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### Study of sleep quality among residents, interns, staff nurses and medical students

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#### Abstract

**Introduction:** Good sleep quality is essential for physical and mental well-being. Sleep disturbances and poor sleep quality can impact on work performance of health professionals and health workers which effect on health care delivery to patients. Poor sleep quality or disturbance can impact on the academic performance of students and risk for developing various psychological disorders.

**Aims and Objectives:** To assess the quality of sleep and related factors among Residents, Interns, Staff nurses and Medical students.

**Material and Methods:** The Cross-Sectional study was carried out in January 2020 to March 2020 period. Total 200 persons were selected for study. Among them 50 Medical students, 50 Residents, 50 Staff nurses and 50 Interns. Pittsburgh Sleep Quality Index Scale, and Demographic Questionnaire were used for the collection of data.

**Results:** Among the study population, the highest poor sleep quality was found among medical student's total global mean PQSI score of 6.5 followed by residents (mean PQSI score 5.96), staff nurses (mean PQSI score 5.12). Interns had good sleep quality with mean PQSI score 3.85. There were significant association of sleep quality PQSI score among study population ( $p < 0.001$ ). Poor sleep quality had significant association with Daytime dysfunctions among Medical students, Residents, Staff nurses ( $p < 0.0001$ ).

**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

#### 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]. 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 [4]. Psychiatric problems like depression, anxiety, stress is seen in medical students with disturbed sleep [5]. Sleep deprivation have negative effect on performance of medical house staff in medical and surgical specialties [6]. 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 [7]. 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 [8]. 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 (Feleke *et al.* 2015, Wang and Gong 2006). Nursing staff with shift work has poor sleep quality which results in diminished performance quality and effect on patient's safety [9].

Insomnia can cause psychiatric disorders like depression, stress [10]. Chronic sleep disturbance can be a risk for substance abuse disorders [11].

As awareness about sleep disturbance and its impact on performances are less in common persons [12, 13]. Specially it's important in medical house persons to have an awareness about impact of sleep disturbances. Poor sleep quality has many consequences on medical persons which indirectly impact health care delivery to patients.

**Aim:** To Assess Quality of Sleep and related factors among Medical Students, Residents, Interns and Staff nurses.

#### Material and Methods

##### Study Design and Sample

A cross Sectional study was conducted during January 2020 to

March 2020 for approx. 2 months period among Medical students, Residents, Interns and Staff nurses enrolled at Mamata Medical College and Hospital, Khammam, Telangana. Total 200 sample were collected from study population, among them 50 Medical students, 50 Residents, 50 Interns and 50 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

Confidentiality of privacy was assured to all participants, and verbal consent was taken from each participate

### 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>[14]</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 consider 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. Result was evaluated by percentage, mean. For comparison of sleep quality among study population, first mean value was obtained for global pqs score separately from all, then standard deviation obtained, from this p value was obtained. Same for various pqs component score, sleep quality of study variable factors, sleep quality and daytime dysfunction component score of study population. Statistical significance was set at <0.05.

### Results

In this study mean (standard deviation) age for Medical students

were 21.3(1.01), Interns were 23(1.60), Staff nurses were 23.32(1.60), residents 26.4(0.98). Among study population, 74% female and 26% male in Medical students, 50% male and same male in Interns, 56% male and 44% female in Staff nurses, 72% male and 28% female in Residents. There were 84% Staff nurses had rotation shift work or duty, 72% Interns and 36% Residents had rotation shift duty. In study population all Residents, Interns and Medical students were non married, 40% of Staff nurses were married.

Coffee or Caffeinated drink intake were reported by 76% Staff nurses followed by 68% Residents, 54% Medical students and 44% Interns. Alcohol intake was reported 36% among Residents followed by 28% Interns, 20% Staff nurses and 2% Medical students. Cigarette or bidi smoking was reported by 28% Staff nurses, 20% Interns, 8% Residents and 2% Medical students. All were using Mobile or laptop at the time of sleep except 10% Medical students reported not using of mobile or laptop at the time of going for sleep and 16% Staff nurses. (Table 1)

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(3.27), and Staff nurses with mean global pqs score 5.12(2.32). Interns were found to be a having good sleep quality with mean global pqs score 3.84(2.8). There was significant association between global poor sleep quality score and Daytime dysfunction among Medical students, Residents, Staff nurses (p<0.00001) (table 3)

In component of Daytime dysfunction score, there were daytime dysfunction were found higher 68% in Medical student followed by 64% in Staff nurses, 60% in Residents and 30% in Interns (p=0.002). Sleep latency problem were high in Staff nurses 92% followed by 78% Medical students, 72% Residents and 52% Interns (p=0.01) (table 2)

Resident with rotation shift duty had high poor sleep quality with mean global pqs score 6.66 than Staff nurses (mean pqs score 5.38) and Interns (mean pqs score 4.58) (p=0.035) (table 1)

Coffee or Caffeinated drink among Medical students, Residents, Staff nurses had high mean global sleep quality score >5 than Interns (p=0.006). Mobile using at the time of sleep among Medical students, Residents had high global sleep quality score >5 than Staff nurses and Interns (p<0.0001). Interns who is taking alcohol intake had poor sleep quality. Staff nurses and Interns who had Cigarette smoking had poor sleep quality (table 1)

**Table 1:** Sociodemographic variable of study sample and mean global pqs score among various factors. SD=standard deviation, pqs=Pittsburgh Sleep Quality Index

Sociodemographic Variable	Medical students	residents	Staff nurses	Interns
Age in years mean (SD)	21.3(1.01)	26.4(0.98)	23.32(1.60)	23(1.60)
Sex				
Male	13(26%)	36(72%)	28(56%)	25 (50%)
Female	37(74%)	14(28%)	22(44%)	25 (50%)
Total N	50	50	50	50
Global Pqs score mean (SD)	6.5(3.67)	5.96(3.27)	5.12(2.32)	3.84(2.88) p<0.001
Duty shift				
rotation	-	18(36%)	42(84%)	36(72%) P=0.035
Pqs score mean	-	6.66(3.81)	5.38(2.24)	4.58(2.99)
fixed	-	32(64%)	8(16%)	14(28%)
Pqs score mean	-	5.56	4.8	2.14
Alcohol intake	01 (02%)	18 (36%)	10(20%)	14(28%)

Pqsi score mean	10	4.88	3.2	5.14
Cigarette or bidi smoking	01(02%)	04(8%)	14(28%)	10(20%)
Pqsi score mean	10	05	6.5	6.2
Coffee or caffeinated drink intake	27(54%)	34(68%)	38(76%)	22(44%) P=0.006
Pqsi 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	45(90%)	50(100%)	42(84%)	50(100%)
pqsi score mean	6.5(3.52)	5.96(3.27)	4.66(2.03)	3.84(2.88) P<0.0001

**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)	6.5(3.67)	5.96(3.24)	5.12(2.32)	3.84(2.88)	<0.001
Daytime dysfunction mean (SD)	1.18(1.02)	0.84(0.79)	0.92(0.80)	0.52(0.86)	0.002
Sleep latency mean (SD)	1.46(1.16)	1.44(1.18)	1.24(0.65)	0.76(0.87)	0.014
Sleep duration mean (SD)	1(0.90)	1.04(0.72)	0.44(0.50)	0.48(0.50)	<0.0001
Sleep disturbances mean (SD)	1.2(0.67)	1.12(0.32)	0.92(0.56)	1(0.49)	0.043

**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
Total (N)	50	50	50
Global PQSI Score mean (SD)	6.5(3.67)	5.96(3.24)	5.12(2.32)
Day Time Dysfunction N (percentage)	34(68%)	30(60%)	32(64%)
Mean (SD)	1.18(1.02)	0.84(0.79)	0.92(0.80)
P Value	<0.00001	<0.00001	<0.00001

## Discussion

As Aim of study was to know sleep quality among Medical students, Interns, Residents, Staff nurses. In our study 76% Medical students which had higher poor sleep quality sleep followed by Residents 64%, Staff nurses 60%, Interns 36%. GIRI PA, study showed sleep disturbances is high in Postgraduates and Medical students as compared to Interns [15]. Haytham I. Al Saif, SBFM study showed that poor sleep quality is higher rate in Residents (86.3%) than Medical students (74.2%) [16]. The overall sleep disorders of clinical Nurses are high 42% (Han Y, 2016) [17]. Study conducted in kums hospital Iran by Zahra Sepehrmanesh, reported that 191 nurses (95.5%) had sleep problems [18].

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 68%, followed by Staff nurses 64%, Residents 60% and lowest in Interns 30%. El Hangouche, study showed Medical students had poor sleep quality and excessive daytime sleepiness and psychological distress [19]. 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 [18]. In our study 64% Nurses had daytime dysfunction.

In our study PQSI component sleep latency problem was higher in Staff nurses compare to Medical students, Residents, and Interns. Salehi *et al.* study showed Staff nurses had higher sleep latency problem [20]. In our study in PQSI component of use of sleep medication, higher use of medication reported by 30% Staff nurses followed by 10% Residents, 8% Medical students and 2% Interns, but these were no significant statistically for sleep medication uses component among all.

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 [21].

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 [15].

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].

## 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.

### Limitation

There was limited sample size, there may be underreporting of information related to substance use by study population. There was no specificity of quantity of taking substance use information.

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