

## A Cross Sectional Observational Assessment of Sleep Quality among Residents, Interns, Staff Nurses and Medical Students

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### Abstract

**Aim:** The aim of the study was to assess quality of sleep and related factors among medical students, residents, interns and staff nurses.

**Material & methods:** A cross sectional study was conducted for approx. 12 months period among Medical students, Residents, Interns and Staff nurses enrolled at department of Psychiatry Jawaharlal Nehru Medical College, Bhagalpur, Bihar. Total 400 samples were collected from study population, among them 100 Medical students, 100 Residents, 100 Interns and 100 Staff nurses.

**Results:** In this study mean (standard deviation) age for Medical students were 21.7(1.01), Interns were 24(1.60), Staff nurses were 24.34(1.60), residents 26.8(0.98). Among study population, 70% female and 30% male in Medical students, 50% male and same male in Interns, 55% male and 45% female in Staff nurses, 74% male and 26% female in Residents. There were 85% Staff nurses had rotation shift work or duty, 70% Interns and 38% Residents had rotation shift duty. Coffee or Caffeinated drink intake were reported by 75% Staff nurses followed by 70% Residents, 55% Medical students and 45% Interns. There was significant sleep quality score among them ( $p < 0.001$ ). There were significant association between global poor sleep quality score and Daytime dysfunction among Medical students, Residents, Staff nurses ( $p < 0.00001$ ). In component of Daytime dysfunction score, there were daytime dysfunction were found higher 70% in Medical student followed by 68% in Staff nurses, 64% in Residents and 35% in Interns.

**Conclusion:** Sleep quality was poor among medical students, residents, staff nurses. Poor sleep quality association with daytime dysfunction was found among Medical students, Residents, Staff nurses. Poor quality sleep score was reported among demographic variable like Rotation shift, Mobile use, Cigarette smoking and caffeinated drink intake. But some variables were not significant statistically. Further research is needed for identifying factors affecting poor quality to prevent consequences of disturbed or poor quality of sleep.

**Keywords:** Sleep Quality, Residents, Interns, Medical Students, Nurses.

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## Introduction

Sleep is necessary for well psychomotor and cognitive performance. It is also necessary for physical and mental wellbeing. [1] Lack of Sleep affects cognitive performance, interpersonal and social interaction and Emotional intelligent. [2] Epidemiological evidence suggests that sleep duration and poor sleep are associated with premature mortality and various adverse health outcomes like cardiovascular diseases, immune system suppression, obesity, migraine, etc.

Sleep is correlated with performance of Emotional Intelligent. [3] Sleep problems are a common in college students. Poor sleep quality lead to several mental health problems and impair academic performance which is reasonable to say that sleep quality and daytime sleepiness in medical residents has profound implications for their health and for the care of their patients. [4] Sleep deprivation have negative effect on performance of medical house staff in medical and surgical specialties. Residents with sleep disturbance had reported impaired performance like difficulty in cognitive work, difficulty while interacting with patients which lead to risk of misdiagnosis, impairment in learning. [5] Curcio Ferrara, De Gennaro 2000, evaluated sleep disturbances impact on academic performance and learning ability. Nurses are found to have poor quality of sleep, specially who had night shift is found to have more sleep disturbances. [6] Sleep disorders in nurses have impact on their health and quality of work which are risk for medical error, which indirectly affect the patient's health. [7] Nursing staff with shift work has poor sleep quality which results in diminished performance quality and effect on patient's safety. Insomnia can cause psychiatric disorders like depression, stress. [8] Chronic sleep disturbance can be a risk for substance abuse disorders. [9] Poor sleep quality has

many consequences on medical persons which indirectly impact health care delivery to patients.

Thus the aim of the study was to assess quality of sleep and related factors among medical students, residents, interns and staff nurses.

## Material & Methods

A cross sectional study was conducted for approx. 12 months period among Medical students, Residents, Interns and Staff nurses enrolled at department of Psychiatry Jawaharlal Nehru Medical College, Bhagalpur, Bihar. Total 400 samples were collected from study population, among them 100 Medical students, 100 Residents, 100 Interns and 100 Staff nurses. Participant who is having any acute or chronic medical illness, acute or chronic psychiatric disorders like substance use disorder, sleep disorders, anxiety disorder, etc. or any h/o past psychiatric disorders, and who are not willing to participate in study was excluded from the study.

The objectives of the study were well explained to the interns and their written consent were taken before the commencement of the study. They were contacted during their meal time or off days from their shifts. The study protocol was approved by the institutional ethical committee of the medical college. A structured questionnaire with sociodemographic and professional information was created. It contained information on sex, age, marital status, number of children, and year of medical residency. In addition, the questionnaire contained specific questions about sleep, such as medical consultations about sleep problems, use of hypnotics, and sleep hygiene habits. Regarding sleep hygiene, residents determined the frequency of the following habits: irregularity of sleep times, use of bedroom as a study or

recreation place, use of television or computer before bed, physical activity at night, excessive night-time eating, night-time use of stimulant drinks, and staying for long periods lying down without sleep. Each was classified into 2 categories: frequent and rare or occasional.

### Data collection tool

Pittsburgh Sleep Quality Index Scale Questionnaire and Questionnaire of Demographic information and other study variable like shift work or duty detail, habits of alcohol, coffee or caffeinated drink intake, Cigarette smoking, mobile use at the time of going for sleep. Pittsburgh Sleep Quality Index <sup>9</sup>: The PSQI is a 19-item questionnaire for evaluating sleep quality over the previous month. The 19 questions are combined into 7 component scores, it includes 1) Subjective sleep quality, 2) Sleep latency, 3) Sleep duration, 4) Sleep efficiency, 5) Sleep disturbance, 6) Use of sleep

medication and 7) Daytime dysfunctions. Each component is scored on a Likert-type 4-point scale (0, 1, 2, 3) and scored from 0 (no difficulty) to 3 (severe difficulty). The 7 component scores are combined to get total global score which is from 0 to 21. Total global score of 5 or more is considered as poor sleep.

Total score of <5 indicate good sleep quality.

### Statistical Analysis

Data was analysed using SPSS (social science statistic) Software version 22 and one-way anova test for independent measures and statistical analysis was done in same by using chi-square test to study the relation with various study factors. Descriptive statistics are expressed in frequencies and percentages. Statistical significance was set as P value < 0.05.

### Results

**Table 1: Sociodemographic variable of study sample and mean global ppsi score among various factors**

Sociodemographic Variable	Medical students	Residents	Staff nurses	Interns
Age in years mean (SD)	21.7 (1.01)	26.8 (0.98)	24.34 (1.60)	24(1.60)
<b>Sex</b>				
Male	30 (30%)	74 (74%)	55 (56%)	50 (50%)
Female	70 (70%)	26 (26%)	25 (45%)	50 (50%)
Total N	100	100	100	100
Global Ppsi score mean (SD)	6.6 (3.67)	5.95 (3.27)	5.18(2.32)	3.87(2.88) p<0.001
<b>Duty shift</b>				
Rotation	-	38 (38%)	85 (85%)	70(70%) P=0.032
Ppsi score mean	-	6.66(3.81)	5.38(2.24)	4.58(2.99)
fixed	-	32(64%)	8(16%)	14(28%)
Ppsi score mean	-	5.56	4.8	2.14
Alcohol intake	2 (2%)	35 (35%)	20 (20%)	30 (30%)
Ppsi score mean	10	4.88	3.2	5.15
Cigarette or bidi smoking	2 (2%)	8 (8%)	26 (26%)	20 (20%)
Ppsi score mean	10	05	6.5	6.2
Coffee or caffeinated drink intake	55 (55%)	70 (70%)	75 (75%)	45(45%) P=0.007
Ppsi score mean	6.29(4.05)	5.76(3.18)	5.26(2.39)	3.36(1.86)

Mobile use at the time of sleep	92 (92%)	100 (100%)	85 (85%)	100 (100%)
pqsi score mean	6.5(3.52)	5.96(3.27)	4.66(2.03)	3.90 (2.88) P<0.0001

In this study mean (standard deviation) age for Medical students were 21.7(1.01), Interns were 24(1.60), Staff nurses were 24.34(1.60), residents 26.8(0.98). Among study population, 70% female and 30% male in Medical students, 50% male and same male in Interns, 55% male and 45% female in Staff nurses, 74% male and 26% female in Residents. There were 85% Staff nurses had rotation shift work or duty, 70% Interns and 38% Residents had rotation shift duty. Coffee or Caffeinated drink intake were reported by 75% Staff

nurses followed by 70% Residents, 55% Medical students and 45% Interns. Alcohol intake was reported 35% among Residents followed by 30% Interns, 20% Staff nurses and 2% Medical students. Cigarette or bidi smoking was reported by 26% Staff nurses, 20% Interns, 8% Residents and 2% Medical students. All were using Mobile or laptop at the time of sleep except 8% Medical students reported not using of mobile or laptop at the time of going for sleep and 15% Staff nurses.

**Table 2: Sleep Quality, Subscale Component Comparison among Study Participants**

	Medical students	Residents	Staff nurse	Interns	P value
Sleep quality (Global pqsi score) mean (SD)	6.7 (3.67)	5.85 (3.24)	5.20 (2.32)	3.90 (2.88)	<0.001
Daytime dysfunction mean (SD)	1.20 (1.02)	0.90 (0.79)	0.96 (0.80)	0.55 (0.86)	0.003
Sleep latency mean (SD)	1.45 (1.16)	1.42 (1.18)	1.22 (0.65)	0.75 (0.87)	0.012
Sleep duration mean (SD)	1 (0.90)	1.07 (0.72)	0.48 (0.50)	0.52 (0.50)	<0.0001
Sleep disturbances mean (SD)	1.2(0.67)	1.16 (0.32)	0.90 (0.56)	1(0.49)	0.040

There was significant sleep quality score among them (p<0.001). There were significant association between global poor sleep quality score and Daytime dysfunction among Medical students, Residents, Staff nurses (p<0.00001).

**Table 3: Comparison Of Poor Sleep Quality with High Pqsi Score with Daytime Dysfunction Component among Study Population, SD=standard deviation, pqsi=Pittsburgh sleep quality index**

	Medical Students	Residents	Staff Nurses	Interns
Total (N)	100	100	100	100
Global PQSI Score mean (SD)	6.5(3.67)	5.96(3.24)	5.12(2.32)	6.6 (2.40)
Day Time Dysfunction N (percentage)	70 (70%)	64 (64%)	68 (68%)	35 (35%)
Mean (SD)	1.18(1.02)	0.84(0.79)	0.92(0.80)	1.15 (0.75)
P Value	<0.00001	<0.00001	<0.00001	<0.00001

Poor sleep quality was founded highest among Medical students with the global mean (standard deviation) pqs score 6.5 (3.67) than Residents with mean global pqs score 5.96 (3.24), and Staff nurses with mean global pqs score 5.12 (2.32). In component of Daytime dysfunction score, there were daytime dysfunction were found higher 70% in Medical student followed by 68% in Staff nurses, 64% in Residents and 35% in Interns.

### Discussion

Sleep is an important physiological process of life. Sleep quality is directly related with mental, psychological, physical and emotional wellbeing. [10] It has already been previously studied that one-third of adult population suffers from difficulty in sleep. [11] As the aging progress, especially from childhood to adulthood a gradual decline in sleep time has been observed. [12] In humans, after 24 hours of continuous wakefulness, the metabolic activity of the brain decreases significantly. It also helps in the growth and development by releasing of growth hormone and increased breakdown and production of proteins. [13] Sleep quality is one's satisfaction with sleep experience, integrating aspects of sleep initiation, sleep maintenance, sleep quantity, and refreshment upon awakening. [14] Sleep is a basic human need of every person's overall health and wellbeing, which is affected by various factors such as physical, mental, and environmental. [15] Epidemiological evidence suggests that sleep duration and poor sleep are associated with premature mortality and various adverse health outcomes like cardiovascular diseases, immune system suppression, obesity, migraine, etc. [16,17]

In Our study, there were significant association between total global mean sleep quality, and component Daytime dysfunction among Medical students, Residents, Staff nurses. Daytime dysfunction was found to be high in Medical students 70%, followed by Staff

nurses 68%, Residents 64% and lowest in Interns 35%. El Hangouche, study showed Medical students had poor sleep quality and excessive daytime sleepiness and psychological distress. [18] In Kolagary et al.'s (2000) study, 65% of the nurses had difficulty in daily function due to sleep problems. Zahra Sepehrmanesh study showed 19.5% of the Nurses had daytime dysfunction. [19]

In our study, Staff nurse and Residents with rotation shift had poor quality sleep, among them Residents had higher mean PQSI score followed by Staff nurse and Interns. Alshahrani et al. study showed that healthcare workers with shift work had poorer sleep quality. [20] In our study Medical students who had coffee or caffeinated drink had poor quality sleep with higher PQSI score followed by Residents, Staff nurses, Interns. Medical students, and Residents who use Mobile at the time of sleep had poor quality of sleep. Those who had Cigarette smoking among all study population had poor sleep quality, but there was no statistically significant among them. Giri PA, study found medical students who were having coffee intake, alcohol abuse, smoking and use of mobile phones/laptop had disturbance with sleep. [21]

As poor sleep quality founded among Medical students, Residents, Staff nurses. Medical students are the future doctors who are going to care patients, so better learning at academic would come out as a quality Doctors to the population. Sleep problems have an effect on students' mental skill and activities like memory, concentration, self-confidence, thoughts and positive emotions, learning capability, and academic performance. [22] Residents and Staff nurses are pioneer for the health care delivery at Hospitals. Residents have to the care of patients with simultaneously academic workload. Sleep disturbance impact on judgment and performance of nurses and which lead to clinical errors and accidents. [23] Residents are having

reduce quality of life, fatigues, feeling of burnout, and sleep disturbances, all these factors which may risk for medical errors in performances. [24,25]

### Conclusion

Poor sleep quality was founded in Medical students, Residents and Staff nurses. Poor Sleep quality was high among Medical students compare to Residents and Staff nurses, Interns. Poor sleep quality association with daytime dysfunction was found among Medical students, Residents, Staff nurses. Other factors like Residents and Staff nurses with Rotation shift duty were having a poor quality of sleep. Coffee or caffeinated drink intake was found to have a poor sleep quality among Medical students, Residents, Staff nurses. Medical students and Residents who use Mobile at the time of going sleep had poor quality of sleep. Poor sleep quality found among Staff nurses, Medical students, Residents. Another research needs for identifying factor affecting poor quality of sleep to prevent consequences of disturbed or poor quality of sleep. Moreover, we recommend establishing counselling centres in the institute itself in promoting and providing general sleep education among them. Proper scheduling of the workload and working schedule can also help to some extent.

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