

ORIGINAL RESEARCH

Sleeping Medical undergraduate curriculum- Lack of knowledge in final year medical undergraduates regarding Sleep and Sleep disorders**¹Dr Gagneen Sandhu, ²Dr Manjinder Kaur, ³Dr Tripatdeep Singh**¹Asst Prof, GMC Patiala, Punjab, India²Assoc Prof, GGSMC Faridkot, Punjab, India³Director, Academy of Sleep Wake Science, India**Correspondence:**

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Abstract

Introduction: This study was designed so as to use a standardised, validated questionnaire developed specifically to assess Sleep knowledge among medical students. It was also planned to assess if an educational intervention would improve knowledge related to sleep among these students.

Materials and Methods: A cross sectional study was conducted on 1st year medical students of Govt. Medical College Patiala, just prior to the end of their first year. The Assessment of Sleep Knowledge in Medical Education (ASKME) Survey, which was designed as a standardized measure for the assessment of medical education in sleep, was administered as a pre-test and post-test, with an educational intervention in between.

Results: Out of total strength of 200 final year Medical students present on the day of the study 162 gave consent to participate in the study. The pre-test mean scores was $53.76 \pm 15.48\%$ and post-test mean score was $83.27 \pm 9.95\%$, which was significantly higher than pre-test score (p value=0.000). In the pre-test, out of 162, 66 students (40.74%) were in the high score group and 96 (59.26%) were in the low score group. In the post-test out of 162, 158 students (97.53%) were in the high score group and only 4 (2.47%) in low score group.

Conclusion: In conclusion, final year Medical students had poor knowledge regarding Sleep and Sleep Disorders. An Educational Intervention improved the knowledge of Medical students regarding Sleep and Sleep Disorders. We propose to integrate Sleep Medicine into Medical curriculum during different years of Medical education.

Introduction

Sleep has been proposed to be as critical to health as diet and physical activity.(1)Recently American Academy of Sleep Medicine has published a position statement stating that Sleep is a biological necessity, and insufficient sleep and untreated sleep disorders are detrimental for health, well-being, and public safety.(2)

Sleep being so important to health, medical community should be well versed with normal sleep and various sleep disorders and their management. However, in Medical school training, budding physicians are taught about the functioning of the human body and its disorders from the perspective of wakefulness alone. During the four-and-half years of training, only about an hour is spent on Sleep Physiology in the first year of medical undergraduate curriculum. Thereafter nothing is taught about Sleep or Sleep disorders.

In our earlier study we found that medical students when they join medical college have the same poor level of knowledge about Sleep and Sleep disorders as the community from which they come.(3) This is not surprising that programs promoting healthy sleep in the community

are lacking,(1) despite evidence on importance of sleep to public health outcomes, especially cardiovascular health.

Other studies from India also shows that future doctors have insufficient knowledge with more misconceptions (indirectly reflecting inadequate knowledge) regarding Sleep, and that there is a compelling need to develop an educational strategy to overcome misconceptions and improve knowledge regarding Sleep-related problems and proper sleep practices among Medical students. (4)

In our set up when it is highlighted that future doctors at entry level lack sufficient knowledge in Sleep, we often hear that by the end of graduation they will have sufficient knowledge and nothing special needs to be done with regards to educating medical students about Sleep or Sleep disorders.

Keeping above in mind, this study was designed with a view to use a standardised, validated questionnaire (5) developed specifically to assess Sleep knowledge among Medical students about to complete undergraduate medical program. It was also planned to educate the Medical students about Sleep and common Sleep Disorders, and evaluate if such an intervention improves their knowledge.

Methodology

This was a cross sectional study conducted on final year medical students of Govt. Medical College Patiala, immediately prior to their exiting the final year of Medical school.

Plan of the study

A two-hour class was scheduled for final year medical students. Students were informed about the objectives of the study and an informed written consent was obtained.

Knowledge of sleep and sleep disorders was assessed using the Assessment of Sleep Knowledge in Medical Education (ASKME) survey, which was designed as a standardized measure for the assessment of medical education in sleep.(5) The ASKME survey is a validated 30-item questionnaire that includes five separate areas of sleep knowledge: 1) Basic sleep principles, 2) Circadian sleep/wake control, 3) Normal sleep architecture, 4) Common sleep disorders and 5) The effects of drugs and alcohol on sleep. The items were presented in a “true,” “false” or “I don’t know” format. The questionnaire demonstrated a high degree of internal consistency and reliability among the survey items.(5) The score was determined by adding the correct answers.

The participants were divided into two groups according to their pretest scores which were taken from previously published literature:(6)

- a. High score group- those who scored more than 60% on the ASKME survey
- b. Low score group- those who scored less than 60% on the ASKME survey

An Educational PowerPoint presentation was prepared by sleep specialist, certified by Indian Board of Sleep Medicine via World Sleep Federation exam, covering following domains: 1) Basic Sleep Principles, 2) Circadian Sleep Wake Control, 3) Normal Sleep Architecture, 4) Common Sleep Disorders and 5) The effect of drugs and alcohol on Sleep.Immediately after the pre-test survey education was imparted by Sleep specialist over 1hr on selected domains using the prepared presentation. Students were given enough opportunity to ask questions before giving the post test.

After the educational intervention, the students’ knowledge was again tested using ASKME survey. Success of the educational intervention was defined as 70% of the low score group changing into the high score category.

Statistical Analysis

The results were expressed in Mean±SD of the scores of all participants. Data was analyzed using paired t test using Microsoft Excel software 2010. Descriptive statistics including means were used to measure the common pattern of the analyzed data set. p value <0.05 was considered statistically significant.

Results

Out of total strength of 200 final year Medical students present on the day of the study 162 gave consent to participate in the study. Out of 162 students, there was no drop out during the post-test. The pre-test mean scores was 53.76±15.48% and post-test mean score was 83.27±9.95%, which was significantly higher than pre-test score. (p value=0.000)(Table 1)

Participants were divided into high score and low score group based on those who scored more than 60% and less than 60% respectively. In the pre-test, 66 students (40.74%) out of 162 were in the high score group and 96 students (59.26%) out of 162 were in the low score group. (Table1).

In the post-test, 158 students (97.53%) out of 162 students were in the high score group and 4 students (2.47%) were in the low score. (Table 1)

The 64 students who were in the high score group in pre-test also scored more than 60% in post-test. An additional 92 students got shifted to high score group in the post-test after the Educational Intervention. This indicates an improvement of 95.8% in post-test as compared to pre-test. In the post test only 4 students were in the low score group as compared to 96 in the pre-test.(Table 1)

In high score group, the mean value of pre-test score was 67.98% and post-test score was 84.05% which was statistically significantly higher than pre-test score (p value=0.000). In the low score the mean value of pre-test score was 43.99% and post-test score was 52.50%, which was statistically significantly higher than the pre-test score(p value=0.000) (Table1).

The number of correct answers for each question significantly increased in the post-test after the Educational Intervention as compared to the pre-test (Table2).

Table 1: Baseline data of participants with no. of participants in high score and low score group and Mean values of pre-test and post-test for high score and low score group

		Pre-test	Post-test	p value
Participants	Total(n)	162	162	
	High score group n(%)	66(40.74%)	158(97.53%)	0.01#
	Low score group, n(%)	96(59.26%)	4(2.47%)	0.000##
Scores	Mean score(%)	53.76±15.48	83.27±9.95	0.000*
	High score group (>60%), n(%)	20.39±2.37 (67.98%)	25.22±2.62 (84.05%)	0.000*
	Low score group(<60%), n(%)	13.2±3.38 (43.99%)	15.75±1.89 (52.50%)	0.000**

*p value of mean value of post-test vs pre-test score in high score group

** p value of mean value of post-test vs pre-test score in low score group

p value of no. of students in post test high score group vs pre test high score group

p value of no. of students in post test high score group vs pre test high score group

Table 2: The percentage and the number of correct answers in pre-test vs post-test for each question in the ASKME questionnaire given to medical students

NO.	QUESTIONNAIRE	Pre-test n(%)	Post-test n1(%)	p value*
1	The need for sleep decrease in persons above 50years of age	70(43.2%)	141(87.0%)	0.000
2	Melatonin is a natural body hormone that typically increases during night time hours	149(92%)	161(99.4%)	0.001
3	More dream sleep (REM) occurs in the second half of the night	117(72.2%)	152(93.8%)	0.000
4	Sleeping longer on weekends is recommended as a regular practice to make up for loss of sleep during the work week	106(65.4%)	152(93.8%)	0.000
5	Newborn infants spend approximately 16-18hours per 24 hour period sleeping	154(95.1%)	157(96.9%)	0.367
6	The report of insomnia is twice as common in older men than in older women	41(25.3%)	130(80.2%)	0.000
7	A young(pre-adolescent) child who regularly has trouble getting to sleep at night should be allowed to sleep later in the morning	98(60.5%)	147(90.7%)	0.000
8	The typical age of symptom onset for narcolepsy is 40 years or older	46(28.4%)	132(81.5%)	0.000
9	The ability to sleep increases in persons above 50years of age	108(66.7%)	156(96.3%)	0.000
10	Slow wave sleep is more prominent in second half of the night	44(27.2%)	72(44.4%)	0.006
11	The amount of slow wave sleep increases in persons above 50 years of age	39(24.1%)	106(65.4%)	0.000
12	Episodes of sleepwalking tend to lengthen throughout the night	38(23.5%)	108(66.7%)	0.000
13	Episodes of REM sleep tend to lengthen throughout the night	58(35.8%)	119(73.5%)	0.000
14	Periodic limb movements during sleep are typically decreased in REM sleep	83(51.2%)	131(80.9%)	0.000
15	Hyperactivity in children can be exacerbated by inadequate sleep	99(61.1%)	110(67.9%)	0.146
16	In alcoholics in recovery, sleep normalizes within one month of alcohol abstention	31(19.1%)	153(94.4%)	0.000
17	Daytime napping is recommended for patients with difficulty initiating sleep	76(46.9%)	157(96.9%)	0.000
18	Weight loss is often indicated in the treatment of primary snoring or mild obstruction sleep apnea	149(92%)	157(96.9%)	0.045
19	Slow wave sleep is enhanced following daytime exercise	132(81.5%)	136(84%)	0.743
20	Children who are chronic bedwetters respond to treatment with anticholinergic drugs	128(79%)	123(75.9%)	0.741
21	Nightmares are more common within the first two hours of sleep	82(50.6%)	137(84.6%)	0.000
22	Heart rate, respiration and blood pressure are	101(62.3%)	104(64.2%)	0.702

	more variable during REM sleep compared with non-REM sleep			
23	Antihypertensive drugs (eg. Beta blockers) may cause sleeping difficulties as a side effect	77(47.5%)	156(96.3%)	0.000
24	Early morning awakenings in the elderly are often associated with changes in the timing of their biological rhythms	117(72.2%)	150(92.6%)	0.000
25	Alcohol can be beneficial in reducing the effects of jet lag	63(38.9%)	159(98.1%)	0.000
26	Nightshift workers are more likely to fell asleep on the job compared with employees with regular, daytime hours	116(71.6%)	156(96.3%)	0.000
27	Sleepwalking episodes commonly occur during REM sleep	44(27.2%)	121(74.7%)	0.000
28	Menopausal women are at higher risk for developing symptoms of sleep apnea compared with pre-menopausal women	107(66%)	154(95.1%)	0.000
29	Irregular sleep scheduling can increase the incidence of sleepwalking in children	116(71.6%)	151(93.2%)	0.000
30	Symptoms of narcolepsy are related to seizure activity in the brain	24(14.8%)	84(51.9%)	0.000

*p value of post-test correct answers vs pre-test correct answers

Discussion

This study demonstrates that the basic knowledge regarding Sleep and Sleep Disorders of Medical students is poor just before the end of final year of Medical school. The study also demonstrates that their knowledge regarding Sleep and Sleep Disorders can be significantly improved after a simple educational intervention.

Similar observations were made in the study done by Almohaya et al.(6) They showed that the knowledge regarding Sleep and Sleep Medicine in Medical students was poor in the final two years of their Medical Education. They also used the standardized questionnaire (6) to assess the knowledge of Medical students. The present study also demonstrated poor knowledge in Medical students about to finish final year of Medical Education. The results of both studies highlight that very little is taught regarding Sleep and Sleep Medicine throughout the five years that a trainee spends in Medical school. In our Medical college only 30 minutes is devoted to the topic of sleep in the 1st year of Medical school, during which, only basic sleep architecture is taught. In contrast to the work of Almohaya et al.(6) this study also involved an educational intervention to improve the knowledge regarding Sleep and Sleep Disorders in final year Medical students. This educational intervention led to significant improvement in post-test scores, with 158 students in the high score group as compared to only 66 students in the high score group in the pre-test.

In the current study, we evaluated the effectiveness of an educational intervention regarding Sleep and Sleep Disorders. We prepared a PowerPoint presentation covering the following aspects about Sleep and Sleep Disorders: 1) Basic sleep principles, 2) Circadian sleep/wake control, 3) Normal Sleep Architecture, 4) Common Sleep Disorders and 5) The effects of drugs and alcohol on sleep. As a result of this intervention, 92 students in the pre-test low score group moved to post-test high score group) an improvement of 95.8% in post-test as compared to pre-test, implying that the educational intervention was successful.

Combining results of our previous study(3) and results from present study suggest that a focussed modification in the syllabus, starting from the first year of medical curriculum, can

improve the knowledge regarding Sleep and Sleep Disorders among Medical students. We believe that this is the first study to show the effectiveness of such an educational intervention to promote the knowledge of Sleep and Sleep Disorders among final year undergraduate medical trainees in Indian settings.

Medical doctors stress a lot on sufficient physical activity, a healthy diet, moderate alcohol consumption, and non-smoking for a healthy life with minimal or no recommendations on Sleep at present. A prospective cohort study in the Netherlands found that during 10 to 14 years of follow-up, the risk of cardiovascular disease was further reduced when sufficient sleep duration was added to the four traditional lifestyle factors (ie, sufficient physical activity, a healthy diet, moderate alcohol consumption, and non-smoking).(7) Similarly, a study evaluated sleep's relationship to the American Heart Association's "Life's Simple 7," seven cardiovascular risk factors that people can improve through lifestyle changes (ie, smoking status, physical activity, weight, diet, blood glucose, cholesterol, and blood pressure). Results show that cardiovascular health scores that include sleep were more strongly associated with cardiovascular disease prevalence and incidence than the traditional Life's Simple 7 score.(8) Another study examined relationships between 10 self-reported healthy lifestyle behaviours and seven self-reported chronic diseases or death. The study found the behaviours that most significantly affected future outcomes were low-fat diet, aerobic exercise, non-smoking, and adequate sleep, with sleep being more significant than other commonly promoted healthy behaviours such as eating a daily breakfast.(9, 10) Finally, a cross-sectional study investigated the associations between sleep, physical activity, and dietary factors as predictors of mental health and well-being in young adults. Results show that sleep quality was the strongest predictor of depressive symptoms and well-being, followed by sleep quantity and physical activity.(10)

Above data clearly highlights that recommendations regarding Sleep should become part of regular advice given by medical doctors for a healthy life. But given the poor knowledge of undergraduate doctors regarding Sleep and sleep disorders whether evaluated at entry(3) or exit from undergraduate medical program is a worrisome situation. Our study highlights that a simple educational intervention can improve the knowledge of future doctors regarding Sleep and Sleep disorders. Our study found significant improvement in the correct responses for every question in ASKME questionnaire We plan to include following topics to be taught in 1st year and final year medical curriculum at our Medical college: 1) Basic sleep physiology 2) Neurophysiology of sleep 3) Circadian physiology 4) Common sleep disorders. One of the limitations of the study is that it needs to be seen how much of this improved knowledge is retained over a long period of time and whether this improved knowledge leads to better health advice being given to patients which includes advise on healthy sleep habits and importance of good night Sleep for good health in addition to advise on sufficient physical activity, a healthy diet, moderate alcohol consumption, and non-smoking. Also, it needs to be seen whether this improved knowledge translates into better sleep for doctors themselves. Another study done in medical students in Saudi Arabia have shown poor knowledge regarding Sleep and Sleep disorders, educational intervention improved their knowledge but did not lead to any change in their own sleep quality.(11)

Future studies are needed to test two things. One, how much of imparted knowledge is retained by students over long period. Second, how much of this improved knowledge regarding sleep and sleep disorders is translated into practice while giving health advice to their patients.

Conclusion

The present study demonstrated that final year students in Medical colleges in one of the medical college in India have poor knowledge regarding Sleep and Sleep Disorders. This

paucity of knowledge can however be rectified with timely educational interventions. We propose that Medical colleges integrate Sleep Medicine into their Medical curriculum during different years of Medical education.

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