

Changes in Burnout and Satisfaction With Work-Life Balance in Physicians and the General US Working Population Between 2011 and 2014

Tait D. Shanafelt, MD; Omar Hasan, MBBS, MPH; Lotte N. Dyrbye, MD, MHPE; Christine Sinsky, MD; Daniel Satele, MS; Jeff Sloan, PhD; and Colin P. West, MD, PhD

Abstract

Objective: To evaluate the prevalence of burnout and satisfaction with work-life balance in physicians and US workers in 2014 relative to 2011.

Patients and Methods: From August 28, 2014, to October 6, 2014, we surveyed both US physicians and a probability-based sample of the general US population using the methods and measures used in our 2011 study. Burnout was measured using validated metrics, and satisfaction with work-life balance was assessed using standard tools.

Results: Of the 35,922 physicians who received an invitation to participate, 6880 (19.2%) completed surveys. When assessed using the Maslach Burnout Inventory, 54.4% (n=3680) of the physicians reported at least 1 symptom of burnout in 2014 compared with 45.5% (n=3310) in 2011 ($P<.001$). Satisfaction with work-life balance also declined in physicians between 2011 and 2014 (48.5% vs 40.9%; $P<.001$). Substantial differences in rates of burnout and satisfaction with work-life balance were observed by specialty. In contrast to the trends in physicians, minimal changes in burnout or satisfaction with work-life balance were observed between 2011 and 2014 in probability-based samples of working US adults, resulting in an increasing disparity in burnout and satisfaction with work-life balance in physicians relative to the general US working population. After pooled multivariate analysis adjusting for age, sex, relationship status, and hours worked per week, physicians remained at an increased risk of burnout (odds ratio, 1.97; 95% CI, 1.80-2.16; $P<.001$) and were less likely to be satisfied with work-life balance (odds ratio, 0.68; 95% CI, 0.62-0.75; $P<.001$).

Conclusion: Burnout and satisfaction with work-life balance in US physicians worsened from 2011 to 2014. More than half of US physicians are now experiencing professional burnout.

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From the Division of Hematology (T.D.S.), Division of Primary Care Internal Medicine (L.N.D.), Division of Biomedical Statistics and Informatics

Affiliations continued at the end of this article.

Medicine is both a demanding and a rewarding profession. Physicians spend more than a decade in postsecondary education, work substantially more hours than most US workers in other fields, and often struggle to effectively integrate their personal and professional lives.¹ They engage in highly technical and intellectually demanding work that often requires complex, high-stakes decision making despite substantial uncertainty. These challenges are offset by meaningful relationships with patients, the intellectual stimulation of the work, and the satisfaction of helping fellow human beings.²⁻⁴ Physicians are also well

compensated relative to many professions, are part of a fraternity of supportive colleagues, and often enjoy the respect and appreciation of their community.

The cumulative effect of these forces on the personal and professional satisfaction of each physician is unique. Although future physicians begin medical school with mental health profiles better than those of college graduates pursuing other fields,⁵ this profile is reversed 1 to 2 years into medical school.⁶ Once in practice, physicians have generally high degrees of satisfaction with their career choice but experience high degrees of

professional burnout and dissatisfaction with work-life integration.^{1,7} Burnout is a syndrome of emotional exhaustion, loss of meaning in work, feelings of ineffectiveness, and a tendency to view people as objects rather than as human beings.⁸ Burnout has profound implications for individual physicians and their families.^{9,10} In addition, burnout appears to impact the quality of care physicians provide¹¹⁻¹⁶ and physician turnover,^{17,18} which have profound implications for the quality of the health care delivery system.^{15,19,20}

In 2011, we conducted a national study measuring burnout and other dimensions of well-being in US physicians as well as the general US working population.¹ At the time of that study, approximately 45% of US physicians met criteria for burnout. Substantial variation in the rate of burnout was observed by specialty, with the highest rates observed among many specialties at the front line of access to care (eg, family medicine, general internal medicine, and emergency medicine). Burnout among physicians also varied by career stage, with the highest rate among mid-career physicians.²¹ Burnout was more common among physicians than among the general US working population, a finding that persisted after adjusting for age, sex, hours worked, and level of education.¹

The landscape of medicine continues to rapidly evolve. Technology, legislation, and market forces have contributed to consolidation of medical practices, fluctuating reimbursement, new care delivery models, increased productivity expectations for physicians, and more widespread use of electronic medical records over the past several years.²² The study of US physicians we first reported on in 2011 was designed to reevaluate the well-being and satisfaction of US physicians approximately every 3 years to assess changes in burnout and satisfaction with work-life balance (WLB) over time. Here, we report results of the 2014 survey in comparison to the 2011 findings.

PATIENTS AND METHODS

The 2014 survey used methods similar to those of the 2011 study.¹ At both time points, we assessed a range of personal and professional characteristics as well as personal well-being in several dimensions (described below).

Participants

Physician Sample. A sample of physicians from all specialty disciplines was assembled using the American Medical Association (AMA) Physician Master File (PMF). The PMF is a nearly complete record of all US physicians independent of AMA membership. To ensure an adequate sample of physicians from each specialty area, we oversampled physicians in fields other than family medicine, general pediatrics, general internal medicine, and obstetrics/gynecology. Canvassing e-mails stating the purpose of the study (eg, to better understand the factors that contribute to satisfaction in US physicians), along with an invitation to participate and a link to the survey, were sent to 94,032 physicians in August 2014 with 3 reminder requests sent over the ensuing 6 weeks. The 35,922 physicians who opened at least 1 invitation e-mail were considered to have received the invitation to participate in the study.²³ Participation was voluntary, and all responses were anonymous.

Population Control Sample. For comparison to physicians, we surveyed a probability-based sample of individuals from the general US population in October 2014. Although the initial population comparison (December 2010) used modest oversampling of individuals younger than 34 years (to allow comparison to medical students and residents),¹ the 2014 population survey oversampled individuals between the ages of 35 and 65 years to better match the age range of practicing US physicians. The population survey was conducted using the Knowledge Panel, a probability-based panel (<http://www.knowledgenetworks.com/knpanel/index.html> and <http://www.knowledgenetworks.com/ganp/reviewer-info.html>) designed to be representative of the US population. On the basis of the intent to compare workers in other fields to physicians, only employed individuals were surveyed. The Mayo Clinic Institutional Review Board reviewed and approved the study.

Study Measures

Both the physician and population controls provided information on demographic characteristics (age, sex, and relationship status), hours worked per week, burnout, symptoms of depression, suicidal ideation, and satisfaction with WLB. Physician professional characteristics

were ascertained by asking physicians about their practice. Population controls also provided information about the highest level of education completed and occupation.

Burnout. Burnout among physicians was measured using the Maslach Burnout Inventory (MBI), a validated 22-item questionnaire considered the criterion standard tool for measuring burnout.^{8,24-26} Consistent with convention,²⁷⁻²⁹ we considered physicians with a high score on the depersonalization and/or emotional exhaustion subscales of the MBI as having at least 1 manifestation of professional burnout.⁸

Although the 22-item MBI is the criterion standard for the assessment of burnout,⁸ its length and the expense of administration limit feasibility for use in long surveys addressing multiple content areas or in large population samples. Thus, to allow comparison of burnout between physicians and population controls, we measured burnout in both groups using 2 single-item measures adapted from the full MBI (ie, physicians completed the full MBI and the 2-item instrument; controls completed just the 2-item instrument). These 2 items correlated strongly with the emotional exhaustion and depersonalization domains of burnout as measured by the full MBI in a sample of more than 10,000 individuals^{30,31} with an area under the receiver operator characteristic curve of 0.94 and 0.93 for emotional exhaustion and depersonalization, respectively, for these single items relative to the full MBI. This approach has also been used in previous large-scale national studies of US physicians collectively enrolling more than 20,000 physicians.^{1,32}

Symptoms of Depression and Suicidal Ideation. Symptoms of depression among physicians were assessed using the 2-item Primary Care Evaluation of Mental Disorders,³³ a standardized and validated assessment for depression screening that performs as well as longer instruments.³⁴ It should be noted that this tool has a high sensitivity but lower specificity such that approximately 1 of every 4 individuals screening positive would meet criteria for major depression if they were to undergo full psychiatric assessment. Recent suicidal ideation was evaluated by asking participants, "During the past 12 months, have you had thoughts of taking your own life?" This

item was designed to measure somewhat recent, but not necessarily active suicidal ideation.³⁵ These questions have been used extensively in other studies and allow ready comparison to the prevalence of suicidal ideation in other studies of the US population³⁶⁻³⁸ and US physicians.^{1,39}

Satisfaction With WLB. Satisfaction with WLB was assessed by the item "My work schedule leaves me enough time for my personal/family life" (response options: strongly agree, agree, neutral, disagree, and strongly disagree).¹ Individuals who indicated "strongly agree" or "agree" were considered to be satisfied with their WLB, whereas those who indicated "disagree" or "strongly disagree" were considered to be dissatisfied with their WLB.

Statistical Analyses

Standard descriptive summary statistics were used to characterize the physician and control samples. Associations between variables were evaluated using the Kruskal-Wallis test (continuous variables) or the chi-square test (categorical variables), as appropriate. All tests were 2-sided with type I error rates of .05. Multivariate analysis of differences across physician specialties was performed using logistic regression. Similarly, a pooled multivariate logistic regression analysis of physicians and population controls was performed to identify demographic and professional characteristics associated with the dependent outcomes. For all comparisons with population controls, physician data were restricted to responders who were between the ages of 29 and 65 years and not retired to match the age of the population sample. Comparisons between physicians in 2011 and 2014 were made using the chi-square test or the Kruskal-Wallis tests, as appropriate. These data were not paired and were treated as independent samples. Comparisons in the proportions of burnout and satisfaction with WLB between physicians and population controls in 2011 relative to 2014 were performed using Breslow-Day tests. All analyses were done using SAS version 9 (SAS Institute Inc).

RESULTS

Well-being of US Physicians

Of the 35,922 physicians who received an invitation to participate, 6880 (19.2%) completed

TABLE 1. Demographic Characteristics of Responding Physicians Compared With All US Physicians

Characteristic	2014 Responders (N=6880)	All US physicians 2014 (n=835,451)	2011 Responders (N=7288)
Sex			
Male	4497 (67.5%)	557,063 (66.8%)	5241 (71.9%)
Female	2162 (32.5%)	277,271 (33.2%)	2046 (28.1%)
Missing	221	1117	1
Age (y)			
Median	56	51.5 ^a	55
<35	332 (5.0%)	59,849 (7.2%)	321 (4.5%)
35-44	1223 (18.4%)	219,394 (26.3%)	1299 (18.0%)
45-54	1416 (21.3%)	219,492 (26.3%)	1842 (25.6%)
55-64	2193 (33.0%)	211,056 (25.3%)	2586 (35.9%)
≥65	1491 (22.4%)	125,660 (15.0%)	1162 (16.1%)
Missing	225		75
Primary care^b			
Primary care	1596 (23.3%)	277,425 (32.1%) ^a	1907 (26.4%)
Nonprimary care	5249 (76.7%)	585,507 (67.9%) ^a	5326 (73.6%)
Specialty			
Anesthesiology	236 (3.5%)		309 (4.3%)
Dermatology	164 (2.4%)		174 (2.4%)
Emergency medicine	355 (5.2%)		333 (4.6%)
Family medicine	540 (7.9%)		752 (10.4%)
General surgery	259 (3.8%)		276 (3.8%)
General surgery subspecialty ^c	381 (5.6%)		374 (5.2%)
Internal medicine-general	453 (6.6%)		578 (8.0%)
Internal medicine subspecialty ^b	784 (11.5%)		1019 (14.1%)
Neurology	246 (3.6%)		252 (3.5%)
Neurosurgery	58 (0.9%)		82 (1.1%)
Obstetrics and gynecology	246 (3.6%)		312 (4.3%)
Ophthalmology	241 (3.5%)		199 (2.8%)
Orthopedic surgery	239 (3.5%)		269 (3.7%)
Otolaryngology	165 (2.4%)		193 (2.7%)
Other	255 (3.7%)		329 (4.6%)
Pathology	170 (2.5%)		184 (2.5%)
Pediatrics-general	362 (5.3%)		286 (4.0%)
Pediatric subspecialty ^c	321 (4.7%)		239 (3.3%)
Physical medicine and rehabilitation	170 (2.5%)		97 (1.3%)
Preventive medicine, occupational medicine, or environmental medicine	112 (1.6%)		76 (1.1%)
Psychiatry	566 (8.3%)		488 (6.8%)
Radiation oncology	64 (0.9%)		55 (0.8%)
Radiology	261 (3.8%)		216 (3.0%)
Urology	119 (1.7%)		136 (1.9%)
Missing	66		60
Hours worked per week			
Median	50 (40-60)		50 (40-60)
<40	1172 (17.4%)		985 (14.3%)
40-49	1340 (19.9%)		1459 (21.1%)
50-59	1667 (24.7%)		1852 (26.8%)
60-69	1526 (22.6%)		1659 (24.0%)
70-79	535 (7.9%)		455 (6.6%)
≥80	509 (7.5%)		497 (7.2%)
Missing	131		381
No. of nights on call per week			
Median (interquartile range)	1 (0-3)		1 (0-3)
Primary practice setting			
Private practice	3605 (52.6%)		4087 (57.7%)

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TABLE 1. Continued

Characteristic	2014 Responders (N=6880)	All US physicians 2014 (n=835,451)	2011 Responders (N=7288)
Primary practice setting, continued			
Academic medical center	1625 (23.7%)		1494 (21.1%)
Veterans hospital	104 (1.5%)		184 (2.6%)
Active military practice	58 (0.8%)		65 (0.9%)
Not in practice or retired	160 (2.3%)		89 (1.3%)
Other	1303 (19%)		1164 (16.4%)
Missing	25		205

^aAs of March 11, 2015.

^bPhysicians in subspecialty areas were intentionally oversampled to provide an adequate number of responses from physicians from each specialty to allow comparison across specialties. Primary care specialties include the following: Internal medicine-general, general practice, family medicine, obstetrics/gynecology, and pediatrics-general.

^cFor further subspecialty breakdown, see the Supplemental Material, available online at <http://www.mayoclinicproceedings.org>.

surveys. The demographic characteristics of participants relative to all 835,451 US physicians were generally similar, although participants were slightly older (Table 1). The 2014 participants were also similar to the 2011 participants (Supplemental Table 1, available online at <http://www.mayoclinicproceedings.org>) other than a slight increase in women physicians (2011: 28.1%; 2014: 32.5%), consistent with the increased proportion of women among US physicians overall (2011: 30.7%; 2014: 33.2%). Analysis of early responders compared with late responders (a standard approach to evaluate for response bias) by age, sex, and specialty found no statistically significant differences when comparing sex and specialty (primary care vs nonprimary care) and only a minor difference in age (median, 56.0 years vs 57.0 years), providing further evidence that the sample was generally representative of US physicians from a demographic perspective.

Rates of burnout, symptoms of depression, suicidal ideation in the last 12 months, and satisfaction with WLB among participating physicians are summarized in Table 2. When assessed using the full MBI, 46.9% of US physicians had high emotional exhaustion, 34.6% high depersonalization, and 16.3% a low sense of personal accomplishment in 2014. In aggregate, 54.4% of the physicians had at least 1 symptom of burnout based on a high emotional exhaustion score and/or a high depersonalization score. Only 40.9% of the physicians felt that their work schedule left enough time for personal/family life, with 14.6% neutral and 44.5% disagreeing with this assertion.

When compared with 2011, rates of burnout among physicians were higher (54.4% vs 45.5%; $P < .001$) in 2014 and satisfaction with WLB was lower (40.9% vs 48.5%; $P < .001$). In contrast, minimal differences were observed in the proportion of physicians reporting symptoms of depression (39.8% vs 38.2%; $P = .04$) and no difference in the rates of suicidal ideation was observed (6.4% vs 6.4%; $P = .98$).

As in 2011, substantial variation in the prevalence of burnout was observed by specialty. Compared with 2011, the prevalence of burnout was higher for all specialty disciplines in 2014 (Figure 1, A). Family medicine (51.3% vs 63.0%; $P < .001$), general pediatrics (35.3% vs 46.3%; $P = .005$), urology (41.2% vs 63.6%; $P < .001$), orthopedic surgery (48.3% vs 59.6%; $P = .01$), dermatology (31.8% vs 56.5%; $P < .001$), physical medicine and rehabilitation (47.4% vs 63.3%; $P = .01$), pathology (37.6% vs 52.5%; $P = .006$), radiology (47.7% vs 61.4%; $P = .003$), and general surgery subspecialties (42.4% vs 52.7%; $P = .005$) each experienced a more than 10% increase in burnout.

Substantial variation in satisfaction with WLB was also observed by specialty. Satisfaction with WLB was lower in 2014 for all specialty disciplines with the exception of obstetrics and gynecology and general surgery (Figure 1, B). Categorization of the 24 specialty disciplines based on whether the prevalence of burnout and satisfaction with WLB in their specialty was above or below the prevalence of all US physicians in each dimension is shown in Figure 1, C.

We next conducted multivariate analysis to identify factors associated with burnout

and satisfaction with WLB. Age, sex, specialty, hours worked per week, and practice setting were independently associated with both burnout and satisfaction with WLB (all $P < .05$; Supplemental Table 2, available online at <http://www.mayoclinicproceedings.org>).

Comparison of Physicians With the General US Working Population

To compare the professional experience of practicing physicians relative to working US adults, 5313 nonretired physicians aged 29 to 65 years were compared with 5392 employed, nonphysician population control subjects aged 29 to 65 years (Table 3). The overall prevalence of burnout on the 2-item burnout measure for the general US working population was similar to that for the 2011 sample (28.4% vs 28.6%; $P = .85$). Satisfaction with WLB for the general US working population in 2014 was slightly more favorable than for the 2011 sample (61.3% vs 55.1%; $P < .001$).

Compared with population controls, physicians were older (median, 53 years vs 52 years; $P < .001$), more likely to be men (62.2% vs 54.4%), and more likely to be married (82.9% vs 67.5%; $P < .001$). Similar to the 2011 findings, physicians worked a median of 10 hours more per week than US workers in general (50 vs 40 hours), with 41.8% of the physicians and 6.4% of the controls working 60 hours or more per week ($P < .001$ for both). On the 2-item burnout measure, physicians had higher rates of emotional exhaustion (43.2% vs 24.8%; $P < .001$), depersonalization (23.0% vs 14.0%; $P < .001$), and overall burnout (48.8% vs 28.4%; $P < .001$) (Figure 2, A). After adjusting for age, sex, relationship status, and hours worked per week, physicians remained at increased risk for burnout compared with the population (odds ratio, 1.97; 95% CI, 1.80-2.16; $P < .001$) (Figure 2, B). Physicians also had a lower rate of satisfaction with WLB than did the general US working population (36.0% vs 61.3%; $P < .001$). After adjusting for age, sex, relationship status, and hours worked per week, physicians remained less likely to be satisfied with WLB compared with the population (odds ratio, 0.68; 95% CI, 0.62-0.75; $P < .001$).

DISCUSSION

Burnout is a pervasive problem among physicians that appears to be getting worse. Our

TABLE 2. Physician Career Satisfaction, Burnout, Depression, and Quality of Life 2014 Relative to 2011

Variable	2014	2011	P
Burnout indices^a			
Emotional exhaustion			
Median	25.0	21.0	<.001
% low score	2299 (34.1%)	3041 (42.2%)	<.001
% intermediate score	1283 (19.0%)	1433 (19.9%)	
% high score	3165 (46.9%)	2734 (37.9%)	
Depersonalization			
Median	7.0	5.0	<.001
% low score	2951 (44.0%)	3601 (50.1%)	<.001
% intermediate score	1434 (21.4%)	1476 (20.5%)	
% high score	2325 (34.6%)	2116 (29.4%)	
Personal accomplishment			
Median	41	42	<.001
% high score	4064 (61.2%)	4758 (66.6%)	<.001
% intermediate score	1495 (22.5%)	1495 (20.9%)	
% low score	1085 (16.3%)	887 (12.4%)	
Burned out ^b	3680 (54.4%)	3310 (45.5%)	<.001
Depression			
Screen positive for depression	2715 (39.8%)	2753 (38.2%)	.04
Suicidal ideation			
Suicidal ideation in the last 12 mo	438 (6.4%)	466 (6.4%)	.98
Career satisfaction			
Would choose to become a physician again	4476 (67.0%)	5081 (70.2%)	<.001
Would choose the same specialty again	4727 (70.8%)	5119 (70.8%)	.94
Satisfaction with work-life balance			
Work schedule leaves me enough time for my personal and/or family life			
Strongly agree	706 (10.6%)	1233 (17.0%)	<.001
Agree	2012 (30.3%)	2279 (31.5%)	
Neutral	973 (14.6%)	1046 (14.4%)	
Disagree	2004 (30.1%)	1775 (24.5%)	
Strongly disagree	956 (14.4%)	911 (12.6%)	
Missing	229	44	

^aAs assessed using the full Maslach Burnout Inventory. Per the standard scoring of the MBI for health care workers, physicians with scores of ≥ 27 on the Emotional Exhaustion subscale, ≥ 10 on the Depersonalization subscale, or ≤ 33 on the Personal Accomplishment subscale are considered to have a high degree of burnout in that dimension.

^bHigh score on Emotional Exhaustion and/or Depersonalization subscales of the Maslach Burnout Inventory (see Methods).

findings suggest a 10% increase in the prevalence of burnout among US physicians over the last 3 years. More than half of the US physicians in our survey had symptoms of burnout when assessed using the full MBI, with increased rates of burnout observed across all specialties. A substantial erosion in satisfaction with WLB has also been observed among US physicians over the past 3 years, despite no increase in the median number of hours worked per week. In contrast to the increase in burnout and decrease in satisfaction

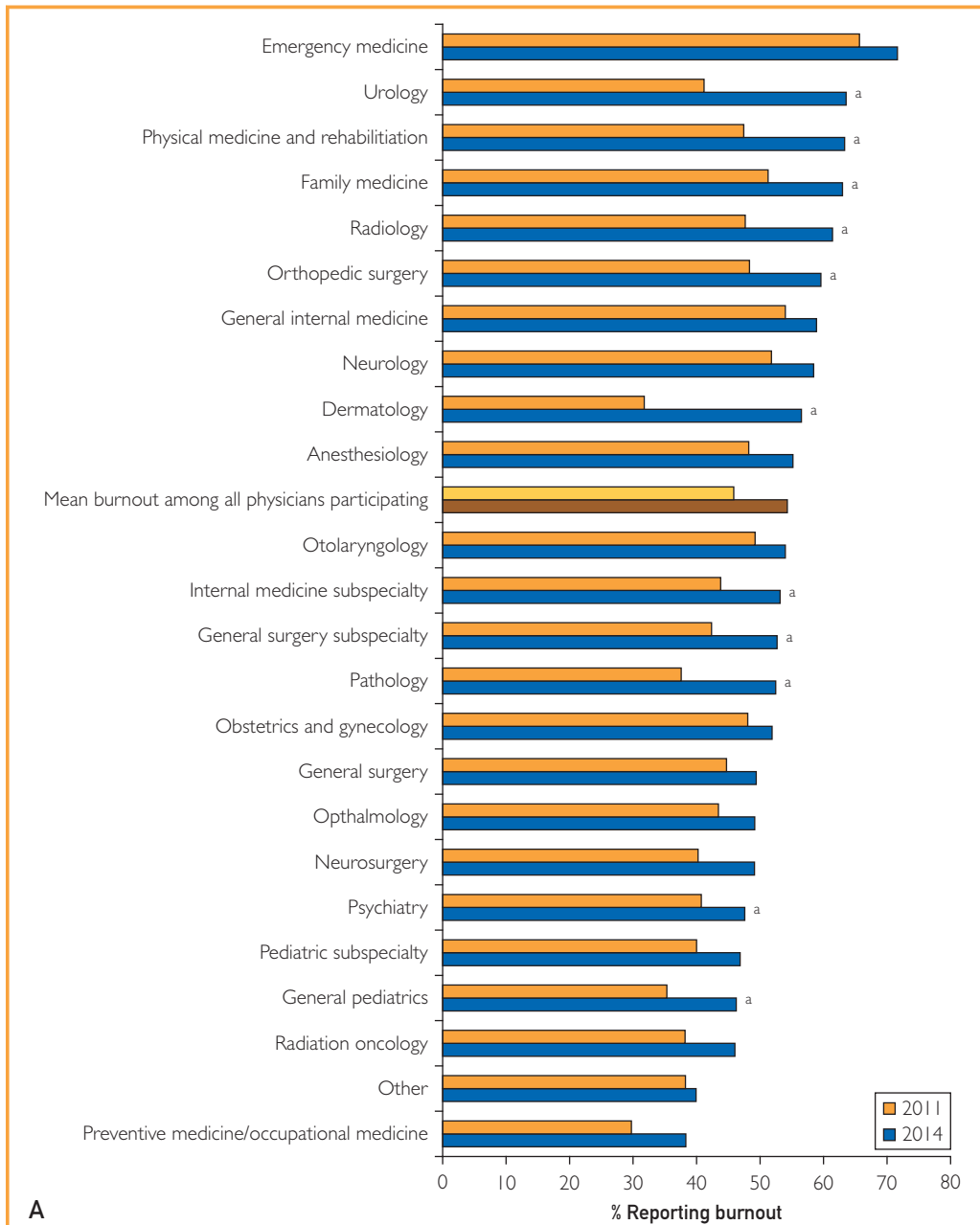
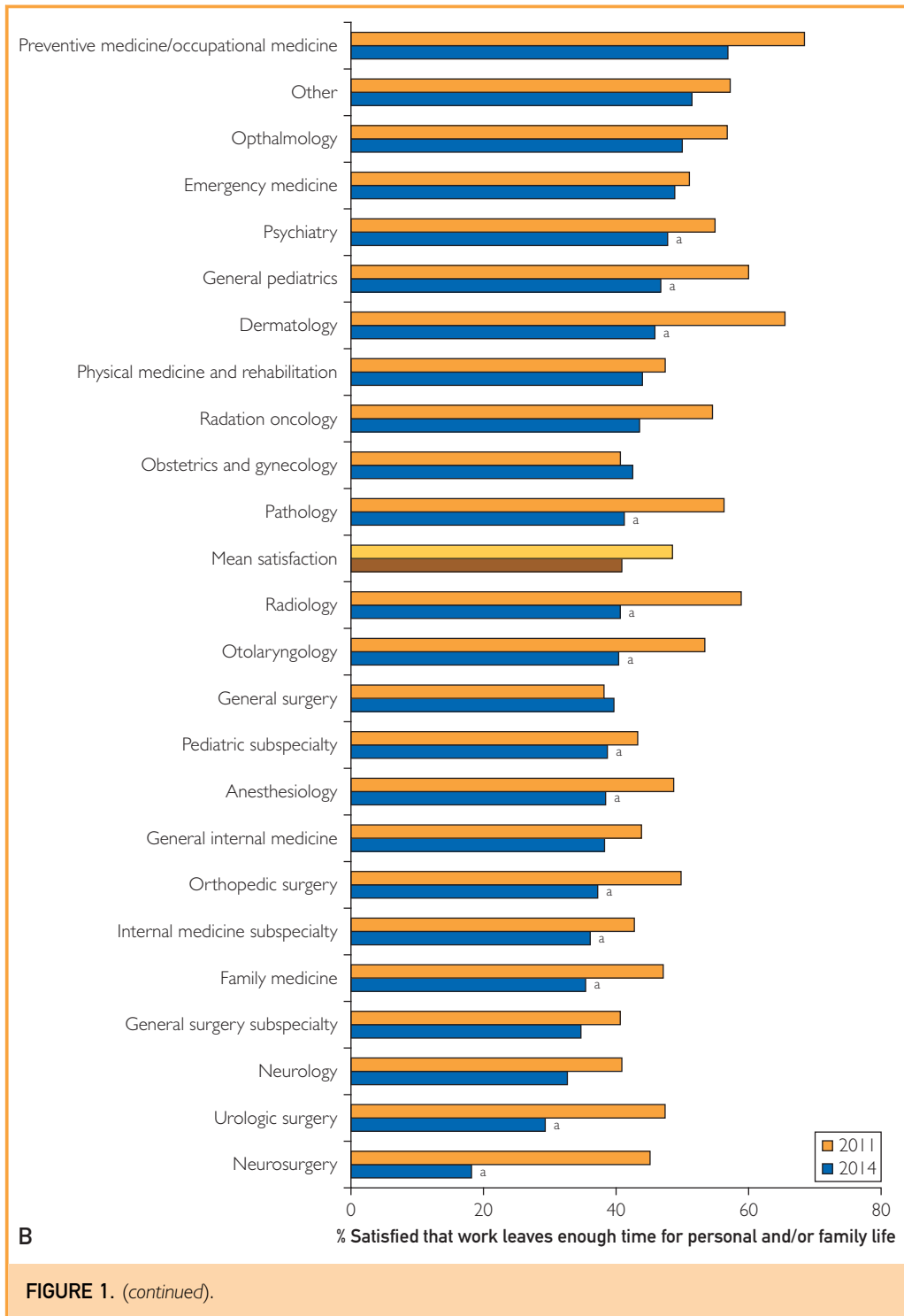


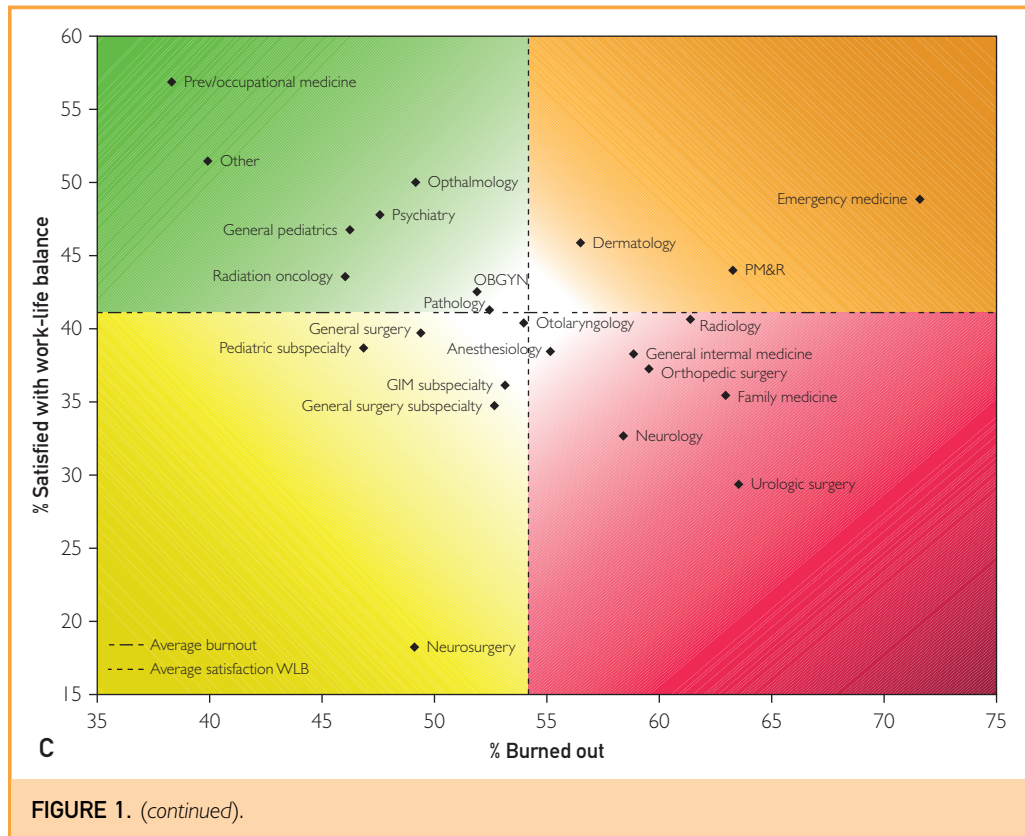
FIGURE 1. Burnout (A) and satisfaction with WLB (B) by specialty 2014 vs 2011. For 1A and 1B, specialty discipline is shown on the y axis and burnout (A) and satisfaction with WLB (B) are shown on the x axis. For 1C, satisfaction with WLB is shown on the y axis and burnout on the x axis. GIM = general internal medicine; OBGYN = obstetrics and gynecology; PM&R = physical medicine and rehabilitation; Prev = Preventive medicine, occupational medicine, or environmental medicine; WLB = work-life balance. ^a $P < .05$ from comparison 2014 to 2011.

with WLB, minimal or no changes were observed in the prevalence of symptoms of depression or suicidal ideation.

It is notable that the increase in burnout and decrease in satisfaction with WLB in physicians

over the last 3 years runs counter to trends in the general US working population over the same interval. These disparate trends have resulted in a further widening in the rates of burnout and satisfaction with WLB among





physicians relative to the US working population, even after adjustment for differences in hours worked, age, sex, and relationship status.

What are the possible solutions to this problem? More than 75% of the physicians are now employed by large health care organizations and meaningful progress will require an effective response at both the individual level and the organization or system level.⁴⁰ Health care organizations should focus on improving the efficiency and support in the practice environment,⁴¹⁻⁴³ select and develop leaders with the skills to foster physician engagement,⁴⁴ help physicians optimize “career fit,”⁴⁵ and create an environment that nurtures community, flexibility, and control, all of which help cultivate meaning in work.^{2,3,41,42,46} Given the high number of hours worked by physicians as well as the unpredictable nature of work hours in some settings (eg, surgery, hospital-based care), health care organizations must also establish principles that help facilitate work-life integration.^{47,48} Organizational approaches to help physicians self-calibrate and promote their own wellness may also be beneficial.^{49,50}

There are also a number of steps physicians can take at the individual level to promote their own wellness. This often begins by identifying personal and professional values and determining how they will be prioritized when conflicts between personal and professional responsibilities arise.⁵¹⁻⁵³ This exercise requires self-awareness, limit setting, and reframing.^{51,53} Training in mindfulness-based stress reduction, which involves self-awareness, a focus on the present, and intentionality in thoughts and actions, has also been shown to be an effective approach to reduce physician stress and burnout.⁵⁴⁻⁵⁶ Scientific studies have also identified the habits and qualities that promote resilience in challenging situations, which are skills that can be learned and developed.^{57,58} Attention to self-care, developing personal interests, and protecting and nurturing relationships are also essential.^{42,47,51,59}

Our study is subject to several limitations. First, most of the physicians did not even open the e-mails informing them of the study and hence never received the invitation to participate. The participation rate among those

TABLE 3. Comparison of Employed Physicians in the Sample Aged 29 to 65 y With a Probability-Based Sample of the Employed US Population Aged 29 to 65 y

Characteristic	Physicians N=5313	Population N=5392	P
Sex			
Male	3291 (62.2%)	2934 (54.4%)	<.001
Female	1996 (37.8%)	2458 (45.6%)	
Age (y)			
Median	53	52	<.001
29-34	324 (6.1%)	526 (9.8%)	<.001
35-44	1220 (23.0%)	1076 (20.0%)	
45-54	1411 (26.6%)	1550 (28.7%)	
55-65	2358 (44.4%)	2240 (41.5%)	
Relationship status			
Single	632 (11.9%)	1300 (24.1%)	<.001
Married	4387 (82.9%)	3642 (67.5%)	
Partnered	223 (4.2%)	354 (6.6%)	
Widowed/widower	52 (1.0%)	96 (1.8%)	
Missing	19	0	
Hours worked per week			
Mean ± SD	55 ± 16.7	40 ± 11.3	<.001
Median	50	40	<.001
<40	627 (11.9%)	1412 (26.2%)	<.001
40-49	1042 (19.7%)	2927 (54.4%)	
50-59	1400 (26.5%)	702 (13.0%)	
60-69	1285 (24.4%)	268 (5.0%)	
70-79	477 (9.0%)	36 (0.7%)	
≥80	445 (8.4%)	39 (0.7%)	
Missing	37	8	
Highest level of education completed			
Less than high school graduate		174 (3.2%)	
High school graduate		1159 (21.5%)	
Some college, no degree		1054 (19.5%)	
Associate degree		657 (12.2%)	
Bachelor's degree		1341 (24.9%)	
Master's degree		745 (13.8%)	
Professional or doctorate degree (other than MD/DO)		262 (4.9%)	
Missing		0	
Occupation			
Professional ^a		2397 (45%)	
Health care ^b		390 (7.3%)	
Service ^c		342 (6.4%)	
Sales ^d		414 (7.8%)	
Office and administrative support		428 (8.0%)	
Farming, forestry, fishing		22 (0.4%)	
Precision production, craft and repair ^e		341 (6.4%)	
Transportation and material moving		158 (3.0%)	
Armed services		26 (0.5%)	
Other		804 (15.1%)	
Missing		107	
Distress			
Burnout ^f			
Emotional exhaustion ^g			
Never	491 (9.4%)	718 (13.3%)	<.001
A few times a year	1075 (20.5%)	1566 (29.1%)	
Once a month or less	663 (12.6%)	736 (13.7%)	
A few times a month	750 (14.3%)	1027 (19.1%)	
Once a week	626 (11.9%)	356 (6.6%)	

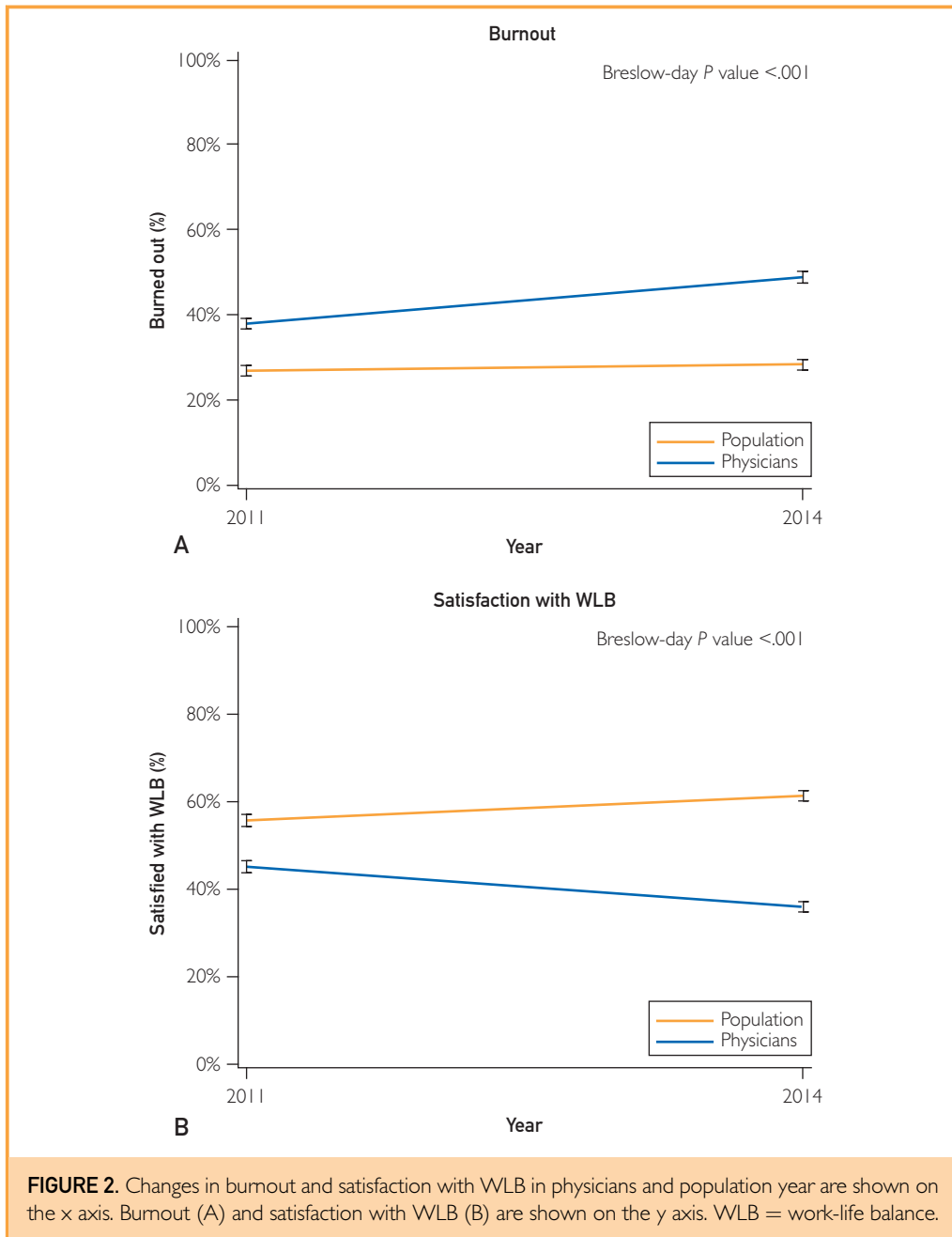
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TABLE 3. Continued

Characteristic	Physicians N=5313	Population N=5392	P
Distress, continued			
A few times a week	908 (17.3%)	634 (11.8%)	
Every day	736 (14.0%)	344 (6.4%)	
Missing	64	11	
% High score ^f	2270 (43.2%)	1334 (24.8%)	<.001
Depersonalization ^h			
Never	1454 (27.7%)	2368 (44.3%)	<.001
A few times a year	1308 (24.9%)	1255 (23.5%)	
Once a month or less	647 (12.3%)	492 (9.2%)	
A few times a month	631 (12.0%)	487 (9.1%)	
Once a week	461 (8.8%)	223 (4.2%)	
A few times a week	555 (10.6%)	311 (5.8%)	
Every day	193 (3.7%)	214 (4.0%)	
Missing	64	42	
% High score ^f	1209 (23.0%)	748 (14.0%)	<.001
Burned out ⁱ	2550 (48.8%)	1529 (28.4%)	<.001
Suicidal ideation			
Suicidal ideation in the past 12 mo	383 (7.2%)	213 (4.0%)	<.001
Work-life balance			
Work schedule leaves me enough time for my personal/family life:			
Strongly agree	402 (7.6%)	1227 (22.8%)	<.001
Agree	1500 (28.4%)	2071 (38.5%)	
Neutral	782 (14.8%)	1012 (18.8%)	
Disagree	1738 (32.9%)	817 (15.2%)	
Strongly disagree	865 (16.4%)	249 (4.6%)	
Missing	26	16	
^a Business/financial, management, computer/mathematical, architecture/engineering, lawyer/judge, life/physical/social sciences, community/social services, teacher nonuniversity, teacher college/university, and other.			
^b Nurse, pharmacist, paramedic, laboratory technician, nursing aide, orderly, and dental assistant.			
^c Protective service, food preparation/service, building cleaning/maintenance, and personal care/service.			
^d Sales representative, retail sales, and other sales.			
^e Construction and extraction, installation/maintenance/repair, precision production (machinist, welder, backer, printer, and tailor).			
^f As assessed using the single-item measures for emotional exhaustion and depersonalization adapted from the full Maslach Burnout Inventory. Area under the receiver operating characteristic curve for the emotional exhaustion and depersonalization single items relative to that of their respective full Maslach Burnout Inventory domain score in previous studies was 0.94 and 0.93 and the positive predictive value of the single-item thresholds for high levels of emotional exhaustion and depersonalization was 88.2% and 89.6%, respectively. ³⁰			
^g Individuals indicating emotional exhaustion symptoms weekly or more often have median emotional exhaustion scores of >30 on the full MBI and have a >75% probability of having a high emotional exhaustion score as defined by the Maslach Burnout Inventory (≥27).			
^h Individuals indicating depersonalization symptoms weekly or more often have median depersonalization scores of >13 on the full Maslach Burnout Inventory and have a >85% probability of having a high depersonalization score as defined by the Maslach Burnout Inventory (≥10).			
ⁱ High score (≥weekly) on emotional exhaustion and/or depersonalization scales.			

who opened the invitation e-mails was only 19%. Although the participation rate is generally consistent with other national survey studies of physicians,^{7,60,61} it is lower than that of physician surveys in general.⁶² We did not use monetary or other incentives to improve participation.⁶³ Nonetheless, several cross-sectional studies have failed to identify significant differences between responding and nonresponding physicians,⁶⁴ with evidence

that nonresponse may be of less concern in physicians surveys than in surveys of the general public.⁶⁵ We found no statistically significant differences between early responders and late responders (a standard approach to evaluate for response bias) with respect to sex or specialty (primary care vs nonprimary care) and minimal differences by age (median, 56 years vs 57 years), providing support that responders were representative of US physicians.



Second, our survey was anonymous and we were unable to assess changes over time at the individual physician level. Third, although the age of individuals in the comparison sample of population controls was generally similar to that of physicians, they were more likely to be women. This was expected because of the demographic characteristics of US physicians and was adjusted for in the multivariate

analysis; however, it remains possible that other unmeasured confounders exist.

Our study also has several important strengths. The physician sample was derived from the AMA PMF, which is a near complete registry of all US physicians. The sample included physicians from all specialty disciplines, practice settings, and environments. Overall, the characteristics of participating

physicians appear similar to those of both US physicians overall and the 2011 comparison sample of physicians. The same validated instruments were used to study physicians in both 2011 and 2014, facilitating direct comparison. We also studied a sample of population controls at both time points to allow comparison of the physician experience with the general US working population and provide context to how the physician experience compares to that of US workers in general.

CONCLUSION

Burnout and satisfaction with WLB among US physicians are getting worse. American medicine appears to be at a tipping point with more than half of US physicians experiencing professional burnout. Given the extensive evidence that burnout among physicians has effects on quality of care, patient satisfaction, turnover, and patient safety, these findings have important implications for society at large.¹¹⁻²⁰ There is an urgent need for systematic application of evidence-based interventions addressing the drivers of burnout among physicians. These interventions must address contributing factors in the practice environment rather than focusing exclusively on helping physicians care for themselves and training them to be more resilient.

SUPPLEMENTAL ONLINE MATERIAL

Supplemental material can be found online at <http://www.mayoclinicproceedings.org>. Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

Abbreviations and Acronyms: AMA = American Medical Association; MBI = Maslach Burnout Inventory; PMF = Physician Master File; WLB = work-life balance

Affiliations (Continued from the first page of this article.): (D.S., J.S.), and Division of General Internal Medicine (C.P.W.), Mayo Clinic, Rochester, MN; and American Medical Association, Chicago, IL (O.H., C.S.).

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Potential Competing Interests: Dr Shanafelt is co-inventor of the Physician Well-being Index. Mayo Clinic holds the copyright on this technology and accordingly Mayo Clinic and Dr Shanafelt have a potential financial interest in this technology. The Physician

Well-Being Index has been licensed to a commercial entity, although no royalties have been received to date.

Correspondence: Address to Tait D. Shanafelt, MD, Department of Internal Medicine, Mayo Clinic, 200 First St SW, Rochester, MN 55905 (shanafelt.tait@mayo.edu).

REFERENCES

- Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med.* 2012;172(18):1377-1385.
- Horowitz CR, Suchman AL, Branch WT Jr, Frankel RM. What do doctors find meaningful about their work? *Ann Intern Med.* 2003;138(9):772-775.
- Clever LH. Some things have not changed. *Ann Intern Med.* 2000;132(1):85-89.
- McMurray JE, Williams E, Schwartz MD, et al. Physician job satisfaction: developing a model using qualitative data. SGIM Career Satisfaction Study Group. *J Gen Intern Med.* 1997;12(11):711-714.
- Brazeau CM, Shanafelt T, Durning SJ, et al. Distress among matriculating medical students relative to the general population. *Acad Med.* 2014;89(11):1520-1525.
- Dyrbye LN, West CP, Satele D, et al. Burnout among U.S. medical students, residents, and early career physicians relative to the general U.S. population. *Acad Med.* 2014;89(3):443-451.
- Shanafelt TD, Balch CM, Bechamps GJ, et al. Burnout and career satisfaction among American surgeons. *Ann Surg.* 2009;250(3):463-471.
- Maslach C, Jackson S, Leiter M. *Maslach Burnout Inventory Manual.* 3rd ed. Palo Alto, CA: Consulting Psychologists Press; 1996.
- Dyrbye LN, Schwartz A, Downing SM, Szydio DW, Sloan JA, Shanafelt TD. Efficacy of a brief screening tool to identify medical students in distress. *Acad Med.* 2011;86(7):907-914.
- Shanafelt TD, Boone SL, Dyrbye LN, et al. The medical marriage: a national survey of the spouses/partners of US physicians. *Mayo Clin Proc.* 2013;88(3):216-225.
- 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.
- Shanafelt TD, Balch CM, Bechamps G, et al. Burnout and medical errors among American surgeons. *Ann Surg.* 2010;251(6):995-1000.
- West CP, Tan AD, Habermann TM, Sloan JA, Shanafelt TD. Association of resident fatigue and distress with perceived medical errors. *JAMA.* 2009;302(12):1294-1300.
- Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. *Soc Sci Med.* 1997;44(7):1017-1022.
- Grol R, Mokkink H, Smits A, et al. Work satisfaction of general practitioners and the quality of patient care. *Fam Pract.* 1985;2(3):128-135.
- Haas JS, Cook EF, Puopolo AL, Burstin HR, Cleary PD, Brennan TA. Is the professional satisfaction of general internists associated with patient satisfaction? *J Gen Intern Med.* 2000;15(2):122-128.
- Shanafelt T, Sloan J, Satele D, Balch C. Why do surgeons consider leaving practice? *J Am Coll Surg.* 2011;212(3):421-422.
- Shanafelt TD, Raymond M, Kosty M, et al. Satisfaction with work-life balance and the career and retirement plans of US oncologists. *J Clin Oncol.* 2014;32(11):1127-1135.
- Wallace JE, Lemaire JB, Ghali WA. Physician wellness: a missing quality indicator. *Lancet.* 2009;374(9702):1714-1721.
- Dyrbye LN, Shanafelt TD. Physician burnout: a potential threat to successful health care reform. *JAMA.* 2011;305(19):2009-2010.

21. Dyrbye LN, Varkey P, Boone SL, Satele DV, Sloan JA, Shanafelt TD. Physician satisfaction and burnout at different career stages. *Mayo Clin Proc.* 2013;88(12):1358-1367.
22. Friedberg MW, Chen PG, Van Busum KR, et al. Factors affecting physician professional satisfaction and their implications for patient care, health systems, and health policy. 2013. http://www.rand.org/content/dam/rand/pubs/research_reports/RR400/RR439/RAND_RR439.pdf. Accessed December 31, 2015.
23. (AAPOR): Aapfor. Standard definitions: final dispositions of case codes and outcome rates for surveys. 2011. <http://www.aapor.org/Content/aapor/AdvocacyandInitiatives/StandardsandEthics/StandardDefinitions/StandardDefinitions2011.pdf>. Accessed December 3, 2012.
24. 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.
25. 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.
26. Leiter MP, Durup J. The discriminant validity of burnout and depression: a confirmatory factor analytic study. *Anxiety Stress Copin.* 1994;7(4):357-373.
27. Thomas NK. Resident burnout. *JAMA.* 2004;292(23):2880-2889.
28. 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.
29. Rosen IM, Gimotty PA, Shea JA, Bellini LM. Evolution of sleep quantity, sleep deprivation, mood disturbances, empathy, and burnout among interns. *Acad Med.* 2006;81(1):82-85.
30. West CP, Dyrbye LN, Sloan JA, Shanafelt TD. Single item measures of emotional exhaustion and depersonalization are useful for assessing burnout in medical professionals. *J Gen Intern Med.* 2009;24(12):1318-1321.
31. West CP, Dyrbye LN, Satele DV, Sloan JA, Shanafelt TD. Concurrent validity of single-item measures of emotional exhaustion and depersonalization in burnout assessment. *J Gen Intern Med.* 2012;27(11):1445-1452.
32. West CP, Shanafelt TD, Kolars JC. Quality of life, burnout, educational debt, and medical knowledge among internal medicine residents. *JAMA.* 2011;306(9):952-960.
33. Spitzer RL, Williams JB, Kroenke K, et al. Utility of a new procedure for diagnosing mental disorders in primary care. The PRIME-MD 1000 study. *JAMA.* 1994;272(22):1749-1756.
34. Whooley MA, Avins AL, Miranda J, Browner WS. Case-finding instruments for depression: two questions are as good as many. *J Gen Intern Med.* 1997;12(7):439-445.
35. Meehan PJ, Lamb JA, Saltzman LE, O'Carroll PW. Attempted suicide among young adults: progress toward a meaningful estimate of prevalence. *Am J Psychiatry.* 1992;149(1):41-44.
36. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Arch Gen Psychiatry.* 1999;56(7):617-626.
37. Kessler RC, Berglund P, Borges G, Nock M, Wang PS. Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990-1992 to 2001-2003. *JAMA.* 2005;293(20):2487-2495.
38. Cooper-Patrick L, Crum RM, Ford DE. Identifying suicidal ideation in general medical patients. *JAMA.* 1994;272(22):1757-1762.
39. Shanafelt TD, Balch CM, Dyrbye L, et al. Special report: suicidal ideation among American surgeons. *Arch Surg.* 2011;146(1):54-62.
40. Hawkins M. 2012 Review of physician recruiting incentives. 2012. <http://www.memithawkins.com/uploadedFiles/MemittHawkins/Pdf/mha2012incentivesurveyPDF.pdf>. Accessed May 5, 2014.
41. Sinsky CA, Willard-Grace R, Schutzbank AM, Sinsky TA, Margolis D, Bodenheimer T. In search of joy in practice: a report of 23 high-functioning primary care practices. *Ann Fam Med.* 2013;11(3):272-278.
42. Linzer M, Levine R, Meltzer D, Poplous S, Warde C, West CP. 10 bold steps to prevent burnout in general internal medicine. *J Gen Intern Med.* 2014;29(1):18-20.
43. Linzer M, Baier Manwell L, Mundt M, et al. Organizational climate, stress, and error in primary care: the MEMO study. In: Henriksen K, Battles JB, Marks ES, Lewin DL, eds. *Advances in Patient Safety: From Research to Implementation (Volume 1: Research Findings)*. Rockville, MD: Agency for Healthcare Research and Quality (US); 2005.
44. Shanafelt TD, Gorringer G, Menaker R, et al. Impact of organizational leadership on physician burnout and satisfaction. *Mayo Clin Proc.* 2015;90(4):432-440.
45. Shanafelt TD, West CP, Sloan JA, et al. Career fit and burnout among academic faculty. *Arch Intern Med.* 2009;169(10):990-995.
46. West CP, Dyrbye LN, Rabatin JT, et al. Intervention to promote physician well-being, job satisfaction, and professionalism: a randomized clinical trial. *JAMA Intern Med.* 2014;174(4):527-533.
47. Shanafelt TD, Sloan JA, Habermann TM. The well-being of physicians. *Am J Med.* 2003;114(6):513-519.
48. Shanafelt TD, West CP, Poland GA, LaRusso NF, Menaker R, Bahn RS. Principles to promote physician satisfaction and work-life balance. *Minn Med.* 2008;91(12):41-43.
49. Dyrbye LN, Satele D, Sloan J, Shanafelt TD. Utility of a brief screening tool to identify physicians in distress. *J Gen Intern Med.* 2013;28(3):421-427.
50. Shanafelt TD, Kaups KL, Nelson H, et al. An interactive individualized intervention to promote behavioral change to increase personal well-being in US surgeons. *Ann Surg.* 2014;259(1):82-88.
51. Quill TE, Williamson PR. Healthy approaches to physician stress. *Arch Intern Med.* 1990;150(9):1857-1861.
52. Clever LH. A checklist for making good choices in trying—or tranquil—times. *West J Med.* 2001;174(1):41-43.
53. Shanafelt T, Chung H, White H, Lyckholm LJ. Shaping your career to maximize personal satisfaction in the practice of oncology. *J Clin Oncol.* 2006;24(24):4020-4026.
54. Krasner MS, Epstein RM, Beckman H, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *JAMA.* 2009;302(12):1284-1293.
55. Fortney L, Luchterhand C, Zakletskaia L, Zgierska A, Rakel D. Abbreviated mindfulness intervention for job satisfaction, quality of life, and compassion in primary care clinicians: a pilot study. *Ann Fam Med.* 2013;11(5):412-420.
56. Beckman HB, Wendland M, Mooney C, et al. The impact of a program in mindful communication on primary care physicians. *Acad Med.* 2012;87(6):815-819.
57. Southwick SM, Chamey DS. *Resilience: The Science of Mastering Life's Greatest Challenges*. Cambridge, UK: Cambridge University Press; 2012.
58. Zwack J, Schweitzer J. If every fifth physician is affected by burnout, what about the other four? Resilience strategies of experienced physicians. *Acad Med.* 2013;88(3):382-389.
59. Shanafelt TD, Oreskovich MR, Dyrbye LN, et al. Avoiding burnout: the personal health habits and wellness practices of US surgeons. *Ann Surg.* 2012;255(4):625-633.
60. Allegra CJ, Hall R, Yothers G. Prevalence of burnout in the U.S. oncology community: results of a 2003 survey. *J Oncol Pract.* 2005;1(4):140-147.
61. Kuerer HM, Eberlein TJ, Pollock RE, et al. Career satisfaction, practice patterns and burnout among surgical oncologists: report on the quality of life of members of the Society of Surgical Oncology. *Ann Surg Oncol.* 2007;14(11):3043-3053.
62. Asch DA, Jedziewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol.* 1997;50(10):1129-1136.
63. Kasprzyk D, Montañó DE, St Lawrence JS, Phillips WR. The effects of variations in mode of delivery and monetary incentive on physicians' responses to a mailed survey assessing STD practice patterns. *Eval Health Prof.* 2001;24(1):3-17.
64. Kelleman SE, Herold J. Physician response to surveys: a review of the literature. *Am J Prev Med.* 2001;20(1):61-71.
65. Puleo E, Zapka J, White MJ, Mouchawar J, Somkin C, Taplin S. Caffeine, cajoling, and other strategies to maximize clinician survey response rates. *Eval Health Prof.* 2002;25(2):169-184.