Burnout and Self-Reported Patient Care in an Internal Medicine Residency Program

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Background: **Burnout is a syndrome of depersonalization, emotional exhaustion, and a sense of low personal accomplishment. Little is known about burnout in residents or its relationship to patient care.**

Objective: **To determine the prevalence of burnout in medical residents and explore its relationship to self-reported patient care practices.**

Design: **Cross-sectional study using an anonymous, mailed survey.**

Setting: **University-based residency program in Seattle, Washington.**

Participants: **115 internal medicine residents.**

Measurements: **Burnout was measured by using the Maslach Burnout Inventory and was defined as scores in the high range for medical professionals on the depersonalization or emotional exhaustion subscales. Five questions developed for this study assessed self-reported patient care practices that suggested suboptimal care (for example, "I did not fully discuss treatment options or answer a patient's questions" or "I made . . . errors that were not due to a lack of knowledge or inexperience"). Depression and at-risk alcohol use were assessed by using validated screening questionnaires.**

Results: **Of 115 (76%) responding residents, 87 (76%) met the criteria for burnout. Compared with non–burned-out residents, burned-out residents were significantly more likely to self-report providing at least one type of suboptimal patient care at least monthly (53% vs. 21%; $P = 0.004$). In multivariate analyses, burnout—but not sex, depression, or at-risk alcohol use—was strongly associated with self-report of one or more suboptimal patient care practices at least monthly (odds ratio, 8.3 [95% CI, 2.6 to 26.5]). When each domain of burnout was evaluated separately, only a high score for depersonalization was associated with self-reported suboptimal patient care practices (in a dose–response relationship).**

Conclusion: **Burnout was common among resident physicians and was associated with self-reported suboptimal patient care practices.**

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Burnout is a syndrome of depersonalization, emotional exhaustion, and a sense of low personal accomplishment that leads to decreased effectiveness at work (1). Burnout differs from depression in that burnout only involves a person's relationship to his or her work, whereas depression globally affects a person's life (1). A broad range of professions that share an intense involvement with people—including physicians (2, 3), nurses (4, 5), and educators (6)—experience burnout. Burnout is associated with decreased job performance (7) and reduced job commitment (5) and predicts stress-related health problems (8) and low career satisfaction (9, 10).

Burnout appears common among practicing physicians, with rates ranging from 25% to 60% (3, 10–14). However, only two small studies have described burnout in physicians during postgraduate residency training (15, 16). Moreover, no research has evaluated the potential relationship between physician burnout and patient care. We evaluated the prevalence of burnout among internal medicine residents in a single university-based program and evaluated the relationship of burnout to self-reported patient care practices.

METHODS

Participants

All residents in the University of Washington Affiliated Hospitals Internal Medicine Residency program (except the first author, who was a 3rd-year resident) were eligible for this study. Residents in the program graduated from 45 U.S. medical schools and 4 international medical schools; the cohort comprised residents in primary care and residents in categorical and preliminary internal medicine. The residents rotate through a university medical center, a Veterans Affairs hospital, and county and community hospitals. Fifty percent of their rotations include in-hospital on-call shifts. The University of Washington Human Subjects Institutional Review Board approved the study.

Data Collection

We mailed a 92-item, self-administered survey to residents' homes in February 2001. The survey ad-

dressed topics in the following order: demographic characteristics; residency experience of work stresses; Maslach Burnout Inventory (MBI) (1); depression, at-risk alcohol use, and other substance abuse; patient care practices and attitudes; personal coping strategies to manage stress; the value of program features aimed at resident well-being; and career satisfaction. The accompanying cover letter stated that the purpose of the survey was to "better understand residents' feelings and identify what aspects of the residency are most stressful"; the letter also explained that participation was elective and that responses would be anonymous. Residents were blinded to any specific hypothesis of the study, and "burnout" was not mentioned in the cover letter. As an incentive to participate, residents who returned a separate postcard indicating that they had completed a survey were eligible for a drawing for a $100 gift certificate. After the survey was mailed once to all residents, two reminders were sent by e-mail.

Context

Burnout, a syndrome of emotional exhaustion, depersonalization, and perceived low personal accomplishment, is common among practicing physicians.

The frequency and consequences of burnout among physician trainees (residents) are largely unknown.

Contribution

This survey from a single university-based training program showed that 76% of medical residents met criteria for burnout. Of these residents with burnout, 50% had depressive symptoms and 9% had at-risk alcohol use.

Burned-out residents more often reported career dissatisfaction (41% vs. 11%) and suboptimal patient care practices (53% vs. 21%) than residents without burnout.

Editor's Note

Useful information on burnout and renewal can be found at www.acponline.org/careers/catalog_resources.htm.

—The Editors

Survey Measures

Burnout

The MBI is a 22-item questionnaire that has been shown to be reproducible and valid (1, 17–19) and is generally considered the gold standard measure for burnout (8). The inventory asks respondents to indicate on a 7-point Likert scale (which does not include the word "burnout") the frequency with which they experience certain feelings related to their work. The MBI evaluates three domains of burnout: 1) emotional exhaustion, which is measured with a subscale of 9 items (for example, "I feel emotionally drained from my work"); 2) depersonalization, which is measured with a subscale of 5 items (for example, "I've become more callous toward people since I took this job"); and 3) personal accomplishment, which is measured with 8 items (for example, "I feel I'm positively influencing people's lives through my work") (1).

On the basis of the MBI responses, independent subscale scores are calculated for each of the three domains of burnout. Low, average, and high scores for each domain are based on the low, medium, and high terciles of scores from a previously published study of 1104 medical professionals (1). For our study, we defined burnout as a high score on the depersonalization or emotional exhaustion subscales. We did not include the subscale scores for personal accomplishment in the criteria for burnout because previous research has suggested that this subscale measures a somewhat distinct dimension (1).

Self-Reported Patient Care Practices and Attitudes

For this study, we specifically developed eight statements describing self-reported practices (5 items) and attitudes (3 items) of patient care (**Table 1**). These statements were developed on the basis of hypothesized effects of burnout on patient care. In this report, we describe these items collectively as suboptimal patient care practices and attitudes; however, the questionnaire did not use this wording or explicitly indicate that these aspects of patient care were considered undesirable. The survey instructions asked residents to "rate how frequently you found yourself exhibiting the following attitudes or behaviors for any reason (time constraints, feeling rushed, need to leave hospital, etc.)." The response options were "never," "once," "several times per year," "monthly," and "weekly."

We constructed two summary measures for self-reported patient care practices. The first, more inclusive, summary measure was self-report of one or more suboptimal patient care practices reported monthly or weekly; this measure is hereafter called "suboptimal patient care practices at least monthly." A second summary

Table 1. **Self-Reported Characteristics of Participants**

Variable	Participants, *n (%)*
All respondents	115 (100)
Women	61 (53)
Married or partnered	63 (55)
Children	12 (10)
>1 year between undergraduate and medical school	48 (42)
Year of residency	
1	55 (48)
2	34 (30)
3	26 (23)
Maslach Burnout Index subscales*	
High score for depersonalization	74 (64)
High score for emotional exhaustion	61 (53)
Low score for personal accomplishment	36 (31)
Self-reported suboptimal patient care practiced at least monthly	
"I found myself discharging patients to make the service 'manageable' because the team was so busy."	41 (36)
"I did not fully discuss treatment options or answer a patient's questions."	10 (9)
"I made treatment or medication errors that were not due to a lack of knowledge or inexperience."	10 (9)
"I ordered restraints or medication for an agitated patient without evaluating him or her."	16 (14)
"I did not perform a diagnostic test because of desire to discharge a patient."	16 (14)
Self-reported suboptimal patient care attitudes experienced at least monthly	
"I paid little attention to the social or personal impact of an illness on a patient."	35 (30)
"I had little emotional reaction to the death of one of my patients."	21 (18)
"I felt guilty about how I treated a patient from a humanitarian standpoint."	15 (13)

* High depersonalization for medical professionals is a subscale score of 10 or higher; high emotional exhaustion for medical professionals is a subscale score of 27 or higher; and low personal accomplishment for medical professionals is a subscale score of 40 or higher (source, reference 1).

measure identified residents who self-reported one or more suboptimal patient care practices weekly. Residents identified by the second summary measure, which is hereafter called "suboptimal patient care practices weekly," are a subset of those identified by the first. We did not include the items for suboptimal patient care attitudes (**Table 1**) in these summary outcome measures because the suboptimal patient care attitude items were similar to items on the depersonalization subscale of the MBI and were therefore expected to be correlated with that subscale. Neither the individual questions about suboptimal patient care practices nor the summary measures have been validated.

Depression and Substance Abuse

We hypothesized that depression and substance abuse would be related to burnout and to self-reported suboptimal patient care attitudes and practices. The survey included a two-item screening questionnaire for depression that was developed as part of PRIME-MD (Primary Care Evaluation of Mental Disorders) (20) and that performs as well as longer screening questionnaires (21). Screening positive for depression was defined as answering "yes" to at least one of the two questions. This screening instrument has a positive likelihood ratio of 2.23 (95% CI, 1.98 to 2.50) for the diagnosis of current major depression and a negative likelihood ratio of 0.07 (CI, 0.04 to 0.15) (21). In addition, residents were asked whether they had had "major depression at any time in residency."

The survey included the three questions on consumption from the Alcohol Use Disorders Identification Test (AUDIT) (questions 1 to 3) to screen for at-risk alcohol use (22). To assess symptoms of alcohol dependence, we also included three additional AUDIT questions that pertained to 1) not fulfilling responsibilities because of drinking, 2) being unable to stop drinking, and 3) drinking in the morning (23). At-risk alcohol use was defined as self-report of 1) consuming 6 or more alcoholic drinks on at least one occasion per month (AUDIT question 3) or 2) having one or more symptoms of alcohol dependence in the past year. Question 3 on the AUDIT has a positive likelihood ratio of 11.00 (CI, 5.24 to 23.23) and a negative likelihood ratio of 0.48 (CI, 0.39 to 0.60) for heavy drinking or active alcohol abuse or dependence according to *Diagnostic and Statistical Manual of Mental Disorders*, third edition revised (DSM-IIIR) (22). By using the same comparison standard and data from the same validation study (unpublished findings), the screening test in our survey—which used questions about any symptoms of alcohol dependence in the past year combined with AUDIT question 3—has a positive likelihood ratio of 7.77 (CI, 4.29 to 14.06) and a negative likelihood ratio of 0.46 (0.29 to 0.62). To measure recreational use of other substances, such as 3,4-methylenedioxymethamphetamine (MDMA, also known as XTC or Ecstasy), we developed the following question: "How often do you use other recreational substances (marijuana, sedatives, stimulants, XTC, other)?" The response options were "never," "less than monthly," "monthly," "weekly," and "daily or almost daily." This question has not been validated.

Demographic and Other Participant Characteristics

We collected limited demographic information to ensure the anonymity of the respondents and to encourage participation and honest reporting (**Table 1**). The survey did not ask residents their age; however, as a proxy measure to identify older residents, one question asked whether the respondent had taken "a break more than 1 year between undergraduate work and medical school." To further protect anonymity, we obtained no information on the participants' specific training program (for example, transitional internship or categorical or primary care internal medicine residency) or current rotation site.

Residency Experience and Career Satisfaction

Other questions measured the level of stress that residents attributed to various aspects of their residency experience (14 items), the perceived value of personal coping strategies (8 items), and the perceived value of residency program features aimed at resident well-being (16 items). These questions, which were developed and tested before the surveys were distributed, have not been validated. Two questions were used to assess career satisfaction. Although these two questions have not been validated, they were based on questions previously used to study resident career satisfaction; thus, we can compare our data with those from previously published studies (10). The complete questionnaire is available from the authors upon request.

Statistical Analysis

Our initial analyses compared responses among the 1st-, 2nd-, and 3rd-year residents. Next, for all other characteristics, we performed bivariate analyses to compare residents who met criteria for burnout with those who did not. For the comparisons, all of which exclusively involved categorical variables, we used the chi-square test or Fisher exact test to determine statistical significance.

To evaluate whether burnout was independently associated with self-reported suboptimal patient care practices, we used forward stepwise logistic regression to control for measured demographic characteristics, responses to screening questions about depression, self-reported major depression during residency, at-risk alcohol use, and recreational substance use. In these multivariate analyses, we first modeled the odds ratio for self-reported suboptimal patient care practices at least monthly by comparing residents who met criteria for burnout with those who did not. Next, by using the same outcome measure, we constructed three forward stepwise logistic regression models in which each MBI subscale was evaluated as a dichotomous independent variable (for example, high and low depersonalization). Subsequently, we evaluated the three MBI subscales simultaneously in the same model. We then performed these multivariate analyses for the second summary outcome measure—self-reported suboptimal patient care practices weekly.

We conducted secondary analyses to evaluate differences between burned-out and non–burned-out residents in self-reported stressors, personal coping strategies, and the value of available program features aimed at helping residents with stress management. Chi-square or Fisher exact tests determined statistical significance.

The statistical software used for all analyses was SPSS, version 10.0.7 (SPSS, Inc., Chicago, Illinois).

Role of the Funding Sources

This study was not formally funded. Investigators received salary support from institutional sources and grant support (as noted at the end of the text), but these sources were not involved in the design of the study; in the collection, analysis, or interpretation of data; or in the decision to submit the manuscript for publication.

RESULTS

Of the 151 eligible residents, 115 (76%) returned surveys in February or March 2001. Participation decreased by residency year (the response rates were 90% among the 1st-year residents, 71% in 2nd-year residents, and 62% in 3rd-year residents; chi-square test for trend, $P = 0.001$). However, in bivariate analyses, resident responses to questions about burnout, depression, substance use, or patient care practices did not differ significantly by year of postgraduate training. Therefore, for the remaining analyses, we combined data for participants from all years of residency training.

Table 1 shows demographic data, MBI subscale scores, and self-reported suboptimal patient care practices and attitudes. Eighty-seven (76%) responding residents met criteria for burnout. The responding resi-

Table 2. **Resident Characteristics Hypothesized To Be Associated with Burnout**

Variable	Participants Who Did Not Meet Criteria for Burnout (*n* = 28)	Participants Who Met Criteria for Burnout (*n* = 87)	*P* Value
	n (%)		
Depression history			
Self-reported major depression during residency	3 (11)	27 (31)	0.031
Positive result on depression screening*	8 (29)	44 (51)	0.042
Substance use			
At-risk alcohol use†	2 (7)	8 (9)	>0.2
Monthly or weekly recreational drug use	0 (0)	3 (3)	>0.2
Career satisfaction			
Happy with career choice	25 (89)	51 (59)	0.003
Not sure would choose to become a physician again	2 (7)	23 (26)	0.031

* A positive result on this screening test is not equivalent to a diagnosis of current major depression. (Likelihood ratios are presented in the Methods section.)
† At-risk alcohol use was defined as self-reported consumption of at least 6 drinks on at least one occasion monthly or weekly ($n = 7$) or self-report of any symptom of alcohol dependence in the past year ($n = 7$).

dents had the following mean scores on the MBI subscales: for depersonalization, 12.7 (for medical professionals, a score ≥ 10 is considered high—indicating burnout); for emotional exhaustion, 26.4 (≥ 27 is considered high); and for personal accomplishment, 36.2 (this subscale has an inverse relationship to burnout, and a score ≤ 33 is considered low) (1).

Residents who met criteria for burnout were significantly more likely to report a break of more than 1 year between undergraduate and medical school (47% vs. 25%; $P = 0.039$). Rates of self-reported major depression and positive screening results for depression were also significantly increased among residents who met the criteria for burnout; career satisfaction showed a strong inverse relationship to burnout (**Table 2**). Other measured demographic characteristics or screening results for at-risk alcohol use or substance abuse (**Table 2**) did not significantly differ between residents who met criteria for burnout and those who did not.

Burnout and Self-Reported Suboptimal Patient Care Practices and Attitudes

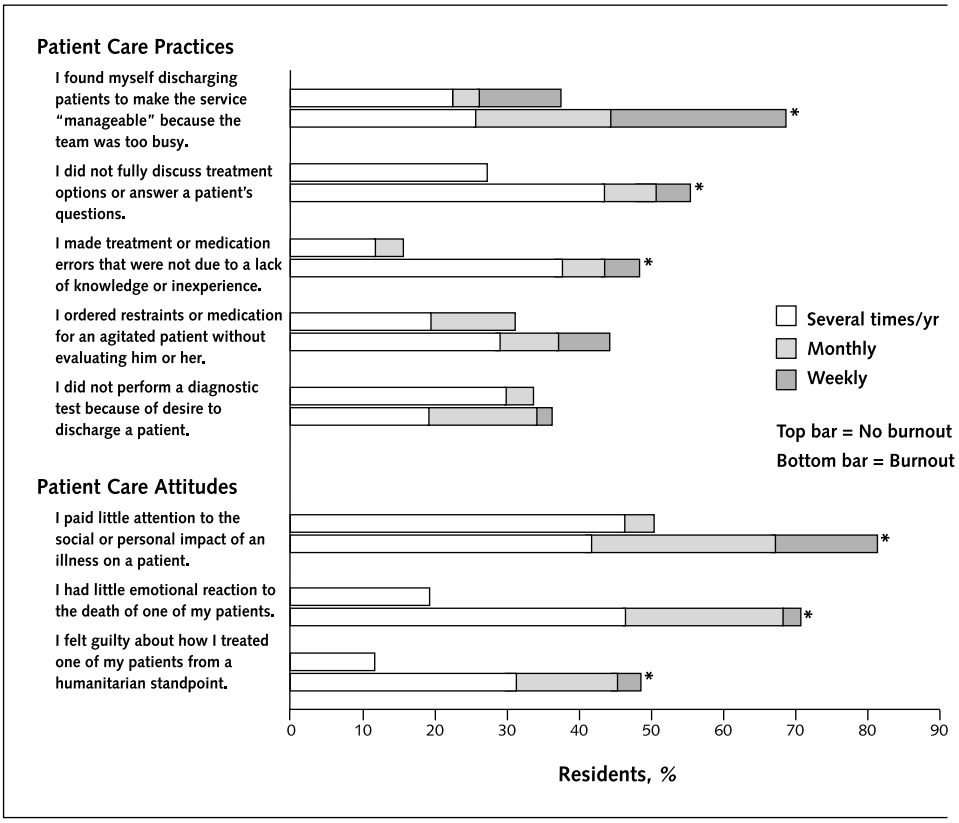
In bivariate analyses, residents who met the criteria for burnout were significantly more likely to report engaging in six of the eight suboptimal patient care practices and attitudes at least several times per year compared with residents who did not meet the criteria for burnout (**Figure**). Residents who met the criteria for burnout were also significantly more likely to report suboptimal patient care practices at least monthly (53% vs. 21%; $P = 0.004$) or weekly (32% vs. 11%; $P = 0.026$).

When we used multivariate logistic regression to evaluate the independent relationship between burnout and self-reported suboptimal patient care practices, burnout best predicted self-report of suboptimal patient care practices at least monthly (odds ratio, 8.3 [CI, 2.6 to 26.5]; $P < 0.001$). In these multivariate analyses, residents who reported a break of more than 1 year between undergraduate and medical school were less likely than other residents to report suboptimal patient care practices at least monthly (odds ratio, 0.3 [CI, 0.1 to 0.7]; $P = 0.008$), and 2nd-year residents were significantly more likely than 3rd-year residents to report suboptimal patient care practices at least monthly (odds ratio, 4.9 [CI, 1.4 to 16.8]; $P = 0.011$). No other measured characteristic—including sex, self-report of major depression during residency, positive result on depression screening, at-risk alcohol use, or substance abuse—was significantly associated with self-reported suboptimal patient care practices at least monthly. Only burnout significantly predicted suboptimal patient care practices reported weekly (odds ratio, 4.0 [CI, 1.1 to 14.2]; $P = 0.036$). No demographic or screening variable, aside from burnout, was significantly associated with self-report of suboptimal patient care practices weekly.

We evaluated each MBI subscale independently to assess its relationship to the two summary measures for self-reported suboptimal patient care practices. Only high scores on the depersonalization subscale were significantly associated with self-reported suboptimal patient care practices at least monthly (odds ratio, 5.8 [CI, 2.2 to 15.4]; $P < 0.001$) or weekly (odds ratio, 2.8 [CI, 1.1 to 7.7]; $P = 0.041$).

Because the threshold for a high depersonalization score had been defined somewhat arbitrarily (as a score in the top tercile among 1104 medical professionals [1]), we wondered whether the relationship between depersonalization and self-reported practices of suboptimal patient care reflected a threshold or a dose–response relationship. We therefore conducted secondary analyses to evaluate the odds of suboptimal

Figure. **Relationship of burnout to self-reported suboptimal patient care practices and attitudes.**



In each pair, the top bar represents residents who did not meet criteria for burnout ($n = 27$), and the bottom bar represents residents who met criteria for burnout ($n = 87$). The chi-square statistic compared residents who met criteria for burnout with those who did not on rates of each practice self-reported to occur at least several times per year. $^*P < 0.05$.

patient care practices at least monthly among residents with depersonalization scores in each quintile (**Table 3**). In this fully adjusted model, we included quintile of scores for the MBI subscales as a categorical variable, with the lowest quintile as the referent category. Compared with residents whose depersonalization scores were in the lowest quintile, residents with depersonalization scores in the two highest quintiles were significantly more likely to report sub-optimal patient care practices at least monthly. This analysis also suggested a dose–response relationship: Increasing quintiles of depersonalization scores were associated with increasing odds of self-reported suboptimal patient care practices at least monthly ($P = 0.014$ for depersonalization in quintiles overall).

Reported Stress and Relationship to Burnout

Secondary analyses explored relationships between burnout and resident reports of major stresses, personal coping strategies, and program features for managing stress. For the entire group of participating residents, the stresses most often rated as major were inadequate sleep (41%), frequently working shifts longer than 24 hours (40%), and inadequate leisure time (42%). Residents who met the criteria for burnout were significantly more likely to report each of these three stressors as major (for self-report of inadequate sleep or frequent shifts > 24 h, $P = 0.001$; for report of inadequate leisure time, $P = 0.012$); residents meeting burnout criteria were also significantly more likely to rate feeling uncertain about their future ($P = 0.042$) and feeling that their personal needs were inconsequential ($P = 0.031$) as major stressors.

The two personal coping strategies most often rated as "significant" or "essential" for managing stress, regardless of burnout, were talking with family or a significant other (72%) and talking with other residents or

Table 3. **Odds Ratio of Self-Reported Suboptimal Patient Care Practices, according to Depersonalization Score***

Quintile of Depersonalization Score	Odds Ratio of Self-Reported Suboptimal Patient Care Practiced Monthly or Weekly (95% CI)	*P* Value†
Lowest	1.00 (referent)	–
2nd	0.78 (0.19–3.13)	>0.2
3rd	1.51 (0.45–5.12)	>0.2
4th	4.00 (1.05–15.21)	0.042
Highest	4.96 (1.39–17.71)	0.014

* Data in the table were derived from a forward stepwise logistic regression model (as described in the Results section).
† For depersonalization (in quintiles) overall, $P = 0.014$.

interns (75%). Residents who met the criteria for burnout were significantly more likely to rate physical exercise ($P = 0.010$) and "a survival attitude" ($P < 0.001$) as "significant" or "essential" for managing stress.

Residents most often cited the following features of their residency program as being important for managing stress: having at least 4 days off per month (97%), receiving ancillary help (95%), and availability of a night-float (64%). Residents valued these features regardless of burnout. Residents who met the criteria for burnout were significantly less likely to rate the following program features as "important," "significant," or "essential": presentations on stress and the risk for depression ($P = 0.005$), constructive feedback ($P = 0.020$), and career counseling ($P = 0.003$).

Discussion

To our knowledge, this is the largest published study of resident burnout and the only study to evaluate the relationship between physician burnout and measures of patient care. Burnout was very common among residents in all 3 years of residency training: More than 75% of respondents met the criteria for burnout. Burned-out residents were two to three times more likely to report suboptimal patient care practices at least monthly or weekly. In multivariate analyses adjusted for demographic characteristics and for responses to screening questionnaires for depression and substance abuse, depersonalization was the only dimension of burnout that was significantly associated with self-reported practices of suboptimal patient care. As we had expected, burnout was inversely related to career satisfaction.

Our study had several important limitations. Although the response rate was high, response bias remains a possibility, and the prevalence of burnout in this residency program could range from 57%, if all 36 nonrespondents were not burned out, to 87%, if all nonrespondents were burned out. We conducted our study primarily in February—a time of year during which resident morale is typically low and depression most common; therefore, surveying residents at a different time of year could have resulted in different rates of burnout. We could not compare respondents with nonrespondents because, to fully protect the anonymity of all residents (regardless of participation), we obtained only limited demographic information from respondents and did not seek review-board approval to obtain data on nonrespondents.

Our outcome measures for patient care practices were based on self-report, and we do not know the extent to which these self-reports accurately reflect the frequency of the five suboptimal patient care practices assessed in the survey. Although these questions have face validity, their criterion validity and reproducibility have not been studied. In addition, biased reporting of patient care practices could explain the observed relationship between burnout and patient care practices. For example, residents who met criteria for burnout could have over-reported suboptimal patient care behaviors. Alternatively, residents who were not burned out might

Table 4. **Comparison of Resident Burnout, according to the Maslach Burnout Index, in Published Reports**

Category on the Maslach Burnout Index	Internal Medicine Residents—Present Study ($n = 115$)	Family Practice Residents ($n = 64$)*	Internal Medicine Residents and Pediatrics Residents ($n = 43$)†
Average score for emotional exhaustion‡	26.4	25.3	28.5
Average score for depersonalization‡	12.7	12.2	14.0
Average score for personal accomplishment§	36.2	37.7	35.2

* Participants were in a community-based residency program (15).
† Participants were a convenience sample of residents from a university-based program who attended a workshop (16).
‡ A higher value indicates increased burnout.
§ A lower value indicates increased burnout.

have been more susceptible to social desirability bias; therefore, these residents could have under-reported their suboptimal patient care practices. However, other participant subgroups that might be expected to over-report suboptimal patient care practices or that could be less susceptible to social desirability bias—such as residents with positive results on depression screening or those with a low score for personal accomplishment—did not have increased rates of self-reported suboptimal patient care practices. Although we believe our results regarding the association between burnout and self-reported suboptimal patient care practices should be viewed cautiously and should be used primarily to generate hypotheses for future research, we doubt that these findings solely reflect biased reporting. Finally, this study is limited by its cross-sectional design. Future longitudinal studies are required to evaluate the possibility of a causal relationship between burnout and suboptimal patient care practices.

Neither sex nor responses on depression or substance abuse screening confounded the observed association between burnout and patient care practices. Likewise, because all respondents returned surveys in February or March, the time of year should not have confounded the relationship between reported burnout and patient care practices. However, we did not ask respondents about their current rotation site, workload, or on-call schedule. Such unmeasured potential confounders could explain the observed relationships between burnout and patient care and should be explored in future research.

Residents who met the criteria for burnout differed from other residents in their responses to several questions: the depression screening, major stresses, personal coping strategies, and program features considered valuable for managing stress. However, this cross-sectional study cannot assess whether any of these variables is causally related to burnout.

The generalizability of our results in this sample of residents from a single internal medicine program is unknown. However, we doubt that our results reflect unique characteristics of the residency program or residents studied. The mean scores that we observed for burnout are similar to those of two smaller studies in residents (**Table 4**) (15, 16). Moreover, the rates that we observed for positive results on depression and substance abuse screening are consistent with the findings of other reports on residents (24–30). Finally, residents in this program work in inpatient and outpatient settings that are typical for U.S. university-based training programs in internal medicine. For these reasons, it seems unlikely that our findings are unique to the program that we studied.

Our study has several important strengths. To our knowledge, our study is larger than previously reported studies of burnout among residents, and we had an excellent survey response rate (31). Residents were blinded to the purpose of the study. Although patient care outcomes were based on self-report, it seems likely that an alternate study design, by using directly observed behaviors as outcomes, could also reflect bias due to changes in resident behavior. Despite a relatively small study sample, our observed association between burnout and self-reported suboptimal patient care practices was statistically significant and large enough to suggest that the association of burnout with suboptimal patient care could be clinically meaningful. Moreover, our data suggest a dose–response relationship between depersonalization score and self-reported suboptimal patient care behaviors.

During the past 20 years, postgraduate physician training programs, including the one described in this report, have devoted increasing attention to improving the working conditions of residents (32–36). These programs are also working harder to identify impairment due to depression and substance abuse (34). This study suggests that burnout may be a type of resident impairment that is more prevalent than either depression or substance abuse and that resident burnout may be associated with suboptimal patient care. Previous studies of burnout in practicing physicians have shown that burnout can develop at any stage in the career of a physician (3, 10) and have linked burnout to physician satisfaction (3, 37), physician turnover (38), and physician resource use (39); however, no previous study has directly linked burnout to a measure of the quality of care. Given current national efforts to increase patient safety and patient involvement in health care (40) and to improve the quality of care (41), our findings suggest an important new research agenda regarding postgraduate medical education.

Resident burnout could contribute to the dehumanizing effects of medical education—especially for medical students, but also for other residents. Socialization of

medical students has been described as a "hidden curriculum" in which students acquire attitudes and habits from other physicians (42). The high rate of burnout among residents, who spend far more time with medical students (43) and each other than with faculty physicians, raises the possibility that resident burnout influences what medical students and junior residents interpret as appropriate professional behavior. Burnout could contribute to increases in cynicism and decreases in compassion that have been previously observed over the course of postgraduate training (24, 32, 35, 44).

If future studies replicate our findings, increased understanding of the personal and programmatic factors that lead to burnout will be essential. Although this cross-sectional study could not assess the causes or prevention of burnout, resident perceptions of factors that increase and decrease stress may inform future research. Residents in this study most often cited workload as their major stress. This finding reinforces the importance of limits on workload and adequate time away from work. Other strategies to relieve resident and physician stress have been proposed and merit evaluation (16, 32, 36, 45). For example, one program found that a single 4-hour workshop teaching coping skills to residents improved burnout measured 6 weeks later (16).

Burnout appears to be common in residents and is associated with decreased resident well-being and career satisfaction. In addition, burnout is associated with self-reported patient care practices that are suboptimal. Further investigation of the prevalence, prevention, causes, consequences, and management of resident burnout is needed.

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