended multiple- choice questions, Study design: cross sectional study. 85 % of medicos are sleeping less than 8 hours per night. 56.5 % of III and IV years and 34 % of I and II years sleep late in the night. Only 5 %-18 % can do normal work after a sleepless night. Sleepless nights due to continuous examinations reduce academic performance. (50 % of I and II year, 45.5 % of III and IV year). The present study updates us with information that the medical professionals suffer from sleep deprivation which leads to reduced performance and health issues. Appropriate counseling and proper planning to reduce the stress imposed should be practiced to control the situation rightly.

Keywords: Sleep deprivation, circadian rhythm, academic performance.

INTRODUCTION

Sleep is defined as a state of unconsciousness from which a person can be aroused¹. In this state, the brain is relatively more responsive to internal stimuli than external stimuli. Sleep affects our physical and mental health and is essential for the normal functioning of all the systems of our body. A normal healthy adult sleeps for 7-8 h^{1,2}. The stages and states of human sleep are defined on the basis of Electroencephalograms. There are two states of sleep:

- Rapid Eye Movement (REM) sleep
- Non Rapid Eye Movement (NREM) sleep

The two states occur cyclically, each cycle lasting for 90-120 minutes.²

- The NREM sleep state: This forms 75 %-80 % of sleep and occurs in 4 stages.
- The REM sleep state: This forms 20 %-25 % of total sleep and is characterized by rapid eye movements. The percentage of REM sleep is inversely proportional to age^{1,2}
- Sleep and wakefulness are closely related. Besides the duration, the timing is also essential for adequate day time functioning and a healthy living. The sleep-wake cycle is a circadian rhythm which goes hand in hand with various other rhythms in the body like deep body temperature, cellular mitoses and other cardiac, endocrine and neurobehavioral functions¹. Therefore, a distorted sleep-wake rhythm has a significant effect on these interlinked cycles too. This can lead to undesirable effects on the body causing effects ranging from somnolence, attention deficits, concentration difficulties and performance decrements to long term effects on the cardio-respiratory functions. There have been studies which exhibited this connection and the importance of a sound night's sleep for the day to be less tiring and more fruitful for the subjects. Sleep related problems are common among young adults who are enrolled in professional colleges.

The various causes of sleeplessness among students are:

- Academic demands
- New social opportunities
- Change in sleeping circumstances
- Diminution of parental guidance
- Erratic school schedules
- Part-time jobs, and
- Long night life

A sleep deprived individual is prone for lacking concentration, being unpleasant and irritable to his co-workers and even makes gross errors in his activities. It also has a long term effect on his body systems like the brain and the heart.

Why medical students??

The habit of sleeping late and sleeping less was more among medical students due to the increased academic demands leading to effects on their health. Thus, our intention was to scan through the sleeping pattern among medical students in our college and see for any abnormal sleep-wake patterns, habits, impact of sleeplessness on the day's work and even their knowledge about the right sleeping habits. Medical profession is not just a long course but also demands precision in our work, for gross mistakes due to reasons like sleeplessness which can be prevented is inexcusable. Hence, it was planned to do a study among medical students in order to assess their sleep pattern.

Aim

The aim of this study is to Assess sleep deprivation of medical students and its impact on their academic performance and health.

Objectives

- To study the sleep pattern among medical students, and
- To analyze the causes and effects of sleep deprivation based on a given questionnaire.

MATERIALS AND METHODS

The study was conducted in a Tertiary teaching institute. The study population consisted of 4 batches of medical students (each 100)-

- Group A-1st year MBBS
- Group B-2nd year MBBS
- Group C- 3rd year MBBS
- Group D-4th year MBBS

It was a survey based study. First a basic proforma consisting of name, age, gender, nativity (urban or rural) and place of stay (day scholar or hosteller) was given. Then a questionnaire, consisting of 20 closed ended questions was given to them. Questions on their usual sleep time, sleep pattern, causes of sleep deprivation, if any, methods to induce and reduce sleepiness and the impact of sleeplessness on day to day activities were asked in the form of multiple choice questions. Students were asked to tick mark against the option(s) which best described their sleeping habits. With the data obtained, results were analyzed based on the following parameters

- Knowledge about functions of sleep
- Sleeping pattern
- Effects of sleep deprivation
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The results were also compared on the basis of gender, year of study, nativity and place of stay for a better analysis of their effects on a normal sleep pattern.

RESULTS

The results of the survey were analyzed on the basis of gender, day scholar / hostelite and year of study. Primarily three parameters were taken into account-knowledge about normal sleep-wake functions, existing sleep-wake patterns and effects of sleep deprivation. Details about the study population are given in Table 1.

General Results

In the study population which consisted of 400 students (214 females and 186 males), it was found that 88 % of them were aware about the important functions of a peaceful sleep-wake pattern. It was found that 85 % of the study population slept less than 8 hours. It was accounted that 44 % of the population slept after 12 am. This sleep deprivation was compensated by sleeping during the day (68 %) and sleeping during weekends (70.9 %). 58 % of the population was woken up by a parent or with the use of an alarm. It was also found that a massive 90 % of the population experienced at least one sleepless night which in turn made them feel uncomfortable the following day (85 %). They agreed to experience symptoms such as burning eyes, headache, yawning and fatigability (62 %). 69 % of the population attributed the cause of their sleeplessness to be due to examinations and 50.2 % felt that their performance went down due to reduced sleep.

Results-Day Scholars and Hostellers

The results were compared between hostellers and day scholars and it was found that the habit of sleeping late was more common among the hostellers accounting for 55.9 %. Also this leads to an additional habit of sleeping during the day time (73.2 %). On being asked about how they were being woken up, 54.3 % of the day scholars were woken up either by parent or an alarm. 64.7 % of hostellers agreed that they cannot do normal work after a sleepless night (as shown in Table).

Results-Year of study

Due to reasons like additional burden of study, co curricular activities, sudden change in environment etc about 66 % (p = 0.001)

of the students during their initial two years developed the habit of sleeping late and 91 % of them slept less than 8 hours. These two factors- sleeping late and sleeping less, led to an additional habit- sleeping during the day time which accounted of 69.5 % of the 1st and 2nd years. It was agreed by 63 % of the students from the initial two years of MBBS that they cannot do normal work after a sleepless night and their performance was affected due to sleep deprivation (50 %). Also, it was agreed by 75 % of the 3rd and 4th years that the cause of their sleeplessness was usually exams.

Results-Gender

As a part of our analysis of normal sleep wake patterns, we found that about 71.1 % of females slept less than 8 hours and this also led to 57 % of females to sleep during the daytime and 56 % during weekends. The most common cause for the sleep deprivation, as expected was exams, agreed by 74 % of females and 60.5 % of males. Also 56 % of males and 44 % females experience distressing symptoms the following day after a sleepless night. 61 % of the males agree that they cannot do normal work after a sleepless night. We also analyzed methods adopted by the study population to induce/postpone sleep and use if medications in order to sleep properly, but with no significant results.

DISCUSSION

Similar studies have been carried out in the past regarding the association between the sleep pattern and the academic performance among university students. One such study was conducted by URSIUS College. It was found in their study that more than 70 % of the university students were having sleep related problems and only about 11 % got good quality sleep, in comparison to 85 % of the students in our study who slept less than 8 hours. The most consistent findings were that lower academic results were associated with less sleep duration, with later rise times / awakening times³⁻⁶. About 50 % of our study population agreed that their performance dropped during continuous examinations, the main cause being lack of proper sleep. Lower academic results were associated with evening-ness orientation^{4,6}. In 1971, Friedman *et al* found that residents who had been on call the night before made more errors in reading an electrocardiogram than their rested colleagues. Chronic partial sleep deprivation is defined as sleep duration of less than 5 to 6 hours for several consecutive nights. Chronic partial sleep loss is common in residency accounting for 66 % (sleep 6 hours or less). Residents who report sleeping 5 hours or less are more likely to report having worked in an "impaired condition" and having made medical errors⁷⁻⁹. Our study showed that 70.9 % of our study population had at least one sleepless night, which lead to decreased work interests the following day, as agreed by 31 %. Taub and Berger¹⁰⁻¹³ found that regular sleepers whose sleep schedules were altered experienced performance losses relative to baseline and those irregular sleepers had lower performance scores than regular sleepers. These results complement the findings of the present study. Most students are sleep deprived during the exams or in the preparatory phase which is mainly due to anxiety. Similarly it's also true that when the person is sleep deprived, he is more anxious. Thus these two factors are mutually contributory. Manber and Bootzin¹⁴ found that sleepy individuals with irregular sleep schedules who regularized their sleep schedules but suffered sleep loss in the process experienced an increase in daytime sleepiness and a concomitant deterioration in daily mood and concentration ratings. Billiard *et al*.¹⁶ found that unintended daytime sleep episodes were more prevalent among subjects with irregular sleep-wake schedules (6.4 %) than among subjects with regular sleep-wake schedules (2.2 %). 33 % of our study group had a habit of sleeping during the day and about 70.9 % compensated for the week's lost sleeping hours during the day. Cognitive performance over the day depends on the interaction between hour of the day and diurnal type of the individual. It was also found in a study that anxiety and sleep are interconnected. Hours without sleep influences health, with long-term total sleep deprivation having the most

pronounced negative effect¹⁵⁻¹⁷. Finally, inter-individual variation in how sleep loss affects performance may be a moderator. Some individuals appear to be profoundly and others minimally affected by the same number of hours without sleep¹⁶⁻²². In our study 45.7 % were of the opinion that in spite of being tired and sleepy, they were able to perform well after a sleepless night, thus suggesting that some among the study population may have developed a habit of sleeping less with minimal effects the following day. But the effects of this habit on a long term may still be detrimental for the body.

Bonnet and Altar²³ manipulated sleep schedules of irregular sleepers to produce very regular schedules and found only a trend towards improved performance. It is conceivable that the adjustment to the sharp change in regularity imposed in their study requires more time and that the trend toward improved performance might have eventually led to significant performance improvements. Future studies should examine the effects of regularizing sleep schedules on both subjective and objective components of Sleepiness.

TABLE 1

		Total number	Percentage
Gender	Male	186	46.6
	Female	214	53.4
Year of study	1 st year	100	25
	2 nd year	100	25
	3 rd year	100	25
	4 th year	100	25
Native	Urban	220	55
	Suburban	123	30.7
	Rural	57	14.3
DS/H	Day scholar	176	43.9
	Hostelite	224	56.1

FIGURE 1

GENERAL RESULTS

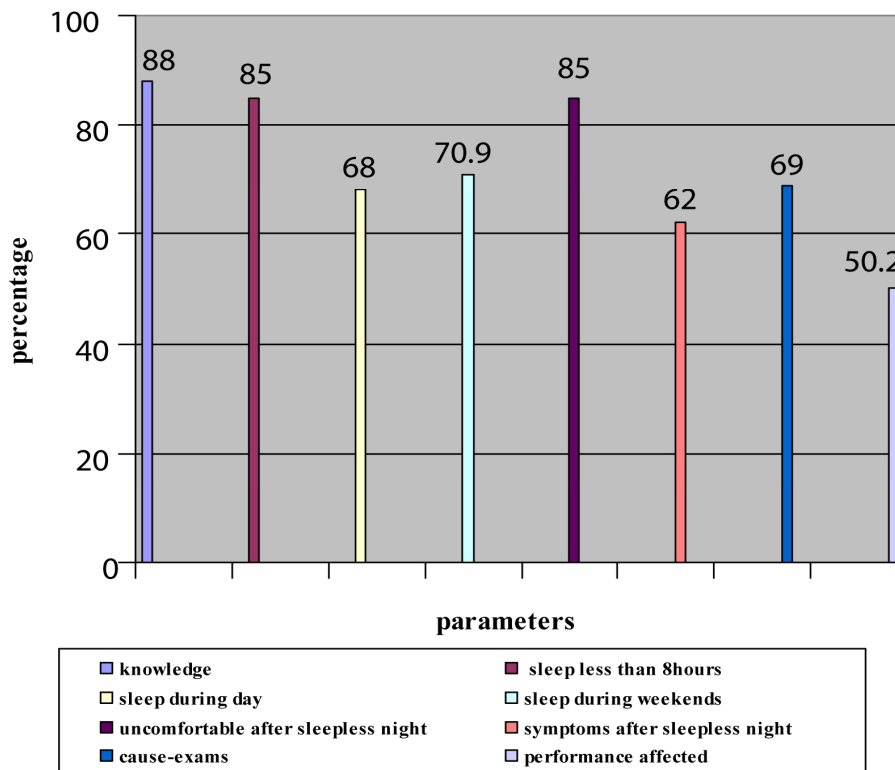


FIGURE 2

Comparison between dayscholars and hostellers

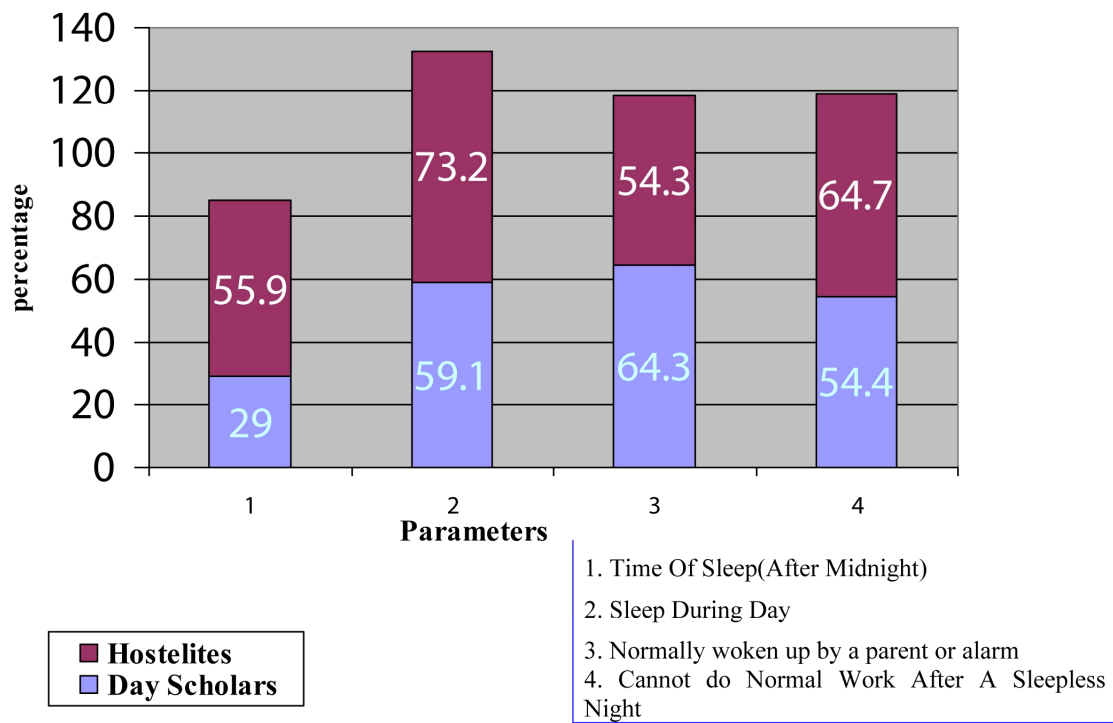


FIGURE 3

Comparison in terms of year of study

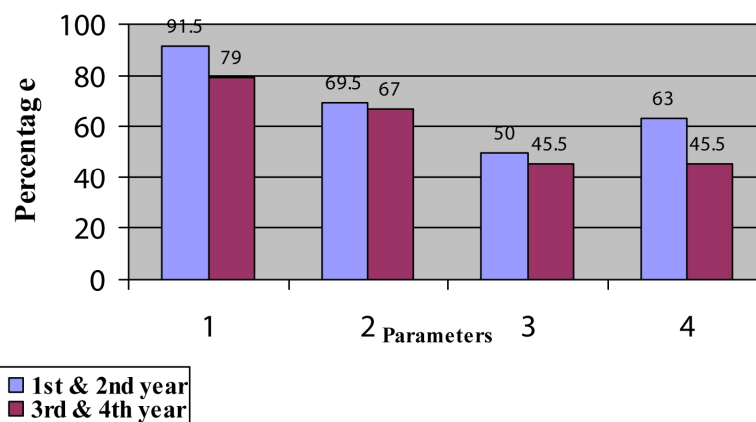


FIGURE 4

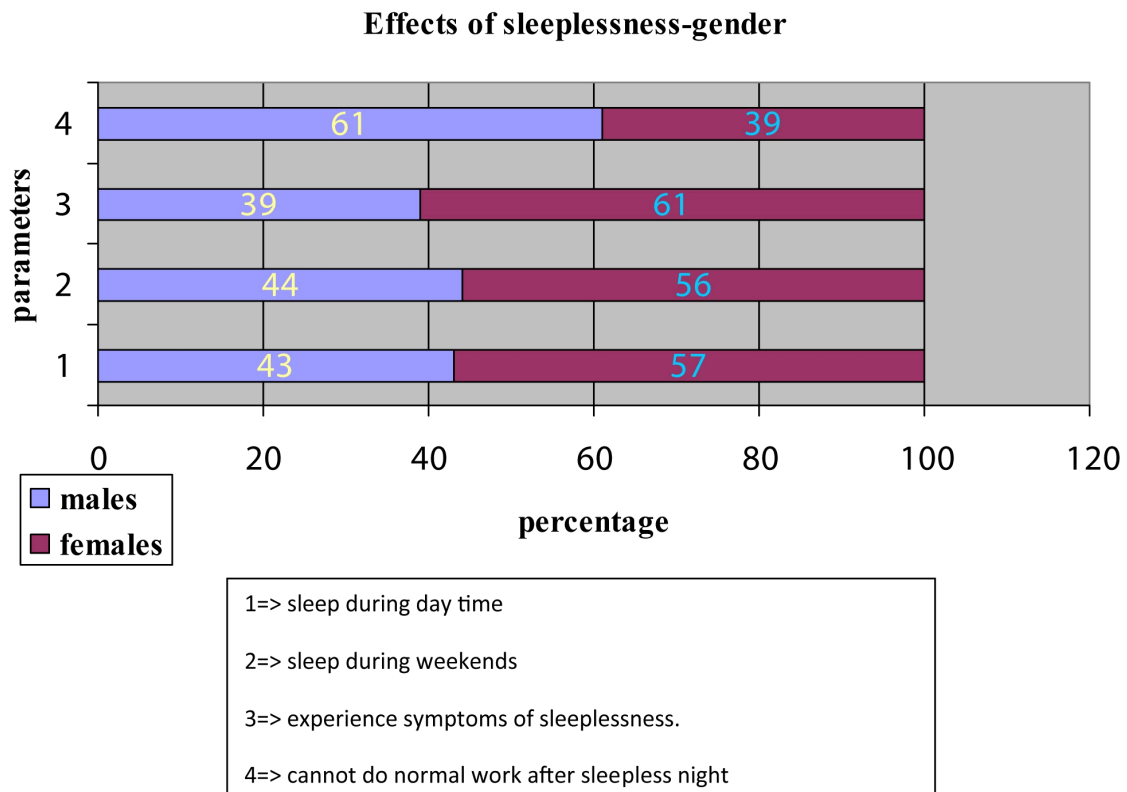
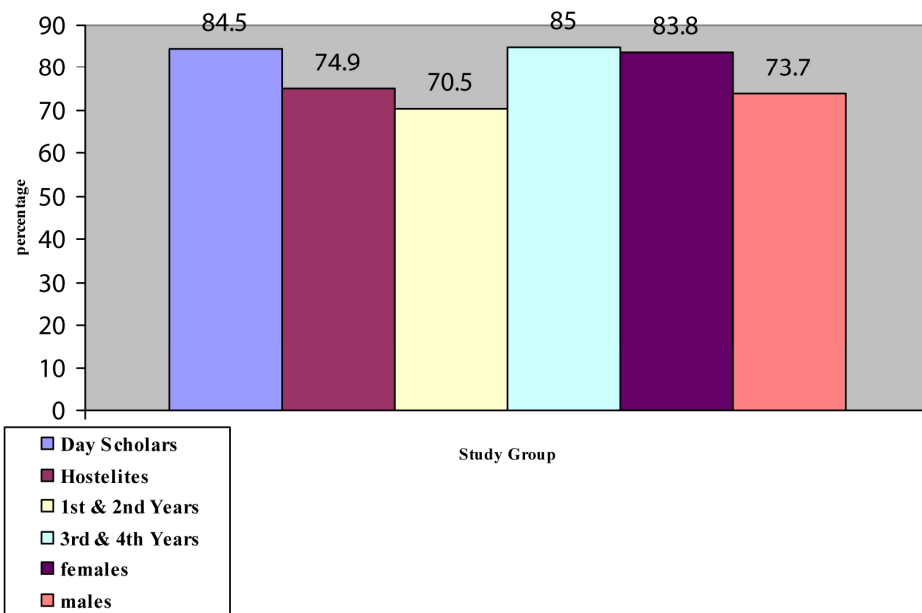


FIGURE 5

Sleep Deprivation due to Medical Curriculum




CONCLUSION

Sleeplessness affects the academic performance of students due to various reasons such as anxiety, lack of concentration, exhaustion etc. in addition it also affects long term memory. Students must understand that the brain needs its rest and any intrusion in the brain's "resting hours" will affect the whole body's functioning as well. Students must develop ways to study smart instead of the intense studying patterns, which not only affects their health but does more futile than good to their academic performance. As mentioned earlier, our field not only expects hard work, but also accuracy and consistency which can be achieved only when our mind and body are in a position to give its best for patient care. The first step to tackle this situation is to create awareness among the most vulnerable, about sleep deprivation, about the ill effects it causes and ways to reduce it by incorporating ideas such as meditation, yoga etc. Information about the "do's and don'ts" of a proper sleep cycle must be taught so that students inculcate the right habits that can help them excel in their health and academics as well. To conclude, medical students should find ways to manage time so that they get the rest that they require and at the same time maintain the legacy of optimal health education and healthy patients in the future.

REFERENCES

- Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson J. Harrison's Principles of Internal Medicine. 16th Ed: McGraw-Hill; 2005.
- John E Hall. Guyton's book on physiology. 12thEd: Elsevier Health Sciences; 2010.
- Gomes, Ana Allen, Tavares, Azevedo, Maria Helena. Sleep-wake patterns and academic performance in university students. Paper presented at the European Conference on Educational Research, University of Lisbon; 2002.
- Medeiros ALD, Mendes DBF, Lima PF and Araujo JF. The relationships between sleep-wake cycle and academic performance in medical students. Biological Rhythm Research 2001; 32 (2): 263-270. <http://dx.doi.org/10.1076/brhm.32.2.263.1359>
- Trockel MT, Barnes MD and Egget DL. Health-related variables and academic performance among first-year college students: implications for sleep and other behaviors. Journal American College Health 2000; 49 (3): 125-131. <http://dx.doi.org/10.1080/07448480009596294>
- Smith CS, Reilly C and Midkiff K. Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of Morning-ness. Journal of Applied Psychology 1989; 74 (5): 728-738. <http://dx.doi.org/10.1037/0021-9010.74.5.728>
- Veasey S, Rosen R, Barzansky B, Rosen I, Owens J. Sleep loss and fatigue in residency training: a reappraisal. JAMA (Journal of the American Medical Association) 2002; 288: 1116-24. <http://dx.doi.org/10.1001/jama.288.9.1116>
- Carskadon M, Dement WC. Cumulative effects of sleep restriction on daytime sleepiness. Psychophysiology 1981; 18: 107-113. <http://dx.doi.org/10.1111/j.1469-8986.1981.tb02921.x>
- Baldwin DC Jr, Daugherty SR. Sleep Deprivation and fatigue in residency training: results of a national survey of first- and second year residents. Sleep 2004; 27: 217-23.
- Billiard M, Alperovitch A, Perot C, Jammes A. Excessive daytime somnolence in young men, prevalence and contributing factors. Sleep 1987; 10: 297-305.
- Taub J, Berger R. Performance and mood following variations in the length and timing of sleep. Psychobiology 1973; 10: 559-70.
- Taub J, Berger R. Acute shifts in the sleep-wakefulness cycle: effects on performance and mood. Psychosom Med 1974; 36: 164-73. <http://dx.doi.org/10.1097/00006842-197403000-00008>
- Taub J, Berger R. The effects of changing phase and duration of sleep. J Exp Psychol Hum Percept Perform 1976; 2: 30-41. <http://dx.doi.org/10.1037/0096-1523.2.1.30>
- Manber R, Bootzin R. The effects of regular wake-up schedules on daytime sleepiness in college students. Sleep Res 1991; 20: 284.
- Baldwin DC Jr, Daugherty SR. Sleep Deprivation and fatigue in residency training: results of a national survey of first- and second year residents. Sleep 2004; 27(2): 217-23.
- Billiard M, Alperovitch A, Perot C, Jammes A. Excessive daytime somnolence in young men, prevalence and contributing factors. Sleep 1987; 10: 297-305.
- Koslowsky M, Babkoff H. Meta-analysis of the relationship between total sleep deprivation and performance. Chronobiol Int 1992; 9: 132-6. <http://dx.doi.org/10.3109/07420529209064524>
- Pilcher JJ, Huffcutt AI. Effects of sleep deprivation on performance: A meta-analysis. Sleep 1996; 19: 318-26.
- Caldwell JA, Ramspott S. Effects of task duration on sensitivity to sleep deprivation using the multi-attribute task battery. Behav Res Meth Instrum Comp 1998; 30: 651-60. <http://dx.doi.org/10.3758/BF03209483>
- Van Dongen HP, Baynard MD, Nosker GS, Dinges DF. Repeated exposure to total sleep deprivation: Substantial trait differences in performance impairment among subjects. Sleep 2002; 25: 121-123.
- Aeschbach D, Sher L, Postolache TT, Matthews JR, Jackson MA, Wehr TA. A longer biological night in long sleepers than in short sleepers. J Clin Endocrinol Metab 2003; 88: 26-30. <http://dx.doi.org/10.1210/jc.2002-020827>
- Van Dongen HP, Maislin G, Dinges DF. Dealing with inter-individual differences in the temporal dynamics of fatigue and performance: importance and techniques. Aviat Space Environ Med 2004; 75: A147-54.
- Bonnet M, Alter J. Effects of irregular versus regular sleep schedules on performance, mood and body temperature. Biol Psychol 1982; 14: 287-96. [http://dx.doi.org/10.1016/0301-0511\(82\)90009-6](http://dx.doi.org/10.1016/0301-0511(82)90009-6)

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