

A cross-sectional community-based study to assess 'sleep hygiene' in adults residing in Hubballi city

Manjunath S Nekar¹, Kanthesh K^{2*}, D D Bant³

^{1,2}Assistant Professor, ³Professor and HOD, Department of Community Medicine, KIMS, Hubballi, INDIA.

Email: statisticsclinic2018@gmail.com

Abstract

Background: Rapidly changing lifestyle preferences and practices among the urban population have the potential to cause chronic sleep deprivation, which accumulates and results in neurobehavioral and cognitive deficits. Sleep hygiene refers to the recommended behavioural and environmental practices that are intended to promote better quality sleep. Better sleep hygiene is believed to improve sleep quality. **Objectives:** To assess sleep hygiene practices among the adults residing in Hubballi city and to study the association of sleep hygiene practices with overall sleep quality and daytime sleepiness. **Methodology:** 400 adults residing in urban areas, Hubballi were assessed for their sleep hygiene practices and daytime sleepiness using *Pittsburgh's Sleep Quality Index (PSQI)* and *Epworth's Sleepiness Scale (ESS)*. Chi-square test and ANOVA were used to test the association of the sleep hygiene practices with overall sleep quality and daytime sleepiness. **Results:** Among the participants, Males have better sleep quality and daytime awake fullness than females ($p < 0.05$). Young adults have better sleep quality (mean 5.13 ± 2.8) but are sleepier during the day (mean 7.92 ± 3.5). Middle adults had better wakefulness (mean 6.7 ± 3.7). People with higher SES had better sleep quality ($p < 0.05$). Participants with poor sleep quality often resorted to smoking and increased consumption of caffeinated beverages to reduce their day time sleepiness. Reading novels or watching T.V was will help in reducing sleep latency and better sleep quality. **Conclusion:** Adoption of sleep hygiene practices should be promoted for maintenance of sleep /wake cycle. These are essential for maintenance of sleep quality and improvement of daytime efficiency.

Key Words: Sleep , Hygiene, PSQI, ESS ,Behavioral, Lifestyle.

*Address for Correspondence:

Dr Kanthesh K, Assistant Professor, Department of Community Medicine, KIMS, Hubballi, Karnataka, INDIA.

Email: statisticsclinic2018@gmail.com

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INTRODUCTION

Sleep is a recurring state of unconsciousness which is necessary for physical, mental, cognitive, emotional and intellectual well-being of an individual. Both physical and mental repair processes kick-in and accelerate during the hours of sleep. Historically, sleep was thought to be a passive state, that was initiated merely through

'withdrawal of sensory inputs'. With advancement in the field of neurosciences, it has now been well-established, that withdrawal of sensory awareness is believed to be one of the many factors in sleep. In fact, an active initiation mechanism in the complicated neuronal network of the brain facilitates the relative and reversible sensory unresponsiveness and hence the initiation and maintenance of sleep¹. The delicate mechanisms, which govern the regular sleep/wake cycle are prone to be affected by numerous physical, mental and environmental factors. Rapidly changing lifestyle preferences and practices among the urban population have the potential to cause chronic sleep deprivation, which accumulates and results in neurobehavioral and cognitive deficits.² Sleep deprivation has shown to cause an increase in feeling of sleepiness during daytime resulting in deterioration of individual work efficiency³. It has also been shown in scientific studies that sleep deprivation can result in altered mood, cognitive confusion with concomitant decrease in

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vigor and alertness.^{4,5,6,7} Another real world risk associated with sleep deprivation is decreased driving ability and crash risk⁸. Sleep deprivation is also associated with numerous physiological consequences. Relatively short sleepers (< 7 hours) had increased risk of all-cause mortality⁹. There are also epidemiological evidences that reduced sleep duration is associated with larger Body Mass Index (BMI)¹⁰. Both short term sleep restriction and chronic sleep deprivation result in a number of abnormal physiological changes including high BP¹¹, activation of sympathetic nervous system¹², reduced leptin levels¹³ and increased inflammatory markers¹⁴. Better sleep hygiene is believed to improve sleep quality. Various sleep hygiene practices have been prescribed by clinicians as a part of non-pharmacological therapy for insomnia. However, no reliable studies have been conducted to substantiate the hypothesis that better sleep hygiene leads to better sleep quality. Therefore, this study was conducted in Hubballi city to assess the prevalence of sleep hygiene practices and to assess the association between these practices and overall sleep quality among the general population. The study will help us to highlight the role of various sleep hygiene practices in ensuring a better sleep quality. In the wake of growing evidence associating sleep deprivation with numerous metabolic, endocrinological, cardiovascular, immunological and behavioral deteriorations, the necessity to improve sleep quality has been felt immensely. Sleep hygiene refers to the recommended behavioral and environmental practices that are intended to promote better quality sleep.

Objective

To assess sleep hygiene practices among the adults residing in Hubballi city and to study the association of sleep hygiene practices with overall sleep quality and daytime sleepiness

MATERIALS AND METHODS

A cross-sectional, community based study to assess the sleep hygiene in adults residing in Hubballi city” was conducted from 19th May, 2015 to 15th June, 2015 at Karnataka Institute of Medical Sciences, Hubballi, Karnataka. Considering that the prevalence of sleep hygiene practices among general population to be 50%, error margin to be 10% and confidence interval to be 95% the following formula has been used:

$$\begin{aligned} n &= 4PQ/L^2 \\ &= 4(0.5)(0.5)/(0.05)^2 \\ &= 400 \end{aligned}$$

Hence, the sample size was fixed at 400.

10 Areas of urban and sub-urban Hubballi were selected randomly. The participants of our study include adults aged 18-65 years residing in the above mentioned areas of Hubballi. The study population was divided into three categories viz, 18-25 year, 26-45 years and 46-65 years for convenience and analysis. A semi-structured, pre-validated questionnaire was developed and administered to adults aged 18-65 years. The questionnaire includes common sleep hygiene practices such as watching TV in bed, using mobile phones and computers until bedtime, smoking and consumption of alcohol or caffeinated beverages too closer to bed time, reading a novel in bed and so on. The questionnaire also contains sections developed using two highly reliable and validated scales viz, Pittsburgh’s Sleep Quality Index (PSQI) and Epworth’s Sleepiness scale (ESS). PSQI and ESS were included in the questionnaire to assess the association of sleep hygiene practices with sleep quality and day-time sleepiness.

Pittsburgh’s Sleep Quality Index (PSQI)¹⁵

PSQI is a 19-item questionnaire designed to measure sleep quality over a 1-month period. The first 4 items ask the respondents about their usual bed time, wake time, sleep latency and sleep duration (fill-in-the-blank format). The remaining items ask if the respondents have, in the 1-month duration, experienced certain symptoms (scored from 0-3). The 19 primary items yield 7 different components (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, sleep medication and day-time dysfunction) and the global PSQI score. The PSQI global score has a good internal constancy. The individual components have agreeable internal constancy. PSQI has been extensively used in various studies to assess sleep quality in different age-groups and has demonstrated reliability and validity.

Epworth’s Sleepiness Scale (ESS)¹⁶

ESS is a 7-item questionnaire which assesses daytime sleepiness. The 7 questions ask the respondents; how probable they were to fall asleep in certain circumstances during daytime. Each question is scored from 0 to 3 (0-never, 1-rarely, 2-occasionally, 3-regularly) and the final ‘Sleep score’ is calculated as the sum of the 7 individual scores. ESS has a good internal constancy. ESS has been used as a tool to assess daytime sleepiness in various medially oriented studies and it has demonstrated excellent reliability and validity

RESULTS

In our study nearly 164 (41%) of them were in the age group of 18-25 years, 146 (36.5%) between the age group of 26-45 years, 90 (22.5%) in the 46-65 years of age. Nearly 202 (50.5%) of the respondents were male and 198 (49.5%) were females. All the participants were literate in our study.

Table 1: Mean Values of Sleep hygiene variables

AGE GROUPS	Sleep latency		Sleep disturbance		Use of sleep medication		Daytime dysfunction	
	N	MEAN±S.D	N	MEAN±S.D	N	MEAN±S.D	N	MEAN±S.D
18-25 YEARS(1)	164	.96±.909	163	.98±.484	164	.97±.488	164	.78±.851
26-45 YEARS(2)	146	.90±.845	146	1.04±.421	146	1.04±.421	145	.70±.834
46-65 YEARS(3)	90	1.17±1.124	90	1.23±.498	90	1.23±.498	90	.66±.781
TOTAL	400	.98±.943	400	1.06±.475	400	1.06±.477	400	.72±.829

In our study sleep latency was .96±.909 in Group 1, 0.90±.845 in Group 2 and 1.17±1.124 in Group 3. Sleep disturbance was found to be having mean .98±.484, 1.04±.421 and 1.23±.498 in group 1, 2 and 3 respectively. Use of Sleep medication was found to be .97±.488 in group 1, 1.04±.421 in group 2 and 1.23±.498 in group 3. Daytime dysfunction was found to be .78±.851 in group 1, .70±.834 in group 2 and .66±.781 in group 3.

Table 2: Age Group comparison of Pittsburgh's Sleep Quality Index (PSQI) And Epworth's Sleepiness Scale (ESS)

AGE GROUPS	GPSQIS		DAY TIME SLEEPINESS (EPSS)	
	N	MEAN±S.D	N	MEAN±S.D
18-25 YEARS(1)	164	5.13±2.866	164	7.95±3.464
26-45 YEARS(2)	146	5.06±2.364	146	6.75±3.734
46-65 YEARS(3)	90	6.38±3.815	90	7.02±3.535
TOTAL	400	5.39±2.987	400	7.30±3.614

The Pittsburgh's Sleep Quality Index was found to be having mean 5.13±2.866 in Group 1, 5.06±2.364 in group 2 and 6.38±3.815 in group 3. Epworth's Sleepiness Scale (ESS) mean value in group 1 was 7.95±3.464, in group 2 was 6.75±3.734 and in group 3 it was 7.02±3.535. The overall mean value of GPSQIS was 5.39±2.987 and EPSS was 7.30±3.614.

Table 3: Responses of subjects for various variable of sleep Hygiene.

		Frequency	Percentage
Subjective sleep quality	Very good	84	21
	Fairy Good	263	65.7
	Fairly Bad	44	11
	Very Bad	9	2.3
Sleep Latency	Not latent (<15 minutes)	148	37
	Mildly latent (15-30 minutes)	144	36
	Fairly latent (30-60 minutes)	75	18.7
	Very latent (>60 minutes)	33	8.3
Sleep Duration	Very Good (>8 hours)	88	22
	Fairly Good	144	36
	Fairly bad	154	38.5
	Very bad (<5 hours)	14	3.5
Sleep Efficiency	Very Good (>85%)	313	78.3
	Fairly Good	53	13.3
	Fairly bad	19	4.6
	Very bad (< 65%)	15	3.8
Sleep Disturbance	Not disturbed	34	8.5
	Mildly disturbed	309	77.3
	Fairly disturbed	57	14.3
	Very disturbed	0	0
Sleep Medication	Never	374	93.5
	Once a week	17	4.3
	Twice a week	1	0.2
	Thrice a week or more	8	2

Daytime Dysfunction	Not dysfunctional	196	49
	Mildly dysfunctional	131	32.7
	Fairly dysfunctional	61	15.3
	Very dysfunctional	12	3
Global PSQI Score (Sleep Quality)	Good (0-5)	247	61.7
	Bad (6-15)	151	37.8
	Very Bad (16-21)	2	0.5
Epworth sleepiness scale (Daytime sleepiness score)	Normal (0-7)	223	55.7
	Moderately Sleepy (8-14)	165	41.3
	Extremely Sleepy (15-21)	12	3

In our study majority of them 236(65.7%) of them had a fairly good sleep quality. Sleep latency of less than 15 minutes was seen in nearly 148 (37%) of the study subjects. Only 14 (3.5%) of the subjects had very bad sleep duration of less than 5 hours whereas 313 (78.3%) of them had very good sleep efficiency. Nearly 309(77.3%) of them had mildly disturbed sleep. Majority 374(93.5%) of the subjects never used any type of sleep medication for the purpose of sleep. Nearly half of the study participants did not had any daytime dysfunction. Overall 247 (61.7%) of the subjects had Good Global PSQI Score for sleep quality and 223 (55.7 %) of them had normal Epworth Sleepiness Scale for daytime Sleepiness score.

Table 4: Relationship between Age, Gender and Sleep Quality

		GPSQIS Range			P Value
		0-5	6-15	16-21	
Gender	Female	119	79	0	0.0002
	Male	128	72	2	
Age Group	18-25 Years	105	58	1	0.181
	26-45 Years	96	50	0	
	46-65 Years	46	42	1	

The GPSQIS Range was found to be statistically significantly associated with gender and was found to not significant statistically for the age group.

Table 5: Relationship between Age, Gender and ESS Range

		ESS Range			P Value
		0-7	8-14	15-21	
Gender	Female	105	87	6	0.0002
	Male	118	78	6	
Age Group	18-25 Years	78	80	6	0.042
	26-45 Years	95	47	4	
	46-65 Years	49	38	2	

The Epworth Sleepiness Scale was found to be associated with both Gender and Age group significantly.

DISCUSSION

The sleep hygiene is an aspect of life that need special care among the growing children for the development of appropriate and sound intellectual as well as psychological development of children. A study in Romania’ by Franklin C Brown, Walter C Buboltz and Barlow Soper also included adult population from 18-65 years divided into 3 sub-groups similar to our study.¹⁷ A study “Relationship b/w SHA, SHP and Sleep Quality in University Students” by Bogdan Ioan and Aurora Szentagotai suggested SHP are strongly related to sleep quality which co relates with findings of our study. Our results indicated decreased sleep quality among individuals with inappropriate SHPs like smoking and compensatory sleep in line with “SHP in a pupation-based sample of Insomniacs”, a study by Catherine Jefferson, Christopher Drake and Holy M Scofield.¹⁸ “Sleep duration and SHPs in adolescents” a

study conducted on Indian population by Bindu John suggested a decrease in sleep duration in adolescent due to lifestyle changes and academic pressure.¹⁹ Investigators in our study also found that there are few relevant detrimental effects of poor sleep hygiene among the children which are characterized by daytime sleepiness and irritability. The similar kind of observations were also done in the study done by Bhatia *et al.*²⁰ and Sanjay Dixit *et al.*²¹ In the study done by Camerron *et al.* nearly 50.9% of the study participants met the clinical cut off of the PSQLi Score for sleep quality. In our study nearly 61.7% of them had good sleep quality .²² Age appears to be one of the important factor affecting sleep hygiene awareness but no the sleep quality. In our study also age group was found to not associated significantly with the sleep quality. The findings of our study can be compared with the study findings of Bogdan L V *et al.*²³ Younger People report

Poor sleep quality may be due to lack of awareness in the known technique of sleep or with the pressure to meet the social and study demands, whereas for the older patients even though they have a good sleep hygiene awareness the practice of better sleep practices have to be done.

CONCLUSION AND RECOMMENDATION

Adoption of sleep hygiene practices should be promoted for maintenance of sleep /wake cycle. These are essential for maintenance of sleep quality and improvement of daytime efficiency. Males have marginally better sleep quality and daytime awake fullness than females. Young adults have better sleep quality but are sleepier during the day. Middle adults had better wakefulness. Keep your mind free of any thoughts while going to bed. Reading novels or watching TV decrease your sleep latency. Say no to tobacco smoking. Daytime napping should be restricted.

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