http://doi.org/10.33279/jkcd.v14i04.764

Orginal Article

FREQUENCY OF INSOMNIA AND ITS ASSOCIATION WITH ACADEMIC PERFORMANCE AMONG MEDICAL AND DENTAL STUDENTS

Muhammad Hassan[1], Shabnam Shahjehan[1], Adeela Mustafa[1], Syed Muhammad Ibrahim[1], Huma FatimaTu Zara[1], Aalia Karim[1], Muhammad Yasir[1]

[1]Department of Community Medicine, Khyber Medical College Peshawar

ABSTRACT

Objectives: *To determine the frequency of insomnia among medical students and to assess the effects of insomnia on the academic performance of medical and dental students.*

Materials and Methods: *A descriptive cross-sectional study was performed on medical and dental students of Peshawar, after obtaining approval from IREB. A simple random sampling technique was used to collect data through questionnaires distributed among students. The calculated sample size was approximately 153, determined using the WHO sample size formula. Selection criteria included medical and dental students, both males and females aged 18 to 25 years who were willing to participate. Data was collected using the Sleep Quality Scale, an item of question assessing academic performance, and a demographic information sheet. Data was stratified in different age groups and by gender. As variables in our study were qualitative so chi-square test was applied to find the association between qualitative variables. A p value of P<0.05 was considered significant.*

Results: *In this study,153 students were enrolled. Out of these 37% were females and 62% were males.Prevalence was found to be 46%. 92% of participants were in the age range of 21 to 23 years. The prevalence of poor-quality sleep was 18% among medical and dental students while 54% rated their sleep quality as good even after sleeping for 5 to 6 hours at night.53% of participants took 15-30 minutes to fall asleep and 41% of participants usually got up around 10 am during the past month. A significant association p< 0.05 was found between Pittsburg sleep quality index and academic performance with a P-value of 0.04.*

Conclusion: *From the result of our study, it was concluded that Insomnia or bad sleep quality effects the academic performance of medical and dental students.*

Key words: *Insomnia, academic performance, sleep quality*

Cite as: Hassan M, Shahjehan S, Mustafa A, Ibrahim SM, Zara HFT, Karim A, Yasir M. Frequency of insomnia and its association with academic performance among medical and dental students. Journal of Khyber College of Dentistry Dec 2024, Vol. 14, No. 4. http://doi.org/10.33279/jkcd.v14i04.764

INTRODUCTION

Healthy habits including sleep quality are essential for maintaining mental and physical health. Adolescents are mostly affected by Insomnia which produces a negative impact on their health[1].

The most important predictor of exam scores among students is the hour of sleep acquired before exams[2]. The problem-solving skills and increased memory performance of adults depend on good-quality sleep[3]. Sleep is equally important for humans like breathing, eating, and other activities[4]. While the contemporary world often overlooks the importance of sleep, it is recognized as a fundamental human requirement, comprising one-third of our lives[5]. Multiple studies showed a high percentage of sleep issues

Correspondence:
Adeela Mustafa
Associate Professor
Department of Community Medicine, Khyber Medical College Peshawar
Email: adeelaamir17@gmail.com

Date Submitted: December 2023
Date Revised: March 2024
Date Accepted: June 2024

(51%) in medical students. Additionally, students often experience delayed sleep onset and inadequate sleep duration which has shown to impair cognitive functions[6]. Research on students has identified that anxiety, stress, irritability, confusion, and depressive symptoms are common psychological issues among this group[7]. Good sleep quality supports improved academic performance. Conversely, students experiencing poor sleep quality often face difficulties such as decreased concentration and focus. Sleep deprivation is connected to increased absenteeism[8].

The American Medical Association reported that sleep problem predisposes adolescents to different risks and poor academic performance is one of them[9]. In African countries like Ethiopia and Nigeria, 62% and 32% of medical students reported poor quality sleep[10]. A survey was conducted on medical and dental students from two medical and dental colleges in Jordan during the 2018/2019 academic year. The prevalence of sleep disorders ranged from 0.6 to 23 %[11].

A study conducted on Chinese students through a questionnaire was used to assess that about 90% of Chinese students were reported sleepy during lecture and this percentage even rose to 35.5% for Malaysian students[12]. In Nepal, the prevalence of poor-quality sleep among medical students was found to be 44% and 30 % among non-medical students[13]. Medical students in Pakistan reported both poor quality of sleep and also sleeping for less than six hours which resulted in waking up lethargic[14].

Further, a study published in the Journal of Postgraduate Medical Institute reported that Peshawar students' sleep-related issues often lead to dysfunctional coping mechanisms, which could later contribute to burnout in professional life, as well as diminished resilience in handling patient care - a key concern for future healthcare providers[15].

So, the purpose of the present study was to highlight the importance of sleep, identifying sleep problems, and to understand how sleep quality affects academic success. Once these problems are addressed then academic performance can be improved.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted. The study was approved by the ethical review board No 613/IREB/KMC. The research was carried out at Khyber Medical College, Rehman Medical College, Northwest School of Medical Sciences, and Pak International Medical College from February 2023 to August 2023. 153 students were enrolled in the study from these colleges. The sample size was calculated by the WHO sample size calculator. The anticipated proportion of insomnia from previous study was 13 %[16] and the confidence interval was kept at 95% with margin of error 5%. A simple random sampling technique was used by obtaining the sampling frame of selected colleges then selecting the sample randomly by lottery method. Participants were male and female medical and dental students with age range of 18-25 years and those who refused to participate in the study or those who have psychiatric or using sleeping pills were excluded. Written informed consent was taken from all the participants. Information was gathered using a specially designed questionnaire which included demographic information, to assess the quality of sleep including sleep duration, and disturbances during sleep Pittsburgh's scale was used[15]. This scale was validated in our local context by piloting on 10% of the sample then discussing with field experts. After this it was finalized and applied. Data was analyzed using SPSS version 22. Association between insomnia and academic performance was found by chi square test. Confounders were controlled by well-defined eligibility criteria.

RESULT

In this study, 153 students were enrolled. Stratification was done on basis of age and gender. Out of these 37% were females and 62% were males.92% of participants were in the age range of 21 to 23 years .53% of participants took 15-30 minutes to fall asleep and 41% of participants usually got up around 10 am in morning during the past month. When asked about actual hours of sleep, the response of 31% of participants was up to 5 hours.54% rated their sleep quality as good while 84% did not take any sleep medication. Frequency of insomnia was 46%. Chi-square test was applied to find the association and found that there is a significant association between sleep problems and Academic Performance with a P value of <0.05

A significant association between insomnia and reading concentration(p-0.05), insomnia and imaging concepts (p-0.007), insomnia and class participa-

Table 1: Descriptive Statistics of Sleep Problems

Sleep Problems		n	%
During the past month how long has it usually taken you to fall asleep each night	Less than 15 min	18	11.5%
	15 -30 min	84	53.5%
	30-60 min	41	26.1%
	1 hour	14	8.9%
During the past month when have you usually gotten up in the morning	6 am	12	7.6%
	7 am	45	28.7%
	8 am	28	17.8%
	9 am	8	5.1%
	10 am	64	40.8%
During the past month how many hours of actual sleep did you get at night	5 hours	48	30.6%
	6 hours	38	24.2%
	7 hours	41	26.1%
	8 hours	28	17.8%
	9 hours	2	1.3%
During the past month how would you rate your sleep quality overall	Very good	26	16.6%
	Good	84	53.5%
	Bad	28	17.8%
	Very bad	19	12.1%
During the past month how often have you taken medicine to help you sleep	Not during past month	132	84.1%
	Less than once a week	11	7.0%
	Once or twice a week	2	1.3%
	Three or more times a week	12	7.6%

Table 2: Descriptive Statistics of Academic Performance

Academic Performance		n	%
Do you feel that disturbed sleep affects academic Performance	It does not	18	11.5%
	It might	45	28.7%
	It does	94	59.9%
With impaired sleep pattern, how active is your class participation	Satisfactory	31	19.7%
	Average	66	42.0%
	rare	60	38.2%
With impaired sleep patterns, how interesting did the lectures happen to be	Very interesting	7	4.5%
	Interesting	52	33.1%
	Not interesting	98	62.4%
With impaired sleep patterns, how do you grade your memorizing ability	Better	9	5.7%
	Good	77	49%
	Worst	71	45.2%
With impaired sleep, how difficult you find imaging concepts	Very difficult	23	14.6%
	Difficult	98	62.4%
	Not difficult at all	36	22.9%
With impaired sleep, how difficult do you find to concentrate on reading	Very difficult	38	24.2%
	Difficult	77	49.0%
	Not difficult at all	42	26.8%
With impaired sleep, how difficult do you find to make a decision	Very difficult	37	23.6%
	Difficult	68	43.3%
	Not difficult at all	52	33.1%

Table 3: Association of Disturbed Sleep and Academic Performance

Effect on academic Performance						
During Past month how many hours of sleep you got at night	**Time**	**No effect**	**Might affect**	**Does affect**	**Frequency & %**	**P value**
	hours	4 (8%)	11 (23%)	33 (69%)	48 (31%)	0.04
	6 hours	5 (13%)	19 (50%)	14 (37%)	38 (25%)	
	7 hours	4 (10%)	11 (27%)	26 (63%)	41 (27%)	
	8 hours	5 (18%)	4 (14%)	19 (68%)	28 (18%)	

There is a significant association between hours of sleep at night and academic performance with a p-value of 0.04.

Table 4: Association of sleep pattern with class participation

With impaired sleep patterns, how active is your class participation?						
During the past month, how long has it usually taken you to fall asleep each night?	**Time**	**satisfactory**	**average**	**rare**	**n & % age**	**P-value**
	Less than 15 min	8 (44%)	7 (39%)	3 (17%)	18 (12%)	0.001
	15-30 min	10 (12%)	30 (37%)	42 (51%)	82 (54%)	
	30-60 min	6 (15%)	23 (58%)	11 (28%)	40 (26%)	
	1 hour	6 (46%)	4 (31%)	3 (23%)	13 (8%)	

There is a significant association between insomnia and class participation with a p-value of 0.001.

tion(p-0.002) was found in both genders.

Similarly, a significant association between insomnia and interest in lectures(p-0.01), class participation(p-0.009), sleep quality (p-0.001) was found in different age groups.

DISCUSSION

Results of the present study showed that the prevalence of poor-quality sleep was 46% among medical students while 54% rated their sleep quality as good. The wake-up time for 41 % of the students was 41% and 58% went to bed till 1 am during the past month.60% responded that disturbed sleep affects their academic performance. A study conducted at Nishtar Medical university ,40.7% of the students experienced insomnia[17], another study conducted at Sheikh Zayed Medical college;40% of students suffered from insomnia with higher prevalence in females[18]. Our study showed that 31% of students who slept for 5 hours and 24% of students who slept for 6 hours rated their sleep quality as good only 18% rated their sleep quality as bad.

Another study conducted in Poland showed the data from 2,413 people aged 18-79 years. The results were that 60% of respondents faced difficulties falling asleep and 45% in sleep maintenance. Results also showed that in the younger population aged 18-39 years, subjective insomnia was reported by 44.3% of women and 32.1% of men[19]. Our research showed similar results with both males and females, aged 18-30 years, facing difficulties falling asleep. Among them, 53.5% took 15-30 minutes while 26.1% took 30-60 minutes to fall asleep. 8.9% took at least an hour while only 11.5% took less than 15 minutes to fall asleep.

A study at the University of Lahore reported that students suffering from insomnia experienced decreased concentration, fatigue and poor academic performance[20]. A cross-sectional study was conducted with 388 students at Debre Berhane University, Ethiopia. Even though the prevalence of insomnia was 61.6%, no significant association was found between insomnia and the academic performances of students[21]. On the contrary, our research showed that about 60% of students were of the view that sleep disturbances affected academic performance. Another cross-sectional survey comprising 50,054 students aged 18-35 years was conducted at Norwegian colleges and universities which showed an association of insomnia with a higher risk of failed examinations and delayed study progress[22]. Our study showed similar results with 49% of students finding it difficult to concentrate on what they are reading and 62.4% of students finding it difficult to build concepts, hence delaying study progress.

In Asian countries, the results were not much different. A study conducted in India in 2019 showed the prevalence of poor sleep which was 63.2%. Though the prevalence was quite high, 60% of poor sleepers were high achievers which showed that sleep quality matters and not the sleep duration[23]. Similarly, the present research showed that even though many of the students slept for only 5-6 hours at night, 53.5% of students rated their sleep quality as good and 16.6% rated it very good. The ones with good sleep quality also performed well academically hence further strengthening the manifestation that sleep quality matters and not the duration.

Another cross-sectional study was conducted at Shifa College of Medicine, Islamabad with 191 students participating in the study. About 84.3% (86/102) of the passed students and 81.6% (71/89) of failed students slept for 7 hours at night. 63.5% of the participants felt that their performance was not affected by the disturbances in sleep[24]. These results are somewhat varied from those of the present study. Our results also showed that 84% of the students didn't need to take any medications for sleep in the past month but regarding their academic performance about sleep, about 60% of the students felt that sleep disturbances affected their performance.

CONCLUSION

This study found that disturbed sleep problem exists among medical students which affect their academic performance. The academic schedules developed should be such that they favor, not only the mental health but also, the physical health of the students by introducing various co-curricular activities.It is also recommended that further studies should be conducted on topics like this as they are still underexplored in developing countries like Pakistan, with a larger sample size, diverse population and with different study designs as Cross sectional study design used in this study makes it difficult to establish causation.

REFERENCES

1. Sugisawa, H.; Harada, K.; Sugihara, Y.; Yanagisawa, S.; Shimmei, M. Social Networks' Health Habits Over Life Course and Late-life Health Habits. Am. J. Health Behav. 2020, 44, 100–117. [Google Scholar] [CrossRef] [PubMed]
2. Sitticharoon C, Srisuma S, Kanavitoon S, Summachiwakij S. Exploratory study of factors related to educational scores of first preclinical year medical students. Adv Physiol Educ. 2014;38:25–33. [PubMed] [Google Scholar] [Ref list]
3. Könen T, Dirk J, &Schmiedek F. Cognitive benefits of last night's sleep: daily variations in children's sleep behavior are related to working memory fluctuations. J Child Psychol Psychiatr 2015;56(2), 171-182.
4. Saygın M, Öztürk Ö, Gonca T, Has M, Hayri UB, Kurt Y, Yağlı MA, Çalışkan S, Akkaya A, Öztürk M. Investigation of sleep quality and sleep disorders in students of medicine. Turkish thoracic journal. 2016 Oct;17(4):132.
5. Alqudah M, Balousha SA, Balusha AA, Al-U'datt DA, Saadeh R, Alrabadi N, Alzoubi K. Daytime sleepiness among medical colleges' students in Jordan: Impact on academic performance. Sleep Disorders. 2022 Mar 10;2022.
6. Adeosun SO, Asa SO, Babalola O, Akanmu MA. Effects of night reading on daytime sleepiness sleep quality and academic performance of undergraduate pharmacy students in Nigeria. Sleep Biol Rhythms 2018; 6:91-4.
7. Busato VV, Prins FJ, Elshout JJ, Hamaker C. Intellectual ability, learning style, personality, achievement motivation and academic success of psychology students in higher education. Pers Individ Dif 2010; 29: 1057-1068.
8. Ahmed U, Riaz A, Ramzan M (2013) Assessment of Stress and Stressors: A Study on Management Students. IJCRB 2013; 687-699. 19.
9. Haile YG, Alemu SM, Habtewold TD. Insomnia and its temporal association with academic performance among university students: a cross-sectional study. BioMed research international. 2017 Jun 29;2017.
10. Wondie T, Molla A, Mulat H, Damene W, Bekele M, Madoro D, Yohannes K. Magnitude and correlates of sleep quality among undergraduate medical students in Ethiopia: cross–sectional study. Sleep Science and Practice. 2021 Dec;5(1):1-8.
11. Yassin A, Al-Mistarehi AH, Yonis OB, Aleshawi AJ, Momany SM, Khassawneh BY. Prevalence of sleep disorders among medical students and their association with poor academic performance: A cross-sectional study. Annals of Medicine and Surgery. 2020 Oct 1;58:124-9.
12. Lu J, Fang GE, Shen SJ, Wang Y, Sun Q. A Questionnaire survey on sleeping in class phenomenon among Chinese medical undergraduates. Med Teach 2011;33(6):508
13. Paudel K, Adhikari TB, Khanal P, Bhatta R, Paudel R, Bhusal S, Basel P. Sleep quality and its correlates among undergraduate medical students in Nepal: A cross-sectional study.PLOS Global Public Health. 2022 Feb 18;2(2):e0000012.
14. Waqas A, Khan S, Sharif W, Khalid U, Ali A. Association of academic stress with sleeping difficulties in medical students of a Pakistani medical school: a cross sectional survey. PeerJ. 2015;3:e840 doi. org/10.7717/peerj.840
15. ul Ain N, Ahmad H, Rehman S, Emman S, Sethi MR, Irfan M. Dysfunctional beliefs and attitudes about sleep in undergraduate medical and dental students. Journal of Postgraduate Medical Institute. 2020 Jul 14;34(1).
16. Buysse DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry. 2003;18:498
17. Shakeel HA, Maqsood H, Ishaq A, Ali B, Hussain H, Khan AR, Shah SA. Insomnia among medical students: a cross-sectional study. Int J Res Med Sci. 2019 Mar;7(3):893.
18. Adnan M, Ali MH, Nikhet S, Begum F, Arshad A, Khizar B. Prevalence of Insomnia among Medical Students. Pakistan Journal of Medical & Health Sciences. 2023 Apr 18;17(03):240.
19. Nowicki Z, Grabowski K, Cubała WJ, Nowicka-Sauer K, Zdrojewski T, Rutkowski M, et al. Prevalence of self-reported insomnia in the general population of Poland. Psychiatr Pol. 2016; 50:165-73
20. Khan K, Waqas M, Sarwar R, Ahmad S, Faizan M. Effects of insomnia on daily performance of medical students: A cross sectional study conducted in university of Lahore, Pakistan. Rawal Medical Journal. 2019 Aug 7;44(3):622-.
21. Haile YG, Alemu SM, Habtewold TD. Insomnia and Its Temporal Association with Academic Performance among University Students: A Cross-Sectional Study. BioMed research international. 2017;2017(1):2542367.
22. Vedaa Ø, Erevik EK, Hysing M, Hayley AC, Sivertsen B. Insomnia, sleep duration, and academic performance: a national survey of Norwegian college and university students. Sleep Medicine: X. 2019 Dec 1;1:100005

23. Gemnani VK, Ambwani JK, Shaikh BA, Larik SA, Shaikh MA, Malik E. Impact of Insomnia on Academic Performance Among Undergraduate Medical Students of Chandka Medical College (Shaheed Mohtarma Benazir Bhutto Medical University) Larkana. InMedical Forum Monthly 2019 (Vol. 30, No. 1)

24. Shafiq A, Gulzar A, Imtiaz I, Sami MA, Riaz F, Imtiaz K, Ambreen H. Association of social media addiction with insomnia among university students. The Professional Medical Journal. 2023 Jan 31;30(02):276-80.

CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.

AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	MH, SS, AM, SMI, HFTZ, AK, MY
Acquisition, Analysis or Interpretation of Data:	MH, SS, AM, SMI, HFTZ, AK, MY
Manuscript Writing & Approval:	MH, SS, AM, SMI, HFTZ, AK, MY

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.