ORIGINAL ARTICLE

ASSESSMENT OF QUALITY OF SLEEP IN MEDICAL STUDENTS BY USING PITTSBURGH SLEEP QUALITY INDEX

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ABSTRACT

Background: Poor sleep quality is a global problem and rightly labeled as an epidemic of modern era. College and university students are no exceptions to this menace.

Objective: To assess the quality of sleep-in medical students using Pittsburgh sleep quality index

Methods: This observational, cross-sectional study was conducted on 419 undergraduate medical students of Azra Naheed Medical College, Lahore. Google survey form consisting of two components, demographics and PSQI scale was used to collect data. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 20.0. Chi-square test was applied for statistical significance and p-value <0.05 was considered significant.

Results: Of the 419 students, 220 (52.5%) were females and 199 (47.5%) were males. Out of them sleep impairment was documented in 298 (71.1%) of medical students. Overall, 96% students used electronic gadgets just before going to sleep. Significant impairment of sleep was reported between year of medical school and PSQI. Sleep impairment was highest among first year and final year students 85.5% and 71.8% respectively.

Conclusion: Sleep quality in medical students is impaired and more so in the first and final year of medical school.

Keywords: Medical students, sleep quality, PSQI

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INTRODUCTION

Sleep is an integral component of human physiology, which acts as restoration activity for daily activities and helps in sustaining normal physical, mental and emotional health of a person[1]. Ample sleep enhances a person's memory, strengthens his ability to face emotionally tough situations and increases emotional intelligence[2,3].

Chronic Sleep deprivation has many detrimental effects, resulting from activation of stressful responses in brain's prefrontal cortex consequently leading to inordinate secretion of cortisol and adrenaline[4]. Thus this negatively effects individuals physical, mental and social health[5]. Moreover, cardiovascular disease, diabetes, obesity and metabolic syndrome are commonly seen in people with disturbed sleep[6,7]. Road traffic accidents are a common consequence of sleep deprivation resulting from lack of judgement and day time sleepiness[8].

None the less, sleep disorders are considered as first sign in development of behavioral problems and mental illnesses in future.

Poor sleep quality is a global problem and rightly labeled as an epidemic of modern era. Around 15% - 35% of general population is estimated to have disturbed sleep[9]. College and university students are no exceptions to this menace. Disturbed sleep quality has been reported in 24-59% of university going students[10]. Studies conducted at various parts of the world have consistently documented impaired sleep-in medical students from 60% in Hong Kong to 90% in China which is much worse than students of other disciplines[11]. Both cognition and alertness are vital for performance of medical students which are greatly influenced by sleep impairment. An Iranian study has linked poor sleep quality with reduced motor brain function, impaired behavior and lower academic performance[12]. Thus, sleep deprivation due to any cause is thought to negatively affect cognition, leading to impairment of judgement, resulting in medical errors, lack of empathy and lower emotional intelligence which are all vital building blocks or characteristics of a Physician. As today's medical students are going to be tomorrow's healers, thus sleep impairment today will affect and consolidate their future behaviors and will have an impact on health care system of tomorrow. Very few local studies have evaluated quality of sleep-in medical students in Pakistan. We conducted this study to examine sleep impairment in Pakistani medical students and study its relationship with year of medical school. The objective of this study was to assess quality of sleep-in medical students using Pittsburgh sleep quality index

METHODS

This observational, cross-sectional study was conducted on undergraduate medical students of Azra Naheed Medical College, Lahore after getting approval from the Institutional ethical review board. Students of MBBS program were invited to participate in the survey. Duration of study was three months from 1st July 2022 to 30th September 2022. A Sample size of 377 was calculated by utilizing the Raosoft online sample calculator tool by keeping a margin of error as 5% and confidence interval as 95%[13].

A Google survey form was developed which comprised of two components. First component consisted of student's demographic profile, daily habits and class achievements, while second component comprised of Pittsburgh sleep quality index (PSQI). A pilot study was conducted on 5 medical students who didn't face any difficulty in understanding and filling of the questionnaire.

Pittsburgh sleep quality index is a validated and a reliable tool used for measuring quality and quantity of sleep-in adults around the world.[14]. It is a self-rated questionnaire which has a test-retest reliability 0 .994. PSQI has been validated with a sensitivity of 100%, and a specificity of 93%. It has internal consistency and a reliability coefficient (Cronbach's alpha) of 0.83 for its seven components[15,16].

Five to 10 minutes are needed to complete PSQI by assessing 19 questions regarding 7 pivotal components of sleep which include sleep duration, sleep disturbance, subjective sleep quality, sleep latency, use of sleep medications, sleep quality and daytime dysfunction. Each Component is scored on a 3-point scale (0 for no-difficulty to 3 for severe difficulty). Summation of seven components results is the global PSQI score which ranges from 0 to 21. Global PSQI score of more than 5 is seen in patients with poor sleep quality.

Google survey form was posted in each MBBS class official group. Student participation was solely on voluntary basis and participation was considered equivalent to consent. Incompletely filled forms were excluded from the study. Three reminders one, one week apart were posted for students to complete the form. Survey was anonymous participants were assured regarding anonymity, and confidentiality of data. Statistical Package for the Social Sciences (SPSS) for Windows, version 20.0 was used for analysis. Qualitative data like gender, clinical settings, and year of medical school were expressed in frequencies and percentages while quantitative data like age and global PSQI score were expressed in means ± standard deviation. Chi-square test was applied for statistical significance, and p-value <0.05 was considered significant.

RESULTS

A total of 419 students were analyzed, out of them 19.8%, 31.7%. 11.7%, 18.1% and 18.6% belonged to first, second, third, fourth and final year respectively. Among all, female students were 220 (52.5%) and male students were 199 (47.5%). Evening naps were taken by 289 (68%) students and 405 (96%) students used electronic gadgets just before falling to sleep. Daytime dysfunction was experienced by 150 (35.8%) students, whereas only 35 (8%) students used over the counter sleep medications more than twice a week.

Table 1: PSQI individual components and year of Medical School

	Year of Medical School					Total	P value
PSQI	First year	Second year	Third year	Fourth year	Final year		
Sleep quality	8	26	7	12	23	76	P=
Very good	1.9%	6.2%	1.7%	2.9%	5.5%	18.1%	0.009
Fairly good	44	62	20	43	41	210	
	10.5%	14.8%	4.8%	10.3%	9.8%	50.1%	
Fairly bad	21	31	20	16	11	99	
	5.0%	7.4%	4.8%	3.8%	2.6%	23.6%	
Very bad	10	14	2	5	3	34	
	2.4%	3.3%	0.5%	1.2%	0.7%	8.1%	
Sleep latency	12	32	13	15	18	90	p= 0.499
≤15 min	2.9%	7.7%	3.1%	3.6%	4.3%	21.5%	
16-30 min	26	44	15	20	25	130	
	6.2%	10.5%	3.6%	4.8%	6.0%	31.1%	
31-60 min	21	30	9	26	15	101	
	5.0%	7,2%	2.2%	6.2%	3.6%	24.2%	
>60 min	24	27	12	14	20	97	
	5.7%	6.5%	2.9%	3.3%	4.8%	23.2%	
Sleep duration	9	38	11	24	14	96	p= .021
>5-6 h7 h	2.1%	9.1%	2.6%	5.7%	3.3%	22.9%	
6-7 h	23	20	7	16	16	82	
	5.5%	4.8%	1.7%	3.8%	3.8%	19.6%	
5-6 h	22	30	17	18	29	116	
	5.3%	7.2%	4.1%	4.3%	6.9%	27.7%	
5-6 h	29	45	14	18	19	125	
	6.9%	10.7%	3.3%	4.3%	4.5%	29.8%	
Sleep quality	64	112	41	64	55	336	p= 0.215
>85%	15.3%	26.7%	9.8%	15.3%	13.1%	80.2%	
75%-84%	12	15	5	9	20	61	
	2.9%	3.6%	1.2%	2.1%	4.8%	14.6%	
65%-74%	6	6	3	2	3	20	
	1.4%	1.4%	0.7%	0.5%	0,7%	4.8%	
<65%	1	0	0	1	0	2	
	0.2%	0.0%	0.0%	0,2%	0,0%	0.5%	
Sleep disturbance	2	20	4	9	1	36	p= 0.000
	0.5%	4.8%	1.0%	2.1%	0.2%	8.6%	
1-9	53	86	34	53	42	268	
	12.6%	20.5%	8.1%	12.6%	10.0%	64.0%	
10-18	19	24	11	13	30	97	
	4.5%	5.7%	2.6%	3.1%	7.2%	23.2%	
19-27	9	3	0	1	5	18	
	4.5%	5.7%	2.6%	3.1%	7.2%	23.2%	
Sleep medications	72	109	43	66	62	352	p=0.128
Not during the past month	17.2%	26.0%	10.3%	15.8%	14,8%	84.0%	
Less than once a week	3	17	1	5	6	32	
	0.7%	4.1%	0.2%	1,2%	1.4%	7.6%	
Once or twice a week	3	4	3	5	6	21	
	1.2%	1.0%	0.7%	1.2%	1.4%	5.0%	
Three or more times a week	5	3	2	0	4	14	
	1.2%	0.7%	1.2%	0.0%	1.0%	3.3%	
Day time dysfunction	9	37	8	18	36	108	p=0.000
Not during the past month	21.1%	8.8%	1.9%	4.3%	8.6%	25.8%	
Less than once a week	35	49	14	28	25	151	
	8.4%	11.7%	3.3%	6,.7%	6.0%	36.0%	
Once or twice a week	27	33	22	26	14	122	
	6.4%	7.9%	5.3%	6.2%	3.3%	29.1%	
Three or more times a week	12	14	5	4	3	38	
	2.9%	3.3%	1.2%	1.0%	0.7%	9.1%	

Poor sleep quality was documented in 298 (71.1%) students who had a PSQI score > 5. Mean global PSQI score documented was 7.40 ± 3.42 with a minimum score of 0 and maximum score of 18. Higher PSQI score were seen in 85.5% of first year and 71.8% of final year students. Furthermore, poor sleep quality was observed in 46.97% of male and 53.02% of female students. Fairly bad to very bad subjective sleep quality was documented in 133 (31.74%) students, among whom it was 31(7.4%), 45(10.7%), 22 (9.8%), 21 (5%) and 14 (3.3%) in first, second, third, fourth and final year students respectively. Late night snacks and caffeinated beverages had a significant association with impaired sleep on the chi square test ($p < 0.05$). Moreover, out of the 26 students who considered themselves at the bottom third of class academically, amongst them only one student didn't have sleep impairment ($p < 0.05$) on applying Chi square test.

DISCUSSION

Our study provides valuable insights in to the sleeping habits of medical students. We documented sleep disturbance in more than two third (71%) of our students and most of them slept for less than 5 hours a day. This worse quality of sleep could be attributed to huge academic pressures, competitive medical school environment, huge exam stress and having to work very hard to maintain grades, which they all do at the expense of their sleep. Our results show much higher sleep impairment than previous studies conducted in Pakistan which had documented sleep impairment in 40% - 61% of medical students[17,18]. An important contributing factor to this rise in sleep impairment could be attributed to internet and electronic gadgets usage as they have become an essential and inseparable part of the modern lifestyle. During COVID-19 pandemic internet and smartphone use had increased multi fold, as mode of education shifted from on campus to online settings. More than 90% of our students used electronic gadgets just before going to sleep, this unlimited access to smart phone and internet has resulted in increased amount of time spent on net surfing by students therefore contributing to difficulty in going to sleep.

We observed quality of sleep to be more disturbed in female students as compared to male students which are very similar to the findings of Khero M[20]. One reason for this finding could be that more than half of study population in these studies comprised of female students. Whereas, on the contrary no such gender difference in quality of sleep was reported by Alotaibi in their study which was conducted mostly on students in their clinical years of medical school[3].

This study reported sleep quality to be largely impaired in first and final year medical students. These findings are antonymous to the findings of Khero M who had documented impaired sleep quality to be higher in students of third, fourth and final year of medical school. Few explanations of our findings could be that, students when enter medical school during first year have to face multiple challenges. Firstly, there is an increased academic and practical workload which encompass over multiple disciplines with variable schedules and deadlines[9]. Secondly students are introduced to novel teaching and assessment methodologies which they are not accustomed to. Furthermore, these assessments have weight-age in final assessments, all of which contribute to the stress of scoring and, student do so at the expense of their sleep. Thirdly many students have to leave their loved ones and reside in dormitories/ hostels, they also face a paradigm shift and gain more social independence, all these factors when combined take a toll on student's academics and interpersonal relationships, thus predisposing them to anxiety, depression and many other behavioral problems.

Final year was the other class with extensively disturbed sleep quality. Our findings are supported by various national and international studies[20]. As final year students have to manage the stress of acquiring new clinical skills alongside making sense of the bookish knowledge for passing their exit exam. Above all they have to learn to deal sick patients, manage and counsel distressed attendants and maintain good rapport with hospital staff all of which leads to stress and impaired sleep[21]. Contrary to our findings Cheng found no difference in PSQI scores between students of different year of medical school[22].

This study found a significant association between impaired sleep and academic performance which were consistent with the findings of Maheshwari who found disturbed sleep quality to be associated with poor academic performance and increased level of anxiety[23]. On the contrary, no such effect of sleep impairment was observed on academics in a study conducted by Javaid R on students of medical and allied health sciences in Lahore[24].

Many authors have declared sleep disorders as harbingers for development of future behavioral problems and mental illnesses in medical students[25]. Thus, efforts should be undertaken, to educate students and design preventative interventions to improve sleep

habits in them and furthermore, students at risk of developing sleep impairment should be identified and provided with specialized educational supportive measures to help them. If efforts are not made in this regard, it will have negative repercussions on health care provision in the future.

CONCLUSION

Sleep impairment is high in medical students of Pakistan, a marked increase has been observed in recent years with predominance in female students. Similarly, use of electronic gadgets just before going to sleep has increased in recent years. Late night snacks and caffeinated beverages negatively affect sleep quality. Moreover, sleep impairment has a negative effect on student academics.

LIMITATIONS

The limitations of our study are that, it was done in one institute and its findings cannot be generalized. Second, we used simple random sampling, whereas cluster/stratified random sampling could be used in future studies. Last, we did not study the predisposing factors which lead to impaired sleep and also did not measure association of disturbed sleep with student psychological health.

ETHICAL APPROVAL

The study was approved by the Institutional Review Board of Azra Naheed Medical College, Superior University, Lahore, Dated 01.07.2022.

CONFLICTS OF INTEREST

No conflicts of interest are reported by authors

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AUTHOR'S CONTRIBUTIONS

MJ, MAQ: Concept, design, data collection & analysis, manuscript writing, final approval of draft
MAQ: Concept, design, data collection, approval of draft
MZL: Study design, final review of the article