

TO COMPARE SLEEP QUALITY AMONG BASIC SCIENCES & CLINICAL POST GRADUATES TRAINEES WORKING AT TERTIARY CARE TEACHING HOSPITALS AND ALLIED COLLEGE

Nomira Waheed, Mamuna Qayum*, Waleed Ali**

University of Lahore, Lahore Pakistan, *Rahbar Medical and Dental Colleges Lahore Pakistan, **Mayo Hospital Lahore Pakistan

ABSTRACT

Objective: To compare sleep quality among clinical faculties and post graduates trainees working at tertiary care teaching hospitals Lahore and basic sciences trainees selected from allied colleges.

Study Design: Comparative cross sectional study.

Place and Duration of Study: This study was conducted over period of three months, Jan 2018 to Apr 2018 in Mayo Hospital Lahore, Lady Atchison Hospital Lahore and King Edward Medical University Lahore.

Patients and Methods: Post graduate trainees were evaluated during a time period of January 2018 to April 2018 after taking consent as per declaration of Helsinki. These were divided in two equal groups of clinical and Para-clinical faculties. All relevant data was collected by a validated questionnaire, Pittsburgh sleep quality Index (PSQI). It is used as tool for assessment of, subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medication and day-time sleepiness.

Results: One hundred residents participated in study. Fifty residents were from clinical faculties departments of general medicine, pediatrics, psychiatry, general surgery, orthopedic surgery, and obstetrics-gynecology. The Para clinical faculties consist of department of anatomy, physiology, forensic medicine, community medicine, biochemistry, pathology and microbiology. Among clinical group 36 are poor sleepers (PSQI ≥ 5) compared to 05 of non-clinical group. The difference was found significant ($p \leq 0.0001$ by fisher's exact test-2-tailed). The results revealed that clinical faculty residents have less sleep duration and poor sleep quality. On the other-side sleep efficiency was most affected in para-clinical faculties group. The day time sleepiness and use of sleep medication was more in poor sleeping individuals.

Conclusion: Our study highlighted poor sleep quality among clinical postgraduate's residents. It is recommended to introduce manageable working hours and shifts of convenient duration.

Keywords: Assessment, Post graduate-Residents, Sleep quality.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Sleep is defined as a state of rest, during which there is natural unconsciousness due to, non apparent brain activity, apart from basic maintenance functions of body¹. It is an outcome of circadian rhythm- a reversible state of slowing brain electrical activity, altered autonomic changes and muscle tone. In circadian rhythm, a healthy mind and a state of wellbeing requires adequate duration and quality of sleep. According to National sleep foundation in Washington. DC, average requirement of sleep for adult is 7-9 hours per day², but it varies according to age and

individuals. Loss of adequate hours of sleep at night results in sleep deprivation. In a highly skilled and stressful occupation of medical profession, it has schedules that conflict with circadian rhythms which predispose to physical, mental, emotional, and psychological fatigue³ due to sleep deprivation. It is seen that during training, duty hours are very tough and prolong with reduced period of relaxation. In South Korea residents doctors have 24 hour-on-call shift every other day or every third day⁴. It means residents perform night duty followed by routine day time working hours. These prolong working hour's results in acute or chronic stress. Macrothink institute of Pakistan research found stress have drastic impact that results in several problems as headaches, stomach aches; sleep deprivation etc⁵.

Correspondence: DrMamunaQayum, House# 206, Street No# 3 Sector A DHA Phase-5 Lahore Pakistan

Email: mahmunawaheed123@gmail.com

Received: 13 Jun 2018; revised received:01-Oct-2018; accepted: 17Oct 2018

Sleep deprivation affects on central nervous system resulting in sensory motor disturbance and life threatening situations⁶, which have disastrous effects for doctors and patients. Realizing these issues, in North America the Accreditation council for graduate medical education introduced new regulation for residents. In these first year residents have maximum shift of 16 hours and in subsequent years it is restricted up to 24 hours⁷. In Pakistan, the duty hours of post-graduate trainees are rigorously hard-hitting 60-90 hrs a week⁸. Generally a shift of 36-48 hrs and in case of ward week (from saturday morning at the start of week- till saturday evening of next week) postgraduate resident remain in ward, over burdened with a little period of relaxation. Spending 80-90 hours per week in hospitals causes sleep deprivation and negative work performance by the trainee doctors. According to the Pakistan economic survey 2017-18 the doctor-patients ratio is one doctor for 957 persons. It is now realized that in spite of less numbers of doctors⁹ compared to population, working hours of residents needs to be revisited, to get better performance and motivation. Various studies from corner to corner of the globe have tried to grasp the attention of health establishment and individuals to monitor fatigue and sleep deprivation of residents along with help of other chief residents¹⁰. These helped to deal the adverse affects of sleep deprivation on doctor's performance and enthusiasm, their cognitive capability, behavior frustration about health-life¹¹. The aim of current research was focused to highlight sleep quality of post graduate trainees in clinical and Paraclinical faculties, in tertiary care hospitals of Lahore and Allied colleges. It will help to identify the difference between sleep qualities of residents in different specialties.

MATERIAL AND METHODS

This comparative cross sectional study was carried out in Mayo Hospital Lahore, Lady Atchison Hospital Lahore, and allied colleges-King Edward Medical University Lahore during a period of Jan 2018 to April 2018. Sample size was calculated by WHO calculator for sample

size¹². Population proportion was taken as 78.84% and absolute precision 10%. A total of 100 post graduate trainees doctors were evaluated after taking informed consent by simple random sampling. Doctors who were registered with Pakistan Medical and Dental Council (PMDC) were included in the study. The age limit was 26 years to 40 years. They are enrolled in a structured training program, and working, in their respective teaching hospitals and allied colleges exclusively. The exclusion criteria's were pregnant and lactating female doctors. The trainees with sleep disorders such as insomnia, parasomnia, obstructive sleep apnea, depression were excluded. The trainee doctors on stimulants and anti depressants drugs were also excluded from the study. The residents with medical diseases like, diabetes, hypertension, asthma, heart, lung and renal disease, auto immune disease, endocrinological diseases were excluded. The subjects having age less than 26 years or more than 40 years were also excluded. Those residents were not included who were doing jobs in clinics or hospitals in addition to their training (teaching) hospitals and allied college. Subjects were given validated self-administered questionnaires, using Pittsburgh sleep quality index (PSQI) scale. Pitts-sleep quality index scale is a questionnaire, measuring subjective sleep quality and disturbance over previous month and differentiate among normal and poor sleepers. It measures sleep quality across seven domains i.e. subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, sleep medication and day-time dysfunction¹³. The combined scores obtained indicate, good sleepers (score <5) and poor sleepers (score ≥5). Performa were distributed among residents during their regular duty hours. The subjects were selected randomly for sample size according to simple random technique. One group of 50 trainees were from Para-clinical faculties-departments of anatomy, physiology, biochemistry, community medicine, pathology, and microbiology. These have minimal to no contact with patients during working periods. Second group of 50 residents from

clinical faculties-departments of Medicine & Allied and Surgery & Allied. These have direct contact with patients during their working hours. The performa consisted of detail history, information about marital status and children. They were asked questions about duty hours sleep latency, sleeping deprivation, effects of sleep deprivation on performance, sleep disturbance, use of any medicine for sleep and sleep latency. It also included medical errors, accidents, and infections. Data was analyzed in SPSS

clinical group trainees. Among these 42 female and male were 58 in number. The mean age was 29.5 ± 2.3 years. Among the clinical group 36 residents were poor sleepers compared to 05 of Para clinical group (PSQI ≥ 5). The difference between two groups was statistically significant $p < 0.001$ by Fisher's exact test-2 - tailed as shown in table-I. In table-II sleep quality was deranged in poor sleepers, when compared to normal sleepers, which is statistically significant. As far sleep time, sleep onset latency, day time dysfunc-

Table-I: Comparison of sleep quality between clinical and Para-clinical groups, using Pitts-sleep quality index score.

	Normal sleepers	Poor Sleepers	Total	<i>p</i> -value
Para-clinical	45	5	50	0.001**
Clinical	14	36	50	
Total	59	41	100	

p-value $\leq 0.05^*$ is significant. PSQI ≥ 5 , PSQI < 5 .

Table-II: Comparison of various measures between normal and poor sleeper.

Variables	Normal sleepers N=59	Poor sleepers N=41	<i>p</i> -value
Mean PSQI score (SD)	3.7 (0.2)	7.9 (0.33)	0.001*
Mean total sleep time (SD)	19 (2.4)	57.5 (8.9)	0.001*
Mean Sleep onset latency (SD)	17.5 (3.79)	35.5 (6.87)	0.001*
Day time dysfunction n (%)	4 (7%)	20 (49%)	0.001*
Use of sleep medication n (%)	0	10 (24%)	0.001*

p-value $\leq 0.05^*$ is significant, PSQI: Pitts sleep quality index, SD: Standard Deviation.

Table-III: Comparison of sleep disturbances between poor and normal sleepers.

Sleep disturbance. Once or more week	Normal Sleepers N=59 n (%)	Poor sleepers N=41 n (%)	<i>p</i> -value
Can't go to sleep in 30 min.	4 (7%)	10 (24%)	0.01*
Wake up in middle of night or early morning.	12 (20.3%)	19 (46%)	0.005*
Have to go to bath room	10 (17%)	18 (44%)	0.003*
Have bad dreams	4 (7%)	15 (37%)	0.001*
Snore loudly	3 (5%)	10 (24%)	0.005*

p-value $\leq 0.05^*$ is significant.

version 21. Descriptive statistics like mean, standard deviation, frequency and percentage were calculated. Chi-square/Fisher's exact test was applied for the comparison of categorical variables. Independent sample test was applied for the comparison of score. Level of significance was kept 0.05.

RESULTS

Of the 100 postgraduate trainees doctors who participated, 50 were of basic sciences and rest of 50 of clinical faculties. Sleep quality and sleep duration was most affected among the

tion and use of sleep medication, concerned there is statistically significant difference presents. The residents with sleep latency > 30 minutes and total sleep time < 6 hours were associated with poor sleep quality and significant statistically. The poor sleeper can't go to sleep in 30 minutes and have sleep disturbance due to waking up at night due to different reason as shown in table-III.

DISCUSSION

Doctors are pillars of health services in a country. A doctor's physical and mental health

must be perfect. Mental health is the ability of an individual to form harmonious relations with others and participate in social and physically environment positively. Sleep deprivation is most common in postgraduate trainees due to prolong duty hours. In general, sleep deprivation results in poor sleep quality and affects male and female of all ages depending upon their job shift and workloads. The goal of present study is to compare sleep quality in clinical and para clinical postgraduate trainees, as they progress from the stress free life to stressful time of training. A resident doctor of clinical faculty in a teaching hospital is dealing a large number of patients. The areas of responsibility for resident are, Outpatients department (OPD), in patients department (Wards), Theater, Trauma center, Emergency on calls and Consultation liaison duties. In a single unit these duties are not clearly divided, so each resident is expected to perform many of these duties and involved at all levels to increase learning process. This result in prolong working hour ranging 18-36 hours at stretch twice or thrice in a week. The emergency duty is once or twice in a month, continuous for 12-48 hours at a stretch when with special Sunday. There are ward weeks after every 5-6 weeks in which the residents stay's in ward for complete one week (saturday morning to next saturday afternoon). In para-clinical faculties the trainee work for 8 hours, with no evening and night duties and have emergency duty on rotational basis in their departments-laboratories. In our study, we found that clinical faculty trainees are poor sleeper than para-clinical. Same results were found in a research at Turkey that sleep quality of resident was affected by excessive duty hours and number of night duties. This lead to day time sleepiness. They concluded that medical residents in Surgical & Allied had poor sleep quality¹⁴. Our study supported clinical faculties residents have poor sleep quality, than para clinical faculties trainees. This correlation is, same as a study carried out in neighboring country¹⁵. Similar results were found in Albert-Ludwigs University Freiburg, Freiburg in Breisgau, Germany that significant

deterioration of sleep quality and well-being was when a resident enters in training program¹⁶. Due to lack of sleep mental health is impaired. In another local study 78.8% postgraduate residents reported sleep deficit⁸. Poor sleep quality affects memory process and learning capabilities³. The result is, junior doctors opportunity to extract maximum knowledge from training system is compromised. Sleep deprivation, day time stress and sleepiness are factors that affect the performance of post-graduate residents. Same results were found in longitudinal observational survey in multiple specialties at Partners Health Care hospitals USA where first year residents had changed in sleep pattern when sleep deprived¹⁷. The aforementioned perspective is consistent with our finding that day time dysfunction increase up to 49% in poor sleepers. Our results are similar to a foreign research about excessive day time sleepiness 28.8% and poor sleep quality 59.3% among residents¹⁸. Similar results were established in a research at Brazil, about sleep deprivation and excessive sleepiness in residents¹⁹. To improve sleep quality the department of radiation oncology introduced The Sleep, Alertness, and Fatigue Education in Residency (SAFER) module for residents and core faculty members²⁰. In this module the chief resident makes appropriate alternate arrangements to relieve them of duties if fatigue and sleep deprivation is suspected which adversely affects learning process, patient care and surgical procedures. The present study reflects that poor sleeping subjects use sleep medicine 24%, mostly by clinical faculties trainees because they are in direct contact with patients care. Similar results were found in a study carried out in India where it was found that poor sleep, and day time sleepiness in residents results in less satisfaction with life and use sleep medication of addictive potential at some time during residency²¹. They reported, it was more common in clinical faculty trainee doctors, because they face tough routine. In addition they have to ensure a pleasant attitude toward patients relatives and make critical therapeutic decisions¹⁴, but due to poor

sleep quality gets defeated. In Pakistan the aim to become a specialist doctor comprise of premedical school, five years of Medical College, one year of house job followed by post graduate training program of three to seven years depending upon the chosen specialty. Trainee has to get education and at the same time service to the institute minding the hospital labor need. The residency curriculum administrator seriously concentrates on educational obligations, but trainees are economical source of extremely skilled job that can fill gaps in coverage²². The beauty of Pakistani culture is strong family system. During training some residents are married with children as well. In addition to family responsibility their money is required for residency requirements. The requirements are increased when doing training away from home station, female doctors, with children and if both partners are in residency program. In addition, less amount of the stipend stimulates residents to work in their free time, increasing the workload and reducing sleep time and leisure. Thus, the creation of an exclusive dedicated regiment for medical residency with better pay and better working conditions are failed. These aspects create frustration and can pilot to poor sleep quality ending making mistakes at duty²³ especially in the emergency and trauma center departments in public hospitals. In a developed country like US, medication errors cost \$4 billion annually, and many patients lost their lives²⁴. These problems are addressed by America's leading voice Pamela Wible, who found that 75% of medical residents are on anti depressants or stimulants or both²⁵. Same alarming situation of poor sleep quality is found in many parts of globe²⁶ and in our research as well. It is a comparative cross sectional study based on self reported measures. Its limitations are respondents bias, and recall bias can't be ruled out. In it we use a validated tool with established reliability. Inclusion of questionnaire to measure sleep quality in different ways proved that results are reliable and reasonably valid. The response rate was 97%. The reason for non-responder was lack of time. The results of study may be

generalized to other residents groups with similar occupational distinctiveness and settings.

CONCLUSION

Our study highlighted poor sleep quality among clinical post-graduates residents. It is important to realize the need for timely recognition of poor sleep quality of post graduate trainees. It requires intercession to introduce flexible duty hours and modify teaching schedules according to the philosophy, and practice of sleep hygiene, for post graduate medical residents. Such reforms will ensure an improve quality of life for the trainee who will functions at his best, in providing patient care. This is the ultimate goal to achieve in medicine, by Post graduate residents.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

REFERENCES

1. Definition of sleep noun from the Oxford Advanced Learner's Dictionary. Oxford University Press 2018.
2. National Sleep Foundation Recommends New Sleep Times. Sleep Health; J Clin Sleep Med 2018; 4(3): 233-43.
3. Rosalyn M. King, Schumacher M, Desmond Sipes. The Effects of Sleep Deprivation on Memory, Problem Solving, and Critical Thinking. An Ex-Post Facto Experimental Study 2015.
4. Lim SK, Yoo SJ, Koo DL. Stress and sleep quality in doctors working on-call shifts are associated with functional gastrointestinal disorders. World J Gastroenterol 2017; 23(18): 3330-37.
5. Aslam HD, Mansoor N, Suleman Q. Analysis of Level of Stress among Doctors in Public and Private Hospitals of Pakistan. Intl J Lear Devel 2013; 3(2): 109-35.
6. Drossman DA. Functional Gastrointestinal Disorders: History, Pathophysiology, Clinical Features and Rome IV. Gastro-enterology 2016; 150(6): 1262-79.
7. Iglehart JK: The ACGME's final duty-hours standards-Special PGY-1 limits and strategic napping. N Engl J Med 2010; 363: 1589-91.
8. Mustahsan SM, Ali SM, Khalid F, Mohsin Ali AA, Ahmed H, Ali Hashmi SA, et al. Sleep deprivation and its consequences on house officers and postgraduate trainees. J Pak Med Assoc 2013; 63(4): 540-3.
9. Health & Nutrition-Ministry of Finance. Pakistan Economic Survey 2017-18.
10. University of Illinois Cherted 1867. Metropolitan Group of Hospital. Manual Resident Policies & Procedure final. 2017-2018.
11. William DS. Killgore, Thomas J. Balkin, Angela M, Yarnellb, Vincent F, Capaldi II. Sleep deprivation impairs recognition of specific emotions. Neurobiology of Sleep and Circadian Rhythms 2017; 3: 10-16.
12. NCDs | STEPS Sample Size Calculator and Sampling Spread sheet. <http://www.who.int/ncds/steps/resources>.

13. Hashmi AM1, Khawaja IS2, Butt Z3, Umair M4, Naqvi SH4, Jawad-Ul-Haq. The Pittsburgh Sleep Quality Index: Validation of the Urdu Translation J Coll Physicians Surg Pak 2014; 24(2): 123-26.
 14. Ayşe Didem Esen, Gözde Nizamoğlu Mercan, Ezgi Kaçar, Dilek Toprak. Sleep Quality and Related Factors in Medical Residents. TurkJ Family Med Prim Care 2017; 11(4): 271-77.
 15. Vasant meghna, Srinivasa Murth, Ajita Sunil Nayak. Assessment of sleep quality in post-graduate residents in a tertiary hospital and teaching institute. Ind Psychiatry J 2014; 23(1): 23-26.
 16. Kathrin Wunsch, Nadine Kasten, Reinhard Fuchs. The effect of physical activity on sleep quality, well-being, and affect in academic stress periods. Nat Sci Sleep 2017; 9: 117-26.
 17. Zebrowski JP, Pulliam SJ, Denninger JW, Berkowitz LR. So Tired: Predictive Utility of Baseline Sleep Screening in a Longitudinal Observational Survey Cohort of First-Year Residents. J Gen Intern Med 2018; 33(6): 825-30.
 18. Aguiar Melo MC, Chagas Medeiros FD, de Bruin VMS, Abraão Pinheiro Santana J, Bastos Lima A, Francesco Daher ED. Sleep Quality Among Psychiatry Residents. Can J Psychiatry 2016; 61(1): 44-49.
 19. Purim KS, Guimaraes AT, Titski AC, Leite N. Sleep deprivation and drowsiness of medical residents and medical students. Rev Col Bras Cir 2016; 43(6): 438-44.
 20. Duty Hours in the Learning and Working Environment and Fatigue. UCSF Department of Radiation Oncology. The Regents of the University of California 2015.
 21. Siddalingaiah HS, Chaudhuri A, Chandrakala D, Amarjeet Singh. Excessive daytime sleepiness and its determinants: do they have a pattern with study semesters among postgraduate medical resident doctors? Int J Community Med Public Health 2018; 5(1): 382-89.
 22. Ryan Park. Why so many young Doctors work such awful hours. Neither truck drivers nor bankers would put up with a system like the one that influences medical residents' schedules. The Atlantic 2017.
 23. Wible P. 75% medical students and residents are on anti-depressant or stimulants or both. Ideal medical care Sep 4, 2017.
 24. Graban M. Statistics on Healthcare Quality and Patient Safety Problems Errors and Harm. August 9, 2009.
 25. Alhifzi S, Al-Ghonimy A, Al Aboudi M, Al Abdullah R, Olaish A, BaHammam AS. Assessment of Sleep Quality, Daytime Sleepiness, and Depression among Emergency Physicians Working in Shifts. J Nat Sci Med 2018; 1: 17-21.
 26. Siddalingaiah HS, Chandrakala D, Amarjeet S. Sleep pattern, sleep problems and comorbidities among resident doctors at a tertiary care institution in India: a cross sectional study. Int J Community Med Public Health 2017; 4(12): 4477-84.
-