Study of Sleep Habits and Related Problems Among Medical Students

Dev Himanshubhai Desai*, Maharshi Patel, Alpesh Patel

Smt. NHLMMC, VS-SVP Hospital, Ellisbridge, Ahmedabad-380006, India

Corresponding Author*

Dev Himanshubhai Desai
Smt. NHLMMC, VS-SVP Hospital, Ellisbridge, Ahmedabad-380006, India
Email: devhdesai01@gmail.com

Abstract

Introduction: To investigate various sleeping habits and problems related to sleep encountered by population of undergraduate medical students studying in 1st and 2nd professional years of Medical College.

Methods: Sleeping practices & related problems of the subject population were examined using a convenience sample of 166 UG students. A modified PSQI questionnaire was used. Each subject's responses were analyzed using 7 components and were each given a score which were summed and could theoretically range from 0 to 21 to predict insomnia.

Results: The target population studied showed a mean PSQI score of 6.19. 117 showed subthreshold insomnia, 48 showed moderately severe clinical insomnia, and 1 showed severe clinical insomnia. Overall volunteers showed restricted sleep with only 25% volunteers reporting more than 7 hours sleep. 91% of the volunteers reported some kind of regular sleep disturbance. All volunteers showed some form of sleep latency (negligible to intermediate) though none reported high levels. 79% of volunteers showed sleep efficiency more than 85% whereas, only 5% volunteers reported using sleeping medication during the previous month. Almost 77% reported some form of daytime dysfunction.

Conclusion: These findings indicate that deficient sleep and non-uniform sleep wake patterns, which are universally reported in the adolescent and young adult populations, are equally documented among the medical student population as well. Given the strong correlation amidst the caliber of sleep and bodily as well as mental wellbeing, psychoeducational initiatives for sleep disturbances in the studied populace are recommended, all the while being advocated urgently.

Keywords: Sleep latency & efficiency• Medication, Daytime dysfunction • Insomnia

Introduction

Background

Sleep is a vitally important physiological process of the human body [1]. It is highly associated with psychological as well as physical health along with additional actions taken to ensure welfare [2]. Lack of sleep and manifestations associated with sleep disturbances are often overlooked and are also rather poorly recognized. Adequate sleep has proven important to the mental and physical well-being of the human species, and a supposed chronic lack of sleep has been previously linked to impairment of neurobehavioral function [3]. Although the prevalence of sleep disorders varies, it is estimated to affect 22%-65% of the general population [4 -6]. The composition of sleep and alertness in individual participants has been observed to differ with their age, occupational requirements, physiological and psychosocial characteristics and other psychiatric and physical illnesses [7]. Past few years have seen increased interest in sleep and sleeplessness related problems due to acknowledgement that drowsiness and exhaustion are becoming autochthonous in our populace [8].

There exists increasing confirmation on the existence of threats and manifestations of various sleep disorders amid university undergraduates [9]. Various surveys have established a somewhat elevated predominance of sleep-associated grievances, like poor sleep, difficulty falling asleep or maintaining sleep, early morning awakenings, inadequate sleep quality, early morning sleepiness, and daytime napping, among university undergraduates [10-14]. Earlier analysis also reveals the damaging influence of various sleep disorders, snoring, and daytime sleepiness on the scholastic efficiency of the students [15-19].

Amid college students, medical students happen to be under especially extreme degree of stress, therefore there is imperative requirement for enough rejuvenating sleep (to uphold cognitive as well as physical health) to bring about successful conclusion their goals [20]. A prior study displays an extreme predominance of symptoms and a raised danger to acquire various sleep disorders amid medical students. Reduced sleep has now become the norm for young doctors during their training years as they stay awake during the night to study for medical college examinations followed by long hours at the clinics [21].The increasing stress on students due to their medical school examinations along with various entrance examinations for further studies is affecting their health and lifestyle drastically. Hence the target of this study to investigate various sleeping habits and problems related to sleep encountered by population of undergraduate medical students studying in 1st and 2nd professional years of Smt. NHL Medical Municipality College, GMERS Medical College and BJ Medical College and compare the results obtained with different similar studies done in other parts of the world essentially observing if a similar pattern is obtained.

Methodology

Study Design

This is a cross-sectional, questionnaire-based, observational study during the timeframe from December 2019 till January 2020 among undergraduate medical students enrolled at Smt. NHL Medical Municipality College, GMERS Medical College and BJ Medical College in Ahmedabad, Gujarat, India studying in 1st and 2nd professional years. The data was collected only for this particular study. The questionnaire presented to the volunteers was based on the standard Pittsburgh Sleep Quality Index (PSQI). It was a standard Pittsburgh Sleep Quality Index (PSQI) form that was filled out by all participants. The IRB approval was not acquired as the study did not involve any procedures or clinical trials. Recruitment and data collection continued for 6 weeks. Collection of data was dispensed beneath author supervision with the assistance of premade google forms. The consent of the entire participant was taken before. Data collected included information regarding all parameters of the Pittsburgh Sleep Quality Index (PSQI).

Patient Population

A subject population of 166 undergraduates was used. Data of students studying only in medical schools with no history of any chronic illness that may alter sleep or any ongoing acute illness was collected. All other entries were excluded from the study. Before procuring data the volunteers were provided with a concise description regarding the project and its targets. Confidentiality was assured to each student who volunteered. None of the participants were monetarily reimbursed. The survey was delivered in English language, the official coaching language in Indian medical colleges.

Statistical analysis

Pittsburgh Sleep Quality Index (PSQI) - The Pittsburgh Sleep Quality Index (PSQI) is a self-graded survey evaluating sleep status and disruptions over the timeframe of 1-month. Nineteen distinctive elements produce seven "component" scores varying from 0 to 3: subjective sleep quality, sleep latency, sleep duration, established sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The total of points for these seven elements yield one comprehensive total result. Highest score achievable is 21. Scores>5 display critical sleep disturbance. The clinometric and clinical characteristic of the PSQI imply its profitability both in psychiatric clinical application as well as research projects [22].

From the set of 19 questions answered by the subjects, Scores were generated for seven components of the PSQI scale as given in (Table 1).

Table 1. Significance of the scores calculated via the PSQI scale for all 7 components and an abstract idea of what the numerical score signifies calculated for each component.

Component	Score			
	0	1	2	3
Sleep Quality	Very Good	Fairly Good	Fairly Bad	Very Bad
Sleep Latency	Absent	Negligible	Intermediate	Severe
Sleep Duration	>7 hours	6 to 7 hours	5 to 6 hours	<5 hours
Sleep Efficiency	>85%	75% to 84%	65% to 74%	<65%
Sleep Disturbances	Absent	Negligible	Intermediate	Severe
Medications				
Daytime Dysfunction	No problem	Slight problem	Moderate problem	Severe problem

The traits of participants were depicted utilizing frequency and percentages for all the final "component" categorical values. A chi square test has been utilized for assessing the interconnection amongst the categorical variables. Karl-Pearson's correlation coefficient was utilized to assess for noteworthy associations amongst individual categorical values.

The statistical analysis of data was done via Microsoft Excel 2013.

Statistical tests conducted included Average, Addition, Percentage, Statistical Significant Test (chi test/p-value), Karl-Pearson's correlation coefficient, Charts and Tables.

Being survey based, it was exempted by the IRB. Criteria denoted by Declaration of Helsinki were strictly followed.

Results

From (Table 2), we can conclude that

1. Sleep Quality - 23% of the volunteers reported very good sleep quality whereas 16% reported sleep quality to be fairly bad or worse. Almost 61% volunteers reported Fairy Good Sleep Quality.

2. Sleep Latency - All volunteers reported some form of sleep latency ranging from negligible (72%) to intermediate (28%) though none reported severely high levels.

3. Sleep Duration - Overall volunteers showed chronically restricted sleep with only 25% volunteers reporting more than 7 hours sleep time, 31% reporting 6-7 hours of sleep, 29% reporting 5-6 hours' sleep time and 15% even reporting less than 5 hours of sleep time.

4. Sleep Efficiency - 79% of volunteers showed sleep efficiency more than 85% whereas only 2% of total volunteers showed sleep efficiency less than 65%. Meanwhile 14% volunteers reported sleep efficiency in range 75%-84% and 5% in range 65%-74%.

5. Sleep Disturbances - 91% of the volunteers reported some kind of regular sleep disturbance including from negligible (74%), intermediate (16%) and severe (1%). 9% of the volunteers did not report any form of sleep disturbances.

6. **Use of Sleeping Medication**- 5% volunteers reported using sleeping medication during the previous month out of whom 3% reportedly used sleep medication on a regular basis. 1% volunteers reported using sleeping medication 1 or 2 times per week while another 1% used it 3 or more times per week. 95% did not use any sleep medication during past month.

7. **Daytime Dysfunction**- 77% of the volunteers reported some form of daytime dysfunction in which 47% noted it as a slight problem, 25% as a moderate problem and 5% noted it as a severe problem. 23% volunteers did not note any sort of daytime dysfunction.

Table 2. All seven components of the PSQI scale calculated based on the responses of volunteers along with their final score for that particular components ranging from 0(not significant) to 3 (sign of severe abnormality). The volunteers have been grouped based on their final score for each of the seven components.

Components	Score			
	0	1	2	3
Sleep Quality	38(22.891%)	101(60.843%)	24(14.457%)	3(1.807%)
Sleep Latency	0(0%)	120(72.289%)	46(27.710%)	0(0%)
Sleep Duration	41(24.698%)	51(30.722%)	48(28.915%)	26(15.662%)
Sleep Efficiency	131(78.915%)	23(13.855%)	9(5.421%)	3(1.807%)
Sleep Disturbances	15(9.036%)	122(73.49%)	27(16.265%)	2(1.204%)
Use of Sleeping Medication	157(94.578%)	5(3.012%)	2(1.204%)	2(1.204%)
Daytime Dysfunction	39(23.493%)	77(46.385%)	41(24.698%)	9(5.421%)

From (Tables 3.1 and 3.2), we can conclude that,

1. The categorical variables of Sleep Duration and Daytime Dysfunction have a high level of relation as the value of Karl-Pearson's correlation coefficient is 0.90132816. This is significant as volunteers who had inadequate levels of sleep duration had observed a significantly observable daytime dysfunction and drowsiness that hampered normal daily activities. This is shown in Figure 1.

2. Similarly, the Sleep Disturbance and Sleep Latency were also significantly correlated with a value of Karl-Pearson's correlation coefficient of 0.968667693. This is obvious as volunteers who had frequent night time sleep disturbances are bound to have sleep latency that could result in sleepiness during daytime. This is shown in Figure 1.

Tables 3.1 and 3.2. Out of the seven components scores generated from the questionnaire, Sleep Duration and Daytime Dysfunction were correlated according to the Karl-Pearson's correlation coefficient (=0.90132816). Similarly Sleep Disturbance and Sleep Latency were also correlated in analogous manner as per Karl Pearson's correlation coefficient (=0.968667693).

Compon ent	Sleep	Daytime	Compon ent	Sleep	Sleep
Values	Duration	Dysfuncti on	Values	Disturban ce	Latency
0	24.70%	23.49%	0	9.04%	0%
1	30.72%	46.39%	1	73.49%	72.29%
2	28.91%	24.70%	2	16.27%	27.71%
3	15.66%	5.42%	3	1.21%	0%
	Karl-	=		Karl-	=
	Pearson 's correlati on coefficie nt	0.901328 16		Pearson' s correlatio n coefficien t	0.9686676 93

Tables 4.1, 4.2, and 4.3. Denote the number participants having generated a particular score the different categorical variables denoted as components of the PSQI scale. The P-value calculated by chi square test statistic for all the categorical variables compared individually is less than 0.001.

Component	0	1	2	3	
Sleep quality	38	101	24	3	*P* value<0.001
Sleep					
medication use	157	5	2	2	
			Table 4.1		
Component	0	1	2	3	
Sleep quality	38	101	24	3	*P* value<0.001
Sleep efficiency	131	23	9	3	
			Table 4.2		
Component	0	1	2	3	
Sleep latency	0	120	46	0	*P* value<0.001
Sleep					
medication use	157	5	2	2	
			Table 4.3		

From (Tables 4.1, 4.2 and 4.3), we can conclude that,

1. Sleep quality of volunteers and use of sleep medication by volunteers have a directly positive relationship that is validated by the fact that the chi-square statistic for these categorical values is 178.3793 and the p-value is <0.001.

2. Sleep quality and efficiency of sleep of volunteers have a directly positive relationship that is validated by the fact that the chi-square statistic for these categorical values is

84.6527 and the p-value is <0.001.

3. Sleep latency of volunteers and use of sleep medication by volunteers have a directly positive relationship that is validated by the fact that the chi-square statistic for these categorical values is 298.879 and the p-value is <0.001.

From Graph 5 (Figure 1) we can conclude that

1. 70% (117) of the volunteers had subthreshold insomnia. It was deduced that another 29% (48) suffered from moderately severe clinical insomnia. Only 1 volunteer reportedly suffered from severe clinical insomnia based on analytical parameters of PSQI. Reportedly there was no subject without any form of clinical insomnia.

2. The result of a Statistical Significant Test (chi test/p-value) done on this parameter showed p-value<0.001 thus proved the significance of this study and disproving the null hypothesis.

3. Surprisingly no volunteer presented without any sleep related problems among all the subject population.

4. The target population studied showed a mean PSQI score of 6.19 (results ranging from 1 to 16).

5. PSQI Score;

a. 0: No clinically significant insomnia

b. 1-7: Subthreshold insomnia

c. 8-1: Moderately severe clinical insomnia
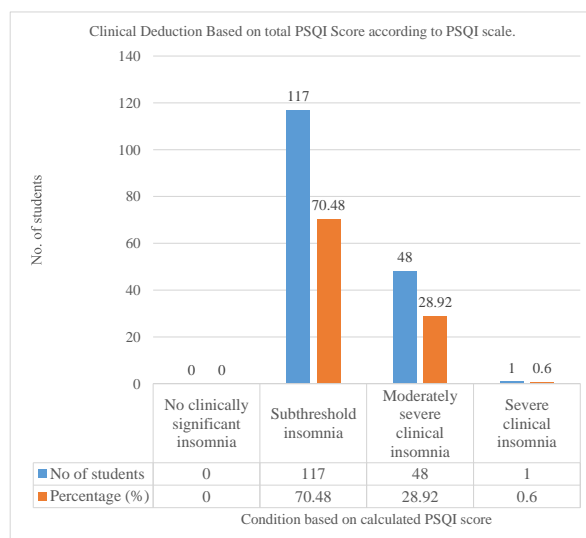
d. 15-21: Severe clinical insomnia

Figure 1. Subthreshold insomnia.

Discussion

Sleep related disorders have long been neglected however they are problems requiring urgent actions and may have various social as well as demographic consequences in the long run. As observed by a previous study, medical students are obligated to spend a large amount of time learning the theoretical knowledge prerequisite of medical professionals, all the while merely serving as an audience of the actual medical management of the patients at best. According to our study approximately more than half of the medical students observed are prone to develop clinical insomnia and one thirds is already suffering from clinically diagnosable insomnia.

These results are analogous to a previous study done among medical students in Jordan [23]. However, the key finding in our study was that among the whole subject population, not a single volunteer was present who did not have any clinically significant insomnia related symptoms.

Our study showed that almost one fourths of the volunteers were extremely short sleepers (sleep<5 hours). Inadequate sleep duration and destitute quality of sleep amongst medical students can be attributed to their colossal scholastic assignments, workplace demeanours along with propensities that they are expected to have all the while possessing insufficient knowledge of

sleep hygiene. Such continued behaviour may as well be negative to intellectual as well as social functioning [24].

Medical students endure an extreme strain due to scholastic requirements, especially amid evaluation phase. Strain due to deficient sleep and extreme daytime sleepiness may result in issues regarding interpersonal relationships, depression, anxiety, as well as alcohol and substance abuse [25- 26]. As seen by a previous study, it was established that stress is intricately correlated with the occurrence of sleep disorders. This may be the reason for the results obtained in our study as medical students are constantly in a stressful environment.

The discoveries of the analysis can be considered priceless for institutional executives, wellness advocates, and medical advisors aiming to accentuate their consideration towards familiar sleep issues amongst medical undergraduates. The outcomes of our research inspire the healthcare institutions to extend cognizance of the deleterious ramifications of sleep issues on scholastic performances. In spite of the necessity for additional investigations so as to set up a cause effect association, the accountable experts for students' wellbeing can do something in order to ameliorate the sleep propensities of medical undergraduates. It is worthwhile to illuminate medical undergraduates regarding the results of terrible sleep propensities and sleep disorders through interference projects, and motivate them to seek professional advice of sleep physicians in order to analyse and oversee management of any suspected sleep disorders.

Polysomnology is a critical domain with in the medical field which permits medical students and experts to analyse their own sleep associated problems on top of the ones of their patients. In spite of the various studies with respect to the topic in discussion, undergraduates and experts are prone to disregard the sleep issues and their conceivable results [27- 28]. The impact of inadequate sleep like memory loss, feeling depressed, feeling irritable and impacts on daily life were observed in the students. A well-rested mind has a huge impact on the perceived common well-being as well as normal functioning among students [29].

Our study incorporates a few restrictions that ought to be specified. Sleep issues may be more awful as compared to the ones detailed as a part of analysis, as volunteers may have given psychologically alluring responses like not suffering from a few of the sleep problems asked about in our questionnaire [30-36]. This study could be confined due to underreporting as well. Besides, ours is a cross-sectional study based solely on the information of the past couple of months and thus cannot be taken as a general pattern of the students' common sleep propensities and conduct. This may be due to the upcoming examinations of the volunteers [37].

Further studies supporting larger period with diversified sets of data on office days and holidays are required. Differentiation between similar studies in numerous countries with similar demographic population is additionally suggested [38]. Although it not going to be a simple task as there is a lot of fluctuation in operational definitions and numerous dissimilar measures are applied to assess sleep. More research that implement additionally definitive diagnostic tools are required to better understand the correlation between sleep and stress disorders. Even an integrated comparison between results obtained from various such diagnostic tools could yield better and more accurate results.

Conclusion

The findings of our study demonstrate that the general sleep predispositions of Indian medical students do not facilitate healthy living. These findings indicate that sparse sleep and variable sleep wake patterns, extensively observed in the adolescent and younger adult populations are equally seen among the medical student population as well. In spite of the numerous publications on the topic in question, students as well as practitioners have a tendency to overlook sleep disorders and their potential consequences. Given the strong correlation amidst the calibre of sleep and bodily as well as mental wellbeing, psychoeducational initiatives for sleep disturbances in the studied populace are recommended, all the while being advocated urgently. Adequate counselling, superior envisioning and encouragement should be granted to students that are more prone to suffer from sleep disorders.

Limitations

1) The results here are statistical significant yet, with a larger sample size, the generalization of the results can be done much better and it can lead to a better result with shorter range of confidence interval as well.
2) Volunteer bias - it can occur though standard questionnaire is being used as only those may give consent and participate who is well aware of the contents of questionnaire or what the questionnaire is going to ask them about.

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