

Sleep habits and associated phenomenon in Indian adults

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Abstract

Study Objective: Sleep is influenced by cultural norms. Scant data is available regarding sleep habits and associated phenomenon in Indian adults; the study designed evaluated these.

Methods: This is a descriptive study on attendants of patients at Department of Neurology, AllMS, utilizing a Sleep Questionnaire, modified from NSF Sleep Habits Questionnaire 2002 and 2005. Data from 104 subjects was analyzed using Microsoft Excel 2007.

Results: Subjects clustered in the age range of 21-50 years. Most subjects slept between 2200 and 2400 hours, with rise time between 0500 and 0700 hours, delayed rise time on weekends, and sleep time between 7-9 hours. Subjects rated their sleep quality as high with few awakenings of short duration. Use of sleep aids was infrequent. Snoring was reported by 24% with no difference between men and women. A very small percentage had symptoms suggestive of sleep disordered breathing or restless legs. Women in general took longer to fall asleep, slept less, woke up earlier, napped more frequently, co-slept with children, had increased care giving responsibilities, admitted racing thoughts prior to bedtime, and less daytime sleepiness compared with men in this sample. The napping behavior and caregiving duties attained statistical significance ($p=0.005$ and $p=0.005$, respectively).

Conclusion: The study described sleep patterns in Indian adults and highlighted differences between the two sexes.

Keywords: sleep habits, sleep phenomenon, India, sleep patterns

Introduction

Sleep is recognized as an important bodily function, even though the exact mechanism and purpose remain unclear^{1,2}. Theories include restorative and somatic growth theory, metabolic theory, survival theory, neuronal growth and processing. It affects several aspects

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of the human body including- mood, memory, cognition, physical restoration, immune functions and physical growth, to name a few. On the corollary, it is influenced by multiple factors such as physiological, psychological, environmental and sociocultural factors. In the recent past there has been an increase in awareness of normal sleep and sleep disorders in India^{3,4,5}. The field, however, still remains in its infancy. There is little description of sleep habits or of associated phenomena among Indian adults, even though many reports have detailed incidence of sleep disorders in a variety of population subsets. Polls conducted in the Western world by National Sleep Foundation have attempted to clarify this issue in USA⁶. It is important to understand the current state of sleep

habits among adults in India in order to initiate/improve educational campaigns, understand disorders, define medical curriculum and develop public health policy.

In the present study, we undertook the task of determining sleep habits and associated phenomenon in Indian adults.

Methods

Participants

The participants were recruited from the attendants (ages 18 or older) of patients of outpatient (70.2%) and inpatient (27.8%) units of Department of Neurology at All India Institute of Medical Sciences, New Delhi, between the dates July 20 and August 19, 2009. Location of recruitment of two patients was not noted. The study was approved by the Institute Ethics Committee of AIIMS. Informed consent was obtained from the subjects.

A total of 130 subjects were recruited, although four refused to participate. The questionnaire was pretested on 20 patients and modified. Thereafter, data was collected on 106 subjects. Data analysis was performed on 104 of these 106 subjects. Because of technical difficulties, data was not saved on two subjects.

Survey and Analysis

The study was a descriptive survey using a close ended questionnaire titled "Sleep Habits of Indian Adults" (see Figure 1). The questionnaire was a modified version of National Sleep Foundation Sleep in America Poll 2002 and 2005^{6,7}. It was pretested on 20 subjects and modified. Question defining "the person you sleep with" was added. Participants were questioned by the investigators and the results recorded directly onto Adobe Acrobat 8 Professional. The data was exported to Microsoft Excel 2007 and analyzed there. The comparison of a proportion between two groups was carried out using Z-test. The result was considered significant at 5% level of significance (p-value). Data from eight questions was not tabulated as cultural barriers precluded accurate comprehension and consequent answers to these (see Figure 2).

Results

Demographics

One hundred and four patients completed the questionnaire adequately. Eighty two (78.9%) were in the age group 21-50 years of age. One person was older than seventy years. Males accounted for 75 (72.1%) and females for 29 (27.9%). Average BMI of 89 subjects was 23 ± 3.8 . Fifteen patients had BMI <16. Seventy nine (76%) subjects were married, twenty two (21.2%) were single. Three were widow/widowers. None was divorced. Thirty one (29.8%) subjects were unemployed (of these, twenty were housewives, one student).

Sleep Habits

Sleep schedule : On weekdays (work days) for 71.1% of subjects, the bedtime was between 2200 and 2359 hours. Most men (73.3%) and women (65.5%) went to bed at that time. For 66% of subjects the rise time was between 0500 and 0659 hours. A higher percentage of women (13.7%) compared with men (8.1%) rise between 0400-0459 hours. While bedtime on weekends (non work days) remained essentially unchanged, there was a delay in rise time. The later was seen among both sexes (see Table 1). Of note, 57.7% of subjects slept between 7 and 9 hours. However, more women (44.8%) compared with men (35.6%) slept less than 7 hours ($p = 0.34$) (see Table 2). When naps were tallied, 48.3% of women reported napping compared with 22.7% of men ($p = 0.005$) (see Table 3).

Co-sleeping : Of the 62 (59.6%) who slept with someone in bed, data is available on 61. Nineteen co-slept with children alone and another 18 with spouse and children. Fifteen women co-slept with children alone and 4 with spouse and children. Four men co-slept with children alone and 14 with spouse and children.

Need for care giving : Twenty four (23.1%) of subjects reported the need to care for someone at night. Over half of these (54.2%) were women. Of the women, 44.8% were involved in care giving compared with only 14.7% of the men ($p = 0.005$).

Quality of sleep : Subjects were asked to rate their sleep on a scale of 1-10 (with 10 being extremely restful sleep). The vast majority (81.7%) rated their sleep at seven or greater, with 32.3% rating it at 10.

Figure 1: Sleep habits of indian adults questionnaire

SLEEP HABITS OF INDIAN ADULTS	
QUESTIONNAIRE	
Demographics	
Name	_____
Age	_____
Height	_____ Weight _____ BMI _____
Sex	_____
Address	_____
Sleep duration	
Bedtime on weekdays:	_____ Rise time on weekdays: _____
Bedtime on weekends:	_____ Rise time on weekends: _____
How many hours do you usually sleep per night	_____
Do you take naps in the afternoons/evenings	Yes _____ No _____
Sleep surroundings	
Do you usually sleep with someone else in your bed	Yes _____ No _____
If yes, with whom?	Spouse _____ Children _____ Children and spouse _____ Other _____
Do you usually sleep with someone else in your room	Yes _____ No _____
Do you provide care to someone else in the night	Yes _____ No _____
Is your sleep disturbed by heat	_____ cold _____ noise _____ light _____
Quality of sleep	
How would you rate your quality of sleep (1-10)	_____
Insomnia	
How long does it usually take you to fall asleep	_____
How many times do you typically wake up at night	_____
When you wake up at night, how long are you usually awake	_____
In which part of the night do the awakenings occur:	
Soon after falling asleep	_____ Middle of the night _____ Early morning _____
What do you typically do while you are awake during the night	Get up _____ Lie down _____
Sleep disordered breathing	
Snore loudly enough that others complain	Yes _____ No _____
Suddenly wake up from sleep, gasping for breath	Yes _____ No _____
Observed by others having breathing problems during sleep	Yes _____ No _____
Restless legs syndrome/Periodic limb movements of sleep	
Notice parts of your body jerk	Yes _____ No _____

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Leg/foot twitches observed during sleep Yes _____ No _____

Experience crawling feelings in legs late in the day Yes _____ No _____

Narcolepsy

Fall asleep during physical effort Yes _____ No _____

Fall asleep while laughing or crying Yes _____ No _____

Muscles become weak when emotional Yes _____ No _____

Daytime sleepiness

Fall asleep during the day Yes _____ No _____

Fall asleep involuntarily Yes _____ No _____

Have trouble at school/work/driving because of sleepiness Yes _____ No _____

Experience vivid dreams upon awakening or falling asleep Yes _____ No _____

Have thoughts racing through your mind Yes _____ No _____

Use of medications for sleep issues

Have you used sleep aids No _____ Prescription _____ OTC _____ Indigenous _____ Other _____

Social history/Habits

Coffee cups/day _____

Tea (Chai) cups/day _____

Cigarettes/bidis per day _____

Chewing tobacco Yes _____ No _____

Alcohol Yes _____ No _____

Marital status: married _____ single _____ widow/er _____ divorced _____

Occupational status: unemployed _____ employed _____ retired _____

Current occupation: _____

Figure 2 : Questionnaire

Is your sleep disturbed by heat _____ cold _____ noise _____ light _____

In which part of the night do the awakenings occur:

Soon after falling asleep _____ Middle of the night _____ Early morning _____

What do you typically do while you are awake during the night Get up _____ Lie down _____

Fall asleep during physical effort Yes _____ No _____

Fall asleep while laughing or crying Yes _____ No _____

Muscles become weak when emotional Yes _____ No _____

Fall asleep during the day Yes _____ No _____

Experience vivid dreams upon awakening or falling asleep Yes _____ No _____

Table 1: Bedtime and rise times on weekdays and weekends

	Time	People	Percentage	
Bedtime on Weekdays n = 103	20-2059	2	1.9%	
	21-2159	9	8.7%	
	22-2259	41	39.8%	
	23-2359	33	32.0%	
	0-059	15	14.6%	
	1-159	2	1.9%	
	2-259	1	1.0%	
	Risetime on Weekdays n=103	4-459	10	9.7%
	5-559	38	36.9%	
	6-659	30	29.1%	
7-759	15	14.6%		
8-859	7	6.8%		
9-959	1	1.0%		
10-1059	2	1.9%		
Bedtime on Weekends n = 102	20-2059	2	2.0%	
	21-2159	11	10.8%	
	22-2259	37	36.3%	
	23-2359	31	30.4%	
	0-059	14	13.7%	
	1-159	4	3.9%	
	2-259	3	2.9%	
	Risetime on Weekends n = 102	4-459	7	6.9%
	5-559	31	30.4%	
	6-659	29	28.4%	
7-759	20	19.6%		
8-859	7	6.9%		
9-959	4	3.9%		
10-1059	2	2.0%		
11-1159	1	1.0%		
12-1259	1	1.0%		

Measure of sleep continuity: Seventy three (70.2%) of subjects felt that they fall asleep in less than 30 minutes. A higher percentage of men (76%) felt as such compared with women (55.1%) ($p=0.22$). Eighty five percent (85%) reported none to two awakenings at night. Most (77.2%) reported awakenings of less than fifteen minutes in duration.

Associated phenomena: Twenty four subjects reported snoring. Percentage of men and women who reported

Table 2: Hours of sleep per night (n=104)

Hours	People	Percentage
< 4	1	1.0%
4-459	3	2.9%
5-559	7	6.7%
6-659	26	25.0%
7-759	44	42.3%
8-859	16	15.4%
9-959	5	4.8%
10-1059	1	1.0%
11-1159	1	1.0%
>12	0	0.0%

Table 3: Do you take naps in the afternoon/evenings?

	People	Percentage
No (n = 104)	73	70.2%
Yes (n = 104)	31	29.8%
Males (n = 75)	17	22.7%
Females (n = 29)	14	48.3%

snoring was equal at 24%. Four subjects reported a gasping sensation and three (2.8%) were witnessed to have apneas. 16.3% reported parts of body jerking, 7.7% had been told that their lower extremities twitched while asleep, and 3.8% were aware of uncomfortable sensation in the lower extremities prior to falling asleep. When questioned about "thoughts racing through the mind at bedtime," 53.8% admitted to the same. Of the women, 58.6% admitted the same compared with 52% of the men ($p=0.07$).

Daytime sleepiness: Twenty two (21.2%) reported falling asleep involuntarily, with 22.7% of men reporting this behavior compared with 17.2% of women ($p=0.27$). Nineteen percent reported trouble at work/school because of sleepiness.

Use of sleep aids: Five subjects used sleep aids with three using prescription drugs, one over the counter preparation and one indigenous medication.

Other habits affecting sleep: Of all subjects, 78.8% drank tea, 11.5% smoked, 12.5% chewed tobacco and 12.5% consumed alcohol.

Shift work: Ten (9.6%) subjects reported a form of shift work affecting their sleep.

Discussion

General

In general, there is paucity of data regarding sleep habits among Indian adults, even though some data exists for the pediatric population⁸. Suri et al described epidemiology of sleep disorders and noted that 55% of those surveyed were observed to have a sleep related disorder⁹.

Our study is distinct from Suri's study. The focus of our study was to define sleep habits and not just sleep disorders. We surveyed adult population that were necessarily urban. It consisted of attendants of patients and since AIIMS is a tertiary level referral center, subjects were noted to be both from urban and rural settings. Our survey consisted of face to face interview using the questionnaire. We felt that the questions were liable to interpretation by the subjects depending upon their cultural background. A face to face interview insured correct interpretation and accurate answers. Though the level of literacy was not assessed, it is likely that Suri's patients were more literate as reflected by their ability to read and answer a mailed questionnaire.

The male to female ratio is not representative of the community sample. The most plausible explanation is that more male relatives accompanied the patients rather than female. This would fit the cultural norm. Most subjects had a normal or low BMI. This would explain the finding of decreased percentage of snorers noted. 35.6% of subjects slept less than 7 hours. Even though far less percentage of women held jobs, women slept less in comparison with men.

Though it was not the intent of the study, interestingly, a distinct pattern emerged when men were compared to women. Though the sample size was small and statistically significant conclusions couldn't be drawn, women in general took longer to fall asleep, slept less, woke up earlier, napped more frequently, co-slept with children, had increased care giving responsibilities, admitted racing thoughts prior to bedtime and less daytime sleepiness compared with men in this sample. This is reflective of either intrinsic biologic rhythm or strongly influenced by cultural factors prevalent in Indian society.

It also appears that co-sleeping is commonly practiced in India. It was more common among women with more women sleeping with their children. Though care giving was shared by both men and women, clearly women

were involved to a larger extent. This once again is reflective of cultural influence on sleep patterns as traditionally women are more responsible for these duties.

In contrast to Suri's study, subjects rated their quality of sleep as high. The difference may lie in distribution of adults- urban vs rural, level of literacy and economic status. The finding was surprising considering this was a sample of subjects whose relatives were quite ill.

Sleep disordered breathing was infrequently reported, probably reflective of low BMI in general. One fifth did suffer from sleepiness during the day that was compromising. This would translate to a large number of people in a county like India.

Limitations

This was a descriptive study. The sample size was small making sophisticated statistical analysis difficult. Small size also makes it difficult to generalize the results to the population at large. Recruitment from health care settings (though the volunteers were healthy) could introduce an element of bias. Level of literacy was not assessed. The investigators were unable to analyze answers to eight questions because the subjects demonstrated inadequate comprehension of questions. This was most likely secondary to literacy level and cultural barriers.

Implications for Future Research

The study raises issues that require further clarification. Future studies should include larger sample size to allow sophisticated statistical analysis and increase applicability to general community. It would be best to recruit volunteers from community settings rather than healthcare. Questions may be reframed to better suit the local culture. Research may also aim to compare sleep habits of men and women. Consideration may be given to assessing people's knowledge about sleep in general.

Conclusion

In spite of limitations noted, the study served its intended purpose of describing sleep habits in a sample of adult Indians. In addition, it highlighted differences between the two sexes.

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