

# Orthopedic, Clinical, and Paraclinical Resident Working Pattern in A Government Tertiary Care Hospital in Western India

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## Abstract

**Background:** In 2003, the Accreditation Council for Graduate Medical Education in the United States (US) had laid guidelines for resident doctor working hours, with Institute of Medicine setting further changes in 2010, with the sole aim of enhancing patient care. In India, no such guideline exists. They are a few dedicated studies of resident working pattern studying their stress levels, mental health, and other aspects. With overburdened understaffed government teaching hospitals and lack of facilities, resident doctors who form the backbone of patient care are overworked. With this background, we undertook this study at a tertiary care government hospital in Western India with the aim of understanding the working pattern of residents.

**Materials and Methods:** The study enrolled 38 residents. All these residents enrolled had Monday as emergency day. The residents included were from clinical and paraclinical specialties, and from the first, second, and third postgraduate years. These residents were followed for a week starting Monday to Sunday and a questionnaire was filled regarding their working hours, sleep duration, and eating pattern. Appropriate statistical test was applied.

**Results:** The results showed that the 1<sup>st</sup> year resident (junior resident) worked 114 h per week, slept for only 35 h per week, attended to 261 patients, and the continuous work at a stretch was 24 h (minimum - 19 to maximum - 30). The 2<sup>nd</sup> year (senior resident) and 3<sup>rd</sup> year (chief resident) residents had slightly more sleep hours and less working hours, however compared to the US and United Kingdom standards, the residents were overworked and underslept.

**Conclusion:** The study is a pilot study at a tertiary care hospital which shows that residents have inadequate sleep hours/week, excess working hours/week (>80 per week), along with other parameters as mentioned in results which directly affect patient care, thus suggesting setting guidelines for residents in India on lines of the United States, Europe.

**Key words:** Resident Medical Officer, Tertiary care center, Working pattern

## INTRODUCTION

India is a developing country with a billion plus population, most of which is underprivileged and poor. Majority of the population cannot afford the costly private medical health services and depend on the government health-care centers (PHC, rural hospitals, and district hospitals).

The government-run medical colleges and general hospitals provide the tertiary care for large section of the Indian public at a miniscule or else free of cost, these medical services are grossly underfunded and inadequate, understaffed, and overburdened.<sup>[1]</sup> Resident medical officer (1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> year postgraduates along with the interns) form the backbone of these institutions. In India, the working pattern of the resident doctors is not structured and varies from hospital to hospital with the absence of set working guidelines (duty hours).<sup>[1]</sup> It is a common scenario in most of the medical colleges and hospitals to see residents who are overburdened, have prolong duty hours without sleep, stressed out, have inadequate hostel facilities, meager pay, lack of security, deprived of hygienic food and water, and health-related problems. The

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developed nations of the west, namely, United States (US), United Kingdom (UK), and Switzerland have fixed set guidelines for the working of residents to enhance patient care with fixed duty hours which is absent in India.<sup>[1-3]</sup> There are some studies in India that describe stress in resident doctors,<sup>[3,4-10]</sup> but only few or no studies showing their working pattern,<sup>[1]</sup> therefore, we undertook this study at a premier tertiary care hospital in Western India with the aim of understanding the working pattern of a resident (1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> year in clinical and paraclinical specialty) over a busy week.

## MATERIALS AND METHODS

The study was conducted at a premier tertiary level government hospital in Western India with bed strength of approximately 1300, with all specialties and super specialty departments and catering to the OPD of 3000 patients daily. The yearly intake of residents of all specialties is 550. All necessary ethics committee approval was taken. Our study involved only the clinical departments (Surgery, Medicine, Pediatrics, Orthopedics, ENT, Ophthalmology, Skin, Anesthesia, Chest and TB) and paraclinical departments (Pathology, Microbiology, PSM). The study involved data collection from all resident doctors who were in units having Monday as their emergency day. Monday was selected as it is the day having maximum OPD and IPD admissions in the hospital. All resident doctors of a unit having Monday emergency meant – 1<sup>st</sup> year residents (junior resident [JR]), 2<sup>nd</sup> year residents (senior resident [SR]), and 3<sup>rd</sup> year residents (chief resident [CR]) were enrolled. They were followed for 1-week period starting from Monday to Sunday for 24 h per day. Their information was filled daily on a preset questionnaire which included department, day, type of resident, day start 7 am to end 7 am next day, comorbidity, time of joining duty, end of duty, per day sleep hours, eating pattern (breakfast, lunch, and dinner), number of OPD patients seen, number of IPD patients seen, number of ICU patients seen, any illness/week, education timings (for residents, by residents), recreational activities, and duration.

This data were entered on Microsoft Excel sheet. The data were analyzed and appropriate statistical analysis done and test applied.

## RESULTS

The average total duty work hours (TDW) for all the residents were maximum on Monday which was emergency day. On Monday, TDW hours for JR of all departments

**Table 1: Day wise pattern**

Residents/days	JR (1 <sup>st</sup> year)	SR (2 <sup>nd</sup> year)	CR (3 <sup>rd</sup> year)
<b>Monday</b>			
TDW (h)	23.96	16	19.6
TS (h)	2.68	4	5
TPS (OPD, IPD, ICU)	62	60	58
Calories (cal)	1464	1641	1500
<b>Tuesday</b>			
TDW (h)	14	11	12
TS (h)	5	6.3	6.45
TPS (OPD, IPD, ICU)	27	18	26
Calories (cal)	1617	1810	1767
<b>Wednesday</b>			
TDW (h)	16	11.7	11.6
TS (h)	5	6.19	6
TPS (OPD, IPD, ICU)	43	36	47
Calories (cal)	1675	1818	1709
<b>Thursday</b>			
TDW (h)	15	12	14.2
TS (h)	5	6.4	5
TPS (OPD, IPD, ICU)	25	23	27
Calories (cal)	1653	1675	1772

JR: Junior resident, SR: Senior resident, CR: Chief resident, TDW: Total duty work, TS: Total sleep, TPS: Total patient seen

**Table 2: Day wise pattern**

Residents/days	JR (1 <sup>st</sup> year)	SR (2 <sup>nd</sup> year)	CR (3 <sup>rd</sup> year)
<b>Friday</b>			
TDW (h)	16.2	11.4	11.5
TS (h)	5	5.6	6.18
TPS (OPD, IPD, ICU)	41	31	30
Calories (cal)	1768	1601	1870
<b>Saturday</b>			
TDW (h)	14	11.7	9.5
TS (h)	6	6.3	6
TPS (OPD, IPD, ICU)	44	39	27
Calories (cal)	1608	1774	1678
<b>Sunday</b>			
TDW (h)	14.5	10.7	10.9
TS (h)	5.6	6.4	6.09
TPS (OPD, IPD, ICU)	19	16	18
Calories (cal)	1750	1850	1900

JR: Junior resident, SR: Senior resident, CR: Chief resident, TDW: Total duty work, TS: Total sleep, TPS: Total patient seen

enrolled was 23.96 h, for SR it was 16 h, and for CR it was 19.6 h, which was also the continuous work at a stretch for the residents [Tables 1 and 2].

The average total sleep (TS) h on Monday for JR was 5 h, SR was 6 h, while CR was 5 h which was extremely low, the average for all other parameters studied like number of patient seen and calorie intake for all days of the week is mentioned in Tables 1 and 2.

The weekly parameters are mentioned in Table 3, for JR, the continuous work at a stretch was average 24 h (minimum 19 to maximum 30), sleep hours was 35 h per week, total work hours was 114. Furthermore, the patients seen were the week was 261 (IPD, OPD, and ICU).

**Table 3: Weekly pattern**

Weekly	Continuous stretch work (minimum-maximum) in hours	Sleep (hours)	Total working (hours)	Total patients seen
JR	24 (19–30)	35	114.1	261
SR	16.6 (6–22.5)	41	84	223
CR	20 (15–25)	40.7	89.3	233

JR: Junior resident, SR: Senior resident, CR: Chief resident

## DISCUSSION

Health-care delivery in India comprises of public government hospitals and private clinics and hospitals. Majority of the population is poor and unafforded hence depends on government public health care which consists of PHC, Rural Hospitals, Government Medical Colleges and Hospitals for health care needs. These government hospitals provide all kinds of specialty and super specialty care. These hospitals cater to a large number of populations and are overburdened, understaffed, with poor infrastructure and machinery.<sup>[1]</sup>

The organizational culture among medical establishment is very hierarchical.<sup>[11]</sup> In these organizations residents form the backbone and entitled to do all the work, it is observed that they overworked. There are reports of widespread bullying going unreported.<sup>[5,12]</sup> Chronic shortage of physicians leads to extreme amounts of overwork and very high level of stress among residents.<sup>[3]</sup> There are very few studies documenting resident burnout in India. This high workload leads to poor performance and tendency to make mistakes which can be and are fatal in medical environment. There are countless cases of medical negligence being regularly reported and documented which can be traced to overwork. Considerate behavior is the least which is expected from the medical staff around him. However, the overworked and harried medical resident is not in such a position. This rude behavior toward patients is also a contributing cause of regular cases of violence toward the doctors by the patient attendants frequently reported in media.

The International Labour Organization recommendations prohibit more than 48 h of work each week since 1962.<sup>[13]</sup> Similarly, the EU rules allow for only a 48-h work week for a resident.<sup>[14]</sup> This was followed by major changes in National Health Service, UK. Even the factories act in the country provisions for payment of overtime and holidays for work. More than 48 h a week.<sup>[15]</sup>

In the US, the effect of residents' long hours on performance was studied in the early 1970s, and as early as 1980–1981, the Accreditation Council for Graduate Medical Education (ACGME) Program Requirements for Graduate Medical Education in both Internal Medicine and Pediatrics included statements on a balance of education and service demands.

In February 1988, the recommendations of an ACGME task force on resident hours and supervision specified standards for all accredited programs that included: (1) 1 day in seven away from the hospital; (2) on-call duty in the hospital no more frequently than every third night; (3) adequate backup if sudden and unexpected patient care needs create resident fatigue sufficient to jeopardize patient care; and (4) institutional policies to ensure that all residents are adequately supervised, with reliable methods of communication between residents and supervising physicians. The Institute of Medicine set further guidelines in 1989, with regular upgradation in 1990s.<sup>[16]</sup> Although work hours and shift duration decreased somewhat for residents over the next decade, it was not until the goals of the patient safety movement aligned with research documenting a connection between fatigue and clinical performance that stronger regulations came into place. In 2003, the ACGME implemented rules limiting work hours for all residents, with the key components being that residents should work no more than 80 h per week or 24 consecutive hours on duty, should not be “on-call” more than every third night, and should have 1 day off per week. (Some fields, principally surgical specialties, received partial exemption from the regulations.) The ACGME's current duty hour regulations went into effect in July 2011. These regulations maintained a maximum limit of 80 work hours per week but eliminated extended duration shifts (which have been linked to errors in prior studies) for 1<sup>st</sup> year residents, and strengthened oversight by senior physicians (by comparison, residents in many other countries work significantly fewer hours; the European Working Time Directive currently limits residents in Europe to no more than 48 h per week on duty).<sup>[16-20]</sup>

The Flexibility in Duty Hour Requirements for Surgical Trainees trial, published in 2015, randomized 118 general surgery residency programs to adhere to the 2011 ACGME regulations or to abide by more flexible rules that essentially followed the prior standard of a maximum 80 h workweek. The study found no significant differences in patient outcomes including death and serious complications.<sup>[16,21]</sup>

In India, there are few studies on resident doctor work, they highlight the stress pattern and prevalence of stress,<sup>[1,3,4]</sup> no study in India exists which shows the working pattern of resident doctors.

Hence, we undertook our study with the aim to know working pattern of resident doctor over a period of a week. Our findings showed that the 1<sup>st</sup> year resident (JR) worked 114 h per week, slept for only 35 h per week, attended to 261 patients, and the continuous work at a stretch was 24 h (minimum - 19 to maximum - 30). The 2<sup>nd</sup> year (SR) and 3<sup>rd</sup> year (CR) residents had slightly more sleep hours and less working hours, however compared to the US and UK standards, the residents were overworked and underslept. The JR attended to 261 patients/week (OPD, IPD, and ICU) put together and more than the SR and CR. With overwork and less sleep hours, it can directly affect patient care and personal health both mentally and physically as can be seen by their calorie intake. The results also show that although all residents are at risk, the 1<sup>st</sup> year residents are the susceptible group both mentally and physically and more needs to be done to increase their number and orientation and counseling so as to aim for their well-being.

Collier *et al.* showed that overall prevalence of provisionally diagnosed depressive and major depressive disorder in medical students was found to be 21.5% and 7.6%, respectively. Their results revealed that year of study and academic performance of medical students have a significant association with the prevalence of depression. 1<sup>st</sup> year students had the highest prevalence of depression followed by 2<sup>nd</sup> year students ( $P < 0.001$ ). It was also observed that students with poor or excellent academic performance (based on the scores obtained in recent terminal or annual examinations) had higher rates of depression ( $P < 0.05$ ).<sup>[7]</sup> A study based in the US found 24% of medical students to be depressed.<sup>[22]</sup> In another study in the US, 12% of medical students were diagnosed with probable major depression. In India, the prevalence of depression was around 39%.<sup>[23]</sup>

Supre *et al.*,<sup>[24]</sup> Shah *et al.*<sup>[3]</sup> were studies in undergraduates students which evaluated the stress among the students. Ulmer *et al.*, we conducted a prospective, controlled intervention of the effect of resident service census caps and unit-based admissions on residents' workload, conference attendance, duty hour compliance, and patient safety census caps, and unit-based admissions were associated with improvements in resident workload, conference attendance, duty hour compliance, and readmission rates while patient outcomes were maintained.<sup>[19]</sup>

Levine *et al.* showed that a systematic review of the literature, we found that reduction or elimination of resident shifts exceeding 16 h led to improvements in resident quality of life (8/8 improved), improvements in patient safety and quality of care (7/11 improved; 4/7 unchanged; 0/7 worsened); and generally unchanged medical education (4/14 improved; 9/14 unchanged;

1/14 worsened). Under the ACGME standards, shifts of 24–30 h have remained the norm, but in the past 5 years, data have emerged strongly indicating that such extended shifts pose significant hazards for patients and residents. In this systematic review, we gathered together both published and unpublished data regarding programs that reduced or eliminated these extended shifts. While the precise nature of the changes made varied from one center to the next, all interventions included in our study either eliminated or reduced the frequency of shifts exceeding 16 h (extended shifts). Most led to improvements in patient safety and quality of life, without adverse educational consequences. This new evidence could be of value to policymakers and program directors as they seek to develop evidence-based work hour reforms. Further, data comparing specific approaches to eliminating or reducing extended shifts continue to be needed.<sup>[25]</sup>

The limitation of our study was the small sample size. Gulzer *et al.* suggested that there needs to be a recognition and awareness of the contribution of medical residents toward the cause of health care in the country. In view of our economy getting bigger, health care also needs a bigger contribution both in terms of the size of the pie but also as a percentage. Health care in the country is woefully underfunded and this state of affairs is unacceptable.<sup>[1]</sup>

## CONCLUSION

Thus, with this we would like to suggest a more extensive study about resident working pattern and would suggest to set up a body to set working guidelines for the residents in the state and country, which will ensure safe, proper health care delivery and also give healthy and stress-free learning opportunity to budding doctors.

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