Career Fit and Burnout Among Academic Faculty

Tait D. Shanafelt, MD; Colin P. West, MD, PhD; Jeff A. Sloan, PhD; Paul J. Novotny, MS; Greg A. Poland, MD; Ron Menaker, EdD; Teresa A. Rummans, MD; Lotte N. Dyrbye, MD

Background: Extensive literature documents personal distress among physicians and a decrease in their satisfaction with the practice of medicine over recent years. We hypothesized that physicians who spent more of their time in the aspect of work that they found most meaningful would have a lower risk of burnout.

Methods: Faculty physicians in the Department of Internal Medicine at a large academic medical center were surveyed in the fall of 2007. The survey evaluated demographic variables, work characteristics, and career satisfaction. Burnout was measured using the Maslach Burnout Inventory. Additional questions evaluated which professional activity (eg, research, education, patient care, or administration) was most personally meaningful and the percentage of effort that was devoted to each activity.

Results: Of 556 physicians sampled, 465 (84%) returned surveys. A majority (68%) reported that patient care was the aspect of work that they found most meaningful, with smaller percentages reporting research (19%), education (9%), or administration (3%) as being most meaningful. Overall, 34% of faculty members met the criteria for burnout. The amount of time spent working on the most meaningful activity was strongly related to the risk of burnout. Those spending less than 20% of their time (approximately 1 d/wk) on the activity that is most meaningful to them had higher rates of burnout (53.8% vs 29.9%; $P<.001$). Time spent on the most meaningful activity was the largest predictor of burnout on multivariate analysis (odds ratio, 2.75; $P=.001$).

Conclusions: The extent to which faculty physicians are able to focus on the aspect of work that is most meaningful to them has a strong inverse relationship to their risk of burnout. Efforts to optimize career fit may promote physician satisfaction and help to reduce attrition among academic faculty physicians.

Arch Intern Med. 2009;169(10):990-995

THE PRACTICE OF MEDICINE has the potential to be a tremendously fulfilling and meaningful endeavor. Physicians are responsible for caring for the nation's sick, promoting the public health, advancing the science of medicine, and passing the torch of knowledge to the next generation of physicians. Unfortunately, despite the value and importance of these pursuits, an expanding body of literature reports growing personal distress among physicians and a decrease in their satisfaction with the practice of medicine.[1-5] Specifically, numerous studies have documented high rates of burnout and poor mental health among US physicians and have suggested that physician distress can have a profound impact on patient quality of care as well as on a physician's personal health.[1,2,5-8]

For editorial comment see page 927

A complex array of factors, including decreased autonomy, increased administrative work, less time with patients, and difficulty balancing personal and professional responsibilities all contribute to physician distress.[1,2,9] In addition to these challenges, which face all physicians, a unique set of additional challenges are experienced by academic physicians. These challenges include declining levels of funding provided by the National Institutes of Health to support scientific research and changes to the structure of residency that have increased the clinical responsibilities of faculty physicians and have reduced time for traditional academic pursuits such as research and education.[10-17] Another challenge for academic faculty involves navigating the requirements that compete for their time, such as research, education, patient care, and administrative responsibilities. The degree of satisfaction that faculty members derive from these different tasks varies, and individuals may not always have the opportunity to focus on the areas that they view as most personally meaningful.[10,12,15-19] To our knowledge, no studies have evaluated the relationship between career fit (the extent to which an individual is able to focus their effort on the aspect of work that they find most meaningful) and faculty burnout.

Author Affiliations: Departments of Internal Medicine (Drs Shanafelt, West, Poland, Menaker, and Dyrbye), Cancer Center Statistics (Dr Sloan and Mr Novotny), and Psychiatry and Psychology (Dr Rummans), Mayo Clinic, Rochester, Minnesota.

We hypothesized that the degree of career fit among academic physicians would relate to burnout and faculty satisfaction. Specifically, we hypothesized that faculty physicians who are able to spend more time devoted to the activity that they find most meaningful would have greater professional satisfaction and lower rates of burnout. In the present study, we studied physicians in the Department of Internal Medicine (DOM) at 1 large, academic medical center and evaluated the relationship between career fit, burnout, and intention to leave academic medicine.

METHODS

PARTICIPANTS

With the exception of the study investigators, all physicians who were permanent faculty members of the DOM, Mayo Clinic, Rochester, Minnesota, were eligible for participation in this study. Participation was elective, and all responses were anonymous. The study was reviewed and approved by the Mayo Clinic institutional review board.

DATA COLLECTION

The DOM faculty physicians were surveyed electronically in September and October 2007. A cover letter stated that the purpose of the survey was to better understand the factors that contribute to career satisfaction among physicians specializing in internal medicine and its related subspecialties. Participants were not informed of the specific hypothesis of the study. The survey included 87 questions regarding demographic information, work characteristics, and burnout. Nonresponders received up to 3 e-mail messages reminding them to complete the survey. Physicians who did not respond to any of these requests were sent a paper version of the survey via campus mail.

Burnout was measured using the Maslach Burnout Inventory, a validated 22-item questionnaire that is considered a standard tool for measuring burnout.[20-23] The Maslach Burnout Inventory has 3 subscales that are used to evaluate the 3 domains of burnout: emotional exhaustion (EE), depersonalization (DP), and low personal accomplishment (PA). We considered physicians with a high score for medical professionals on the DP (score $\geq$10) and/or EE (score $\geq$27) subscale as having at least 1 manifestation of professional burnout.[20,24,25] Additional questions were used to evaluate practice characteristics (hours worked per week, the percentage of professional effort spent in various activities [eg, research, education, patient care, or administration]), which work activity was most personally meaningful (research, education, patient care, administration, and nonvisit patient care activities [eg, returning patient phone calls, writing letters to patients, and checking laboratory results]), and personal strategies used to deal with stress. The percentage of effort spent in the activity rated as most personally meaningful was used as a metric of career fit. As a measure of career satisfaction, responders were also asked about the likelihood that they would leave academic medicine, leave their current position, or reduce their effort to part time in the next 24 to 36 months. For these items, responders were grouped into categories ($\leq$40% likelihood vs >40% likelihood) based on previously published use of this threshold.[12] With respect to hours worked per week, physicians were asked, on average, how many hours per week they spent (1) working on site (eg, physically at work seeing patients, doing research, teaching, or performing administrative tasks), (2) performing work-related tasks at home (eg, preparing talks, writing articles, or working on grants), and (3) keeping abreast of developments in their field (eg, reading journals) or performing tasks to maintain certification (eg, completing American Board of Internal Medicine modules). These 3 values were summed to calculate total hours worked per week. After development, the survey was reviewed by the department chair, the research chair, a senior department administrator, and the director of staff development and was modified on the basis of their feedback before use.

STATISTICAL ANALYSIS

The primary analysis involved the use of descriptive summary statistics for estimating the prevalence of burnout among DOM faculty. Next, we examined differences in burnout by various demographic and practice characteristics. χ^2 Tests were used to assess differences in percentages between groups; Wilcoxon rank sum tests were used to assess differences between groups for continuous variables; and simple linear regression was used to assess associations in continuous variables (EE, DP, and PA) as dependent variables in building separate models. Stepwise logistic regression was used to evaluate independent associations between demographic and practice characteristics and categorical dependent variables (ie, burnout or intent to leave academic medicine). All analyses were performed using SAS version 8 (SAS Institute Inc, Cary, North Carolina).

RESULTS

STUDY PARTICIPANTS

A total of 465 of 556 DOM faculty physicians (83.6%) responded to the survey. The personal and professional characteristics of study participants are summarized in **Table 1**. Approximately 23% of the participants were women. Based on DOM faculty demographic data, responding physicians were similar to the entire DOM faculty, which includes 23.7% women. More than 90% of the study participants were married or had a partner, and 63% had school-age or younger ($\leq$18 years) children living at home.

With respect to professional characteristics, 132 of 465 responders (28.4%) were generalists (general internal medicine, primary care internal medicine, preventive medicine, or hospital internal medicine), and the remaining 333 (71.6%) practiced internal medicine subspecialty work. With respect to the percentage of effort, 82% of the faculty physicians were currently working full time. The mean total of hours worked for all responders was 69 h/wk, which included an average of 55 h/wk physically at work (eg, seeing patients, doing research, teaching, or administrative tasks), 10 h/wk working from home (eg, preparing talks, writing papers, or working on grants), and 4 h/wk keeping abreast of developments in their field (eg, reading journals) or performing tasks to maintain certification (eg, completing American Board of Internal Medicine modules).

ASPECT OF WORK MOST PERSONALLY MEANINGFUL AND CAREER FIT

A majority (68%) of physicians reported that patient care was the aspect of work that they found most personally meaningful, with smaller percentages reporting research (19%), education (9%), administration (3%), or nonvisit patient care activities (<1%) as being the most meaningful activity. Tailoring of the actual distribution of effort to

Table 1. Personal and Professional Characteristics

Characteristics	No. (%)
Personal	
Age, y	
<35	21 (4.6)
35-44	154 (34.1)
45-54	174 (38.5)
55-64	93 (20.6)
≥65	10 (2.2)
Sex	
Female	102 (22.8)
Male	345 (77.2)
Relationship status	
Single	28 (6.3)
Married	397 (89.8)
Partner	8 (1.8)
Divorced	7 (1.6)
Widowed	2 (0.5)
Children ≤ age 18 y living at home	285 (63.1)
Professional	
Mean total h/wk	69
Physically at work, mean, h	55
Working from home, mean, h	10
Maintaining certification, mean, h	4
Faculty working less than full time	80 (18)
Specialty	
Allergy	6 (1.3)
Cardiology/vascular medicine	96 (20.6)
Endocrinology	35 (7.5)
Internal medicine	97 (20.8)
Gastroenterology	63 (13.5)
Hospital internal medicine	19 (4.1)
Hematology	33 (7.1)
Infectious disease	20 (4.3)
Nephrology	30 (6.5)
Preventive medicine	16 (3.4)
Pulmonary and critical care	37 (8.2)
Rheumatology	12 (2.6)
Aspect of work viewed as most personally meaningful	
Patient care	308 (68)
Research	86 (19)
Education	42 (9)
Administration	13 (3)
Nonvisit patient care tasks	1 (0.2)

the most meaningful aspect of work was observed (**Table 2**). For example, those who viewed research as the most personally meaningful aspect of work spent an average of 39% of their time on research compared with 11% or less research time for those who viewed patient care, education, or administration as most meaningful. Despite this tailoring of effort to match interests, physicians from all categories spent more time, on average, on performing patient care tasks than on any other activity. There were minimal differences in the percentage of time spent on their most meaningful activity among physicians younger than 55 years (age <35 years = 54% of effort; age 35-44 years = 52% of effort; and age 45-54 years = 54% of effort), while those aged 55 and older appeared to spend more time on their most meaningful activity (age 55-64 years = 62%; age ≥65 years = 79%; *P* value for trend, <.001). No difference in the average amount of time spent in the activity rated most meaningful was observed based on sex or being a generalist as compared with a subspecialist.

Overall, 385 of 437 physicians (88%) spent at least 20% of their effort (approximately 1 d/wk) on the activity that they reported to be most personally meaningful; however, this percentage varied based on whether individuals viewed patient care, research, administration, or education as the most meaningful aspect of work (**Figure 1**). Subspecialists were more likely than generalists to spend at least 20% of their effort on the activity that they reported to be most personally meaningful (mean, 90% vs 82%; *P* = .04). No difference in the percentage of physicians who spent at least 20% of their effort on the activity reported to be most personally meaningful was observed by age or sex.

BURNOUT

Burnout among study participants is summarized in **Table 3**. Six responders did not answer enough Maslach Burnout Inventory questions to be included in our analysis. The mean (SD) EE, DP, and PA scores were 20.9 (11.1), 4.4 (4.8), and 40.7 (6.3), respectively. Of 459 faculty physicians, 61(13.3%) had high DP scores and 138 (30.2%) had high EE scores. Overall, 156 faculty members (34.0%) were burned out. With respect to demographic characteristics, women (43% vs 31%; *P* = .02) and physicians younger than 55 years (37.3% vs 19.4%; *P* < .001) had higher rates of burnout. No difference in burnout was observed based on relationship status or on whether physicians had children 18 years or younger living at home. Generalists were more likely to be burned out than subspecialists (42.3% vs 20.7%; *P* = .02). Physicians who were burned out also worked an average of almost 5 more hours per week than physicians who were not burned out (mean hours worked, 72.1 vs 67.5, *P* = .006).

RELATIONSHIP BETWEEN CAREER FIT AND BURNOUT

To begin to assess the relationship between career fit and burnout, we evaluated the relationship between the percentage of effort as a continuous variable and EE, DP, PA, and overall burnout. As continuous variables, the percentage of effort spent on patient care, education, research, administration, and most meaningful activity had minimal correlation with EE, DP, or PA scores (all $r < 0.13$). We next evaluated whether a threshold of time spent on the most personally meaningful activity related to burnout. In evaluating cut points between 5% and 90%, the 10%, 15%, and 20% cut points separated burnout risk equally well, suggesting that spending at least 10% to 20% of the time in the area most personally meaningful was associated with lower risk of burnout (**Figure 2**). Those who spent less than 20% of their time (approximately 1 d/wk) on the activity most meaningful to them were more likely to be burned out (53.8% vs 29.9%; *P* < .001).

INTENT TO LEAVE ACADEMIC MEDICINE AND TO REDUCE EFFORT TO PART-TIME

Overall, 83 of 449 physicians (18.5%) stated that they intended to leave their current position in the next 36 months,

Table 2. Most Meaningful Activity and Allocation of Actual Effort

Area Most Personally Meaningful	% Time Spent on					
	Patient Care	Education	Research	Administration	Nonvisit Care[a]	Total
Patient care	67.1	4.8	10.6	9.5	7.8	**99.8**
Education	64.0	15.1	3.6	6.7	10.5	**99.9**
Research	41.7	3.5	38.6	10.1	5.9	**99.8**
Administration	50.8	5.1	10.8	26.9	6.4	**100**

[a] Includes such activities as returning patient phone calls, writing letters to patients, and checking laboratory results.

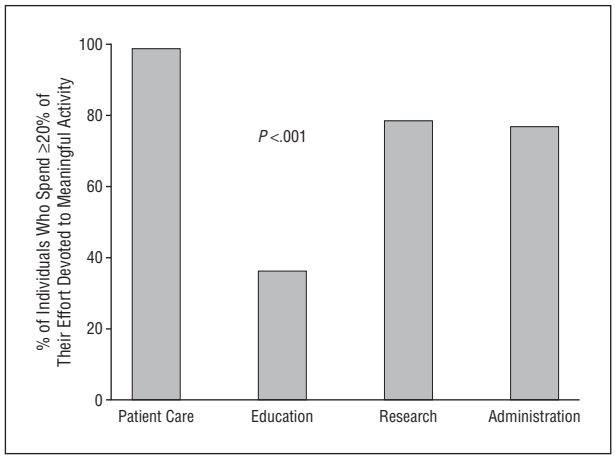

Figure 1. Career fit by activity viewed most personally meaningful. The y-axis shows the percentage of individuals who spend at least 20% of their effort in the activity viewed as most personally meaningful based on whether patient care, education, research, or administration is viewed as the most meaningful activity (x-axis). The results indicate that a smaller percentage of those who view education as the most meaningful aspect of their work spend at least 20% of their time in the activity that they view most meaningful.

Table 3. Burnout

Burnout Indices[a]	No. (%)
Emotional exhaustion (range, 0-54)	
Low	209 (45.7)
Moderate	110 (24.1)
High	138 (30.2)
Depersonalization	
Low	334 (72.9)
Moderate	63 (13.8)
High	61 (13.3)
Personal accomplishment	
High	302 (66.2)
Moderate	94 (20.6)
Low	60 (13.2)
Burned out[b]	156 (34)

[a] High scores on the emotional exhaustion and depersonalization subscales and low scores on the personal accomplishment subscale are considered indicators of burnout.
[b] High score on emotional exhaustion and/or depersonalization subscale (see the "Methods" section).

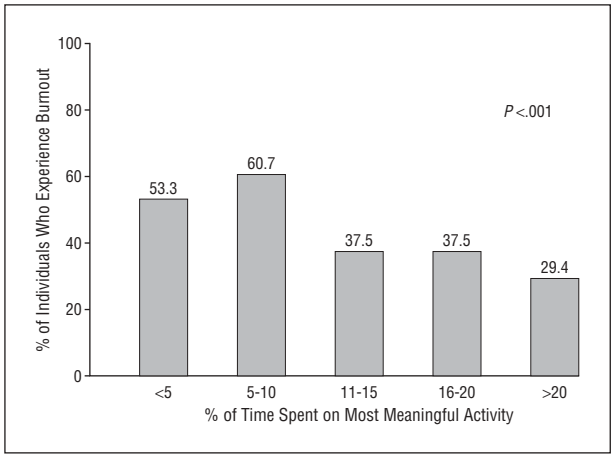

Figure 2. Burnout by amount of time spent on activity viewed most personally meaningful. The y-axis shows the percentage of individuals within each group who experience burnout. The x-axis indicates the amount of time spent in the activity viewed as most personally meaningful.

and 43 of 434 (9.9%) stated they intended to leave academic medicine altogether during this interval. Of 342 physicians younger than 55 years, 55 (16.1%) intended to leave their current position and 25 (7.3%) intended to leave academic medicine in the next 36 months. Similarly, 60 of 359 physicians (19.0%) currently working full time reported that they intended to reduce their effort to less than full time in the next 24 months, including 43 of 286 physicians (14.3%) younger than 55 years. There were no differences observed in the intent to leave academic medicine based on sex, marital status, or being a generalist rather than a subspecialist. Physicians without children 18 years or younger at home were twice as likely to report an intent to leave academic medicine (14.2% vs 7.2%; $P=.02$). There were no differences in intent to reduce from full-time to part-time work based on relationship status, on having children 18 years or younger at home, or on being a generalist rather than a subspecialist. Women were twice as likely as men to report that they intended to reduce from full-time to part-time work (26.9% vs 14.3%; $P=.02$) and were also more likely to already be working less than full time (48% vs 9%%; $P<.001$).

We next evaluated the relationship between faculty physicians' burnout and their intent to (1) leave their current position, (2) leave academic medicine, or (3) reduce from full-time work to part-time work. Burned out physicians were more likely to report an intent to leave their current position in the next 36 months (24.7 vs 15.5; $P=.02$). Among physicians working full time, burned out physicians were also more likely to report an intent to reduce from full-time work to part-time work in the next 24 months (24.0% vs 12.2%; $P=.004$). Although burned out physicians were also more likely to report an intent to leave academic medicine in the next 36 months (13.9%

Table 4. Multivariate Models: Personal and Professional Factors Independently Associated With Intent to Leave Academic Medicine and With Burnout[a]

Factor	Odds Ratio (95% Confidence Inteval)	*P* Value
Intent to leave academic medicine		
Age >55 y	3.91 (1.93-7.94)	<.001
Burnout	2.28 (1.13-4.60)	.02
Burnout		
Spending <20% of time on most meaningful activity	2.75 (1.49-5.10)	.001
Age <55 y	2.30 (1.31-4.07)	.004
Generalist	1.76 (1.06-2.92)	.03
Total hours worked per week	1.02[b] (1.004-1.031)	.01

[a]Variables included in multivariate analysis included age, sex, relationship status, children younger than 18 years, total hours worked, time spent in most meaningful activity, generalist vs subspecialist, and working full time vs part time.
[b]Risk of each 1 additional hour worked per week.

vs 8.1%; *P*=.06), this difference did not reach statistical significance.

MULTIVARIATE ANALYSIS

Finally, we performed stepwise logistic regression to evaluate personal (age, sex, relationship status, and children aged ≤18 years) and professional (total hours worked, time spent in most meaningful activity, generalist vs subspecialist, and working full time vs part time) factors that are independently associated with intent to leave academic medicine and burnout. The only factors independently associated with increased risk of leaving academic medicine were age older than 55 years (odds ratio [OR], 3.91; *P*<.001) and burnout (OR, 2.28; *P*=.02) (**Table 4**). Four factors were independently associated with increased risk of burnout: lack of career fit (devoting <20% effort to most meaningful activity; OR, 2.75; *P*=.001), age younger than 55 years (OR, 2.30; *P*=.004); total hours worked (OR for each additional hour worked per week, 1.02; *P*=.01), and being a generalist (OR, 1.76, *P*=.03) (Table 4).

COMMENT

Although previous studies have suggested a link between physician burnout and work load, autonomy, medical mistakes, malpractice suits, and difficulty balancing personal and professional life, there is little information regarding an association between the meaning that physicians derive from their work and their vulnerability to burnout. In the present study, we found a strong relationship between the amount of time that physicians spend in the aspect of work that they find most personally meaningful (career fit) and burnout. Physicians who spent at least 20% of their time in the aspect of work that was most meaningful to them had a rate of burnout roughly half that of those who spent less than 20% effort in the activity that was most meaningful to them. After the amount of time physicians spent on their most meaningful activity was controlled for, no relationship was observed between which activity was most personally meaningful (patient care, research, education, or administration) and burnout. The association between time spent in the most meaningful activity and burnout was strong and was the largest predictor of burnout on multivariate analysis after other factors were controlled for. Notably, burnout and age were the only factors that were independently associated with the intent to leave academic medicine.

These findings have important implications for the administrative leadership and department chairs at academic medical centers. These centers are responsible for training the next generation of physicians, for serving as the primary origin of scientific discovery and advances in the fields of medicine and health care delivery, and for providing tertiary medical care to patients with complex and unusual health care problems. Their physician faculty is the most critical resource for academic medical centers to discharge these responsibilities to society. Unfortunately, a number of studies suggest that many physician faculty members at academic medical centers are dissatisfied[10-14] and are considering leaving academia.[10,12,14] Other than age, burnout was the only variable in our study that was associated with intent to leave academia, suggesting that efforts to minimize burnout are critical for the long-term health of academic medical centers. Our findings suggest that a lack of career fit, working more hours per week, younger age, and being a generalist rather than a subspecialist are characteristics that are associated with a greater risk of burnout, information that may help academic centers as they attempt to identify which faculty members would derive the greatest benefit from interventions to improve satisfaction.

Our results also suggest that academic centers should have clearly defined job descriptions for their faculty members and that they should attempt to hire individuals whose career ambitions align with their expectations. While this suggestion seems intuitive, academic centers have increasingly demanded greater clinical productivity from their faculty members[12,13,15-17] and have even created positions whose primary purpose is to see a high volume of patients rather than to perform the traditional scholarly activities (ie, research and education) of academic faculty.[18] These increased clinical requirements, which are necessary to generate revenue and to address manpower issues that are created by resident work hour limitations,[12] may reduce the ability of faculty members to spend time on other activities that are meaningful to them. The deteriorating financial environment at many academic medical centers has also likely reduced the discretionary funds that are available to department chairs

for fostering the career development of junior faculty members.

Finally, it is important to note that the factors that contribute to physician burnout and their relative importance may differ based on the physicians' career type (ie, researcher, educator, clinician, or administrator), on their practice setting (eg, private practice or academic practice), and on which aspect of work that they find most meaningful. For example, those who derive the greatest amount of meaning from medical education or research may have greater difficulty obtaining the necessary protected time to allow good career fit than those who view patient care activities as most meaningful. In contrast, career fit for physicians who view patient care as the most meaningful aspect of work may relate not only to the amount of time that is devoted to patient care but also to specific patient care activities that each physician finds particularly rewarding (eg, hospital medicine, end-of-life care, procedures, and patient counseling). This aspect was not explored by our study and merits additional investigation to assess whether it explains some of the variation in burnout among physicians who view patient care as the most meaningful aspect of work.

Our study has several important strengths. First, it included a very large sample of physicians from a diverse group of internal medicine–related subspecialties. It had an excellent response rate for a physician survey,[26,27] and the rate of observed burnout is consistent with that seen in previous studies of physicians.[1,2,4,5] However, it also has several limitations. First, the results from a single academic institution may not be generalizable to other institutions. Second, the extent to which an institution promotes and achieves good career fit among its faculty members likely varies between institutions. Third, it is likely that other unmeasured factors (eg, workload, autonomy, and administrative demands) account for at least some of the variations in burnout and intent to leave academic medicine. Fourth, because this study was cross-sectional, we were unable to determine the causal relationship between variables that were statistically associated.

Consistent with the literature, we found a high rate of burnout among the physician faculty members in the DOM at 1 large academic medical center. Notably, faculty burnout was strongly associated with an intent to leave academic medicine. The extent to which faculty members are able to focus on the aspect of work that is most meaningful to them appears to be inversely associated with their risk of burnout. These findings suggest that efforts to optimize career fit among the physician faculty members at academic medical centers may be important elements of programs to promote physician satisfaction and to reduce attrition from academic medicine.

Accepted for Publication: February 8, 2009.
Correspondence: Tait D. Shanafelt, MD, Department of Internal Medicine, Mayo Clinic, 200 First St SW, Rochester, MN 55905.
Author Contributions: *Study concept and design:* Shanafelt, West, Sloan, Poland, Menaker, Rummans, and Dyrbye. *Acquisition of data:* Shanafelt, West, and Dyrbye. *Analysis and interpretation of data:* Shanafelt, West, Sloan, Novotny, and Dyrbye. *Drafting of the manuscript:* Shanafelt, Sloan, Menaker, and Dyrbye. *Critical revision of the manuscript for important intellectual content:* Shanafelt, West, Novotny, Poland, Rummans, and Dyrbye. *Statistical analysis:* West, Sloan, and Novotny. *Administrative, technical, and material support:* Shanafelt, Menaker, and Dyrbye. *Study supervision:* Shanafelt and Poland.
Financial Disclosure: None reported.

REFERENCES

1. Shanafelt T, Sloan J, Habermann T. The well-being of physicians. *Am J Med*. 2003; 114(6):513-517.
2. Spickard A Jr, Gabbe SG, Christensen JF. Mid-career burnout in generalist and specialist physicians. *JAMA*. 2002;288(12):1447-1450.
3. Pathman DE, Konrad TR, Williams ES, Scheckler WE, Linzer M, Douglas J; Career Satisfaction Study Group. Physician job satisfaction, dissatisfaction, and turnover. *J Fam Pract*. 2002;51(7):593.
4. Ramirez AJ, Graham J, Richards MA, Cull A, Gregory WM. Mental health of hospital consultants: the effects of stress and satisfaction at work. *Lancet*. 1996; 347(9003):724-728.
5. Campbell DA Jr, Sonnad SS, Eckhauser FE, Campbell KK, Greenfield LJ. Burnout among American surgeons. *Surgery*. 2001;130:696-705.
6. Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. *Soc Sci Med*. 1997;44(7):1017-1022.
7. Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med*. 2002;136 (5):358-367.
8. West CP, Huschka MM, Novotny PJ, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA*. 2006;296(9):1071-1078.
9. Konrad TR, Williams ES, Linzer M, et al. Measuring physician job satisfaction in a changing workplace and a challenging environment: SGIM Career Satisfaction Study Group: Society of General Internal Medicine. *Med Care*. 1999;37(11): 1174-1182.
10. Lowenstein SR, Fernandez G, Crane LA. Medical school faculty discontent: prevalence and predictors of intent to leave academic careers. *BMC Med Educ*. 2007; 7:37.
11. Schindler BA, Novack DH, Cohen DG, et al. The impact of the changing health care environment on the health and well-being of faculty at four medical schools. *Acad Med*. 2006;81(1):27-34.
12. Goitein L, Shanafelt TD, Nathens AB, Curtis JR. Effects of resident work hour limitations on faculty professional lives. *J Gen Intern Med*. 2008;23(7):1077-1083.
13. Reed DA, Levine RB, Miller RG, et al. Effect of residency duty-hour limits: views of key clinical faculty. *Arch Intern Med*. 2007;167(14):1487-1492.
14. Demmy TL, Kivlahan C, Stone TT, Teague L, Sapienza P. Physicians' perceptions of institutional and leadership factors influencing their job satisfaction at one academic medical center. *Acad Med*. 2002;77(12, pt 1):1235-1240.
15. Coverdill JE, Finlay W, Adrales GL, et al. Duty-hour restrictions and the work of surgical faculty: results of a multi-institutional study. *Acad Med*. 2006;81(1):50-56.
16. Klingensmith ME, Winslow ER, Hamilton BH, Hall BL. Impact of resident duty-hour reform on faculty clinical productivity. *Curr Surg*. 2006;63(1):74-79.
17. Campbell EG, Weissman JS, Blumenthal D. Relationship between market competition and the activities and attitudes of medical school faculty. *JAMA*. 1997; 278(3):222-226.
18. Buckley LM, Sanders K, Shih M, Hampton CL. Attitudes of clinical faculty about career progress, career success and recognition, and commitment to academic medicine: results of a survey. *Arch Intern Med*. 2000;160(17):2625-2629.
19. Bland CJ, Seaquist E, Pacala JT, Center B, Finstad D. One school's strategy to assess and improve the vitality of its faculty. *Acad Med*. 2002;77(5):368-376.
20. Maslach C, Jackson S, Leiter M. *Maslach Burnout Inventory Manual*. 3rd ed. Palo Alto, CA: Consulting Psychologists Press; 1996.
21. Rafferty JP, Lemkau JP, Purdy RR, Rudisill JR. Validity of the Maslach Burnout Inventory for family practice physicians. *J Clin Psychol*. 1986;42(3):488-492.
22. Lee RT, Ashforth BE. A meta-analytic examination of the correlates of the three dimensions of job burnout. *J Appl Psychol*. 1996;81(2):123-133.
23. Leiter M, Durup J. The discriminant validity of burnout and depression: a confirmatory factor analytic study. *Anxiety Stress Coping*. 1994;7:357-373.
24. Thomas NK. Resident burnout. *JAMA*. 2004;292(23):2880-2889.
25. Schaufeli W, Bakker A, Hoogduin K. On the clinical validity of the Maslach Burnout Inventory and the Burnout Measure. *Psychol Health*. 2001;16:565-582.
26. Kellerman S, Herold J. Physician response to surveys: a review of the literature. *Am J Prev Med*. 2001;20(1):61-67.
27. Asch DA, Jedrziewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol*. 1997;50(10):1129-1136.