

Residents' Ratings of Their Clinical Supervision and Their Self-Reported Medical Errors: Analysis of Data From 2009

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ABSTRACT

Background Medical errors and patient safety are major concerns for the medical and medical education communities. Improving clinical supervision for residents is important in avoiding errors, yet little is known about how residents perceive the adequacy of their supervision and how this relates to medical errors and other education outcomes, such as learning and satisfaction.

Methods We analyzed data from a 2009 survey of residents in 4 large specialties regarding the adequacy and quality of supervision they receive as well as associations with self-reported data on medical errors and residents' perceptions of their learning environment.

Results Residents' reports of working without adequate supervision were lower than data from a 1999 survey for all 4 specialties, and residents were least likely to rate "lack of supervision" as a problem. While few residents reported that they received inadequate supervision, problems with supervision were negatively correlated with sufficient time for clinical activities, overall ratings of the residency experience, and attending physicians as a source of learning. Problems with supervision were positively correlated with resident reports that they had made a significant medical error, had been belittled or humiliated, or had observed others falsifying medical records.

Conclusions Although working without supervision was not a pervasive problem in 2009, when it happened, it appeared to have negative consequences. The association between inadequate supervision and medical errors is of particular concern.

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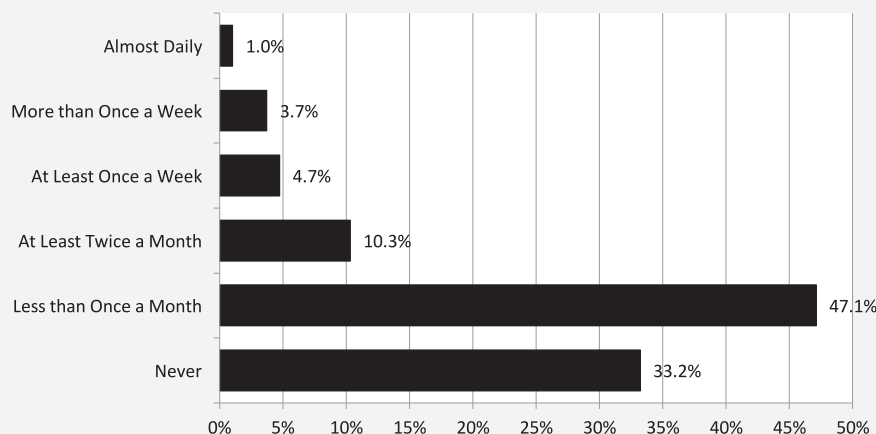
Introduction

Medical errors and patient safety have been major concerns for the medical community for nearly 2 decades.¹ Improving the clinical supervision that residents receive should reduce the frequency of current and future medical errors.¹⁻³ Yet little is known about how residents perceive the adequacy of the supervision they receive and how perceptions relate to medical errors and learning and satisfaction.⁴ We analyzed data from a 2009 survey of residents in 4 large specialties regarding the adequacy and quality of supervision, associations with self-reported data on medical errors, and residents' perceptions of their learning environment.

The traditional model of graduate medical education involves exposing medical school graduates to patients, under the tutelage of experienced physicians, to prepare residents for independent practice by gradually increasing their clinical responsibility. Supervision in this model is the complex process of assessment, judgment, and instruction, and supervision is gradually reduced as residents progress in training. Supervision is frequently viewed as an art as much as a science.¹ Since Kilminster and Jolly's statement that "supervisory practice in medicine has very little empirical or theoretical basis,"⁵ a number of studies have addressed clinical supervision. This includes work by Kennedy and colleagues outlining a useful conceptual model and detailed typology for clinical supervision⁶ as well as efforts to develop a Resident Supervision Index.⁷⁻⁹ In addition, competency-based medical education has focused on the *entrustment* of residents to complete clinical tasks with more clearly established degrees of resident autonomy, clinical supervision, and oversight.^{10,11}

Relatively few studies have queried residents' perceptions of the adequacy of their supervision or

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**FIGURE 1**

Residents' Responses to: "How Often, if Ever, Did You Care for Patients *Without* What You Consider to Be Adequate Supervision From an Attending Physician?"^a

^a N = 624.

have related them to other attributes of the learning environment.^{12,13} Our 1999 study on residents' views of the adequacy of clinical supervision found that 21% of respondents reported having seen patients without adequate supervision more than once a week.⁴

Methods

In 2009, we queried residents in 4 large specialties (internal medicine, obstetrics and gynecology, pediatrics, and surgery) about their perceptions of their clinical supervision and their encounter with 5 types of self-reported medical errors. The index question for supervision was: "During the past year, how often, if ever, did you care for patients *without* what you consider adequate supervision from an attending physician?" The 6 response options ranged from *never* to *almost daily*. We also asked residents if they believed inadequate supervision resulted in their making a significant medical error at any time during their past year and, if yes, whether the error resulted in an adverse patient outcome. To more accurately assess variation within programs, we established a predefined response rate of 70% for each program.

The data were part of a larger survey, with other information published elsewhere.¹⁴ The survey received expedited Institutional Review Board approval from the American Institutes for Research.

Participants responded either online using Survey Monkey (San Mateo, CA) or completed a paper questionnaire. Data were analyzed using SPSS version 18.0 (IBM Corp, Chicago, IL), and included descriptive statistics, Pearson correlations, chi-square tests, regression analysis, and 1-way analysis of variance.

Results

The sample comprised 759 postgraduate year 2 (PGY-2) and PGY-3 residents in 36 programs at 16 institutions, with an overall response rate of 84% (N = 634). The residents represented 9 internal medicine (n = 216), 8 obstetrics and gynecology (n = 80), 10 pediatrics (n = 229), and 9 surgery programs (n = 109).

Reports of Inadequate Supervision

The majority of respondents reported that they had never worked "without adequate supervision" (33%) or that this had occurred less than once a month (47%). Fewer than 10% of respondents reported that they had worked without adequate supervision more than once a week, and just 1% of respondents claimed this had occurred "almost daily" (FIGURE 1). TABLE 1 shows that residents' reports of working without adequate supervision were lower than data from our 1999 survey for all 4 specialties.⁴

In response to a question asking residents to report on the extent to which each of 10 prelisted issues were perceived to be a "problem" in their residency experience, "lack of supervision" was least likely to be rated as a problem. The most frequently cited problems were "not enough time to think or reflect," "too little teaching," and "excessive workload" (FIGURE 2).

TABLE 2 presents correlates for 3 measures of problems with supervision (inadequate supervision, supervision as a problem, and dissatisfaction with the quality of supervision) with residents' ratings of their education experience. Problems with supervision were negatively correlated with having sufficient time

TABLE 1

Changes in Reports of Working Without Adequate Supervision From 1999 to 2009 for Internal Medicine, Pediatrics, Obstetrics and Gynecology, and Surgery^a

Specialties	1999 Survey		2009 Survey		P Value
	Mean (SD)	N	Mean (SD)	N	
Internal medicine	2.40 (1.43)	1042	2.10 (1.21)	210	.001
Pediatrics	2.06 (1.09)	443	1.87 (0.77)	225	.03
Obstetrics and gynecology	2.67 (1.52)	187	2.19 (1.26)	79	.003
Surgery	2.76 (1.59)	250	2.02 (1.03)	106	< .001

^a “During the past year, how often, if ever, did you care for patients *without* what you consider adequate supervision from an attending physician?” (1, never; 2, less than once a month; 3, at least twice a month; 4, at least once a week; 5, more than once a week; 6, almost daily).

for clinical activities, overall ratings of the residency experience, and attending physicians as a source of learning. Problems with supervision were positively correlated with reports that residents had made a significant medical error, had been belittled or humiliated, or had observed others falsifying medical records. Correlations further suggested that unfavorable reports of supervision were associated with residents reporting working while impaired, observing others working while impaired, and higher levels of depression and anxiety.

Residents who reported that they more frequently worked without adequate supervision and residents who rated lack of supervision as a problem were more likely to rate their residency experience in negative terms, and they were also less likely to view attending physicians as a source of learning. Although working without supervision was not a pervasive problem, when it happened, residents suggested that it had real consequences.

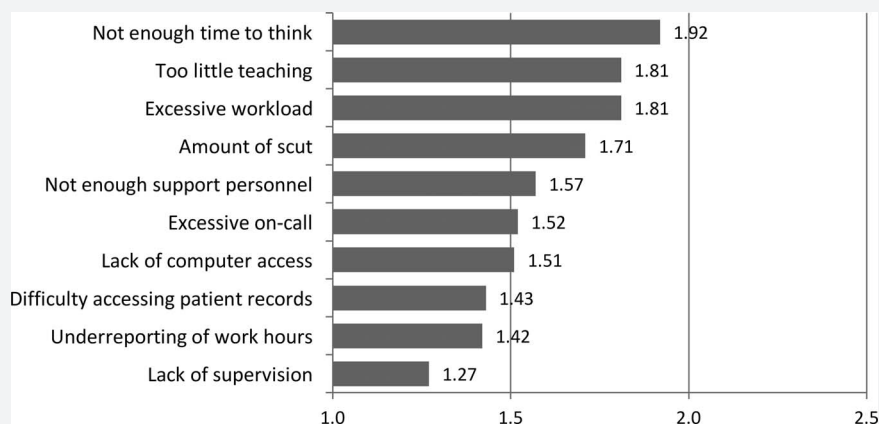
Inadequate Supervision and Medical Errors

The relationship between inadequate supervision and medical errors is of special concern. Reports of errors due to inadequate supervision showed a large

difference, with only 2% of residents who reported never working without supervision reporting they had committed an error due to inadequate supervision compared with 39% for residents who reported working without adequate supervision more than once a month. Residents who reported a lack of adequate supervision more than once per month were 5 times more likely to say they had made an error due to inadequate training, 2.5 times more likely to indicate that they had made an error due to communication problems, 3 times more likely to report an error due to excessive workload, and 20 times more likely to report an error due to lack of supervision.

Variability in Supervision

While the overall data showed favorable findings for adequacy of supervision, substantial variation in resident perceptions of supervision was found across and within programs. Disaggregating this variance, 13% variation was across programs, and the remaining 87% was due to individual resident factors, with 19% of this residual variation accounted for by a regression model that included clinical errors reported, working while ill, reports of observing others in an

**FIGURE 2**

Residents' Reports of Degree to Which Each of These Issues Was a Problem^a

^a N = 634; 1, not at all; 2, minor problem; and 3, major problem.

TABLE 2

Correlates of Residents' Reports of Adequacy of Supervision

	Inadequate Supervision ^a	Supervision a Problem ^b	Dissatisfaction With Quality of Supervision ^c
Negative correlates			
Time enough for clinical activities ^d	−0.31	−0.34	−0.44
Rating of residency ^e	−0.28	−0.34	−0.83 ^f
Hours with attending ^g	−0.16	−0.11	−0.15
Attending as source of learning ^h	−0.13	−0.19	−0.46
Supervisory residents as source of learning ^h	−0.03	−0.13	−0.32
Positive correlates			
Made any significant medical error ⁱ	+0.36	+0.33	+0.21
How often have you been belittled/humiliated? ^j	+0.25	+0.29	+0.21
How often have you observed others falsifying records? ^j	+0.23	+0.29	+0.19
How often have you observed others impaired? ^j	+0.24	+0.23	+0.22
How often have you worked while impaired? ^j	+0.21	+0.20	+0.13
Depression (CES-D-10) ^k	+0.21	+0.27	+0.26
Anxiety (Spielberger Anxiety Scale) ^l	+0.20	+0.24	+0.26
Stress rating ^m	+0.18	+0.17	+0.19
Conflict with an attending physician ⁿ	+0.17	+0.22	+0.16
Conflict with a nurse ⁿ	+0.16	+0.17	+0.19
Conflict with a fellow resident ⁿ	+0.10	+0.12	+0.14
Average weekly work hours	+0.14	+0.09	+0.04

^a “During the past year, how often, if ever, did you care for patients *without* what you consider adequate supervision from an attending physician?” (1, never; 2, less than once a month; 3, at least twice a month; 4, at least once a week; 5, more than once a week; 6, almost daily).

^b Scale of 1–3 as follows: 1, not a problem; 2, minor problem; 3, major problem.

^c “Please rate your past year of residency training in terms of quality of supervision” (1, poor; 4, good; 7, excellent). For analysis, this item has been reverse coded for purposes of continuity with the preceding supervision measures.

^d Scale of 1–4 ranging from 1, not enough time, to 4, enough time.

^e “Please rate your past year of residency training overall” (1, poor; 4, good; 7, excellent).

^f The high correlation between “Rating of Satisfaction” and “Dissatisfaction with Quality of Supervision” may be largely due to both items being located in the same section of the questionnaire.

^g “Within the total work hours reported above, on average, how many hours per week did you spend with an attending physician?”

^h “Please rate how much each of the following contributed to your learning experience” (1, not at all, to 5, a great deal).

ⁱ Value used for analysis is the sum of 5 error items, each rated with a 0–2 scale: 0, no error; 1, 1 error; 2, more than 1 error. Items included were whether the resident reported having made a significant medical error during the past year due to inadequate training, communication failure, excessive workload, and inadequate supervision.

^j Scale of 0–3 as follows: 0, never, 1, 1–2 times; 2, 3–4 times; 3, 5 or more times.

^k The 10-item Center for the Epidemiological Studies of Depression Short form^{15,16}: a cutoff score of 10 or more out of a total possible score of 30 is used to define significant depressive symptoms.

^l Spielberger Anxiety Scale.¹⁷

^m Scale of 1–7 ranging from 1, not at all stressful, to 7, very stressful.

ⁿ Scale of 0–1 as follows: 0, no conflict occurrence; 1, conflict occurrence.

impaired condition, number of weekly work hours, and overall ratings of satisfaction with residency. Using a regression model to account for the remaining individual variation, we were able to predict 30% of the variation in reports of inadequate supervision.

Discussion

Reports of inadequate supervision declined significantly between 1999 and 2009.⁴ Most residents in 2009 reported few or no occasions of working without what they considered adequate supervision,

and inadequate supervision was least likely to be rated as a problem. At the same time, roughly 1 in 10 residents claimed supervision was periodically inadequate. Reports of working without adequate supervision varied substantially across and within programs. When inadequate supervision was reported, it was associated with depressed mood, higher anxiety, feeling not enough time was available for clinical activities, higher rates of interpersonal conflict, and increased reports of medical errors. The difference between the 1999 and 2009 data likely is due to enhancements in the supervision standards that

may have modified the behavior of attending physicians and residents.

An important question is why residents in the same program have different perceptions of their supervision. We postulate that individuals perceive themselves as needing differing amounts of supervision, and a level of supervision presumed adequate for most may be insufficient for some. The classic description of professional socialization by Bucher and Stelling commented on residents' changing views of their clinical supervision over time.¹⁸ When new to their role and unsure, residents eagerly sought instruction and advice from their supervisors. As they gained experience, they wanted to "fly on their own," testing out their growth in competence and judgment, and using supervision to support and confirm their own decisions. Some residents may hide the fact that they need more supervision than they receive, with progressive independence as a "cultural expectation" in graduate medical education.¹⁹ Trainees may also be reluctant to ask for more supervision,^{20,21} and program directors may have a difficult time recognizing the needs of these individuals and tailoring supervision accordingly.

We allowed respondents to make use of their own sense of what the term *inadequate supervision* meant. We suspect that the sense of what makes supervision inadequate is a combination of the actual oversight provided and residents' perceived need for that oversight. Despite the focus on competency-based education²² and entrustment,^{10,11} relatively little is known about variation in supervision, both appropriate and inappropriate, within programs. Reports from residents gleaned from open-ended interviews during experimental nonaccreditation site visits suggest both appropriate variance in supervision to match trainee levels and variance among individual attending physicians, with some offering more and some providing less supervision for a given level of resident competence.²³ Residents expressed concerns about undersupervision and uncertainty early in training, but had concerns about oversupervision as they neared completion of their training and began the transition to practice.²³

Working without adequate supervision is among a set of variables that interact in the intricate process of residency training and the process of becoming a professional. While trainees often deem added faculty supervision unnecessary,²⁴ studies of closed malpractice claims have consistently implicated inadequate supervision.^{25,26} We found a concerning association between residents who reported a lack of adequate supervision more than once per month and a higher

rate of self-reported errors attributed to the lack of supervision.

The balance of supervision and progressive autonomy is intended to help residents progress in their training, navigate between making the inevitable mistakes involved in the learning process, and avoid clinically significant medical errors.²⁷ When inadequate supervision occurs, this may be due to trainee inexperience, reluctance to ask for assistance, and factors in the learning environment, including program size, workload, and clinical and economic pressures on programs and institutions. A study of neurological surgery program directors showed that respondents perceived a correlation between lower PGY level and greater incidence of errors and also found a slight association between larger program size and the number of errors, with this potentially attributable to lack of supervision due to faculty not fully understanding residents' skill levels.²⁸ Conversations with faculty during nonaccreditation pilot site visits suggested that faculty physicians have serious concerns about reduced opportunity to get to know trainees sufficiently to appropriately tailor the supervision to the given trainee and a resultant tendency to oversupervise.²³

Limitations of our analysis include the fact that data were collected in 2009 and may not reflect current supervision patterns. Data are self-reported, and causal relationships cannot be determined from associations in cross-sectional survey data. Future research needs to emphasize variation in supervision for individual residents, in lieu of a formulaic approach characterized in terms of an average resident. It should also explore what information would be helpful to faculty in appropriately tailoring supervision to the given trainee.

Supervision cannot and should not be addressed in isolation but must be viewed in the context of the residency program as a whole. Future studies should also focus on variations in individual residency experience, taking into account that residency programs are complex systems. This will require moving beyond simple bivariate analyses to multivariate representations and broader testing of existing and new conceptual models, including graduated supervision models, use of milestone data, and entrustment models.

Conclusion

In 2009, most residents in 4 large specialties felt that the supervision they received was adequate. Clinical supervision is a complex process, however, involving elements of teaching and oversight, which must meet and match residents' needs for increasing

responsibility, competence, and autonomy as well as patients' needs for safety. For the small number of residents who reported undersupervision, this was associated with higher self-reported medical errors.

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