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Resident Burnout

Niku K. Thomas, MD

THE WELL-BEING OF INTERNS AND resident physicians is a hotly debated topic for which the importance,^{1,2} implications,^{1,3} and solutions^{4,5} have all been questioned. Residency is a stressful, overwhelming period during which residents work long hours and during which the lives of others depend on residents as they increase their knowledge base exponentially. Resident physicians have tremendous responsibilities in the workplace yet may feel they control very little.⁶ This arrangement sets the stage for residents to develop burnout.

Debate exists about whether residents' psychosocial distress has immediate or long-term consequences for patients, or for the physicians themselves.¹ Given the goals of residency training, some stress seems inevitable,⁴ even favorable,⁷ yet scattered studies suggest that residents experience high rates of burnout, a severe stress reaction, and that burnout may be associated with adverse mental health and work performance.

This article reviews studies of resident burnout in the medical literature to address the following questions: (1) What is the level of clinically significant burnout among residents? (2) What factors are associated with development of burnout? (3) What are the health and performance consequences for residents with burnout and their patients? and (4) What coping resources may help residents with burnout? The article concludes by suggesting areas for further research and reform.

For editorial comment see p 2913.

Intense work demands, limited control, and a high degree of work-home interference abound in residency training programs and should strongly predispose resident physicians to burnout as they do other health care professionals. This article reviews studies in the medical literature that address the level of burnout and associated personal and work factors, health and performance issues, and resources and interventions in residents. MEDLINE and PubMed databases were searched for peer-reviewed, English-language studies reporting primary data on burnout or dimensions of burnout among residents, published between 1983 and 2004, using combinations of the Medical Subject Heading terms *burnout*, *professional*, *emotional exhaustion*, *cynicism*, *depersonalization* and *internship and residency*, *housestaff*, *intern*, *resident*, or *physicians in training* and by examining reference lists of retrieved articles for relevant studies. A total of 15 heterogeneous articles on resident burnout were thus identified. The studies suggest that burnout levels are high among residents and may be associated with depression and problematic patient care. However, currently available data are insufficient to identify causal relationships and do not support using demographic or personality characteristics to identify at-risk residents. Moreover, given the heterogeneous nature and limitations of the available studies, as well as the importance of having rigorous data to understand and prevent resident burnout, large, prospective studies are needed.

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BURNOUT

Burnout is a pathological syndrome in which emotional depletion and maladaptive detachment develop in response to prolonged occupational stress. The construct was originally developed through occupational psychology research to describe a pattern observed among some human service workers.⁸ Through serial qualitative surveys, field observations, interviews, and confirmatory factor analysis of the primary survey instrument, researchers have characterized burnout as a psychological construct and established its construct, discriminant, and convergent validity.⁹

According to Maslach et al,⁹ burnout has 3 dimensions: emotional exhaustion, in which overwhelming work demands deplete the individual's energy; depersonalization and cynicism, in which the individual detaches from

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the job; and feelings of inefficacy, in which the individual perceives a lack of personal achievement. These dimensions can coexist in different degrees, making burnout a continuous, heterogeneous construct rather than a dichotomous one.

The 22-item Maslach Burnout Inventory (MBI) measures all 3 burnout dimensions through 7-point Likert scales indicating the frequency of characteristic symptoms and is the most commonly used measure in the medical literature; the inventory was designed for and validated among human service workers,⁹ including residents.¹⁰ Each dimension receives an MBI subscore, which, relative to normative scores for the work population, is categorized as low, medium, or high. A high subscore in emotional exhaustion or depersonalization is considered indicative of clinically significant burnout.¹⁰ The MBI has become the gold standard for identifying burnout in the medical research literature.¹¹

According to the demand-control-support model, occupational stress causes burnout when job demands are high while individual autonomy is low^{11,12} and when job stress interferes with home life.^{6,12,13} Work-home interference may mediate the effect of personal factors on burnout.¹² Considering that residents are routinely challenged with high demands, work-home interference, and low autonomy, the appearance, correlates, and consequences of burnout among residents would almost be expected.

METHODS

The MEDLINE and PubMed databases were searched for peer-reviewed primary data studies of burnout among residents published in the English language, using combinations of the following Medical Subject Heading terms: *burnout, professional; emotional exhaustion; cynicism; or depersonalization; and internship and residency, housestaff, intern, resident, or physicians in training.* Because the construct of burnout is relatively new since the 1980s and because residency programs have evolved

in the past 20 years to adapt to the issues raised in the 1984 Libby Zion case,¹⁴ the search was limited to articles published between January 1983 and September 2004.

This search yielded a total of 67 articles. Abstracts from this list were reviewed by the author and references were selected for retrieval if they were reports of primary data collection that specifically focused on burnout or the dimensions of burnout among residents. As some known references were missing from this database search, reference lists of these articles were then examined for other relevant studies. A total of 15 articles on resident burnout were thus identified. The FIGURE summarizes the search process.

RESULTS

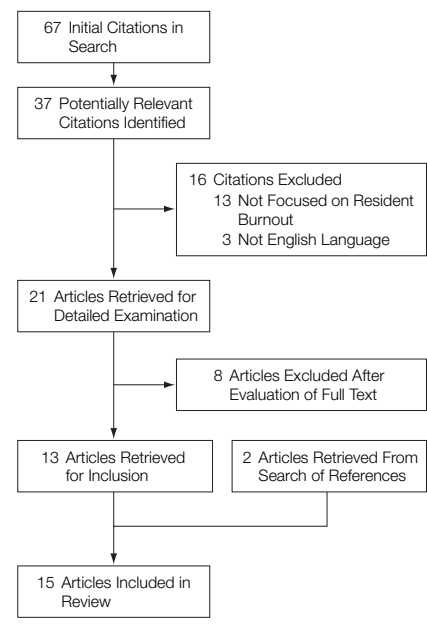
Most studies of burnout in residency were found to be small, cross-sectional surveys, designed to show numerous bivariate associations between burnout dimension scores and personal factors, work characteristics, mental health disorders, and job performance measures. Seven studies involved internal medicine residents, while the remaining studies examined burnout among residents in anesthesiology, surgery, orthopedic surgery, and family practice. Seven studies used a longitudinal design to examine the natural history of burnout or to assess the efficacy of a therapeutic intervention. TABLE 1 and TABLE 2 list the studies, their resident populations, measures of burnout, outcomes of interest, and significant findings. Because of the heterogeneous nature, methodological limitations, and overlapping information reported by these studies, these findings are reported qualitatively.

Prevalence of Resident Burnout

Eleven studies reported cross-sectional estimates of the levels of resident burnout; many have methodological issues that somewhat compromise their estimates.

Collier et al¹⁵ conducted a national multispecialty survey in 1998, distributed to all residents by residency direc-

Figure. Review Selection Process and Results



tors for the Resident Services Committee of the Association of Program Directors in Internal Medicine to identify personal factors associated with resident stress. Respondents indicated whether they thought they had become more or less cynical and humanistic. Although no formally validated burnout scale was administered, the study by Collier et al is included in this review in recognition that cynicism may be a precursor to emotional exhaustion or depersonalization.⁸ In this sample, 61% of respondents reported having become more cynical and 23% less humanistic.¹⁵ However, because the validity of these questions as burnout measures has not been established, these responses should be considered only hypothesis generating. Furthermore, although the study attempted to survey all US internal medicine residents, the very low response rate (18%) is well below the average response rate for physician surveys.¹⁶ This compromises the generalizability of this study's findings because resident distress may have systematically influenced nonresponse.

In a longitudinal survey of 78 multispecialty residents in Israel, Tzischin-

Table 1. Demographic and Methodological Characteristics of Studies Examining Burnout Dimensions Among Residents

Source	Original Sample Size	Period of Study	Resident Population	Study Design	Burnout Measure (Burnout Dimensions)	Covariates Measured
Observational Studies						
Purdy et al, ¹⁹ 1987	71	1984	Ohio; 21% female; family practice	Cross-sectional questionnaires	MBI	Self-assessment item; faculty burnout ratings
Lemkau et al, ²⁸ 1988	71	1984	Ohio; 21% female; family practice	Cross-sectional questionnaires	MBI	MCMi; MBTI; biographical questionnaire
Baldwin et al, ²⁷ 1997	149	1986, 1993-1994	Scottish university class; 45% female; all specialties	Longitudinal interviews or questionnaires	"Feeling overwhelmed" on Attitudes to Work questionnaire (not validated for burnout)	Attitudes to Work questionnaire; recall frequency of mistakes; checklist of physical illnesses; General Health Questionnaire; attitudes to illness; alcohol consumption
Geurts et al, ⁶ 1999	293	NR	Netherlands academic hospital; 36% female; medicine	Cross-sectional questionnaire, stepwise regression analysis, structural equation modeling	MBI (EE, DP)	Work characteristic scale (work schedule, quantitative workload, mental workload, lack of job autonomy, dependence on superior), home characteristics scale, work-home interference scale
Tzischinsky et al, ¹⁷ 2001	78	NR	Israel; 32% women, medicine	Longitudinal questionnaire at baseline, 1 year, and 2 years; mood log and sleep actigraph monitoring at baseline, 6 mo, and 12 mo	MBI	Experience Sampling Method log of positive and negative moods and workload; Symptom Checklist-90; Job Involvement Questionnaire; Perceived Stress Scale; actigraph measures of sleep efficiency and duration
Collier et al, ¹⁵ 2002	22 933	1998	National US sample; 40% female; internal medicine	Cross-sectional questionnaire	Self-report more/less cynical and humanistic (not validated for burnout)	Any of 5 depressive symptoms, demographics, educational debt, moonlighting
Shanafelt et al, ⁵ 2002	151	2001	University of Washington; 53% female; medicine	Cross-sectional survey; multivariate logistic regression	MBI (EE, DP)	Self-reported frequency of suboptimal patient care practices* and attitudes†; PRIME-MD; AUDIT; demographics; stress attributions; career satisfaction
Daly and Willcock, ²¹ 2002	482	1998	New South Wales; all programs in region; medicine	Longitudinal survey at baseline, midyear	MBI	Primary and secondary alexithymia (coping style of emotional insensitivity, externally oriented thinking)
Michels et al, ²⁰ 2003	350 At baseline, 203 eligible for follow-ups	June 1993-January 1996	South Carolina; 32% female; 7 family medicine programs	Longitudinal survey at baseline and every 6 mo	MBI	Beck Depression Inventory, Profile of Mood States, Hassles Survey, State-Trait anxiety and anger scales
Nyssen et al, ²³ 2003	318 Faculty and residents	NR	Belgium University Network; 35% female; anesthesiologists	Cross-sectional questionnaire	MBI (EE)	PSSM-A; WOCOCQ; problematic job situations and characteristics

(continued)

sky et al¹⁷ noted that mean burnout scores increased from baseline to post-graduate year 1 but then decreased after 2 years, even as the perceived stress, also higher after year 1, remained high at 2 years. This characterization of the natural history of burnout is consistent with a previous finding that in-

terns show progressively more fatigue and anger as the internship year progresses.¹⁸

Other studies have examined burnout among residents in a single specialty. In 1984, Purdy et al¹⁹ measured the prevalence and recognition of significant resident burnout by adminis-

tering the MBI and a single-item burnout self-assessment question to a cross-section of 67 family practice residents (response rate, 94%) at Wright State University, Dayton, Ohio. The residents' mean burnout scores were in the moderate range. In the study by Michels et al,²⁰ 350 family practice resi-

Table 1. Demographic and Methodological Characteristics of Studies Examining Burnout Dimensions Among Residents (cont)

Source	Original Sample Size	Period of Study	Resident Population	Study Design	Burnout Measure (Burnout Dimensions)	Covariates Measured
Observational Studies (cont)						
Biaggi et al, ²² 2003	66 residents, 26 attending physicians	December 2000 to March 2001	Spitalzentrum, Biel, and Zurich, Switzerland; medicine	Cross-sectional questionnaire; observation of work activities of 14 residents	Emotional exhaustion and aversion to clients subscales of Hacker and Reinhold's Stresses and Strains Screening in Human Services	Flanagan's Stressors questionnaire (importance of 31 aspects of work and satisfaction with those aspects); work-related stressors: estimated and measured work hours, experienced work intensity, "opportunities to have a say," autonomy (decision making and control), social support from superiors or fellow employees, "superiors interested in the well-being of employees"
Sargent et al, ²⁴ 2004	21	NR	Single university training program; 14% female; orthopedics	Cross-sectional survey	MBI (EE, DP, PA)	Demographics, General Health Questionnaire 12 psychiatric morbidity, life and work stress questionnaire, responses to stress questionnaire, Revised Dyadic Adjustment Scale (relationship issues questionnaire)
Interventional Studies						
McCue and Sachs, ³⁶ 1991	64	NR	Boston, Mass; medicine, pediatrics, and medicine- pediatrics residents	Experimental convenience sample, 43 in intervention group, 21 controls	MBI	Stress management workshop
Ospina- Kammerer and Figley, ³⁷ 2003	24	NR	Southeast United States; 46% women; all years; family practice residents	Experimental convenience sample, 14 in intervention group, 10 controls	MBI (EE)	Respiratory One Method of stress reduction, 4 weekly sessions
Gelfand et al, ²⁵ 2004	37	2003	University of California, Irvine; 11% female; all years; surgery residents	Longitudinal questionnaire and 2-wk daily work activity log; 1 wk before and 6 mo following 80-h workweek implementation	MBI (EE, DP, PA)	None

Abbreviations: AUDIT, Alcohol Use Disorders Identification Test; DP, depersonalization; EE, emotional exhaustion; MBI, Maslach Burnout Inventory; MBTI, Myers-Briggs Type Indicator; MCMI, Millon Clinical Multiaxial Inventory; NR, not reported; PA, personal accomplishment; PRIME-MD, Primary Care Evaluation of Mental Disorders; PSSM-A, Psychological State of Stress Measure; WOCCQ, Working Conditions and Control Questionnaire.

*For example, "I found myself discharging patients to make the service 'manageable' because the team was so busy."

†For example, "I paid little attention to the social or personal impact of an illness on a patient."

dents from 7 South Carolina residency programs completed the MBI during lunch conferences every 6 months between July 1993 and January 1996 and had higher mean depersonalization scores than normative samples but lower scores than the Ohio family practice residents. However, since these studies were conducted, the standard for identifying clinically significant burnout includes a score in the

high range for emotional exhaustion or depersonalization.¹⁰ For each dimension in the study by Purdy et al, the mean score was within 1 SD of the threshold for the high range, suggesting that at least 17% of residents scored within that range.

In 1998, Daly and Willcock²¹ surveyed 482 first- and second-year medicine residents from all programs around New South Wales and found moder-

ate average emotional exhaustion and high depersonalization among interns at midyear. In a study published in 1999 of 293 medicine residents in the Netherlands, Geurts et al⁶ reported that these residents had mean scores in the moderate range for clinically significant burnout. In 2001, Shanafelt et al³ mailed a survey assessing burnout and self-reported suboptimal patient care practices to 115 medicine residents (76% re-

sponse rate) in a US residency program. They found that 76% of residents, regardless of postgraduate year, had high emotional exhaustion or depersonal-

ization on the MBI. In a survey of 66 medicine residents in Zurich, Switzerland, between mid December 2000 and January 2001, Biaggi et al²² found that

41% of residents met critical values for emotional exhaustion on the validated subscale of Hacker and Reinhold's Stresses and Strains Screening in

Table 2. Results of Studies Examining Burnout Among Residents

Source	Response Rate, %	Burnout Level	Statistically Significant Findings ($P < .05$)
Observational Studies			
Purdy et al, ¹⁹ 1987	94	Mean EE, DP = moderate burnout	Residents had higher EE and DP than faculty Resident EE scores correlated with self-rated burnout and residency director's ratings in years 2 and 3 Excessive demands on time most often cited as cause of burnout
Lemkau et al, ²⁸ 1988	94	Mean EE = 25 (SD, 7.3), mean DP = 12 (SD, 5.5)	Correlations: high EE with lower social support satisfaction, antisocial and paranoid personality types, positive perception-judging type, avoidant, dependent, passive-aggressive, schizotypal, borderline personalities, anxiety, somatoform, dysthymia, alcohol abuse, psychotic thinking, psychotic depression symptom disorders High DP with part-time or unemployed spouse, feeling-thinking type
Baldwin et al, ²⁷ 1997	95	NR	Correlation between "feeling overwhelmed" and self-reported number of minor mistakes ($r = 0.22$), emergency admissions, times had to retrieve equipment, patient deaths
Geurts et al, ⁶ 1999	60	Mean EE = 14.2 (SD, 6.9); mean DP = 5.8 (SD, 3.2)	Work-time schedule, quantitative workload, and problematic dependency on superiors contributed to work-home interference High quantitative workload, problematic dependency on superiors, and work-home interference contributed to EE and DP Having a supportive home situation was protective against DP
Tzischinsky et al, ¹⁷ 2001	NR	Mean MBI at baseline = 2.31 (SD, 1.3); burnout increased from baseline to year 1 of residency but decreased after 2 years	Linear regression analysis: neither sleep duration nor departmental workload (derived from number of patients) predicted burnout
Collier et al, ¹⁵ 2002	18	23% Less humanistic, 61% more cynical (67% women, 56% men)	Residents with children reported increased humanism, decreased cynicism Correlation between cynicism and multiple depressive symptoms
Shanafelt et al, ⁵ 2002	76	76% Had high EE or DP; mean DP = 12.7, EE = 26.4, PA = 36.2	Statistically significant adjusted odds of burnout with >1 y between undergraduate and medical school, self-reported major depression, positive depression screen, negative career satisfaction, self reported suboptimal patient practices monthly/weekly (DP)
Daly and Willcock, ²¹ 2002	NR	Interns at midyear: moderate EE; high DP	Alexithymia at 6 mo correlated with EE ($r = 0.2$) Primary alexithymic personality style predicted high "burnout"
Michels et al, ²⁰ 2003	(72-75)	Mean MBI scores, men: DP = 9.55, EE = 19.53; women: DP = 7.19, EE = 18.86	Men, whites, and third-year residents had higher DP than others Differences worsened over time Men had higher DP than norms
Nyssen et al, ²³ 2003	48	Median burnout = 27 (moderate)	"Work organization" most problematic work characteristic Negative correlation between stress and control
Biaggi et al, ²² 2003	87	41% With "critical values" for emotional exhaustion; one third reported aversion to patients	Greatest importance/satisfaction deficits: time off, future career prospects, clear management, adequate feedback on personal performance, a right to a voice in important matters, culture of openness and tolerance, good salary, flexible work hours, time autonomy, opportunities for learning Work intensity: high in 69% of residents, "too high" in 3%; one third felt overburdened by the workload often or most of the time
Sargent et al, ²⁴ 2004	100	Mean EE and DP high	EE: anxiety about clinical competence, increased work-home, stress in relationships with faculty and senior residents, and perceptions of work as stressful DP: increased number of hours worked, stress in relationships with nurses, anticipated postresidency financial debt
Interventional Studies			
McCue and Sachs, ³⁶ 1991	NR	NR	MBI scores decreased 6 wk after intervention
Ospina-Kammerer and Figley, ³⁷ 2003	NR	NR	Mean EE decreased after intervention
Gelfand et al, ²⁵ 2004	69	Baseline: 50% high EE, 56% high DP; 6 mo: 47% EE, 70% DP	No significant reduction in mean burnout despite significant reduction in mean weekly work hours (100.7 h to 82.6 h)

Abbreviations: DP, depersonalization; EE, emotional exhaustion; MBI, Maslach Burnout Inventory; NR, not reported; PA, personal accomplishment.

Human Services, and one third of residents reported "aversion to patients."

In 2003, Nyssen et al²³ administered the emotional exhaustion MBI subscale to 119 anesthesiology residents (response rate, 48%) at various levels of training in the Belgium University Network. Reporting their burnout distribution by age rather than training level, the authors noted that 47% of anesthesiologists younger than 30 years had high emotional exhaustion subscores on the MBI.

In a survey of 21 orthopedic surgery residents from a single US university identifying social and work factors associated with burnout, Sargent et al²⁴ found that average emotional exhaustion and depersonalization scores were within the high range. Similarly, in a recent longitudinal study of 37 general surgery residents from all years affiliated with the University of California, Irvine, who completed the MBI and kept daily diaries recording their work activities for 2 weeks (69% response rate at baseline), 50% of surgery residents had high emotional exhaustion and 56% had high depersonalization.²⁵

Although it appears that burnout may be higher among surgical residents than among medicine residents, the limitations of these studies, including differences in sample size, survey instruments, and statistical reporting, make these comparisons tenuous. Additionally, the international extrapolation of these prevalence estimates is limited by cross-cultural variation in work environment.

Resident Burnout and Work Characteristics

Residents' perceptions of and reactions to the stress produced by work characteristics may vary, predisposing them differentially to burnout. The literature on burnout in other health care professions (eg, attending physicians,¹² nurses²⁶) has explored prospectively the interactive roles of work intensity, work demands, and work control in triggering burnout, but data on this issue are limited for residents.

Three studies had residents name factors they found to be most stressful and

1 analyzed the association between these ratings and resident burnout status. When Purdy et al¹⁹ asked Wright State University family practice residents what factors they believed contributed most to resident burnout, they most often cited time demands. In the report by Nyssen et al,²³ which descriptively explored stress, burnout, and residents' ratings of stressful work characteristics, anesthesia residents also reported as commonly problematic a lack of control over time management as well as work planning, work organization, inherently difficult job situations, and interpersonal relationship conflicts.

Biaggi et al²² also specifically explored the relationship between emotional exhaustion and depersonalization, work stressors, and residents' assessment of the relative importance of work stressors and resources. One third of the medicine residents felt overburdened by the workload often or most of the time and 69% rated their work intensity as "high" ("too high" in 3%). The work characteristics rated with the greatest deficit between their importance and residents' level of satisfaction included time off, flexible working hours, autonomy with regard to managing one's own time, opportunities for learning, future career prospects, clear management, adequate feedback on personal performance, a right to a voice in important matters, a culture of openness and tolerance, and a good salary.

These 3 studies did not report differences in problematic work situations ratings stratified by burnout category, however, so it is not possible to know whether residents with high burnout rated some work situations as more influential.

Other studies have attempted to explore the relationship between work characteristics and burnout, examining factors that may be components of a causal pathway. A stratified analysis by Shanafelt et al³ found that medicine residents with high burnout were more likely than those without burnout to rate as major stressors feeling un-

certain about their future and feeling that their personal needs were inconsequential, 2 subjective perceptions that may provide targets for personal and systemic interventions. Baldwin et al²⁷ reported associations between work perceptions and feeling overwhelmed in interviews and a mailed survey of 142 Scottish medical students during their first undergraduate year and their senior residency year. They noted that feeling overwhelmed was correlated with number of emergency admissions, having to retrieve equipment, and the number of patient deaths. Of note, feeling overwhelmed was not significantly correlated with long hours worked over the previous week or functioning less well at work. "Feeling overwhelmed at work" during postgraduate training, a predecessor and possible proxy for emotional exhaustion and depersonalization,⁸ had emerged as a significant factor during factor analysis of the Attitudes to Work questionnaire. This subjective feeling of being overwhelmed, however, is rather elusive and likely multifactorial, not simply a factor of the number of hours worked or slept, and not necessarily indicative of high burnout.

In the linear regression analysis of the longitudinal study by Tzischinsky et al,¹⁷ in which medicine residents' sleep-wake cycles were actigraphically monitored for 5 to 7 days at a time at baseline, 6 months, and 12 months and the MBI and a workload log were completed at baseline, 1 year, and 2 years, neither sleep duration nor departmental workload (number of patients) predicted burnout. Unfortunately, the authors did not specify the sampling methods used to select the residents surveyed or the days to record workload and sleep deprivation, raising the possibility that sleep data may inadvertently have been gathered during low-intensity work periods. Whereas burnout is chronic, workload can vary considerably, warranting a generalizability measure. Presumably, using random assignments could have minimized this problem. Although this finding must be viewed cautiously, it

is notable that most quantitative measures of workload were not subjectively cited as significant stressors by residents in 3 other studies either.^{19,27,28}

However, 2 studies did find an association between increasing work hours and workload with burnout. Using stepwise regression methods to analyze data from their Netherlands survey, Geurts et al⁶ developed structural equation modeling to characterize the relative contributing and mediating roles of work and home characteristics. Five stepwise regression analyses revealed that work schedule, quantitative workload, and problematic dependency on superiors contributed to work-home interference, that the latter 3 also independently contributed to both emotional exhaustion and depersonalization, and that having a supportive home situation was protective against depersonalization. This model is similar to the findings of Linzer et al¹² among practicing physicians. Similarly, in the cross-sectional study of orthopedic residents by Sargent et al,²⁴ depersonalization was significantly associated with increased number of hours worked, conflict between work and home life, and stress in relationships with nurses. Similar to medicine residents,^{5,6} emotional exhaustion in these orthopedic residents was associated with residents' anxiety about their clinical competence, conflict between work and home life, stress in relationships with faculty and senior residents, and perceptions of work as stressful.

Work hours, workload, and overwork may represent similar constructs. Although cross-cultural comparisons are difficult to make, 1 interpretation of these studies is that these time constraints as well as social conflict, which are common stressors in residency,²⁹ contribute to work-home interference, and that these stressors, along with feeling uncertain about the future and feeling that personal needs are inconsequential, lead to emotional exhaustion and depersonalization. Why some who are exposed to these conditions do not develop burnout remains unclear.

Resident Burnout and Demographic Factors

Some demographic and personality characteristics are presumed to be stable over time and are thought to precede the onset of burnout in residency. In these studies, however, few demographic factors seem to be associated with burnout in residents. Because women have a higher lifetime risk of developing depression,³⁰ it is reasonable to ask whether this increased risk extends to burnout as well. Contrary to expectation, however, none of these studies has demonstrated a higher risk or differential effect of burnout for women. In fact, 1 study suggests that men are at higher risk of burnout. However, these data are limited because only 4 of the 15 studies reported burnout by sex.

Collier et al¹⁵ found that reporting high educational debt was associated with higher cynicism, whereas having children was associated with less self-reported cynicism. Of course, with its low response rate, the sample of Collier et al may overrepresent resident financial distress as well as emotional distress. In contrast, in the article by Lemkau et al,²⁸ which reports personality and demographic correlates for the small survey of Wright State University family practice residents,¹⁹ no bivariate association was found between burnout and amount of financial debt, number of children, sex, marital status, availability of a confidant, or frequency of exercise. Rather, residents with high emotional exhaustion scores were less satisfied with their broadly defined social support systems, while those with high depersonalization scores more often had spouses who were not employed or were part-time employed (information not reported by Collier et al), somewhat consistent with the finding of Geurts et al. Of note, the study by Lemkau et al may have limited power to detect sex differences because of the very small number of women surveyed. Michels et al²⁰ reported an association between burnout and sex, in which men, white residents, and third-year residents had significantly higher depersonalization scores than others, and these differences increased with repeated mea-

surements. There were very few nonwhites in the sample, however, limiting the generalizability of this finding. Shanafelt et al³ also found no association with sex or marital status; to preserve anonymity, Shanafelt et al and Collier et al collected little other demographic information.

The cross-sectional nature of these data limit their interpretability because it is not possible to determine whether burnout is a consequence or a cause of social dissatisfaction, spousal employment decisions, childlessness, or even persistently high educational debt. Furthermore, as findings become credible through replication, the fact that these findings consistently replicate negative associations may support the hypothesis that demographic factors are not reliably associated with burnout among residents.

Resident Burnout and Personality Characteristics

As with many behavioral patterns, some investigators have questioned whether certain personality types predispose residents to burnout. The family practice resident survey by Purdy et al¹⁹ and Lemkau et al²⁸ included the Millon Clinical Multiaxial Inventory of personality. Although obsessive personality traits have been believed to be adaptive for physicians,^{31,32} in this cross section, obsessive traits did not relate to any burnout dimension (positively or negatively). Rather, avoidant, dependent, antisocial, and passive-aggressive traits were correlated with higher emotional exhaustion scores while narcissistic, histrionic, compulsive, and schizoid personality traits were not correlated with emotional exhaustion in unadjusted analysis. Some of the correlation coefficients were rather weak (range, 0.21-0.46), however, and the clinical significance of these associations may be overstated. Furthermore, as no adjusted analysis was performed, the contribution of possible confounders like social support cannot be assessed. Given the likelihood that personality type may influence social support from superiors, this unadjusted analysis is difficult to interpret.

Daly and Willcock²¹ noted that an "alexithymic" personality style (inability to recognize or describe one's emotions) predicted high burnout. However, because burnout in this study was defined as high emotional exhaustion or low personal accomplishment (rather than depersonalization), their burnout measure is inconsistent with the validated definition.¹⁰ Thus, the contribution of personality to burnout remains obscure.

Health and Performance

Consequences of Resident Burnout

Burnout can coexist with depression, but causal relationships have not been established in the literature where longitudinal data are lacking. The studies that examined them together have found an association between burnout and depression. However, although 3 studies screened residents for both burnout and depressive symptoms, none addressed the relative timing of the 2 conditions.

In the studies reported by Purdy et al¹⁹ and by Lemkau et al,²⁸ higher emotional exhaustion scores correlated with higher tendencies toward psychotic depression.²⁸ The measure of Baldwin et al,²⁷ "feeling overwhelmed at work," was modestly correlated with depression score on the General Health Questionnaire ($r=0.37$). Although their study was prospective, Baldwin et al analyzed feeling overwhelmed and depressive symptoms without reporting relative times of onset.

It is possible that the experience of emotional exhaustion and poor functioning may trigger a depressive episode. In the study by Shanafelt et al,⁵ 90% of residents who screened positive for depression on the Primary Care Evaluation of Mental Disorders (PRIME-MD) also had high burnout scores at that single time point, while 51% of residents with burnout reported a history of major depression during residency and 31% screened positive for depression. Alternatively, depression may influence burnout. In one study (not reviewed here), the higher their depression score, the more

stressful the interns rated the feeling of being overworked,³³ suggesting that depression may sensitize individuals and predispose them to extreme stress reactions. Moreover, depression and burnout may occur independently. According to 2 prospective studies that followed up depressive symptoms through 1 year, some interns felt progressively less overwhelmed and more competent,³⁴ while others showed progressively more fatigue and anger,¹⁸ yet both studies reported more depression. The nature and direction of the association between depression and burnout for residents remain unclear.

Given the fact that burnout seems to be associated with adverse patient outcomes if it affects other health care workers,^{26,35} the question of how resident burnout influences patient outcomes is compelling. In the study by Baldwin et al,²⁷ "feeling overwhelmed at work" was positively correlated with self-reported number of minor mistakes in the past month, without a significant correlation between General Health Questionnaire 12 score and number of mistakes. In a multivariate logistic regression analysis of data from the University of Washington cross-sectional study, medicine residents with high depersonalization were 8 times more likely to self-report monthly or weekly suboptimal patient practices and 4 times more likely to report suboptimal attitudes.⁵ Even though residents who had taken time off before medical school had higher emotional exhaustion scores, they were 70% less likely to report suboptimal patient care practices, suggesting some kind of protective effect of time off prior to medical school on patient care. Unfortunately, self-reported performance measures may be subject to recall bias or selection bias. An objective measure of error would be useful, as would prospective data examining whether poor patient care precedes and predisposes to burnout.

Resources and Interventions for Residents With Burnout

Although some cross-sectional data have identified common coping practices for residents, the efficacy of these

practices has not been established. To manage stress, about three fourths of the residents in the study by Shanafelt et al⁵ rated talking with family, a significant other, or other residents as "significant" or "essential" strategies, while residents with burnout were more likely to give such ratings to physical exercise and "a survival attitude." In directly evaluating their programs' resources, residents rated as important having at least 4 days off per month, ancillary help, and a night float. Despite reporting feeling irrelevant and uncertain, residents with burnout were less likely to rate as important presentations on stress and depression, constructive feedback, and career counseling. Without studying the efficacy of these strategies for these residents, however, it is unclear whether differential selection of these coping strategies reflects a lack of resources for the distressed, the order in which residents call on resources as they become more distressed, or which strategies fail to protect residents from burnout.

Two studies investigated the role of stress management workshops for residents. McCue and Sachs³⁶ describe a 4-hour stress management workshop in which they trained 43 medicine, pediatrics, and medicine-pediatric residents from a teaching hospital in personal management, relationship, outlook, and stamina skills, and observed that emotional exhaustion scores declined somewhat 6 weeks later. Depersonalization and inefficacy scores worsened, however, as they did in the nonparticipating control group, suggesting that modifying the depersonalization dimension of burnout may be particularly challenging. Ospina-Kammerer and Figley³⁷ also recruited 24 family practice residents who were available to participate in 4 weekly seminars to learn stress reduction techniques. Following the intervention, mean MBI scores decreased in the intervention group. Both studies were small, possibly with limited generalizability. More concerning, however, is that intervention participants may have overrepresented older and more effi-

cient residents, as only residents with enough free time to volunteer received the intervention and residents without free time were assigned to the control group. The small sample sizes also did not allow for efficacy to be analyzed by burnout severity. More randomized efficacy studies of stress management training workshops are needed.

Based on the findings of Geurts et al⁶ and Sargent et al²⁴ that increasing work hours are associated with higher burnout, one might expect the mandatory work-hour restrictions to result in a reduction in depersonalization scores. However, this was not found to be the case in the longitudinal study by Gelfand et al,²⁵ which compared surgery residents' self-reported work hours and burnout scores 1 week before and 6 months after the 2003 implementation of the Accreditation Council for Graduate Medical Education's 80-hour workweek restriction.²⁵ Instead, although work hours decreased significantly because of a reduction in educational activity and home call hours, mean burnout scores did not; in fact, depersonalization increased from 56% to 70%. However, in this analysis, neither burnout scores nor work hours were analyzed by residency year, so a significant but small effect within a single residency year might not be discerned. Also, because the study by Tzischinsky et al¹⁷ suggests that the natural history of resident burnout is to resolve after 2 years independent of persistently high stress, burnout at baseline might persist despite work-hour changes, whereas lower burnout rates might be observed in residents never exposed to the previous work-hour schedule. In addition, postrestriction burnout levels were measured during the winter months, when burnout may already be higher.²¹

COMMENT

The literature on resident burnout is still in the preliminary stages of mostly probing for associations in small samples. Because specialties other than internal medicine are represented by a single

study each, it is premature to conclude that different findings reflect true differences between specialties. Still, these studies, each with its methodological limitations, seem to suggest that residents from various specialties, internationally, experience burnout. These studies also suggest associations between burnout and few demographic factors, a constellation of personality types, and, as with practicing physicians, work-home interference and problematic interactions; however, these associations mostly are documented as low-magnitude correlations or bivariate associations that occur within samples with questionable generalizability. The studies suggest that burnout is also associated with depression and problematic clinical performance, as burnout and depression often occur, and residents with probable burnout perceive that they are less competent and that they commit more medical errors and problematic patient care practices. However, although residents with burnout seem to question their own competence and performance more, there is no objective evidence that they actually perform more poorly than other residents. The paucity of longitudinal data are the main limitation of this area of research, and many questions remain to be addressed in carefully designed studies.

Understanding of resident burnout could be enhanced by more rigorous research,^{38,39} such as studying large samples of residents in carefully planned prospective studies. The work characteristics that residents face are complex and vary by specialty, program, and postgraduate year, and a study designed to characterize burnout must be sufficiently large (or deliberately specific) and prospective to control for these variables and identify risk factors. Future prospective studies also could explore the temporal relationship between the onset of burnout and depression, suicidal ideation, poor clinical performance, substance abuse, career decisions, job turnover, and patient satisfaction. Health services research could explore the costs

associated with these outcomes and the personal and fiscal benefits of interventions, work-hour restriction, or other reform policies.

Preventive structural reform may prove more effective than time-intensive stress management training, but more research is needed. Although the MBI is readily available for program directors to conduct prereform and postreform burnout assessments, few data on residents are available to guide residency directors in preventing, recognizing, and managing burnout. Although resident work hours and sleep deprivation are associated with stress and medical errors,⁴⁰ in the studies examined, sleep deprivation was not found to be associated with burnout, nor was restricting work hours alone associated with a reduction in burnout. Rather, the intensity of the resident's workday and the extent to which it interfered with the resident's home life was repeatedly associated with resident burnout. These studies suggest that residency programs might begin to improve resident well-being by restoring meaning to residents' time commitments, facilitating supportive social interactions, increasing resident work control, and promoting the separation of work and home life. Translating these qualitative concepts into practical strategies will be an important challenge.

Although empirical data examining the nature and consequences of resident burnout remain scant and heterogeneous, a call to study resident well-being on behalf of funding agencies is largely absent. With sufficient funding opportunities, essential research providing information about patient safety, physician retention, and physician health could be conducted.

CONCLUSION

Young physicians who readily embraced hard work in premedical and undergraduate medical education experience high levels of professional burnout in residency training years. Aside from working long hours, something about residency seems to leave

many residents feeling emotionally exhausted and cynical and leaves some depressed and critical of their own patient care performance as well. Further research is needed to determine whether, in accordance with conventional burnout models, the resident who is allowed more work control, meaningful work demands, and better self-care can have better personal outcomes and ultimately provide better patient care.

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