Original Article

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Effects of Working Hours on the Life of Post Graduate Residents and on Patient Care

Qamar Mehboob, Waqar Arif, Muhammad Arif, Muhammad Saqlain, Sana Arif, Amina Javaid Malik

ABSTRACT

Background: Despite a lot of research regarding postgraduate residents (PGRs) duty hours, its benefits are still controversial. There is a constant need for further evaluation. So, we conducted the present research work to update a systematic review of the literature on duty hour restrictions. **Objective:** To evaluate the effects of the 80-hour postgraduate trainees work per week, restrictions on patient safety, resident well-being, and resident education. **Study Design:** Cross-Sectional Survey. **Settings:** Allied Hospital, Faisalabad Pakistan. **Duration:** One year from, Jan 2018 – Jan 2019. **Methodology:** A 15 item structured questionnaire based upon 5-point Likert scale was developed. The participants were 130 including males & females. **Results:** Residents reported per week working hours a mean of 103 ± 0.31, certainly more than 80-hours limit recommended by Accreditation Council for Graduate Medical Education (ACGME). Among all, 78% respondents reported that sleep deprivation had negatively affected their duty. A strong majority of senior PGs (88%), as compared to juniors (72%), believed that work hour limits would have markedly improved effect on patient care and somewhat improve the work life (juniors 69% & seniors 65%). 89% seniors suggested marked improvement in personal life after work hour limits while 55% juniors believed a somewhat improvement. **Conclusion:** Present PGRs duty hour changes are insufficient to improve resident well-being and have negative effects on patient outcomes and performance. Greater flexibility regarding their training requirements, is the need of the day.

Keywords: Work hours, Patient care.

Corresponding Author

DR. QAMAR MEHBOOB, Associate Professor, Physiology, Faisalabad Medical University, Faisalabad-Pakistan
Contact / Email: +92 313-4458720, qamarmehboob89@yahoo.com

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INTRODUCTION

In Pakistan, the total number of registered doctors is increasing day by day. During 2011-12 to 2014-15, with a 13 % increase, the total number of 1,75,223 doctors were registered. Similarly, in 2011-12, 11,649 dentists were registered. But now with an increase of 23 percent, the total number of registered dentists has become 15,106. Postgraduate residents (PGRs) have also remarkable record. In 1947, only seven medical specialists were present which became eighteen thousand in 2007.[1]

This huge number of PGRs is getting training and qualification within Pakistan. In 2006, there were 9,036 applicants for FCPS Part I exam, with an average pass rate of 20%. The number of candidates is increasing rapidly and it is reported that in 2016 it reached to 18,540 who wanted to enter the College training program. However, among them, only 5,100 were qualified. For FCPS II, a total of 4,707 candidates appeared in viva and only 1,521 cleared it. The pass percentage was almost 30% and many of them were repeaters. Internationally, a pass percentage less than 40% is considered poor.[2]

One must think that an examination with such a low pass percentage needs review. Either the exam is conducted wrongly, or the students are not fully prepared for it. So, there is a great need to improve the training programs and bring them to international standards. To achieve this goal, we should develop our formative assessments and for which, the best place is where the trainee is being trained.

In many countries, the postgraduate medical training programs are reviewed regularly specially in the United Kingdom[1, 3] for the betterment of patients' care and also to motivate assessment of present practice in other countries, especially having British systems. In 2003, Accreditation Council for Graduate Medical Education (ACGME) made some changes in resident duty hours and implemented the first complete and detailed resident work hour regulations nationwide.[4]

After an unfortunate death of a young lady named Libby Zion in a New York Hospital, resident duty hour (RDH) restrictions were implemented in the country. When the matter was fully investigated, it was found that resident's fatigue was one of the contributing factors. In July 2003, the Accreditation Council for Graduate Medical Education (ACGME) implemented a 4-week period with an 80-hour duty limit on residents followed by, in 2011, a 16-hour duty period for first year postgraduate residents (PGY1).[5]

In 2012, the province of Quebec recommended 16-hour periods for residents. The objective of duty hour limitations was not only the betterment of patient care, but also to improve residents' well-being, and education.[6] With the decreased duty hours, the impact on training time could have a negative effect on educational and patient care especially in surgical disciplines.[5,7]

A "fixed duty hours" approach to all residents may not be appropriate because of variations in training needs, practice patterns and other requirements of various disciplines.[8]

After the implementation of progressive work-hour restrictions to PG training by ACGME, it became greatly controversial.[9-12] Reports in favor of this stated that in surgical subspecialties, there was an improvement in patient care, while opponents claimed that it jeopardized their education and training for independent surgical practice.[13-15] In modern surgical training,

the contraction in resident work hours may be one of the greatest challenges. Usually, during surgical residency, long duty hours were assumed better for both competency and patient safety. During their long stay, residents might observe patients throughout their hospital stay and managed pre-, intra and post-operative treatment.[16] By keeping a continued eye over the patients, different medical errors can also be prevented. Even today, the impact or effect of implementation of work-hour restrictions, on patient safety, remained controversial.

PGRs, especially of the surgical department, are mostly affected by these changes. There is a great need to rule out the effects of these changes. To evaluate the effects of the 80-hour postgraduate trainees work week restrictions on patient safety, resident well-being, and resident education, we conducted a research project based on 15 items structured questionnaire.

METHODOLOGY

Study Design: Cross-Sectional Survey.
Settings: Allied Hospital, Faisalabad Pakistan.
Duration: 1 year (Jan, 2018 - Jan, 2019).
Sample Technique: Convenient sampling technique.
Sample Size: 130 participations.
Inclusion Criteria: Male & female, married/unmarried, PGRs from 1st to 4th/5th year.
Exclusion Criteria: House officers, medical officers, PGRs with any family problem which can affect their working at hospital.
Methods: We conducted a research project consisting 15 items structured questionnaire based upon five-point Likert scales. 130 (Surgical & allied) PG residents of Allied Hospital, Faisalabad were approached for the study. We divided the participants into 2 groups. We include 1st and 2nd year residents in 1st group (PGY1 & 2) and 3rd, 4th and 5th year PGRs in 2nd group. Both groups include married as well as unmarried participants. Informed consent was obtained. The data was collected and arranged in tabulated form. The results were analyzed statistically. Correlation was considered significant at the 0.01 level (2-tailed).

RESULTS

Total 130 PGRs were approached. Of these respondents, 63.84% were juniors (PGY1 & 2) and 25.38 were females (Table-1). The mean age of participants was 27.33 ± 1.71 years. Out of them, 30% were married and 70% were unmarried. According to our data, 38% of the respondents were working for 91-100 hours per week and 33% for 101-110 hours per week. The mean working hours/ week was 103 ±0.31. In contrast the respondents' ideal work hours mean was 84 ± 0.11 hours per week. The average call frequency was every 5th day, as reported by 54% of respondents.

Description of the ideal working hours

	N	Minimum	Maximum	Mean	Std. Deviation
IWH	130	30.00	81.00	38.8308	8.11176
Valid N (listwise)	130				

IWH: Ideal Work Hours

Table 1: Various sample characteristics (n= 130)

	Characteristic	N	%
Clinical PGY	1	31	23.84
	2	49	37.69
	3	19	14.6
	4	30	23.07
	5	11	8.46
Age in Years	< 25	9	6.92
	25-30	114	87.69
	> 30	7	5.38
Gender	Male	97	74.61
	Female	33	25.38
Marital Status	Single	91	70
	Married	39	30
Duty hours/ Week	< 80	3	2.30
	81-90	27	20.76
	91-100	49	37.69
	101- 110	43	33.07
	> 110	8	6.15
Ideal work hours according to you	< 80	39	30
	81-90	86	66.15
	91-100	1	0.76
	101-110	2	1.53
	> 110	2	1.53
Average call frequency	Every day	0	0
	Every 2nd day	0	0
	Every 3rd day	46	35.38
	Every 4th day	14	10.76
	Every 5th day	70	53.84

Table 2: Survey responses: Satisfaction & perceptions of work environment (n=130)

Response		n	%
Sleep deprivation has negatively affected work	Strongly agree	102	78.46
	Somewhat agree	19	14.61
	Disagree	6	4.61
	Somewhat disagree	2	1.53
	Strongly disagree	1	0.76
Work environment is abusive	Strongly agree	1	0.76
	Somewhat agree	80	61.53
	Disagree	20	15.38
	Somewhat disagree	30	23.07
	Strongly disagree	0	0
Have you seriously considered quitting surgical/medical career?	Strongly agree	0	0
	Somewhat agree	63	48.46
	Disagree	9	6.92
	Somewhat disagree	11	8.46
	Strongly disagree	47	36.15
Are you satisfied with your residency training?	Strongly agree	7	5.38
	Somewhat agree	55	42.30
	Disagree	47	36.15
	Somewhat disagree	21	16.15
	Strongly disagree	0	0
Would you choose surgical/medical career again?	Strongly agree	66	50.76
	Somewhat agree	14	10.76
	Disagree	19	14.61
	Somewhat disagree	20	15.38
	Strongly disagree	11	8.46

According to our research, 78% of the participants reported that sleep deprivation has negatively affected their work (Table-2). A total of 42% of respondents were being satisfied with their residency training while 48% were seriously considered quitting surgical/medical career. 51% reported that they would choose surgical/medical career again.

The majority (97%) of participants strongly believed that anticipated effects of restrictions on resident work hour improved their personal life. With regard to the quality of resident work 93% believed that it would has positive effect while few (1.5) had opposite thought that such type of restrictions either somewhat or strongly deteriorates their work life.

Table 3: Anticipated effects of restrictions on resident work hour

Effect	On patient care	On resident work life	On resident personal life
Markedly improved	59.23%	52.30%	57.69%
Somewhat improved	31.53%	40.76%	39.23%
No effect	5.38%	5.38%	0.76%
Somewhat deteriorate	1.53%	0.76%	1.53%
Markedly deteriorate	2.30%	0.76%	0.76%

Table 4: Effects on resident's health

Response		N	%
Proper diet intake during work hours	Strongly agree	11	8.46
	Somewhat agree	42	32.30
	Disagree	2	1.53
	Somewhat disagree	31	23.84
	strongly disagree	44	33.84
Regular bowl habits	Strongly regular	6	4.61
	Somewhat regular	39	30
	Irregular	7	5.38
	Somewhat irregular	42	32.30
	Strongly irregular	36	27.69
Time for studies during training	Strongly agree	2	1.53
	Somewhat agree	43	33.07
	Disagree	19	14.61
	Somewhat disagree	25	19.23
	Strongly disagree	41	31.53
Giving proper time to your family	Never	17	13.07
	Rarely	89	68.46
	Sometimes	17	13.07
	Often	5	3.84
	All of the time	2	1.53

During our research, we also did a comparison between juniors and seniors opinion. 88% of seniors and 72% of juniors were agreed that work hour limits markedly improved the patient care. Duty hours of senior and junior trainees were compared statistically.

Most residents, either junior or senior, reported that work hour limitations would have marked beneficial impact on their work life.

Table 5: Comparison of Junior and Senior PGRs

		Juniors	Seniors
Work hour limits would have impact on patient care	Markedly improved	72%	88%
	Somewhat improved	28%	12%
Work hour limits would have impact on work life	Markedly improved	31%	35%
	Somewhat improved	69%	65%
Work hour limits would have impact on personal life	Markedly improved	45%	89%
	Somewhat improved	55%	11%

Table 6: Duty hours per week

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Juniors	83	18.50	100.00	54.0361	11.11162
Valid N (listwise)	83				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Juniors	83	18.50	100.00	54.0361	11.11162
Seniors	47	18.50	100.00	58.0957	15.86891
Valid N (listwise)	47				

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Juniors	83	54.0361	11.11162	1.21966
Seniors	47	58.0957	15.86891	2.31472

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Juniors	44.304	82	.000	54.03614	51.6099	56.4624
Seniors	25.098	46	.000	58.09574	53.4365	62.7550

Correlations

		Juniors	Seniors
Juniors	**Pearson Correlation**	1	.737**
	Sig. (2-tailed)		.000
	N	83	47
Seniors	**Pearson Correlation**	.737**	1
	Sig. (2-tailed)	.000	
	N	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

Health is a national responsibility. There is a great need for training programs for PGs at national as well as provincial level. Furthermore, a long-term plan should be developed to emulate the condition in Australia and UK where completion of training is compulsory even for family/general practitioners[1]. In Pakistan, social security support of people needing health care is poorly developed. Although the systems of PG training in Pakistan are well grounded and future prospects are good yet efforts should be made to develop medical career more effective and more attractive.

According to our research, there was an overall improvement in PGs quality of life and we found similar results as reported by many other researchers.[17-21] Previously, in 2002, it was reported that PGs, especially in surgical field, were working for greater hours per week than the 80-hour limit applied by ACGME requirements. In our study, we found the same results with a positive effect on resident quality of life and on patient care.

In 2011, ACGME, in its four-week period,[22] revised the guidelines for resident duty hours and limited these to 80 hours per week. To improve their working abilities, residents must be provided with one day in seven free from all educational and clinical responsibilities, averaged over a four-week period, inclusive of call. Adequate time for rest and personal activities must be provided. This should consist of a 10-hour time period provided between all daily duty periods and after in-house call. Rathore FA also recommended that sufficient time should be provided to PGs for rest and personal activities. Furthermore, he proposed that hospital administration should also facilitate these residents during their on-call duties.[22] We found similar results in our research. With the limited duty hours, there was marked improvement of PGs personal life especially for seniors 89% as compared to juniors, 45%.

According to PMDC criteria, with a 10-hour rest period, in-house call must occur no more frequently than every third night[23]. In our research, we found that most of PGs (54%) recommended every 5th day on call duty while few (35%) supported PMDC recommendations.

In a report forwarded by Ahmed (2014),[5] it was stated that recent resident hour changes had not improved resident well-being with a negative effect on patient care. He recommended greater flexibility to accommodate resident training. Further research regarding the outcomes of work hour limitations might be beneficial.[13]

During the academic year 2001-2002, in a combined effort of residency program directors of National Graduate Medical Education Census, American Medical Association and Association of American Medical College, it was reported that surgery residents were found to have 78.9 average weekly on-duty hours[24] while reported by general surgery residency program directors, residents worked 91 hours per week.[25] A survey of gynecological residents conducted in 2000, reported working hours were 80 hours / week (42% residents) with 77% residents who reported desiring work hour limitations.[26] In our research, we found that in present circumstances, only 42% PGs were satisfied with their residency training while 36% disagreed.

For the evaluation of outcomes of work hour limitation-compliance strategies on PGs, we hope that our data will serve as a baseline. In a series of resident work hour reform measures, ACGME requirements might be the first wave. Many researchers reported that ACGME requirements are not enough.[27]

CONCLUSION

Current PGRs duty hour changes are insufficient to improve resident wellbeing and have negative effects on patient outcomes and performance. Greater flexibility regarding their training requirements is the need of the day.

LIMITATIONS

The study is done in one setting only. Nationwide sample collection can change the outcome.

SUGGESTIONS / RECOMMENDATIONS

We suggest that more and more surgical residency programs should be introduced to ensure education of PGRs. Work hours of residents should be reduced which will improve their health as well as it will be helpful in provision of high-quality patient care.

CONFLICT OF INTEREST / DISCLOSURE

The author certify that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter.

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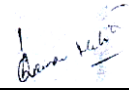
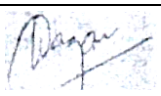
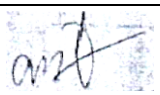
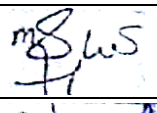
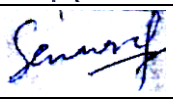
REFERENCES

1. Biggs JS. Postgraduate medical training in Pakistan: observations and recommendations. J Coll Physicians Surg Pak. 2008;18(1):58-63.
2. President addresses 13 reconstituted faculties – CPSP https://www.cpsp.edu.pk/bulletin/generate_pdf?view_pdf=a-guideline-to-faculties
3. Craft A. Modernizing medical careers: a response from the Academy of Medical Royal Colleges. J R Soc Med. 2006;99(4):165-7.
4. Whang EE, Perez A, Ito H, Mello MM, Ashley SW, Zinner MJ. Work hours reform: perceptions and desires of contemporary surgical residents. J Am Coll Surg. 2003;197(4):624-30.
5. Ahmed N, Devitt KS, Keshet I, Spicer J, Imrie K, Feldman L, et al. A systematic review of the effects of resident duty hour restrictions in surgery: impact on resident wellness, training, and patient outcomes. Ann Surg. 2014;259(6):1041-53.
6. Nasca. An Open Letter to the GME Community. Chicago, IL: Accreditation Council for Graduate Medical Education; 2016:1-6.

7. Lambert TW, Smith F, Goldacre MJ. The impact of the European Working Time Directive 10 years on: views of the UK medical graduates of 2002 surveyed in 2013–2014. JRSM Open. 2016;7(3):2054270416632703.
8. Drolet BC, Sangisetty S, Tracy TF, Cioffi WG. Surgical residents' perceptions of 2011 Accreditation Council for Graduate Medical Education duty hour regulations. JAMA Surg. 2013;148(5):427-33.
9. Harris JD, Staheli G, LeClere L, Andersone D, McCormick F. What effects have resident work-hour changes had on education, quality of life, and safety? A systematic review. Clin Orthop Relat Res. 2015;473(5):1600-8.
10. Peets A, Ayas NT. Restricting resident work hours: the good, the bad, and the ugly. Crit Care Med. 2012;40(3):960–6.
11. Pellegrini VD Jr. Perspective: ten thousand hours to patient safety, sooner or later. Acad Med. 2012;87(2):164-7.
12. Sen S, Kranzler HR, Didwania AK, Schwartz AC, Amarnath S, Kolars JC, et al. Effects of the 2011 duty hour reforms on interns and their patients: a prospective longitudinal cohort study. JAMA Intern Med. 2013;173(8):657-62.
13. Jamal MH, Wong S, Whalen TV. Effects of the reduction of surgical residents' work hours and implications for surgical residency programs: a narrative review. BMC Med Educ. 2014;14(1):14.
14. Froelich J, Milbrandt JC, Allan DG. Impact of the 80-hour workweek on surgical exposure and national in-training examination scores in an orthopedic residency program. J Surg Educ. 2009;66(2):85-8.
15. Fried GM, Derossis AM, Bothwell J, Sigmann HH. Comparison of laparoscopic performance in vivo with performance measured in a laparoscopic simulator. Surg Endosc. 1999;13(11):1077-81.
16. Britt LD, Sachdeva AK, Healy GB, Whalen TV, Blair PG. Resident duty hours in surgery for ensuring patient safety, providing optimum resident education and training, and promoting resident well-being: a response from the American College of Surgeons to the Report of the Institute of Medicine, "Resident Duty Hours: Enhancing Sleep, Supervision, and Safety". Surgery. 2009;146(3):398-409.
17. Hutter MM, Kellogg KC, Ferguson CM, Abbott WM, Warshaw AL. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. Ann Surg. 2006;243(6):864-71.
18. Whang EE, Mello MM, Ashley SW, Zinner MJ. Implementing resident work hour limitations: lessons from the New York State experience. Ann Surg. 2003;237(4):449-55.
19. Irani JL, Mello MM, Ashley SW, Whang EE, Zinner MJ, Breen E. Surgical residents' perceptions of the effects of the ACGME duty hour requirements 1 year after implementation. Surgery. 2005;138(2):246-53.
20. Fletcher KE, Underwood W 3rd, Davis SQ, Mangrulkar RS, McMahon LF Jr, Saint S. Effects of work hour reduction on residents' lives: a systematic review. JAMA. 2005;294(9):1088-100.
21. Barden CB, Specht MC, McCarter MD, Daly JM, Fahey TJ 3rd. Effects of limited work hours on surgical training. J Am Coll Surg. 2002;195(4):531-8.
22. Rathore FA, Farooq F. Going beyond the resident duty hours in Pakistan. J Pak Med Assoc. 2012;62(2):189-90.
23. Pakistan Medical & Dental Council Postgraduate Medical and Dental Education Regulations, 8th May 2010. http://pmdc.org.pk/LinkClick.aspx?fileticket=nL5x/TDFA/4%3D.
24. Brotherton SE, Simon FA, Etzel SI. US graduate medical education, 2001-2002: changing dynamics. JAMA. 2002;288(9):1073-8.
25. Cochran A, Melby S, Foy HM, Wallack MK, Neumayer LA. The state of general surgery residency in the United States: program director perspectives, 2001. Arch Surg. 2002;137(11):1262-5.
26. Deidre M Defoe, Michael L Power, Gerald B Holzman et al. Long hours and little sleep: work schedules of residents in obstetrics and gynecology. Obstet Gynecol. 2001;97(6):1015-8.
27. Steinbrook R. The Debate over Residents' Work Hours. N Engl J Med. 2002;347(16):1296-302.

AUTHORSHIP AND CONTRIBUTION DECLARATION

AUTHORS	Contribution to The Paper	Signatures
Dr. Qamar Mehboob Associate Professor, Physiology Faisalabad Medical University, Faisalabad Pakistan	Data Collection	
Dr. Waqar Arif Post Graduate Resident, Burn & Reconstructive Surgery Allied Hospital, Faisalabad Pakistan	Data Collection	
Dr. Muhammad Arif Associate Professor, Ophthalmology Faisalabad Medical University, Faisalabad Pakistan	Statistical Analysis	
Dr. Muhammad Saqlain Post Graduate Resident, Neurosurgery Lahore General Hospital, Lahore Pakistan	Performa & Likert Scale Formation	
Dr. Sana Arif Final Year MBBS Student Shaikh Zayed Medical College, Rahim Yar Khan Pakistan	Performa & Likert Scale Formation	
Dr. Amina Javaid Malik Ex-House Officer, University Medical Complex & Research Centre University of Sargodha, Sargodha Pakistan	Interpretation