Demographic and academic characteristics of medical students with sleep disorders- A cross sectional study from Karachi, Pakistan

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ABSTRACT

Objective: To determine the demographic and academic characteristics of MBBS students suffering from sleep disorders.
Study Design: Cross sectional descriptive study
Place and Duration: The research was conducted from 4th September 2016 to 30th November 2017 at the Department of Community Medicine Liaquat National Hospital and Medical College, Karachi, Pakistan
Methodology: The data were collected by using standardized structured questionnaires which included the Insomnia Severity Index, Epworth Sleepiness Scale and Berlin Questionnaire to assess sleep disorders, and the Depression Anxiety Stress Scale to assess stress and anxiety among medical students.
Results: Sleep disorders are common among female medical students (68%). Among the students with sleep disorders, 33 % were studying in third year MBBS, 55 % were suffering from anxiety disorders and 43 % were using internet daily for more than 4 hours.
Conclusion: Female gender and third year medical students had higher frequency of sleep disorders. The results of this study highlighted that daily internet use of more than four hours and anxiety disorders are frequent among the students suffering from sleep disorder.
Keywords: Medical students, Sleep disorders, Insomnia, Stress, Anxiety, Obstructive sleep apnea

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INTRODUCTION

Students encounter a number of challenges during studies which may impact their mental and physical health, academic stress being one of the major predictors of the increasing mental disorders among them during student life, according to McLeod[1]. Academic stress involves mental distress related to expected academic challenges throughout the years of study[2]. Apart from this, students have to deal with a number of other pressures that directly or indirectly lead to deterioration of their health status, including disturbances in their sleep patterns. Sleep quality has a crucial role in maintaining mental health, learning and general wellbeing[3].

Sleep habits alter with age, lifestyles and socio-cultural characteristics during adolescent years. The estimated prevalence of sleep disturbances, frequently reported in college students, varies between 27% and 40%[4].

The frequency of sleep disorders among medical students is greater than the students of other specialties, owing to the increased amount of stress during their academic years and the nature of their clinical rotations[5]. Studies have documented high proportions of stress among medical students in countries like the United States (57%), Thailand (61%), Pakistan (60%) and Malaysia (42%) [6-9].

Apart from academics, gender of the student, age and year of education are also important predictors of insomnia and daytime sleepiness as evidenced by Almojali[5]. Excessive use of the internet is also an added distraction, leading to reduction in sleep duration and daytime sleepiness according to a systemic review[10]. Its use indulges students to stay awake for longer period of hours, impacting their mental and physical health. This is a vicious cycle, ultimately leading to an overall reduction in

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the performance of the students in their academics.

In Pakistan, according to a study, 72 % of medical students sleep late at night and about 40% are poor sleepers[11]. The significant burden of stress and poor sleep quality among medical students in Pakistan is alarming due to the deleterious effects of sleep disturbances on their mental and physical health, quality of life, and the learning process, which in turn may reduce the quality of specialist doctors for patient care in the coming years. Therefore, it is vital to implement appropriate strategies to highlighting the importance of good sleep quality and also the negative consequences of sleep deprivation.

The aim of our study was to identify the demographic characteristics of the medical students who are suffering from different sleep disorders. This would be helpful in the earlier identifying of the high risk students beforehand and will be useful for the health administrator to educate the students about the importance of good sleep habits and time management. We conducted this study with an objective to determine the demographic and academic characteristics of MBBS students suffering from sleep disorders.

METHODOLOGY

This cross-sectional study was conducted from 4th September 2016 to 30th November 2017 for duration of 14 months at the department of Community medicine, Liaquat National Medical College Karachi. The study participants were undergraduate medical students enrolled in first to final years of the five-year Bachelor of Medicine and Bachelor of Surgery (MBBS) degree program at a private medical college i.e. Liaquat National Medical College Karachi, Pakistan. OpenEpi software version 3.01 was used for sample size calculation. Previous study identified that 31% of medical students in Pakistan had poor quality of sleep[11]; this prevalence was used for sample size calculation. The largest sample size calculated was 329. In order to adjust for the expected non-response, 10% was added to the sample size. The final sample size was 360 medical students. However, we included only those students who had sleep disorders which were insomnia, day-time sleepiness and obstructive sleep apnea.

We employed Non-random purposive sampling technique for the recruitment of medical students. The students were briefed regarding the nature and purpose of the study. The exclusion criteria comprised of students having systemic diseases, psychiatric illnesses and substance addiction and those who refused to participate in the study. The data were collected using a structured questionnaire administered by students of 4th year MBBS. They were trained for the interviews by the Principal Investigator. The questionnaire was used to collect information from the students regarding their demographics and educational year along with their sleep disorders and questions to determine if they suffered from mental issues, including anxiety and stress. A relatively quiet and private place was reserved for the respondents to keep the interviews confidential.

The questionnaire included questions regarding demography of the students and four internationally validated and reliable questionnaires, namely the Depression Anxiety Stress Scales (DASS)[12], the Insomnia Severity Index (ISI)[13], the Berlin Questionnaire (BQ)[14] and the Epworth Sleepiness Scale (ESS)[15]. It took 20-25 minutes for an interview to be completed. We defined the variables of anxiety, stress, insomnia, obstructive sleep apnea and day-time sleepiness using the following study instruments:

Anxiety and Stress: The Depression Anxiety Stress Scale (DASS) was used to measure the stress and anxiety among the students. The questionnaire is based on 42 items which are designed to measure depression, anxiety and stress. The following cut-off scores were used for each subscale: anxiety: normal 0–3, mild 4–5, moderate 7–10, severe 11–13 and extremely severe 10+; stress: normal 0–7, mild 8–9, moderate 10– 12, severe 13–16 and extremely severe 17+.

Insomnia: Insomnia Severity Index (ISI) was used to identify insomnia in the students. This ISI is a 7-item self-reported questionnaire that assesses the nature, severity, and impact of insomnia. A total score was >14 were used to detect clinically significant insomnia[13].

Obstructive sleep apnea: We used the Berlin Questionnaire (BQ) as a screening tool for identifying the students with Obstructive sleep apnea. Students who had a positive score on two or more categories were considered at high risk of having obstructive sleep apnea[14].

Day-time sleepiness: The Epworth Sleepiness Scale (ESS) was used to determine day-time sleepiness in medical students. A sum of 9 or more scores on this scale was specified as day-time sleepiness[15].

Data Analysis: The data were analyzed using software IBM SPSS Statistics version 22. The descriptive statistics of demographic and academic variables were calculated as mean and standard deviation for continuous variables and frequency and percentages for categorical variables. Cross-tabs were used to assess the stress and anxiety in students and the frequency of sleep disorders. The study was approved by the Ethical Review Board (ERB) of Liaquat National Hospital and Medical College Karachi, Pakistan.

RESULTS

Out of 329 medical students, 124 of the students had hypersomina, 74 had obstructive sleep apnea and 212 were suffering from insomnia.

Table I shows the characteristics of students with obstructive sleep apnea. Their mean ages were 22.39 (SD 1.76 years). There was an equal distribution of both male and female students having obstructive sleep apnea. Students of third year MBBS had the greatest frequency of obstructive sleep apnea i.e. 33.8%, followed by final and forth year students (25.7% and 18.9% respectively). 43.2% of the students with obstructive sleep apnea were using the internet for 4-8 hours daily. Almost 75.7% had BMI greater than 30 (Not shown in the table).

Table-I also shows the demographic characteristics of students with insomnia. Their mean ages were 22 years (SD 1.69 years). 68% of them were females, compared to only 31% males. 26.4% of the students of third year MBBS reported having insomnia.

Table-I: Demographic characteristics of students (N=360) with Obstructive sleep apnea (n=74), Insomnia (n=212) and Day-time sleepiness (n=124)

Variable		Frequency (%)		
		Obstructive sleep apnea	Insomnia	Daytime sleepiness
Age in years	Mean (SD)	22.39 (SD=1.76)	22 (SD=1.69)	21.85 (SD=1.68)
Gender	Male	38(51.4%)	66(31.1%)	40(32.3%)
	Female	36(48.6%)	146(68.9%)	84(67.7%)
Educational year	First year	4(5.4%)	17(8%)	8(6.5%)
	Second year	12(16.2%)	49(23.1%)	31(25%)
	Third year	25(33.8%)	56(26.4%)	39(31.5%)
	Forth year	14(18.9%)	45(21.2%)	19(15.3%)
	Final year	19(25.7%)	45(21.2%)	27(21.8%)
Internet use(Hours)	<4 hours	19(25.7%)	71(33.5%)	44(35.5%)
	4 to 8 hours	32(43.2%)	91(42.9%)	45(36.3%)
	>8 to 12 hours	14(18.9%)	32(15.1%)	21(16.9%)
	>12 hours	9(12.2%)	18(8.5%)	14(11.3%)
Academic performance affected	Not at all affected	15(20.3%)	40(18.9%)	13(10.5%)
	Sometimes affected	24(32.4%)	74(34.9%)	42(33.9%)
	Frequently affected	15(20.3%)	42(19.8%)	34(27.4%)
	Very frequently affected	20(27%)	56(26.4%)	35(28.2%)

*SD= Standard Deviation

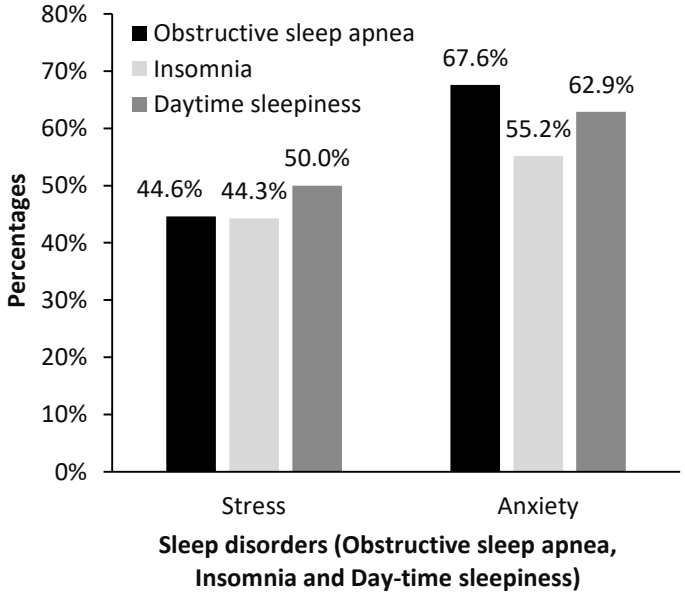

Fig-1: Frequency of stress and anxiety among students with sleep disorders (N=360)

Almost 43% of the students were using the internet for 4-8 hours. According to the demographic characteristics of students with day-time sleepiness show the mean ages were 21.85 years (SD 1.68 years). 67.7% were females compared to only 32.3% males.

Almost 31.5% of students with day-time sleepiness were studying in third year MBBS and 36.3% of them were using the internet for 4-8 hours.

Most of the students mentioned their academic performance "sometimes" being affected by the sleep disorders (32.4% for obstructive sleep apnea, 34.9% for insomnia and 33.9% for day-time sleepiness).

Fig-1 show the frequencies of students with anxiety and stress and their associations with sleep disorders. Students with anxiety had greater frequencies of sleep disorders compared to those with stress. Obstructive sleep apnea was most frequent in students having anxiety (67.60%), followed by day-time sleepiness (62.90%) and insomnia (55.20%). Sleep disorders were almost similar in students with stress (50% day-time sleepiness, 44.60% obstructive sleep apnea and 44.30% insomnia).

DISCUSSION

This study focuses on sleep disorders among MBBS students, who, throughout their five years of training, go through numerous exposures, including academics, research and field visits and clinical rotations. The students, according to the designed curriculum of MBBS, start their clinical practice in their third year. This explains the existence high frequencies of all the three sleep disorders among the students studying in third year MBBS. During clinical rotations, there is excess workload and a complete shift of attachments, including medicine, surgery and gynecology. These clinical rotations require long working hours, along with the courses the students have to study and pass during their examinations. These pressures lead to various mental illness as well as disturbed sleep patterns. Evidence suggests that good quality sleep is vital for optimal neurocognitive and psychomotor performance, including physical and mental health[16].

The overall prevalence of sleep disorders in this sample of students was 51.1%. These frequencies are similar to findings from Iran (40.6%) and India (30.6%)[16,17]. However, studies from China (90%) and Hong Kong (70%) showed their medical students being more deprived of sleep to a greater extent [18,19]. The variations may also be due to the difference in the scales used, for example we assessed sleep disorders through the use of Insomnia Severity Index, Berlin Questionnaire and Epworth

Sleepiness Scale. The study from China used the Pittsburgh Sleep Quality Index (PSQI).

In this sample there were more females compared to males who had insomnia and day-time sleepiness. Generally, studies have found females having more symptoms of sleep deprivation compared to their male counterparts[20]. As a consequence, females find it more difficult in concentrating and remembering recalling things due to sleepiness or tiredness[21]. Reasons have been explained as hormonal changes, socio-cultural factors and greater stress found in females[22].

Most of the students suffering from sleep disorders stated using the internet daily for 4-8 hours. The frequency of internet use has escalated in the last decade, especially among adolescents. Previous studies have also found associations with excessive use of the internet with sleep disorders. One mechanism that explains the negative impact of increase in internet use on sleeping habits can be that nighttime screen time use can lead to a state of high arousal, hence, interfering with the requirements and environment that are essential for sound sleep[23].

Our study showed that the students who had anxiety, reported greater frequencies of sleep disorders compared to those with stress. The relationship between sleep disorders and mental disorders is bidirectional and both may feedback on each other to sustain their existence[22], as explained by Franzen et al.

This study had some limitations. It is a descriptive study; hence results of the study may be generalized with caution. The data has been collected from a private medical college, which may show difference if public sector medical students would have been included, owing to structure of their teaching institutes. The lack of funds did not allow us to include the public sector medical students. The authors made their best efforts to collect unbiased data. However, there may have been recall bias in the study, owing to the recall of the number of hours of sleep needed to be documented by each respondent. There may be wish bias, where majority of the students may have mentioned their academic performance being affected “sometimes” as a result of their sleep disorders.

CONCLUSION

Female gender and third year medical students had higher frequencies of sleep disorders. The results of this study highlight that daily internet use of more than four hours and anxiety disorders are frequent among the students suffering from sleep disorder.

CONTRIBUTION OF AUTHORS

Zainab S: Conceived idea, Literature search, Data analysis
Khoso A: Manuscript writing
Soomro R: Designing and finalization of questionnaire, Data interpretation
Zehra R: Data collection, Manuscript final reading

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