

Original Article

# A Prospective Study on Effect of Stress on Sleep Quality in Young Medical Students in a Tertiary Hospital

**Dishanter Goel**

Associate Professor, Department, of Psychiatry, Teerthanker Mahaveer Medical College Moradabad, UP, India.

## ABSTRACT

**Objective:** The objectives of this study was to evaluate the sleep disruption risk enhancement among the young Medical students due to increasing the demand of clinical and academic duties and Studying the relation between sleep quality and psychological stress which can be useful in implementing an organized mental health program in medical colleges. The main aim is to study the prevalence and the effect of stress on sleep quality in young medical students.

**Methods:** This Prospective cross sectional study was conducted on Medical students of Teerthanker Mahaveer Medical College & Research Centre to recognize the effect of stress on sleep quality among 75 medical students. The instruments used for data collection were a self-report Pittsburg Sleep Quality Index (PSQI) and the General Health Questionnaire (GHQ).

**Results:** Results of present study showed that 59% of subjects were poor sleepers. Furthermore, there was a significant correlation between general health status and sleep quality of students ( $r = 0.5118, p = 0.0001$ ).

**Conclusions:** A considerable proportion of medical students are affected by poor sleep quality. Sleep disruption acts as a barrier for students' performance in examinations. So, it is important to implement health promotion and educational programs for them.

**Key words:** Extradural Hematoma, Oculomotor Nerve Palsy.

## INTRODUCTION


The sleep is one important physiological process in human. The study of includes measurement of both quantitative and qualitative components.

The Quantitative components of sleep measures the duration of sleep whereas qualitative component is measurement of the depth and feeling of restfulness on awakening.<sup>[1]</sup> Studies have shown that sleep deprivation causes serious health problems.<sup>[2]</sup> Some studies have linked reduction in duration and quality to changes in life style,

increased work and social demands and also excess use of technology.<sup>[3]</sup>

Research done among college students<sup>[4-6]</sup> have brought about high prevalence estimated ( $\geq 40\%$ ) of short sleep duration (<7 hours) and poor sleep quality as considered by PSQI.2 Sleep duration and sleep quality both expected to vary by age and sex. Concentrates on have demonstrated a relationship between expanded age and poor sleep quality.<sup>7</sup> Another studies also suggest that the female students having amplified risk of poor sleep quality.<sup>[8,9]</sup> Studies done on college students have reported that stress, anxiety and depressive symptoms are common psychological correlates found among them<sup>[10,11]</sup> and there is a direct relationship between sleep quality and academic performances. Studies have shown sufficient sleep and shorter sleep latency lead to higher academic performances and insufficient sleep lead to disturbance in concentration and in attention also fatigue. Sleep deprivation also results in school absenteeism and suppression of other cognitive functions like abstraction and problem solving.<sup>[12]</sup>

Medical students are under high risk for sleep deprivation due to high clinical and academic expectations. Along with this they have to accept the change in their living style like

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### Corresponding Author

Dr. Dishanter Goel, Associate Professor, Dept. of Psychiatry, Teerthanker Mahaveer Medical College Moradabad, India.

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poor housing, staying away from their family. The above mentioned factors put them at a greater risk of reduced sleeping and affect their physical and mental activities.

The objective of this study was to evaluate the prevalence and correlation of sleep quality and general health in young adult medical students.

## MATERIALS AND METHODS

A cross sectional study was conducted in a tertiary care medical college in Moradabad. Study participants were MBBS students. The study was approved by the institute's ethical committee. We planned for purposive sampling, so our sample size was 50 (25 boys and 25 girls). They were invited to meet in their classroom where they were informed about the purpose of the study and asked to participate in the study. Informed written consent was obtained from all the participants.

### Data collection

A self-administered questionnaire was used to collect information for this study. PSQI is a self-rated questionnaire which helps to assess the sleep quality for the past 1 month. It has 19 self-rated questions and 5 other questions which are to be answered by the bed partner or room partner. The last 5 questions (rated by bed partner or roommate) of the scale do not contribute to the PSQI scoring, so these were not included to get the global score. The 19 questions assess various factors related to sleep quality. The questions are again grouped into 7 component scores and all are reflected equally on a 0 – 3 scale. These components are: sleep quality, sleep latency, habitual sleep efficiency, sleep disturbances, use of sleep medications and daytime dysfunction. Questions 1- 4 was based on estimations for the past and they included —bed timel, —number of minutes to fall asleepl, —getting up timel and —hours of sleep per nightl. While questions 5 to 10 was based on a score ranging from 0 - 3 points (0 - Not during the past month, 1 - Less than once a week, 2 - Once or twice a week, 3 - Three or more times a week). The seven component scores were added to yield a global PSQI score ranging from 0 - 21. Higher the score, worst is the sleep quality. A global score of more than 5 indicates poor sleep quality in the person for the last 1 month.<sup>[1]</sup> GHQ 1213 consists of 12 questions designed for evaluating the general health in the past month. For each item, the participants were asked to rate their level of general health on a four point scale (0 - more than usual, 1 - same as usual, 2 - less than usual, 3 - much less than usual). Six items were reversed (0 - not at all, 1 - no more than usual, 2 - rather more than usual, 3 - much more than usual) and the total score was summed for all 12 items for each participant and the final score would be from 0 to 36. A global score of >15- 19 indicates evidence of stress and score >20 signals sever problem and psychological distress in the past month.

### Statistical Analysis

Statistical analysis was done using SPSS software for analysing the general description of the questionnaires results and comparison of the score of girls and boys

groups. A confidence interval of 95% was achieved with 0.05 level of significance. Association between PSQI and GHQ 12 was assessed using chi square test, regression model and Pearson correlation coefficient.

## RESULTS

A cross sectional study was conducted to find out the effect of stress on sleep quality in young adult medical students. The data was collected from 50 medical students (25 girls & 25 boys) enrolled among first year medical students. Of all the subjects, 59% were grouped as poor sleepers with global PSQI score >5. Most of the students described their sleep quality as very good to fairly good as shown in Table 1. As regards with the gender differences, boys suffered from poor sleep quality when compared to girls. Boys had a tendency to go to bed sooner, they fell asleep later, had shorter sleep duration and less habitual sleep efficiency, while girls had more day time dysfunction because of more sleep disturbances as in Table 1.

**Table 1: Results of PSQI according to gender and in all students.**

PSQI items	Statistical Characters	Boys	Girls	Total
Time of going to bed (hr PM)	Mean (±SD)	10.28±0.77*	11.76±0.53*	11.02±0.65
Time of getting up (hr AM)	Mean (±SD)	6.15 ± 1.2	6.15 ± 0.78	6.13±0.99
Subjective sleep quality (%)	Frequency of very & fairly good state	72.12%	77.23%	74.68%
Sleep latency (min)	Mean (±SD)	21.01±15.23	19.92±12.56	20.47±13.90
Sleep duration (hr)	Mean (±SD)	7.69 ± 1.12	7.26 ± 0.88	7.48±1.00
Habitual sleep efficiency	Mean (±SD)	90.12 ± 9.46	91.23 ± 8.04	90.68 ± 8.75
Sleep disturbances (%)	Frequency of at least once a week	23.52%	35.14%	29.33%
Use of sleep medications (%)	Frequency of at least once a week	2.91%	2.82%	2.87%
Daytime dysfunction (%)	Frequency of at least once a week	40.15%*	51.42% *	45.79%
Poor sleep quality (%)	Frequency of ≥ 5 global score	56.19%	55.62%	55.91%

\*p <0.05 significant

According to the results of GHQ 12, 67% of all students had poor general health. The distribution between boys and girls was 61 % and 71% respectively with significant difference (p <0.05) and 65% of the girls suffer from severe problem and psychological distress when compared to only 20% of boys. General health was affected in both good sleepers and poor sleepers. But severe problems and psychological distress was more significant in poor sleepers when compared to good sleepers as shown in Table 2.

**Table 2: Frequency of stress and severe stress in good and poor sleepers.**

	Score 15 – 19 Evidence of stress	Score > 20 Severe problems & psychological distress
PSQI ≤5	65.13% *	34.87% *
PSQI >5	48.36% *	51.64% *

Frequency of using sleep medications at least once a week was significantly affected in students with severe problem and psychological stress ( $n = 2$ ) when compared to students suffering from stress alone. Sleep disturbances and more frequent daytime dysfunction were also high in students with severe problem and psychological stress as shown in Table 3.

**Table 3: Differences between students with evidence of stress and severe psychological distress expressed in terms of PSQI components.**

PSQI components	Statistical characters	GHQ - 15 to 19	GHQ >20
		N= 18	N = 15
Subjective sleep quality	Frequency of very and fairly good state	14 (77.7 %)	14 (77.70 %)
Sleep latency	Minutes mean $\pm$ SD	17.26 $\pm$ 13.64	17.41 $\pm$ 13.75
Sleep duration	Hours mean $\pm$ SD	7.02 $\pm$ 1.54	6.34 $\pm$ 1.39
Habitual sleep efficiency	Mean $\pm$ SD	94.35 $\pm$ 7.55	92.29 $\pm$ 7.38
Sleep disturbances	Frequency of at least once a week	4 (22.22 %)	7 (38.85 %)
Use of sleep medications	Frequency of at least once a week	0	2*(13.33 %)
Daytime dysfunction	Frequency of at least once a week	7 (38.85 %)	12(66.60%)

\* $p < 0.05$  significant

## DISCUSSION

There is always an increased risk for deprivation of sleep with mental and physical morbidity because of working on a tight schedule and changes in pattern of sleep wake cycle. Studies done on professionals working in a tight schedule have shown an elevated percentage of errors during work because of partial sleep deprivation. Sleep deprivation leads to a variety of neurophysiological and psychological imbalances like decreased alertness and mood variations which have direct effects on an individual's performance. Investigators have seen a direct correlation between insomnia and sleep disruption due to stress with development of depression in medical students.<sup>[14]</sup>

In our study, we found a high prevalence of poor sleep quality (58%) among medical students. Researchers in United States have found that 16.3% of adolescents, 25.9% of adults older than 18 and 71% of college students suffer from at least one type of sleep problems.<sup>[15,16]</sup> While in China 16.9% of adolescents suffer from sleep disturbances and in Taiwan it has increased upto 40%.<sup>[17,18]</sup>

A longitudinal study that followed up adolescents from early adolescents to young adulthood discovered that, the proportion of subjects reporting of not attaining sufficient sleep ranged between 54% and 75%.<sup>[19]</sup> The possible causes could be because of variations in social and physical developments, emotional and behavioural harms, substance use and misuse by this age group.<sup>[20]</sup>

Adolescents living in a developing country like India can have an exaggerated responsibility in increased prevalence of poor sleep quality among them. Along with that, some factors like psychiatric illness and high dominance of poor general health quality among participants can contribute towards an increased prevalence of poor sleep quality. In

future, studies enquiring about etiology can simplify the reasons for such a high prevalence of poor quality of sleep. As a matter of fact, practically analysing the impression of poor sleep quality on school functioning and screening students for sleep problems by education system plays an important role, mainly in those students who are poor performers. In our study, we have found a significant difference between the subjective and objective measures of sleep quality. From the subjective component, 78% of the subjects reported their subjective sleep quality as very good or fairly good and 4% of them were on sleep medications. Simultaneously from the objective component, the results from PSQI revealed that 58% of all the subjects had poor sleep quality and 46% had daytime dysfunction. This difference in results can be explained by some possibilities: Firstly, the subjects were unaware that their symptoms had a relation to the kind of sleep problem. So they reported that their sleep quality was well or very well. Secondly, we have to consider both subjective and objective assessments of sleep quality while assessing poor sleep quality. Because these two are moderately interrelated and that subjective component partly may reflect an individual's opinion or state of mind in addition to some components in their objective sleep patterns. Finally, it could be because of unreliable answers given by subjects.

Our research also revealed a close correlation between self-assessed quality of sleep and self-assessed general health. These finding gives an idea that sleep quality can be used as one of the indicator for general health. This correlation is consistent with the studies that advise a two way connection between sleep and general health statuses of adolescents, in which anyone can be the cause or result of the other.<sup>[20]</sup>

## CONCLUSION

In our study greater part of medical students reported poor quality of sleep. This should be an important alarm to educators. This could be because of inadequate sleep hygiene behaviours for general population to protect sleep in medical students. In future studies can be planned on medical students with comparison to local populations and also studies including screening of individual (e.g., anxiety, depression, sleep attitudes) and school-related (e.g., academic schedule) risk factors with objective sleep outcomes. We can also try to improve quality of sleep in medical students by including sleep hygiene education programs in their curriculum.

Our finding also recommends the health system to try and increase the general public's knowledge about sleep health with the help of media, and also the physicians should try to assess sleep problems in detail and utmost care. There is also requirement for training sleep specialists.

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