Recent Family Medicine Residency Graduates' Perceptions of Resident Duty Hour Restrictions

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Abstract

Background Resident duty hour limits, new requirements for supervision, and an enhanced focus on patient safety have shown mixed effects on resident quality of life, patient safety, and resident competency. Few studies have assessed how recent graduates feel these changes have affected their education.

Objective We assessed recent graduates' perceptions about the effects of duty hour and supervision requirements on their education.

Methods We conducted a cross-sectional survey of graduates from South Carolina Area Health Education Consortium-affiliated family medicine residency programs from 2005 to 2009 by using logistic regression to determine associations between participant characteristics and survey responses.

Results Graduates (N = 136) completed the survey with a 51.3% response rate. Nearly all (96%) reported that residency prepared them for their current work hours; 97% reported they felt adequately supervised; 81% worked fewer hours in practice than in residency; 20% believed the limits had restricted their clinical experience; and 3% felt duty hour limits were more important than supervision. Graduates who practiced in a mid-sized communities were more likely to report duty hour limits restricted their clinical experience than individuals practicing in communities of <10 000 (OR = 6.30; 95% CI, 1.38–28.72).

Conclusions Most graduates who responded to the survey felt supervision was equally or more important than limits on resident duty hours. However, 20% of respondents felt that the duty hour standards limited their education. The duty hour and supervision requirements challenge educators to ensure quality education.

Editor's note: The online version of this article contains the survey used in this study.

Introduction

In 2003, the Accreditation Council for Graduate Medical Education (ACGME) set common standards for r'esident duty hours, with the goal of enhancing education and patient safety in teaching institutions.[1] These restrictions limited residents to an average of 80 hours per week, with a maximum shift length of 30 hours, 10 hours off between shifts, and 1 day free of clinical duties per week. The initial restrictions were accompanied by requirements that faculty provide adequate and graduated supervision of residents, that programs educate faculty and residents as to signs of fatigue, and that programs and institutions prioritize patient safety. Before the ACGME could revisit its 2003 limits, the Institute of Medicine (IOM) responded to continued concern over patient safety by issuing a report calling for further changes.[2] The IOM based its recommendations on studies showing that the 2003 standards had not resulted in added sleep for residents[3] or a reduction in resident fatigue.[4,5] Studies using Medicare and Veterans Administration data failed to show a positive effect of resident duty hour restrictions on patient safety or quality of inpatient care,[6–9] and one review found that positive changes for residents were balanced by negative changes for faculty.[10] A recent systematic review found little or no change before and after duty hour restrictions on a diverse range of outcomes including examination scores, surgical volume, and quality of care measures.[11]

Program directors in a range of specialties have expressed reservations about these new restrictions, with

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many indicating their programs would need significant structural changes to comply,[12] and a survey of residents from multiple specialties found mixed opinions about the effects of the new duty hour limits, although many respondents were neutral.[13] Residents strongly felt that their quality of life would increase but were concerned about negative effects on their education and preparation for senior roles and diminished quality of patient care. A survey of family medicine residency program directors about the IOM recommendations found most believed the recommendations would be detrimental to both patient care and resident education.[14] These concerns echoed similar findings when family medicine programs were surveyed about the original 2003 duty hour limits.[15]

While the perspectives on current residents and program directors are important, recent residency graduates may best be able to gauge whether the new standards for resident hours and supervision affected their clinical experience during residency. Evaluation of recent graduates from family medicine residencies may be especially relevant, as these graduates provide a significant share of primary medical care,[16,17] and these trainees must receive a broad educational experience to deliver the comprehensive and continuous care required in practice. Furthermore, a recent review commented on the lack of duty hour studies in primary care settings.[11] Having trained under the original duty hour limits, the perspective of these recent graduates about whether the limits affected their education may inform the debate about the impact of the added restrictions that were adopted on July 1, 2011.[18] Therefore, we examined recent family medicine graduates' perceptions on how duty hour limits and supervision requirements affected their education.

What was known

Studies have assessed current trainee and faculty perspectives on duty hour limits, but the views of recent graduates have not been explored.

What is new

Most family medicine graduates felt supervision was more important for patient safety than duty hour limits, and 20% felt the limits constrained educational opportunities.

Limitations

Single-institution study; modest response rate and potential for respondent bias; graduates' self-reported perceptions without objective verification.

Bottom line

Graduates practicing in mid-sized communities were more likely to report the limits negatively affected clinical experience. Innovative approaches are needed to ensure high-quality education under limited duty hours.

Methods

We obtained a list of graduates from 2005 to 2009 for each South Carolina Area Health Education Consortium (AHEC)-affiliated family medicine residency program and mailed a questionnaire to each graduate, along with a cover letter detailing the study's purpose and encouraging participation. Respondents returned completed questionnaires in an accompanying self-addressed stamped envelope. A second mailing was sent to nonresponders 6 weeks after the initial mailing.

The survey was designed to ascertain recent graduates' demographics, practice patterns, and attitudes on a variety of subjects. Survey elements included demographic information (age, sex, race/ethnicity), practice characteristics, and board certification status. In addition to demographic information, we theorized that responses to work hours and supervision questions may be associated with current work demands and practice arrangements. The questionnaire was based on prior survey instruments[19,20] and was reviewed by educators and AHEC members for appropriateness, clarity, readability, and content validity.

Size of the community of practice was divided into 3 groups: those $<10\,000$, 10 000–100 000, and $>100\,000$ inhabitants. Practice arrangements were grouped into solo or small (≤ 5 providers) family practice groups, large (>5 providers) family practice groups, hospital or physician organizations, and other. We represented work demands by using variables indicating whether graduates took call never, once per week or less, or more than once per week; whether they provided hospital care or provided prenatal care with delivery; made nursing home visits; made home visits; and average hours worked per week.

The study protocol was approved by the Institutional Review Board of the Medical University of South Carolina.

Graduates' de-identified responses were recorded in a computerized database for analysis. We used descriptive statistics to characterize graduate demographics and responses to the duty hour questions. Chi-square and Fisher's exact tests were used to determine bivariate associations. Logistic regression was used to determine associations between demographic and practice characteristics and responses to resident duty hour restrictions and supervision questions. All variables (age, sex, race/ethnicity, graduation year, practice community size, practice arrangement, mean hours worked per week, frequency of call, and provision of prenatal care with delivery, hospital care, nursing home care, and home visits) were included in the logistic regression analysis. SAS version 9.2 software (SAS Institute, Inc., Cary, NC) was used for all analyses.

TABLE 1 **Characteristics of South Carolina Family Medicine Residency Programs 2005–2009**

Program	University or Community Based	Metropolitan, Micropolitan, or Nonmetropolitan Location[a]	No. of Residents per Year	No. of Respondents
A	Community	Metropolitan	12	22
B	University and Community	Metropolitan	10	23
C	University	Metropolitan	10	27
D	Community	Metropolitan	8	4
E	Community	Metropolitan	8	7
F	Community	Micropolitan	10	18
G	Community	Micropolitan	2	5
H	Community	Metropolitan	12	30

[a] Metropolitan areas are counties with urban populations of >50 000 and adjacent counties with a high degree of economic integration. Micropolitan areas are counties with urban populations between 10 000 and 50 000, and nonmetropolitan areas include all other counties.

Results

A total of 136 graduates completed surveys for analysis (response rate of 51%), and the response rate by program ranged from 25% to 60% (TABLE 1). Our sample was 57% male, mostly non-Hispanic white, and the average ± SD age of respondents was 34 (±4.74) years old (TABLE 2). Almost all graduates (96%) were board certified, and some (7%) had a certificate of added qualification. Respondents were evenly distributed among the 5 years of graduates surveyed. Nearly half of respondents (47%) practiced in communities with between 10 000 and 100 000 residents. Nearly 30% practiced solo or in a small group. Respondents worked an average of 45 (±15.37) hours per week. Slightly more than 20% did not take call, and almost half took call less than once per week. In terms of scope of practice, 9% provided obstetrics services, 45% provided hospital care, 21% provided nursing home care, and 24% made home visits.

Nearly all graduates (96%) felt residency prepared them for their current work hours (TABLE 3), yet 20% believed the limits restricted their clinical experience during residency. Almost all graduates (97%) reported they felt adequately supervised during residency, and only 3% felt the duty hour limits were more important than supervision; half felt supervision was more important than the limits, and nearly 40% felt both were equally important. A majority (81%) reported working fewer hours in practice than they did during residency.

No significant bivariate associations were found. Because of low variation in responses to 2 questions, we were able to run stable regressions on only 3 questions. These logistic regression models found that graduates who felt the duty hour standards limited their clinical experience were less likely to be non-Hispanic white (odds ratio [OR] = 0.57 [95% CI, 0.34–0.96]) and more likely to practice in a community of 10 000 to 100 000 people (OR = 6.30 [95% CI, 1.38–28.72]). Providing hospital care was positively associated with working more in practice than during residency (OR = 6.81 [95% CI, 1.56–29.73]), while non-Hispanic white race/ethnicity was negatively associated with working more in practice (OR = 0.49 [95% CI, 0.28–0.87]).

Discussion

The 2003 duty hour limits and supervision requirements forced residency programs to adapt their clinical services and educational curricula. Many medical educators felt that working fewer hours would result in graduates ill prepared for practice.[21,22] In this survey of recent family medicine graduates who trained under the 2003 standards, most felt prepared for the number of hours they worked in practice and felt appropriately supervised during their training. Most graduates felt supervision was more than or equally as important as restricted work hours. However, 1 in 5 graduates felt their clinical experience in residency was limited by resident duty hour restrictions. The findings paint a mixed picture for the future of graduate medical education. One interpretation is that the residency programs in our AHEC have adapted well to the duty hour limits and were able to provide appropriate supervision and preparation for future work hour demands. This contrasts with a sizeable minority of graduates who feel that training under the standards limited their clinical experiences in residency.

The changes were intended to create a culture of safety and to reduce medical errors through multiple avenues beyond those caused by sleep deprivation. Adequate graduated supervision of residents was another key

TABLE 2 **Characteristics and Selected Practice Patterns of Recent Graduates from South Carolina Family Medicine Residencies**

Graduate Demographics	% of Responses
Mean age (SD)	33.99 (4.74)
Men	57.35
Non-Hispanic white	83.82
Year of residency graduation	
2005	16.91
2006	23.53
2007	22.06
2008	20.59
2009	16.91
Board-certified by American Board of Family Medicine	95.59
Has certificate of added qualifications	7.35
Practice characteristics	
Practice community size	
<10 000	29.84
10 000–100 000	46.77
>100 000	23.39
Practice arrangement	
Solo or small (≤5 providers) family practice	28.68
Large (>5 providers) family practice group	16.91
Hospital/physician organization	22.06
Other	32.35
Mean average hours worked per week (SD)	45.01 (15.37)
Frequency of calls	
No call	21.67
<Once per week	46.67
≥Once per week	31.67
Prenatal care with delivery	8.82
Provide hospital care	44.85
Sees patients in nursing home or other long-term care facility	21.32
Makes patient home visits	24.46

element, and our findings suggest that our family medicine residencies met this goal.

Despite the duty hour limits, most graduates responding to our study reported working less in practice than during residency and feeling prepared for the hours they currently worked. While being prepared for the time demands of practice is important, it does not illuminate preparation for specific tasks. One study compared recent graduates with an earlier cohort of graduates who trained pre-duty hour restrictions and found little difference in self-reported preparation in most curricular areas but decreased preparation for hospital-based procedures (eg, central lines, chest tubes, intensive care unit care).[25] The authors noted that restricted hours might limit hospital-based experiences but had little effect otherwise.

We found that graduates practicing in communities of between 10 000 and 100 000 residents are more likely to feel their clinical experience was limited in residency compared to those practicing in communities with fewer than 10 000 residents. This finding may indicate that graduates electing to practice in more rural areas (our reference group) may feel better prepared for the demands of medical practice with fewer supporting resources. This interpretation is supported by studies showing that health care professionals choosing to practice in rural locations often have rural backgrounds or significant exposure to rural health care delivery during training.[26]

This study has several limitations. The overall response rate may have affected our results. While our sample included all family medicine residencies in one state, it represents a local sample of programs which may limit generalizability. We also lacked information about nonrespondents other than site of training and are unable to fully assess for any response bias. Programs have adjusted to resident duty hour restrictions in multiple ways,[15] and given the small sample size and lack of data for interventions implemented at each program, we were unable to explore differences between programs which may have shed light on whether specific adaptations are associated with perceptions of better supervision or clinical experience and should be included in future studies. While the survey was based on prior instruments and was vetted by family medicine educators, it was not piloted tested, and questions may not have been interpreted consistently by the responders. Finally, our sample was confined to graduates of family medicine residencies, and it is possible that procedural intensive specialties such as surgery face different challenges.

Conclusions

The 2003 duty hour limits appear to have largely failed to show the patient safety and quality of care benefits they were intended to create.[11] Despite this apparent lack of benefit, additional duty hour and supervision requirements went into effect in 2011. Our survey found that recent

TABLE 3 **Recent Graduates' Responses to Work Hour Questions**

Survey Questions	Response	% of Responses
Did residency training prepare you for the number of hours you currently work?	Yes	96.21
Did the restricted work hours limit your clinical experience during residency training?	Yes	20.30
Do you feel your residency program provided appropriate supervision for residents?	Yes	96.99
Are you working more or less now than you did during residency training?	More	19.23
Which of the following factors do you feel is most important for residents during training?		
Restricted work hours		3.08
Supervision		50.77
Both		38.46
Neither		7.69

family medicine graduates did not think the 2003 limits negatively affected graduates' preparation for the hours worked in practice and that graduates felt adequately supervised during residency. However, 20% reported their clinical experience was limited under the 2003 common limits on duty hours. This finding challenges educators to develop and implement educational innovations to ensure quality education, supervision, and patient safety under the 2011 common duty hour limits.[14]

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