

Observational Study to Assess the Sleep Quality Among Residents, Interns, Staff Nurses and Medical Students Using Pittsburgh Sleep Quality Index Scale Questionnaire (PQSI Score)

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Abstract

Aim: Study of sleep quality among residents, interns, staff nurses and medical students.

Material and Methods: Total 240 samples were collected from study population, among them 60 Medical students, 60 Residents, 60 Interns and 60 Staff nurses. Confidentiality of privacy was assured to all participants, and verbal consent was taken from each participate. 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.

Results: In this study mean (standard deviation) age for medical students were 22.3(1.01), Interns were 24(1.60), Staff nurses were 24.32(1.60), residents 27.4(0.98). Among study population, 61.67% female and 38.33% male in medical students, 50% male and same male in Interns, 63.33% male and 36.67% female in Staff nurses, 60% male and 40% female in Residents. There were 71.66% Staff nurses had rotation shift work or duty, 61.66% Interns and 31.67% Residents had rotation shift duty. Poor sleep quality was founded highest among medical students with the global mean (standard deviation) PQSI score 6.6(3.68) than Residents with mean global PQSI score 5.97(3.28), and Staff nurses with mean global PQSI score 5.13(2.33). Interns were found to be a having good sleep quality with mean global PQSI score 3.85(2.9). There was significant sleep quality score among them ($p < 0.002$). There were significant association between global poor sleep quality score and Daytime dysfunction among medical students, Residents, Staff nurses ($p < 0.00002$) (table 3) In component of Daytime dysfunction score, there were daytime dysfunction were found higher 68.33% in medical student followed by 65% in Staff nurses, 60% in Residents and 30% in Interns ($p = 0.003$).

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.

Keywords: Sleep quality, health professionals, PQSI score.

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Introduction:

Sleep is an integral part of human physiology; it could be refreshing and healing. Therefore, disorders of sleep may result in significant derangement in human functionality. Therefore, the need for getting sufficient sleep cannot be overemphasized. Lack of sufficient sleep has been associated with significant weight gain, cardiovascular diseases such as hypertension, neurologic disorders such as Alzheimer's disease, and stroke. Quite recently, a Chinese doctor in 2018 collapsed and died after an 18-h nonstop shift duty without sleep though this was attributed to a subarachnoid hemorrhage from a ruptured cerebral aneurysm; whether lack of sleep had a significant role in her death remains unclear[1]. Lack of sleep also depresses the immune system and also results in loss of memory; this will be particularly alarming for health workers whose primary responsibility is to care for the sick; their job is delicate and gives no room for error, especially in times of decision-making, drug calculation, and administration.

The National Sleep Foundation in the United States of America states that sleep duration vary with age; in the first 3 months of life it is between 14 and 17 h; between 4 and 11 months is 12–15 h; among toddlers it is 11–14 h; in preschoolers and scholar's it is between 10 and 13 h; in teenagers it is 8–10 h while adults should sleep for between 7 and 9 h[2]. However, the mean sleep duration has been shown to vary in different countries; Sweileh et al.,[3] in Nablus, Palestine,

reported a mean sleep duration of 6.4 ± 1.1 h in 400 subjects studied in 2009.

Poor sleep quality had been reported among health professionals, Nazatul et al.,[4] Chien et al.,[5] and Aliyu et al.[6] reported poor sleep quality among Malaysian, Chinese, and Nigerian nurses; similar observations were reported by Surani et al.[7] and Vela-Bueno et al.[8] among physicians. Sleep disorder may result in excessive daytime sleepiness, impaired judgment, and poor neurocognitive and psychomotor performance; these may result in error of clinical decision-making detrimental to patient health.[9-14] There is obviously dearth of local information on sleep disorders, especially among health workers[6,9].

Material and methods:

This cross sectional study was carried out in the Department of Psychiatry, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, UP, India, for 18 months.

Total 240 sample were collected from study population, among them 60 Medical students, 60 Residents, 60 Interns and 60 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 participant

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[14]: 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 25.0 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 22.3(1.01), Interns were 24(1.60), Staff nurses were 24.32(1.60), residents 27.4(0.98). Among study population, 61.67% female and 38.33% male in Medical students, 50% male and same male in Interns, 63.33% male and 36.67% female in Staff nurses, 60% male and 40% female in Residents. There were 71.66% Staff nurses had rotation shift work or duty, 61.66% Interns and 31.67% 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 76.66% Staff nurses followed by 68.66% Residents, 55% Medical students and 40% Interns. Alcohol intake was reported 36.66% among Residents followed by 28.33% Interns, 20% Staff nurses and 3.3% Medical students. Cigarette or bidi smoking was reported by 28.33% Staff nurses, 20% Interns, 8.3% Residents and 3.3% Medical students. All were using Mobile or laptop at the time of sleep except 8.34% Medical students reported not using of mobile or laptop at the time of going for sleep and 16.67% Staff nurses. (Table 1)

Poor sleep quality was founded highest among Medical students with the global mean (standard deviation) pqs score 6.6(3.68) than Residents with mean global pqs score 5.97(3.28), and Staff nurses with mean global pqs score 5.13(2.33). Interns were found to be a having good sleep quality with mean global pqs score 3.85(2.9). There was significant sleep quality score among them ($p < 0.002$). There were significant association between global poor sleep quality score and Daytime dysfunction among Medical students, Residents, Staff nurses ($p < 0.00002$) (table 3) In component of Daytime dysfunction score, there were daytime dysfunction were found higher 68.33% in Medical student followed by 65%

in Staff nurses, 60% in Residents and 30% in Interns ($p=0.003$). 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 pqsi score 6.67 than Staff nurses (mean pqsi score 5.39) and Interns (mean pqsi score 4.59) ($p=0.036$) (table 1) Coffee or Caffeinated

drink among Medical students, Residents, Staff nurses had high mean global sleep quality score >5 than Interns ($p=0.007$). Mobile using at the time of sleep among Medical students, Residents had high global sleep quality score >5 than Staff nurses and Interns ($p<0.0002$). Interns who are 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 pqsi score among various factors

Sociodemographic Variable	Medical students	Residents	Staff nurses	Interns
Age in years mean (SD)	22.3(1.01)	27.4(0.98)	24.32(1.60)	24(1.60)
Sex				
Male	23(38.33%)	36(60%)	38(63.33%)	30 (50%)
Female	37(61.67%)	24(40%)	22(36.67%)	30 (50%)
Total N	60	60	60	60
Global PQSI score mean (SD)	6.6(3.68)	5.97(3.28)	5.13(2.33)	3.85(2.89) $p<0.002$
Duty shift				
Rotation	-	19(31.67%)	43(71.66%)	37(61.66%) $P=0.036$
PQSI score mean	-	6.67(3.82)	5.39(2.25)	4.59(2.99)
Fixed	-	33(55%)	10(16.66%)	16(26.66%)
PQSI score mean	-	5.57	4.9	2.15
Alcohol intake	02 (3.3%)	22(36.66%)	12(20%)	17(28.33%)
PQSI score mean	11	4.89	3.3	5.15
Cigarette or bidi smoking	02(3.3%)	05(8.3%)	17(28.33%)	12(20%)
PQSI score mean	11	06	6.6	6.3
Coffee or caffeinated drink intake	33(55%)	41 (68.33%)	46(76.66%)	24(40%) $P=0.007$
PQSI score mean	6.30(4.06)	5.77(3.19)	5.27(2.40)	3.37(1.87)
Mobile use at the time of sleep	55(91.66%)	60(100%)	50(83.33%)	60(100%)
PQSI score mean	6.6(3.53)	5.97(3.28)	4.67(2.04)	3.85(2.89) $P<0.0002$

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)	6.6(3.68)	5.97(3.25)	5.13(2.33)	3.85(2.89)	<0.002
Daytime dysfunction mean (SD)	1.19(1.03)	0.85(0.80)	0.93(0.81)	0.53(0.87)	0.003
Sleep latency mean (SD)	1.47(1.17)	1.45(1.19)	1.25(0.66)	0.77(0.88)	0.015
Sleep duration mean (SD)	2(0.99)	1.05(0.73)	0.45(0.51)	0.49(0.51)	<0.0002
Sleep disturbances mean (SD)	1.3(0.68)	1.13(0.33)	0.93(0.57)	2(0.59)	0.044

Table 3: Comparison of Poor Sleep Quality with High Pqsi Score with Daytime Dysfunction Component among Study Population,

	Medical Students	Residents	Staff Nurses
Total (N)	60	60	60
Global PQSI Score mean (SD)	6.6(3.66)	5.96(3.24)	5.12(2.32)
Day Time Dysfunction N (percentage)	41(68.33%)	36(60%)	39(65%)
Mean (SD)	1.19(1.03)	0.85(0.80)	0.93(0.81)
P Value	<0.00002	<0.00002	<0.00002

Discussion:

The effect of sleep loss is cumulative; significant buildup may result in complications ranging from mood swings to cognitive malfunction and errors of judgment[15]. This study explored the sleep quality of medical doctors in a tertiary center in a semi-urban setting. The age range of the respondents was between 20 and 66 years, with a mean of 34 ± 8 years; this observation was similar to that of Kolo et al[9].

Unfortunately, all respondents in this study were poor sleepers; this observation is higher than the 85% reported by Zamanian et al.[16], 43.1% reported by Ghalichi et al.[17], 54.2% reported by Aliyu et al.[6], and 61% reported by Kolo et al., respectively[9]; the fewer staff strength in our institution mean that doctors are likely to have frequent call duties, and in a setting of high patient load, they are likely to be overburdened resulting in more sleep loss and deprivation.

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. 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 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.

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