MAYO CLINIC

ORIGINAL ARTICLE

Changes in Burnout and Satisfaction With Work-Life Integration in Physicians and the General US Working Population Between 2011 and 2020

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Abstract

Objective: To evaluate the prevalence of burnout and satisfaction with work-life integration (WLI) among physicians and US workers in 2020 relative to 2011, 2014, and 2017.

Methods: Between November 20, 2020, and March 23, 2021, we surveyed US physicians and a probability-based sample of the US working population using methods similar to our prior studies. Burnout and WLI were measured using standard tools. Information about specific work-related COVID-19 experiences was collected.

Results: There were 7510 physicians who participated in the survey. Nonresponder analysis suggested that participants were representative of US physicians. Mean emotional exhaustion and depersonalization scores were lower in 2020 than in 2017, 2014, and 2011 (all $P<.001$). However, emotional exhaustion and depersonalization scores did not improve in specialties most heavily affected by COVID-19. Overall, 38.2% of physicians reported 1 or more symptoms of burnout in 2020 compared with 43.9% in 2017, 54.4% in 2014, and 45.5% in 2011 (all $P<.001$). Providing care without adequate personal protective equipment (odds ratio [OR], 1.53; 95% CI, 1.35 to 1.72) and having suffered disruptive economic consequences due to COVID-19 (OR, 1.49; 95% CI, 1.32 to 1.69) were independently associated with risk of burnout. On multivariable analysis, physicians were at increased risk for burnout (OR, 1.41; 95% CI, 1.25 to 1.58) and were less likely to be satisfied with WLI (OR, 0.71; 95% CI, 0.64 to 0.79) than other working US adults.

Conclusion: Burnout and satisfaction with WLI among US physicians improved between 2017 and 2020. The impact of the COVID-19 pandemic on physicians varies on the basis of professional characteristics and experiences. Physicians remain at increased risk for burnout relative to workers in other fields.

 ■ Mayo Clin Proc. 2022;97(3):491-506

In 2011, we began longitudinal profiling of the point prevalence of burnout and satisfaction with work-life integration (WLI) among physicians and US workers every 3 years.[1-4] This series of studies has documented greater occupational distress in physicians than in workers in other fields and changes in the prevalence and severity of burnout in physicians, with a peak in 2014. This research has also provided insights into the causes of occupational distress in physicians,[5-8] individual factors related to occupational distress,[9-12] personal and professional consequences,[13-18] and barriers to seeking help.[13,16,17,19]

Numerous changes have occurred since the 2017 study. Most notably, the COVID-19 pandemic has led to exhaustion and magnified work stress for many physicians.[20] Previous studies, primarily focused on

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frontline health care workers during the acute phases of the pandemic, have revealed high rates of depression, anxiety, sleep disturbance, and post-traumatic stress disorder in frontline health care workers.[21-28] Challenges related to the pandemic among US physicians in the first 9 months of the panedmic, however, were heterogeneous and varied widely by occupation, specialty, and region of the country.[25-27,29,30] In several regions, patient care needs created nearly overwhelming workloads, taxed many health care delivery systems to their limits, and, at times, forced physicians to deviate from normal standards of care or practice outside their area of expertise.[24,25,31] For some procedural specialists, the reduction of elective procedures reduced workload, creating a financial strain for some and time of respite for others.[24,32] Other physicians continued to practice within their discipline at typical workload but experienced profound changes in the way they delivered care with a transition to virtual visits.[33]

Whereas the mental and emotional health challenges experienced by physicians during the pandemic have received great attention, substantial occupational distress existed before COVID-19.[1-4] The National Academy of Medicine (NAM) consensus report on clinician well-being was released at the end of 2019, shortly before the onset of the pandemic.[34] This report detailed comprehensive recommendations for health care organizations, accreditors, regulators, professional societies, standard-setting entities at the federal and state levels, technology companies, and government groups to address occupational factors contributing to burnout and other dimensions of work-related distress.

Here, we use the results of the 2020 survey to evaluate changes in occupational burnout and satisfaction with WLI among physicians overall as well as by specialty and other characteristics compared with 2011, 2014, and 2017. We compare the changes in physicians with those among US workers overall during the same interval. We also assess how work-related COVID-19 experiences correlate with burnout and WLI.

METHODS

The 2020 survey employed methods similar to the 2011, 2014, and 2017 studies.[1-3] The primary change for the 2020 study was that the core survey was distributed by paper mailing with a financial incentive; a supplemental electronic survey without incentive (described subsequently) was deployed to increase the number of responses for analysis.

Participants

Mailed (Core) Physician Survey. A sample of 4000 physicians from all specialty disciplines was assembled using the American Medical Association Physician Masterfile, a nearly complete record of all US physicians independent of American Medical Association membership. Similar to prior years,[1-3] we oversampled physicians in fields other than general internal medicine, general pediatrics, family medicine, and obstetrics/gynecology to increase the sample of physicians from smaller specialties.

These physicians were mailed a paper version of the survey on November 16, 2020. Among the 4000 surveys mailed, 329 were returned as undeliverable, resulting in a sample of 3671. The initial mailing included a check for $20. On December 8, 2020, a second copy of the survey without a financial incentive was mailed to nonresponders. Completed surveys returned by March 26, 2021, were included in the analysis. Participation was voluntary and responses were anonymous.

Electronic Physician Survey. An independent sample of 90,000 physicians from all specialties was assembled using a sampling approach that mirrored that of the mailed survey. Survey invitation emails were sent on November 16, 2020, with reminder requests sent during the ensuing 4 weeks.

Secondary Survey of Nonresponders. To estimate response bias, we conducted a secondary survey of a random sample of 1000 physicians (500 physicians who did not respond to the mailed survey and 500 who did not respond to the electronic survey).

Mayo Clin Proc. ■ March 2022;97(3):491-506 ■ https://doi.org/10.1016/j.mayocp.2021.11.021
www.mayoclinicproceedings.org

These individuals were mailed an abbreviated 2-page survey along with a $20 incentive on January 19, 2021. Twenty-four mailed surveys were returned as undeliverable, yielding a final sample of 976. Completed nonresponder surveys returned by March 26, 2021, were included in the analysis.

Population Sample. Similar to our previous approach,[1-3] we surveyed a probability-based sample of employed individuals aged 35 to 65 years from the general US population (n=2508) from November 16, 2020, through November 26, 2020, using the KnowledgePanel (https://www.ipsos.com/en-us/solutions/public-affairs/knowledgepanel). Consistent with the approach used in 2014 and 2017,[2,3] the population survey oversampled individuals aged 35 to 65 years to better match the age range of practicing US physicians. The Stanford and Mayo Clinic Institutional Review Boards reviewed and approved the study.

Study Measures

Both the physician and population controls provided demographic information (age, sex, relationship status) and information on hours worked per week. Physician professional characteristics were ascertained by asking physicians about their practice. Burnout and satisfaction with WLI were assessed using the same approach as in the 2011, 2014, and 2017 surveys (details in Supplemental Methods, available online at http://www.mayoclinicproceedings.org).[1-3]

Information about work-related COVID-19 experiences (direct COVID-19 patient care, insufficient personal protective equipment [PPE], economic impact, personal COVID-19 infection) was collected from respondents (Supplemental Materials: COVID-19 Work Experience Items, available online at http://www.mayoclinicproceedings.org). In addition, to explore the potential of a differential impact of the pandemic by specialty, we identified specialties hypothesized to have been most heavily affected by COVID-19 during the first 9 months of the pandemic (emergency medicine, critical care [adult and pediatric], hospital medicine [adult], and infectious disease [adult and pediatric]) and compared changes in emotional exhaustion and depersonalization scores and the proportion with burnout for these specialties relative to other specialties.

Statistical Analyses

Per protocol design, primary analyses were initially conducted of physicians who participated in the mailed survey. Basic demographic characteristics and burnout scores among physicians who participated in the mailed or electronic survey were compared before pooling for analysis. Standard descriptive summary statistics were used to characterize the physician and population samples. Details about the statistical analysis are provided in the Supplemental Material. All analyses were completed using R version 3.6.0 (R Foundation for Statistical Computing).

RESULTS

Well-being of US Physicians

Of the 3671 physicians who received an invitation to participate in the mailed (core) survey, 1162 (31.7%) completed a survey. Of the 90,000 physicians who were invited to participate in the electronic survey, 6348 (7.1%) completed a survey. Physicians who participated in the mailed survey were slightly older (mean age, 54.85 vs 53.77 years; $P=.004$), were less likely to be women (29.6% vs 39.3%; $P<.001$), and had lower mean emotional exhaustion (mean, 18.64 vs 21.50; $P<.001$) and depersonalization (mean, 5.35 vs 6.19; $P<.001$) scores than those who completed the electronic survey (Supplemental Table 1, available online at http://www.mayoclinicproceedings.org). Responders to both the mailed and electronic surveys were subsequently pooled for further analysis.

Among the 976 individuals in the secondary survey of nonresponders, 210 (21.5%) responded. No statistically significant differences in age, sex, or years in practice were observed between mailed or electronic survey participants and responders to the secondary non-responder survey (Supplemental Table 2, available

TABLE 1. Demographic Characteristics of Responding Physicians Compared With All US Physicians[a,b]

Characteristics	2020 Responders (N=7510)	All US physicians 2020 (N=897,107)	2017 Responders (N=5445)	2014 Responders (N=6880)	2011 Responders (N=7288)
Sex					
Male	4013 (62.4)	569,251 (63.5)	2995 (62.1)	4497 (67.5)	5241 (71.9)
Female	2416 (37.6)	326,894 (36.4)	1818 (37.7)	2162 (32.5)	2046 (28.1)
Other	4 (0.1)		13 (0.3)		
Missing	1077	858	619	221	1
Age (y)					
Median	54	53	53	56	55
<35	218 (3.5)	45,071 (5.0)	305 (6.4)	332 (5.0)	321 (4.5)
35-44	1324 (21.3)	219,022 (24.4)	1120 (23.5)	1223 (18.4)	1299 (18.0)
45-54	1606 (25.8)	227,513 (25.4)	1103 (23.1)	1416 (21.3)	1842 (25.6)
55-64	1806 (29.1)	219,266 (24.4)	1371 (28.7)	2193 (33.0)	2586 (35.9)
≥65	1260 (20.3)	185,623 (20.7)	874 (18.3)	1491 (22.4)	1162 (16.1)
Missing	1284	612	672	225	75
Primary care[c]					
Primary care	1749 (23.4)	346,603 (38.6)	1281 (23.8)	1596 (23.3)	1907 (26.4)
Not primary care	5715 (76.6)	550,439 (61.4)	4103 (76.2)	5249 (76.7)	5326 (73.6)
Missing	46	65			
Specialty					
Anesthesiology	334 (4.5)		254 (4.7)	236 (3.5)	309 (4.3)
Dermatology	178 (2.4)		136 (2.5)	164 (2.4)	174 (2.4)
Emergency medicine	430 (5.8)		304 (5.7)	355 (5.2)	333 (4.6)
Family medicine	532 (7.1)		415 (7.7)	540 (7.9)	752 (10.4)
General surgery	237 (3.2)		160 (3.0)	259 (3.8)	276 (3.8)
General surgery subspecialty[d]	560 (7.5)		398 (7.4)	381 (5.6)	374 (5.2)
Internal medicine—general	519 (7.0)		425 (7.9)	453 (6.6)	578 (8.0)
Internal medicine subspecialty[d]	734 (9.8)		652 (12.2)	784 (11.5)	1019 (14.1)
Neurology	254 (3.4)		195 (3.6)	246 (3.6)	252 (3.5)
Neurosurgery	79 (1.1)		66 (1.2)	58 (0.9)	82 (1.1)
Obstetrics and gynecology	314 (4.2)		195 (3.6)	246 (3.6)	312 (4.3)
Ophthalmology	306 (4.1)		146 (2.7)	241 (3.5)	199 (2.8)
Orthopedic surgery	379 (5.1)		276 (5.1)	239 (3.5)	269 (3.7)
Otolaryngology	66 (0.9)		45 (0.8)	165 (2.4)	193 (2.7)
Other	514 (6.9)		162 (3.0)	255 (3.7)	329 (4.6)
Pathology	200 (2.7)		147 (2.7)	170 (2.5)	184 (2.5)
Pediatrics—general	379 (5.1)		264 (4.9)	362 (5.3)	286 (4.0)
Pediatric subspecialty[d]	270 (3.6)		225 (4.2)	321 (4.7)	239 (3.3)
Physical medicine and rehabilitation	166 (2.2)		131 (2.4)	170 (2.5)	97 (1.3)
Preventive medicine/ occupational medicine	31 (0.4)		30 (0.6)	112 (1.6)	76 (1.1)
Psychiatry	590 (7.9)		432 (8.1)	566 (8.3)	488 (6.8)
Radiation oncology	63 (0.8)		42 (0.8)	64 (0.9)	55 (0.8)
Radiology	280 (3.8)		225 (4.2)	261 (3.8)	216 (3.0)
Urology	45 (0.6)		35 (0.7)	119 (1.7)	136 (1.9)
Missing	50		85	66	60
Hours worked per week					
Median (IQR)	50 (40-60) 60.00]		50 (40-60)	50 (40-60)	50(40-60)
<40	1406 (20.3)		961 (18.9)	1172 (17.4)	985 (14.3)
40-49	1609 (23.3)		1053 (20.7)	1340 (19.9)	1459 (21.1)
50-59	1623 (23.5)		1245 (24.4)	1667 (24.7)	1852 (26.8)
60-69	1450 (21.0)		1084 (21.3)	1526 (22.6)	1659 (24.0)

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Mayo Clin Proc. ■ March 2022;97(3):491-506 ■ https://doi.org/10.1016/j.mayocp.2021.11.021
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TABLE 1. Continued

Characteristics	2020 Responders (N=7510)	All US physicians 2020 (N=897,107)	2017 Responders (N=5445)	2014 Responders (N=6880)	2011 Responders (N=7288)
Hours worked per week, continued					
70-79	375 (5.4)		386 (7.6)	535 (7.9)	455 (6.6)
≥80	453 (6.6)		367 (7.2)	509 (7.5)	497 (7.2)
Missing	594		349	131	381
No. of nights on call per week					
Median (IQR)	1 (0-2)		1 (0-2)	1 (0-3)	1 (0-3)
Primary practice setting					
Private practice	3810 (55.8)		2474 (48.0)	3605 (52.6)	4087 (57.7)
Academic medical center	1863 (27.3)		1394 (27.1)	1625 (23.7)	1494 (21.1)
Veterans hospital	148 (2.2)		107 (2.1)	104 (1.5)	184 (2.6)
Active military practice	38 (0.6)		55 (1.1)	58 (0.8)	65 (0.9)
Not in practice or retired	150 (2.2)		169 (3.3)	160 (2.3)	89 (1.3)
Other	820 (12.0)		950 (18.5)	1303 (19)	1164 (16.4)
Missing	681		296	25	205

[a]IQR, interquartile range.

[b]Values are reported as number (percentage) unless otherwise indicated.

[c]Physicians 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 internal medicine—general, general practice, family medicine, obstetrics/gynecology, and pediatrics—general.

[d]For further subspecialty breakdown, see Supplemental Material.

[e]As of September 30, 2020.

online at http://www.mayoclinicproceedings.org). Similarly, no significant differences were observed in mean scores for the single emotional exhaustion and depersonalization items, the percentage of individuals with a high score in at least 1 of the 2 burnout domains, or the proportion of individuals reporting satisfaction with WLI. These findings suggest that participants in the mailed and electronic surveys were generally representative of the overall sample and US physicians with respect to demographic factors, level of burnout, and satisfaction with WLI.

Finally, we compared participants to all 897,107 practicing US physicians (Table 1). The demographic characteristics of participants relative to all practicing US physicians were generally similar although participants were slightly older (median age, 54 vs 53 years) and slightly more likely to be women (37.6% vs 36.4%; Table 1). A greater proportion of participants were in specialties other than primary care, consistent with the sampling approach (see Methods). The 2020 participants were generally similar to the 2011, 2014, and 2017 participants with respect to age, specialty, hours worked per week, and nights on call per week. The proportion of physicians who identify as female increased during the decade between the 2011 and 2020 surveys, consistent with the increased proportion of women among US physicians in the Masterfile overall (2011: 30.7%; 2014: 33.2%; 2018: 35.0%; 2020: 36.4%).

Mean emotional exhaustion and depersonalization scores were lower in 2020 than those observed in 2017, 2014, and 2011 (Table 2). In aggregate, 38.2% of physicians had at least 1 manifestation of burnout in 2020 compared with 43.9% in 2017 ($P<.001$), 54.4% in 2014 ($P<.001$), and 45.5% in 2011 ($P<.001$). On multivariable analysis pooling responders from the 2011, 2014, 2017, and 2020 surveys adjusting for age, sex, specialty, hours worked per week, and practice setting, physicians who responded in 2020 (odds ratio [OR], 0.50; 95% CI, 0.47 to 0.54), 2017 (OR, 0.60; 95% CI, 0.55 to 0.65), or 2011 (OR, 0.67; 95% CI, 0.62 to 0.72) were at lower odds of burnout compared with physicians who responded in 2014 (Supplemental

TABLE 2. Physician Career Satisfaction, Burnout, and Satisfaction With Work-Life Integration 2020 Compared With 2017, 2014, and 2011[a]

					P value		
	2020	2017	2014	2011	2020 vs 2017	2020 vs 2014	2020 vs 2011
Burnout indices[b]							
Emotional exhaustion							
Mean (SD)	21.0 (13.2)	23.2 (13.2)	25.5 (13.5)	22.7 (13.0)	<.001	<.001	<.001
Low score	3177 (47.9)	1991 (41.0)	2299 (34.1)	3041 (42.2)	<.001	<.001	<.001
Intermediate score	1223 (18.4)	989 (20.3)	1283 (19.0)	1433 (19.9)			
High score	2231 (33.6)	1881 (38.7)	3165 (46.9)	2734 (37.9)			
Depersonalization							
Mean (SD)	6.1 (6.2)	6.8 (6.5)	8.1 (6.6)	7.1 (6.1)	<.001	<.001	<.001
Low score	3972 (59.9)	2644 (54.2)	2951 (44.0)	3601 (50.1)	<.001	<.001	<.001
Intermediate score	1127 (17.0)	907 (18.6)	1434 (21.4)	1476 (20.5)			
High score	1537 (23.2)	1331 (27.3)	2325 (34.6)	2116 (29.4)			
Burned out[c]	2536 (38.2)	2147 (43.9)	3680 (54.4)	3310 (45.5)	<.001	<.001	<.001
Career satisfaction							
Would choose to become a physician again	4652 (72.2)	3508 (68.5)	4476 (67.0)	5081 (70.2)	<.001	<.001	.01
Work-life integration							
Work schedule leaves me enough time for my personal and/or family life							
Strongly agree	908 (14.2)	602 (12.5)	706 (10.6)	1233 (17.0)	<.001	<.001	<.001
Agree	2031 (31.9)	1454 (30.2)	2012 (30.3)	2279 (31.5)			
Neutral	1115 (17.5)	796 (16.6)	973 (14.6)	1046 (14.4)			
Disagree	1636 (25.7)	1272 (26.5)	2004 (30.1)	1775 (24.5)			
Strongly disagree	686 (10.8)	685 (14.2)	956 (14.4)	911 (12.6)			
Missing	1134	636	229	44			

[a]Values are reported as number (percentage) unless otherwise indicated.

[b]As assessed using the full length Emotional Exhaustion and Depersonalization Domains Maslach Burnout Inventory. Per the traditional scoring of the Maslach Burnout Inventory for health care workers, physicians with scores on the emotional exhaustion subscale of 27 or more or on the depersonalization subscale of 10 or more and physicians with scores below 33 on the personal accomplishment subscale are considered to have a high degree of burnout in that dimension.

[c]High score on emotional exhaustion and depersonalization subscales of the Maslach Burnout Inventory (see Methods).

Table 3, available online at http://www.mayoclinicproceedings.org).

A more nuanced picture emerged when comparing differences in burnout by specialty at each time point, with most specialties experiencing a peak in burnout in 2014 (Figure 1A; Supplemental Table 4, available online at http://www.mayoclinicproceedings.org).[35,36] Changes in emotional exhaustion, depersonalization, and burnout since 2017, however, differed by specialty. Notably, specialties hypothesized to be most affected by COVID-19 (emergency medicine, critical care [adult and pediatric], hospital medicine [adult], and infectious disease [adult and pediatric]) experienced no change in mean emotional exhaustion score (2017: 24.3; 2020: 23.0; $P=.10$) and mean depersonalization score (2017: 9.0; 2020: 8.6; $P=.31$) and had no statistically significant change in the proportion of physicians with symptoms of burnout (2017: 50.3%; 2020, 48.6%; $P=.59$). In contrast, mean emotional exhaustion scores (2017: 23.2; 2020: 20.9; $P<.001$) and depersonalization scores (2017: 6.6; 2020: 5.8; $P<.001$) as well as the proportion of physicians with symptoms of burnout (2017: 43.2%; 2020: 37.2%; $P<.001$) improved for all other specialties as a group.

Mayo Clin Proc. ■ March 2022;97(3):491-506 ■ https://doi.org/10.1016/j.mayocp.2021.11.021
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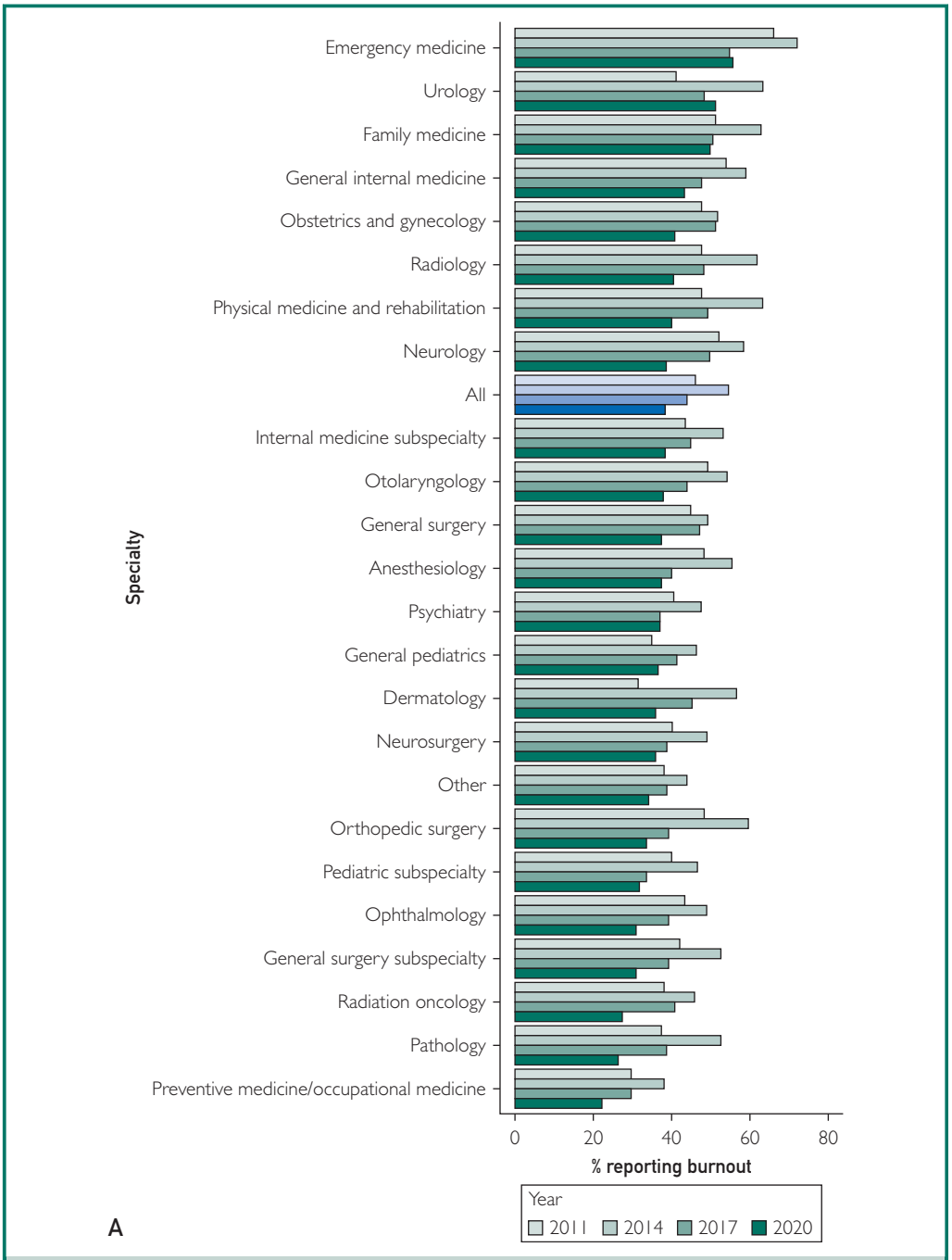

FIGURE 1. Burnout and satisfaction with work-life integration (WLI) by specialty 2020, 2017, 2014, and 2011. For A and B, specialty discipline is shown on the y-axis; burnout (A) and satisfaction with work-life integration (B) are shown on the x-axis. For C, satisfaction with work-life integration is shown on the y-axis and burnout is shown on the x-axis.

Satisfaction with WLI was also more favorable in 2020 than in previous years (Table 2). Differences in satisfaction with WLI between 2011 and 2020 by specialty are shown in Figure 1B and Supplemental Table 5 (available online at http://www.mayoclinicproceedings.org). In aggregate, 46.1% of physicians were satisfied with

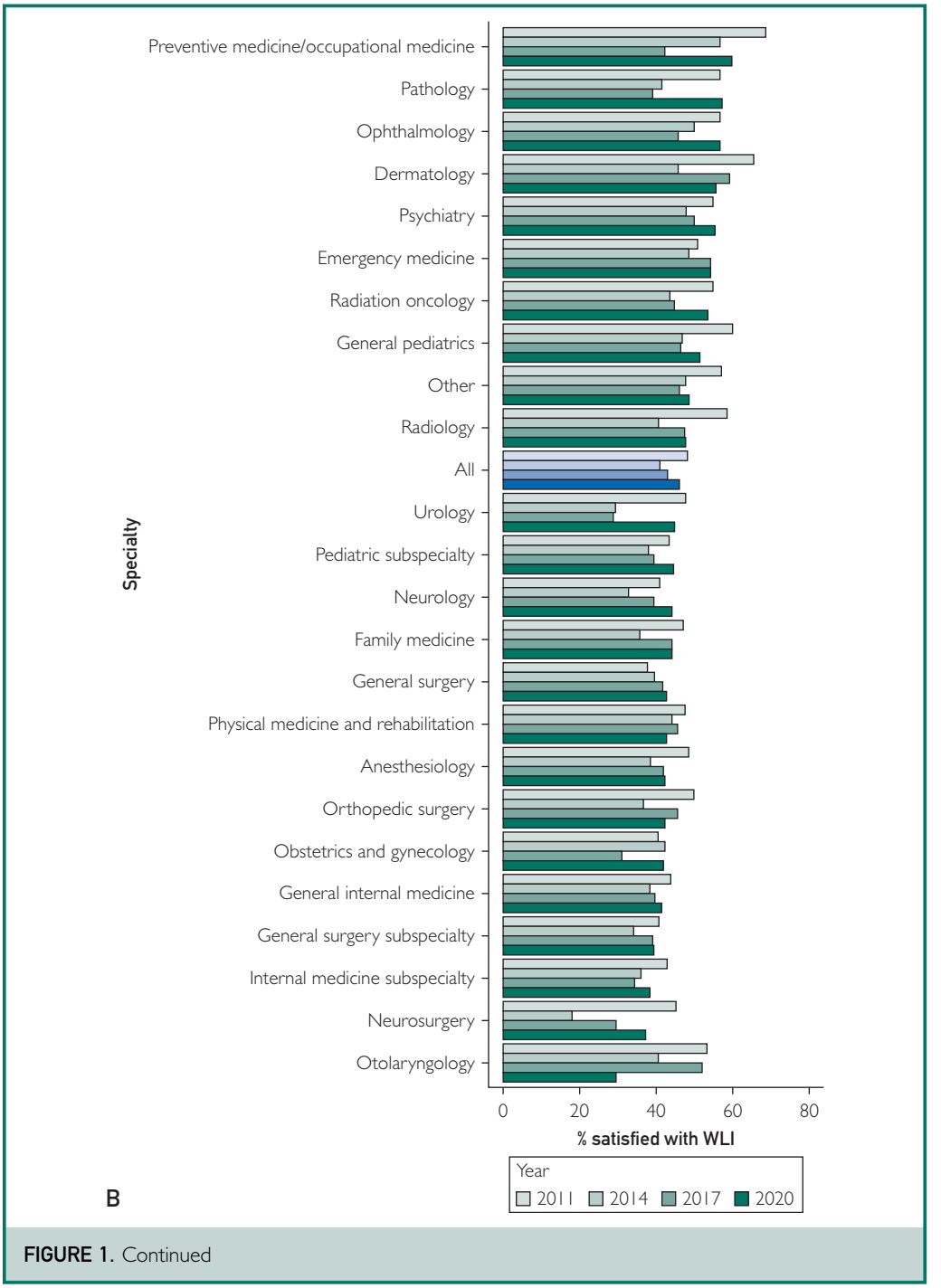

FIGURE 1. Continued

WLI in 2020 compared with 42.8% in 2017 ($P<.001$), 40.9% in 2014 ($P<.001$), and 48.5% in 2011 ($P=.006$). On multivariable analysis pooling responders from the 2011, 2014, 2017, and 2020 surveys adjusting for age, sex, specialty, hours worked per week, and practice setting, physicians who responded in 2020 (OR, 1.17; 95% CI, 1.08 to 1.26), 2017 (OR, 1.12; 95% CI 1.03 to 1.22), or 2011 (OR, 1.44; 95% CI, 1.33 to

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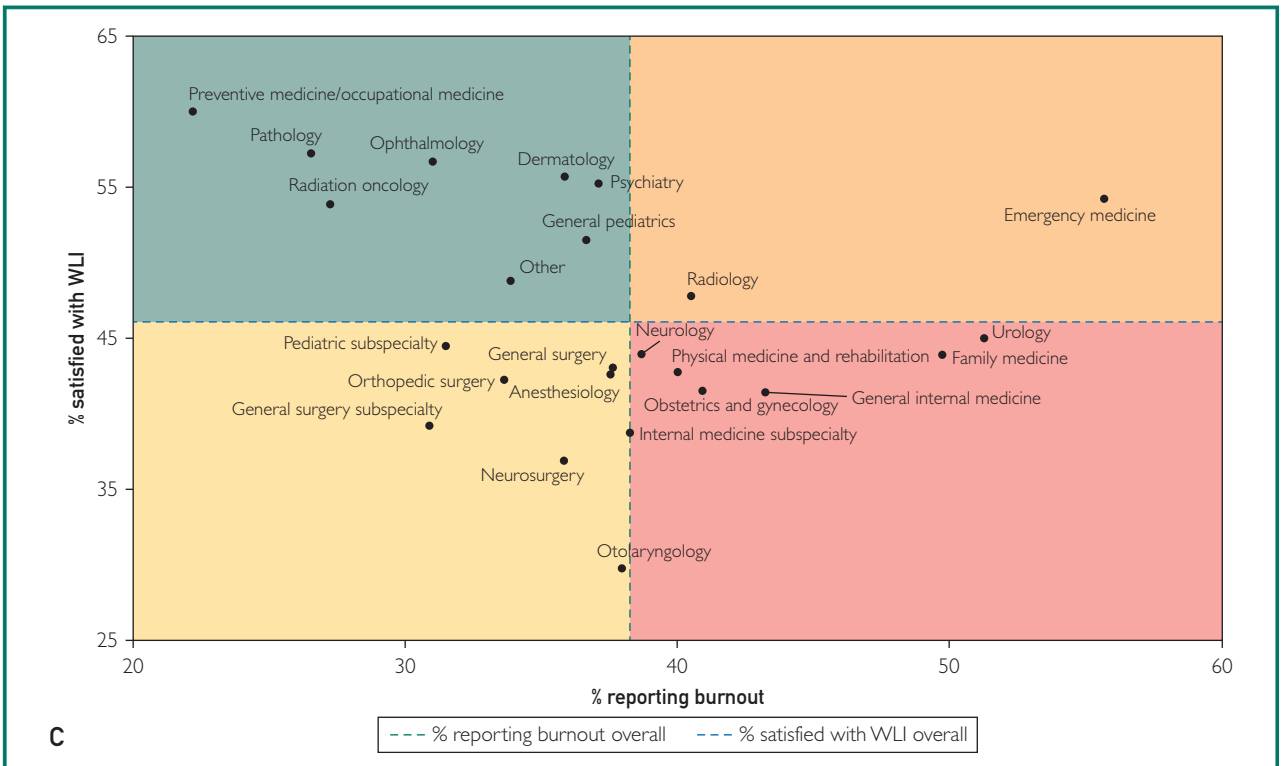

FIGURE 1. Continued

1.55) had higher odds of being satisfied with WLI compared with participants in 2014. Specialties hypothesized to be most affected by COVID-19 (emergency medicine, critical care [adult and pediatric], hospital medicine [adult], and infectious disease [adult and pediatric]) experienced no change in the proportion satisfied with WLI (2017: 47.1%; 2020: 48.7%; P=.64), whereas the proportion improved for all other specialties as a group (2017: 42.1%; 2020: 45.5%; P=.001). Figure 1C illustrates the relationship between burnout and satisfaction with WLI by specialty.

On multivariable analysis of the 2020 data, being female and working more hours per week were independently associated with higher rates of burnout and lower degrees of satisfaction with WLI (Table 3). Practicing in specific specialties was also independently associated with higher (emergency medicine, family medicine) or lower (pathology, pediatric subspecialty, general surgery subspecialty) rates of burnout.

Impact of COVID-19 Experiences

A total of 3534 of 6369 (55.5%) physicians reported having directly cared for a patient with COVID-19 infection, 1948 of 6365 (30.6%) had delivered care without adequate PPE, 2499 of 6371 (39.2%) suffered disruptive economic consequences from COVID-19, and 338 of 6371 (5.3%) personally developed COVID-19 infection. Among those who experienced COVID-19 infection, 44 (12.6%) reported they had no clinical symptoms, whereas 120 (34.4%), 171 (49.0%), and 14 (4.0%) reported having mild, moderate, and severe (ie, hospitalized) symptoms, respectively.

COVID-19 experiences were strongly related to burnout. Mean scores for emotional exhaustion and depersonalization were higher for those who reported any of the 4 COVID-19 experiences (Supplemental Table 6, available online at http://www.mayoclinicproceedings.org). Some COVID-19 experiences were more common for specialties hypothesized to be most affected by

TABLE 3. Multivariable Models in 2020 Among Practicing Physicians[a]

Outcome	Predictor	Odds ratio (95% CI)	*P* value
Burned out[b]	Age 65+ years (vs <35 years)	0.48 (0.35-0.66)	<.001
	Female (vs male)	1.27 (1.12-1.44)	<.001
	Married (vs single)	0.69 (0.58-0.82)	<.001
	Hours worked per week (for each additional)	1.02 (1.02-1.03)	<.001
	Specialty (vs internal medicine subspecialty)		
	Emergency medicine	2.41 (1.81-3.24)	<.001
	Family medicine	1.61 (1.23-2.10)	<.001
	General surgery subspecialty	0.60 (0.46-0.78)	<.001
	Pathology	0.52 (0.34-0.78)	.002
	Pediatric subspecialty	0.61 (0.42-0.86)	.006
	Practice settings (vs private practice)		
	Academic medical center	0.75 (0.66-0.86)	<.001
Satisfied work-life integration[b]	Age 35-44 years (vs <35 years)	0.52 (0.38-0.71)	<.001
	Age 45-54 years (vs <35 years)	0.58 (0.42-0.80)	.001
	Age 55-64 years (vs <35 years)	0.59 (0.43-0.80)	.001
	Age 65+ years (vs <35 years)	0.67 (0.48-0.94)	.02
	Female (vs male)	0.63 (0.55-0.71)	<.001
	Married (vs single)	1.50 (1.25-1.81)	<.001
	Hours worked per week (for each additional)	0.94 (0.94-0.95)	<.001
	Specialty (vs internal medicine subspecialty)		
	General surgery	1.48 (1.03-2.12)	.04
	General surgery subspecialty	1.35 (1.03-1.78)	.03
	Obstetrics and gynecology	1.46 (1.04-2.03)	.03
	Ophthalmology	1.39 (1.01-1.92)	<.05
	Pathology	2.10 (1.43-3.10)	<.001
	Pediatric subspecialty	1.51 (1.06-2.14)	.02

[a]Only statistically significant results were reported here.

[b]Both models included the following variables: age (<35 years referent category), sex (male referent), relationship status (single referent), specialty (internal medicine subspecialty referent specialty), hours worked per week, and practice setting (private practice referent category).

COVID-19 (provided care without adequate PPE; provided care to patients infected with COVID-19), whereas others were more common among other specialties (suffered disruptive economic consequences due to COVID-19; Supplemental Table 7, available online at http://www.mayoclinicproceedings.org). When COVID-19 experiences were added to the multivariable model of the 2020 data, providing care without adequate PPE (OR, 1.53; 95% CI, 1.35 to 1.72) and having suffered disruptive economic consequences due to COVID-19 (OR, 1.49; 95% CI, 1.32 to 1.69) were independently associated with the risk of burnout (Supplemental Table 8, available online at http://www.mayoclinicproceedings.org).

Comparison of Physicians to the General US Working Population

The overall prevalence of burnout on the 2-item burnout measure for the general US working population in 2020 was lower than in 2011, 2014, and 2017 (2011: 28.6%; 2014: 28.4%; 2017: 28.1%; 2020: 25.2%; comparison 2020 to 2017: P=.008; comparison 2020 to 2014: P=.003; comparison 2020 to 2011: P=.002). Satisfaction with WLI for the general US working population in 2020 was similar to 2017 and 2014 and higher than 2011 (2011: 55.1%; 2014: 61.3%; 2017: 61.0%; 2020: 62.5%; comparison 2020 to 2017: P=0.20; comparison 2020 to 2014: P=.33; comparison 2020 to 2011: P<.001).

Mayo Clin Proc. ■ March 2022;97(3):491-506 ■ https://doi.org/10.1016/j.mayocp.2021.11.021
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Demographic differences between the physician and general population samples in 2020 are shown in Table 4. Similar to 2011, 2014, and 2017, physicians reported working a mean of 10 hours more per week (50.8 vs 40.7 hours), with 34.2% of physicians and 6.3% of the general population respondents working 60 hours or more per week ($P<.001$ for both). On the 2-item burnout measure, physicians had higher mean scores and rates of emotional exhaustion (31.0% vs 23.0%; OR, 1.51; $P<.001$), depersonalization (16.0% vs 10.0%; OR, 1.72; $P<.001$), and overall burnout (34.8% vs 25.2%; OR, 1.54; $P<.001$; Figure 2A). After adjustment for age, sex, relationship status, and hours worked per week, physicians remained at increased risk for burnout compared with the general population (OR, 1.409; 95% CI, 1.254 to 1.584; $P<.001$).

Physicians had a lower rate of satisfaction with WLI than the general US working population (43.6% vs 62.5%; OR, 0.46; 95% CI, 0.421 to 0.512; $P<.001$). After adjustment for age, sex, relationship status, and hours worked per week, physicians remained less likely to be satisfied with WLI compared with the general population (OR, 0.71; 95% CI, 0.64 to 0.79; $P<.001$; Figure 2B).

TABLE 4. Comparison of Employed Physicians in the Sample Aged 29 to 65 Years With a Probability-Based Sample of the Employed US Population Aged 29 to 65 Years in 2020[a]

	Physicians[b] N=5294	Population[c] N=2508	*P* value
Sex			
Male	3073 (58.1)	1364 (54.4)	.002
Female	2215 (41.9)	1144 (45.6)	
Missing	6	0	
Age (y)			
Median	51.0 (43.0-59.0)	50.00 (42.0-57.0)	<.001
29-34	223 (4.2)	124 (4.9)	.004
35-44	1364 (25.8)	672 (26.8)	
45-54	1649 (31.1)	840 (33.5)	
55-65	2058 (38.9)	872 (34.8)	
Missing	0	0	
Relationship status			
Single	576 (11.3)	629 (25.1)	<.001
Married	4255 (83.2)	1722 (68.7)	
Partnered	252 (4.9)	117 (4.7)	
Widowed/widower	34 (0.7)	40 (1.6)	
Missing	177	0	
Hours worked per week			
Median	50.00 (40.00-60.00)	40.00 (40.00-45.00)	<.001
<40	849 (16.1)	543 (21.7)	<.001
40-49	1277 (24.3)	1464 (58.6)	
50-59	1340 (25.5)	336 (13.4)	
60-69	1157 (22.0)	124 (5.0)	
70-79	293 (5.6)	15 (0.6)	
≥80	348 (6.6)	18 (0.7)	
Missing	30	8	
Highest level of education			
Completed			
Less than high school graduate		91 (3.6)	
High-school graduate		543 (21.7)	
Some college, no degree		427 (17.0)	
Associate degree		259 (10.3)	
Bachelor's degree		631 (25.2)	
Master's degree		411 (16.4)	
Professional or doctorate degree(other than MD/DO)	5294 (100.0)	146 (5.8)	
Missing		0	
Occupation			
Professional[d]		1247 (49.7)	
Health care[e]		85 (3.4)	
Service[f]		170 (6.8)	
Sales[g]		139 (5.5)	
Office and administrative support		257 (10.2)	
Farming, forestry, fishing		19 (0.8)	
Precision production, craft and repair[h]		164 (6.5)	
Transportation and material Moving		94 (3.7)	
Armed services		6 (0.2)	

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DISCUSSION

We report here detailed information on the changing experience of occupational distress in US physicians relative to the general US workforce during the last decade. The results reveal longitudinal trends at the national level, differences in experience by specialty, impact of the first 9 months of the COVID-19 pandemic, and variability based on the dimension of distress evaluated. Overall, burnout in physicians and workers in other fields was lower in 2020 than in 2011, 2014, and 2017. Mean emotional exhaustion and depersonalization scores as well as the percentage of physicians with burnout improved relative to the 2017 survey, continuing a favorable trend since a peak in 2014.[3] Satisfaction with WLI followed a similar pattern. Despite these encouraging results, physicians remained at roughly

TABLE 4. Continued

	Physicians[b] N=5294	Population[c] N=2508	*P* value
Occupation, continued			
Other		327 (13.0)	
Missing		0	
Distress			
Burnout[i]			
Emotional exhaustion			
Never	619 (11.7)	374 (14.9)	<.001
A few times a year	1351 (25.5)	730 (29.1)	
Once a month or less	773 (14.6)	348 (13.9)	
A few times a month	883 (16.7)	478 (19.1)	
Once a week	463 (8.7)	155 (6.2)	
A few times a week	708 (13.4)	266 (10.6)	
Every day	460 (8.7)	154 (6.1)	
Missing	37	3	
Mean (SD)	2.61 (1.87)	2.29 (1.78)	<.001
High score[j]	1631 (31.0)	575 (23.0)	<.001
Depersonalization			
Never	2045 (38.9)	1227 (49.3)	<.001
A few times a year	1313 (24.9)	603 (24.2)	
Once a month or less	544 (10.3)	208 (8.4)	
A few times a month	518 (9.8)	201 (8.1)	
Once a week	269 (5.1)	71 (2.9)	
A few times a week	370 (7.0)	118 (4.7)	
Every day	204 (3.9)	60 (2.4)	
Missing	31	20	
Mean (SD)	1.54 (1.77)	1.15 (1.58)	<.001
High score[k]	843 (16.0)	249 (10.0)	<.001
Burned out[l]	1790 (34.1)	627 (25.2)	<.001
Missing	39	2	
Work-life integration			
Work schedule leaves me enough time for my personal/family life			
Strongly agree	643 (12.2)	572 (22.8)	<.001
Agree	1652 (31.4)	995 (39.7)	
Neutral	938 (17.8)	496 (19.8)	
Disagree	1422 (27.0)	334 (13.3)	
Strongly disagree	603 (11.5)	109 (4.3)	
Missing	36	2	
Work schedule leaves me enough time for my personal/family life			
Agree/strongly agree	2295 (43.6)	1567 (62.5)	<.001

[a]Values are reported as number (percentage) unless otherwise indicated.
[b]Physician data include responders to the mailed and electronic survey aged 29 to 65 years actively employed at the time of the survey as well as responders to the secondary (nonresponder) survey meeting this criterion.
[c]Aged 29 to 65 years actively employed at the time of the survey.
[d]Business/financial, management, computer/mathematical, architecture/engineering, lawyer/judge, life/physical/social sciences, community/social services, teacher nonuniversity, teacher college/university, other.
[e]Nurse, pharmacist, paramedic, laboratory technician, nursing aide, orderly, dental assistant.
[f]Protective service, food preparation/service, building cleaning/maintenance, personal care/service.
[g]Sales representative, retails sales, other sales.

Continued

40% higher risk of occupational burnout than workers in other fields and were 30% less likely to be satisfied with WLI on adjusted analysis controlling for differences in work hours and other variables.

This study provides insight into the complex impact of the COVID-19 pandemic on US physicians 6 to 9 months into the pandemic. At that time, the pandemic had affected regions of the country with variable intensity and impacted different specialties to varying degree.[27,29] A number of studies, often conducted in geographic hot spots experiencing a surge in COVID-19 cases, have documented the acute stress caused by the pandemic.[22-27] The pandemic also connected many physicians to meaning and purpose in their work.[30] This study provides a more holistic national look at the physician workforce across all specialties and geographies 6 to 9 months into the pandemic (at the end of 2020) with comparison to the pre-pandemic experience. Notably, emotional exhaustion and depersonalization did not improve among specialties hypothesized to be most affected by COVID-19 even as these measures of burnout improved for physicians as a whole.

This study also provides insight into the prevalence of pandemic-related work experiences and their association with occupational distress. In the early days of the pandemic, several regions were overwhelmed by high case volumes, requiring physicians to practice outside their areas of expertise, to provide care without adequate PPE, and to care for patients before any effective treatments for COVID-19 had been established.[25] In other areas of the country, the initial surge in COVID-19 cases came later, enabling organizations to acquire adequate PPE, to be better prepared for high volumes of patients, and to deliver care after the benefits of corticosteroids, anti–SARS-CoV-2 monoclonal antibodies, and antiviral therapy had been established. In parts of the country that were not overwhelmed by cases, physicians in some procedural specialties had a transient decrease in total workload and were not required to practice outside their area of expertise.[32] Consistent with previous

Mayo Clin Proc. ■ March 2022;97(3):491-506 ■ https://doi.org/10.1016/j.mayocp.2021.11.021
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studies,[25-27] physicians who delivered care without adequate PPE, personally experienced COVID-19 infection, or had adverse economic consequences due to the pandemic's effect on their practice were at increased risk for occupational distress.

It is tempting to attribute some of the overall improvement in burnout among physicians to changes in the delivery of care during the pandemic (eg, virtual care, relaxation of documentation and regulatory requirements, breaking down interdisciplinary silos, better team-based care) that may have resulted in greater flexibility and improved WLI.[30,37] However, there are other possible explanations. During the last 5 years, widespread recognition of occupational distress in US physicians and health care workers has motivated organizations and the health care delivery system to address this problem. The NAM began its action collaborative in 2017, and the formal NAM expert taskforce made its specific recommendations for action organization and system-level action in 2019.[34] Randomized controlled trials as well as systematic reviews and meta-analyses[38-40] have reported that organizational interventions can improve well-being, and many organizations began to implement system-level change to improve both the practice environment and organizational culture during the last several years. The pandemic also precipitated action by many more organizations that awoke to the essential role the well-being of their health care workforce played in their ability to provide care for their community.[41,42] These and other factors may contribute to the improvements observed.

It should be emphasized that these results reflect the experience of US physicians 6 to 9 months into the COVID-19 pandemic. Now that nearly all regions of the country have experienced multiple waves of intense COVID-related workloads and had to deal with emergence of the delta and omicron variants, we hypothesize that they may not reflect the physician experience in early 2022 (12-15 months later). The chronicity of the challenges related to COVID-19 and its sustained effects on the health care workforce have led to exhaustion and disillusionment for many. In addition, staffing issues created by some health care workers leaving the workforce have further intensified the work burden for those who continue to provide care. Burnout and WLI are only 2 dimensions of occupational distress; other occupational challenges (eg, moral injury, financial well-being) as well as mental health issues (eg, depression, anxiety, posttraumatic stress disorder) also require additional study. For example, in 2020, the prevalence of anxiety, depression, and suicidal ideation was 2- to 4-fold higher in the US population than before the pandemic.[43,44]

Our study is subject to limitations, most notably the potential for response bias. As is typical of large national physician surveys,[45-47] the overall participation rates in our mailed and electronic surveys were low. Participants were, however, similar to all physicians in the United States with respect to age, sex, and demographic characteristics. We also employed a secondary survey of nonresponders that revealed no statistically significant differences with respect to age, sex, years in practice, burnout, or satisfaction with WLI, suggesting that the participants were representative of US physicians. The study has several important strengths. The sample was drawn from a near-complete record of all physicians in the United States. Validated instruments were used to assess burnout and other variables. Robust methods were used to assess whether participants were representative of

[h]Construction and extraction, installation/maintenance/repair, precision production (machinist, welder, backer, printer, tailor).

[i]As assessed using the single-item measures for emotional exhaustion and depersonalization adapted from the full Maslach Burnout Inventory (MBI). The area under the receiver operating characteristic curve for the emotional exhaustion and depersonalization single items relative to that of their respective full MBI domain score in previous studies was 0.94 and 0.93, and the positive predictive values of the single-item thresholds for high levels of emotional exhaustion and depersonalization were 88.2% and 89.6%, respectively.[35,36]

[j]Individuals indicating symptoms of emotional exhaustion weekly or more often have median scores on the full MBI of >30 and have a >75% probability of having a high score as defined by the MBI (≥27).

[k]Individuals indicating symptoms of depersonalization weekly or more often have median scores on the full MBI of >13 and have a >85% probability of having a high score as defined by the MBI (≥10).

[l]High score (weekly or more often) on emotional exhaustion or depersonalization scale.

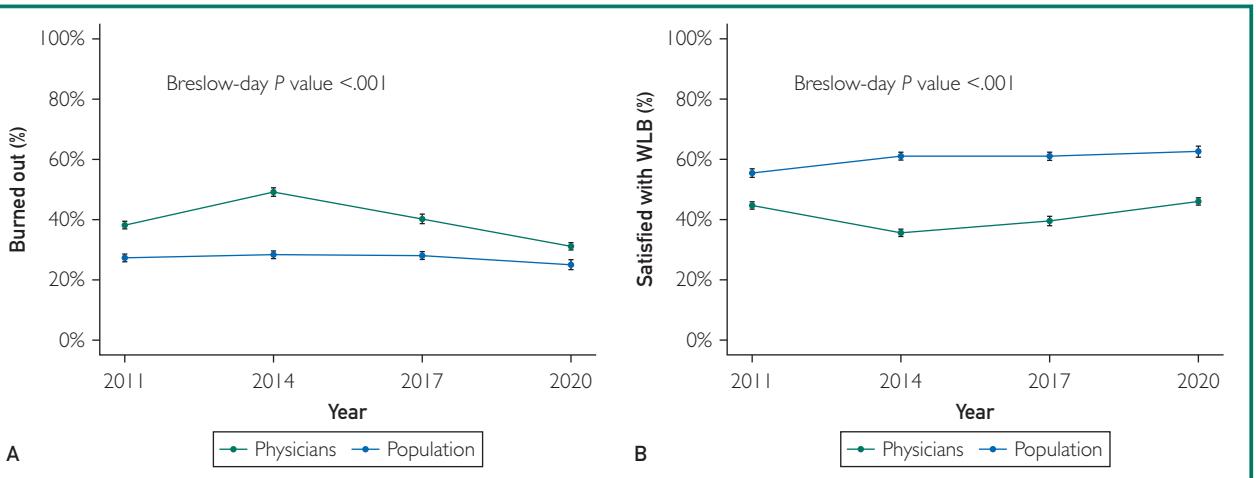

FIGURE 2. Changes in burnout and satisfaction with work-life integration in physicians and population. Year is shown on the x-axis. Burnout (A) and satisfaction with work-life balance (WLB; B) are shown on the y-axis.

US physicians.[48] Evaluation of physicians by similar sampling and identical assessment instruments allows comparison of the physician experience in 2020 with 3 other time points during the last decade.[1-3] A probability-based sample of the US working population was also surveyed at all time points, providing context for changes in the physician experience relative to the changes in the US workforce overall.

CONCLUSION

Occupational burnout and satisfaction with WLI improved among US physicians between 2017 and 2020. This improvement may in part be due to national efforts to improve the health care delivery system and efforts by some organizations to improve the practice environment and to provide better support for physicians. Despite these encouraging findings, physicians remain at increased risk for burnout and problems with WLI relative to the US workforce. The impact of the COVID-19 pandemic on US physicians has varied on the basis of professional characteristics and experiences, with those in certain specialties and those having adverse COVID experiences at increased risk for burnout. Ongoing studies are needed to assess the evolution of occupational distress during later stages of the COVID-19 pandemic as well as the aftermath. Given the association between occupational burnout and turnover, reduced clinical productivity, and adverse impacts on multiple dimensions of quality of care and patient experience, continued efforts to address the elevated rates of burnout in physicians are warranted.

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: **NAM,** National Academy of Medicine; **OR,** odds ratio; **PPE,** personal protective equipment; **WLI,** work-life integration

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The opinions offered in this article are those of the authors and do not necessarily reflect American Medical Association policy.

Grant Support: Funding for this study was provided by the Stanford WellMD Center, the American Medical Association, and the Mayo Clinic Program on Physician Well-being.

Potential Competing Interests: Drs Dyrbye and Shanafelt are co-inventors of the Well-being Index instruments (Physician Well-being Index, Nurse Well-being Index, Medical Student Well-being Index, the Well-being Index). Mayo Clinic holds the copyright for these instruments and has licensed them for use outside of Mayo Clinic. Mayo Clinic pays Drs Shanafelt and Dyrbye a portion of any royalties received. Dr Shanafelt is co-inventor of the Participatory Management Leadership Index. Mayo Clinic holds the copyright for this instrument and has licensed it for use outside of Mayo Clinic. Mayo Clinic pays Dr Shanafelt a portion of any royalties received. Drs Shanafelt and Dyrbye report receiving honoraria for presentations and provide advising for health care organizations. Dr Dyrbye reports receiving funding support from the National Science Foundation. Michael Tutty is a board member for Emergence Healthcare Group.

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