MAYO CLINIC

ORIGINAL ARTICLE

# Suicidal Ideation and Attitudes Regarding Help Seeking in US Physicians Relative to the US Working Population

Tait D. Shanafelt, MD; Lotte N. Dyrbye, MD, MHPE; Colin P. West, MD, PhD; Christine Sinsky, MD; Michael Tutty, PhD; Lindsey E. Carlasare, MBA; Hanhan Wang, MPS; and Mickey Trockel, MD, PhD

## Abstract

**Objective:** To evaluate the prevalence of suicidal ideation (SI) and attitudes regarding help seeking among US physicians relative to the general US working population.

**Participants and Methods:** A secondary analysis of a cross-sectional survey of US physicians and a probability-based sample of the US working population was conducted between October 12, 2017, and March 15, 2018. Among 30,456 invited physicians, 5197 (17.1%) completed the primary survey. Suicidal ideation in the last year, attitudes regarding help seeking, symptoms of depression, and burnout were assessed by standardized questions.

**Results:** Among the 4833 physicians who responded regarding SI, 316 (6.5%) reported having suicidal thoughts in the last 12 months. Most physicians (3527 [72.9%]) reported that they would seek professional help if they had a serious emotional problem. Physicians with SI were less likely to report that they would seek help (203/316 [64.2%]) than physicians without SI (3318/4517 [73.5%]; $P=.001$). On multivariable analysis, symptoms of depression (odds ratio [OR], 4.42; 95% CI, 1.89 to 11.52), emotional exhaustion (OR, 1.07 each 1-point increase; 95% CI, 1.03 to 1.11), and self-valuation (OR, 0.84 each 1-point increase; 95% CI, 0.70 to 0.99) were associated with SI. Among individuals aged 29 to 65 years, physicians were more likely than workers in other fields to report SI (7.1% vs 4.3%; $P<.001$), a finding that persisted on multivariable analysis.

**Conclusion:** In this national study conducted before the COVID-19 pandemic, 1 in 15 US physicians had thoughts of taking their own life in the last year, which exceeded the prevalence of SI among US workers in other fields.

 ■ Mayo Clin Proc. 2021;96(8):2067-2080

Each year, hundreds of US physicians die by suicide. Although most of the relevant data were collected more than 10 years ago, the available evidence suggests that physicians are at higher risk for death by suicide than those in other fields.[1-5] This fact is particularly concerning as physicians typically have characteristics associated with lower risk of suicide, including high education level, more social support, higher income, and higher likelihood of having children.[6] The tragedy is amplified by the fact that, at the time of matriculation, medical students have more favorable mental health profiles with respect to depression, burnout, and quality of life than age- and sex-matched peers going into other fields,[7] a profile that reverses by the second year of medical school and worsens during residency.[8-12]

Physicians appear to have occupation-specific risks for suicide. Studies indicate that physicians are at increased risk for occupational burnout,[13-16] a risk factor for depression and suicide.[6,17-19] Other studies have revealed that being involved in a major medical error[6,20] or a malpractice suit[21]—challenges specific to health care—can heighten suicidal thoughts

From the Department of Medicine, Division of Hematology, Stanford University, Palo Alto, CA (T.D.S., H.W.); Department of Medicine, Division of Primary Care (L.N.D.), and Division of General Internal Medicine (C.P.W.), Mayo Clinic, Rochester, MN; American Medical Association, Chicago, IL (C.S., M.Tut., L.E.C.); and Department of Psychiatry and Behavioral Sciences, Stanford University, Palo Alto, CA (M.Tro.).

among physicians. These effects may be due to the commitment and pride physicians take in their work, their dedication to patients' welfare, and the shame associated with malpractice suits. Psychological autopsy studies of physicians who died by suicide suggest that multiple, often interrelated factors, including psychological illness (depression, substance use), work-related problems, relationship issues, and financial issues, contribute to a physician's suicide.[22]

Despite their understanding of the biologic basis for medical illness, physicians still fear they will be stigmatized for seeking care for mental health conditions.[23-26] This includes concern that seeking care for mental health conditions will have an impact on their license to practice.[26-28] Physicians' deep-seated altruism and desire to do good also often lead to unrealistic expectations and a sense of guilt of "not doing enough."[29,30] These sentiments often lead physicians to sacrifice themselves (excessive work hours, constant worry that they may be missing something that would benefit their patients, and prioritizing work over personal health), leading to emotional distress and suffering.[30] Although physicians are empathetic and compassionate with others, they are frequently intolerant of their own imperfections and harshly critical of their own errors.[29,31] The construct of low "self-valuation" is defined by this harsh internal response to perceived personal shortcomings and an associated propensity to defer self-care.[31] Although it has not been directly evaluated, low self-compassion may further dissuade physicians experiencing suicidal ideation (SI) from seeking help.

In this study, we evaluated the prevalence of SI and attitudes regarding help seeking among physicians relative to the general US working population. In addition, we explored associations of occupational and general indicators of distress with SI among physicians. We also assessed whether self-valuation modified the relationship between medical errors and SI.

## PARTICIPANTS AND METHODS

As previously reported,[15] we conducted a cross-sectional survey of US physicians and US workers in other fields in 2017. The study used a methodologic approach similar to our prior 2011[13] and 2014[14] studies.

### Study Participants

**Physician Sample.** A detailed description of the survey methodology has been previously published.[15] A sample of US physicians across all specialties was assembled from the American Medical Association Physician Masterfile, a nearly complete record of all US physicians. Among the 30,456 physicians who opened at least 1 invitation email or received a paper mailing of the survey, 5197 returned completed surveys (17.1%). A random sample of 1224 physicians who completed the initial electronic survey received a subsurvey assessing self-valuation, resulting in 1001 (81.8%) responses. A secondary survey of nonresponders demonstrated that participants were representative of the overall sample with respect to burnout and work-life integration scores.[15] These responses were subsequently pooled with other survey responses for analysis. Participation was voluntary, and all responses were anonymous. The study was approved by the Stanford University and Mayo Clinic Institutional Review Boards.

**Population Sample.** To provide a comparator group to physicians, we also surveyed a probability-based sample of US workers in all other fields in October 2017. As previously reported,[15] the sample included individuals aged 29 to 65 years with oversampling of adults aged 35 to 65 years to match the age range of physicians. The population survey was conducted using the KnowledgePanel (Ipsos), a probability-based panel designed to be representative of the US population (https://www.ipsos.com/en-us/solutions/public-arrairs/knowledgepanel).

### Study Measures

Both physicians and workers in other fields provided information on age, sex, relationship status, and hours worked per week.

**Burnout.** Burnout was evaluated using the emotional exhaustion and depersonalization


Mayo Clin Proc. ■ August 2021;96(8):2067-2080 ■ https://doi.org/10.1016/j.mayocp.2021.01.033
www.mayoclinicproceedings.org

scales of the Maslach Burnout Inventory (MBI).[32-34] To minimize survey length, burnout was assessed in the population sample with 2 single-item measures from the MBI that have been shown to strongly correlate with the emotional exhaustion and depersonalization scales of the MBI.[35,36]

**Symptoms of Depression.** Symptoms of depression were evaluated by the 2-item Primary Care Evaluation of Mental Disorders assessment, a standardized screening instrument for depression. This instrument has a high sensitivity but lower specificity, such that it is considered a depression screening instrument rather than a diagnostic instrument.[37,38]

**Suicidal Ideation and Attitudes Regarding Help Seeking.** Both physician and population participants were also asked to indicate whether they had experienced recent thoughts of suicide. Specifically, participants were asked, During the past 12 months, have you had thoughts of taking your own life? This item was originally developed by Meehan et al[39] and assesses recent but not necessarily active SI. It has been used in previous studies of physicians[6,9,20] and allows comparison with nonphysician samples.[9,40-43]

Attitudes regarding help-seeking behavior were assessed with a standardized item from the National Comorbidity Survey that asked participants whether they would go for help if they had a serious emotional problem (response options: would definitely go, would probably go, would probably not go, would definitely not go).[44] For regression analysis, response to this item was dichotomized on the basis of whether physicians indicated they would definitely or probably go for help vs probably or definitely not go for help.

**Medical Errors and Malpractice Suits.** Similar to previous studies,[45-47] to identify recent events internalized as a major medical error, physicians were asked, Are you concerned you have made any major medical error in the last 3 months? Physicians were also asked if they had gone through a malpractice suit in the last 2 years.

**Self-valuation.** As previously reported,[48] a random subset of physician participants completed a subsurvey that included the Clinician Self-valuation Scale.[31] Self-valuation consists of a combination of prioritizing self-care, attention to personal well-being, and responding to mistakes or personal imperfection with a desire to learn and to improve rather than to shame (ie, growth mindset). The Clinician Self-valuation Scale is a 4-item instrument that asks participants to rate their experience during the past 2 weeks on a 5-point Likert scale (always, 0; never, 4). By use of a standardized scoring approach, aggregate scores for self-valuation are calculated by summing the score of the individual items and normed to a scale of 0 to 10 (higher more favorable).[49] The population survey included 2 items from the Clinician Self-valuation Scale (the "putting off taking care of my own health" and "self-condemnation" items).

### Statistical Analyses

All analyses were conducted in R (version 3.6.0; R Foundation for Statistical Computing), with all *P* values specified as 2 sided and results deemed statistically significant at a *P* value of less than .05. Standard descriptive statistics were used to describe the physician and population samples. Differences between physician and population samples were analyzed with the Mann-Whitney *U* test for continuous variables and the $\chi^2$ test for categorical variables. Instruments were scored by the standard, published approach. Univariable and multivariable logistic regressions were performed to identify factors associated with SI and help seeking in physicians and population samples. Multivariable logistic regression with an interaction term was used to investigate whether there is an interaction between medical errors and self-valuation on suicide ideation. For multivariable models, we initially conducted the analysis using all physician participants, followed by a repeated model in the random subset

**TABLE 1. Personal Characteristics of Participating Physicians[a,b]**

| | All participants (N=5445) | Subsurvey participants (N=1001) |
|---|---|---|
| Age (y) | | |
| Median (IQR) | 53 (42-62) | 53 (42-62) |
| 25-34 | 305 (6.4) | 68 (6.9) |
| 35-44 | 1120 (23.5) | 243 (24.7) |
| 45-54 | 1103 (23.1) | 215 (21.8) |
| 55-64 | 1371 (28.7) | 298 (30.2) |
| 65-74 | 729 (15.3) | 134 (13.6) |
| >74 | 145 (3.0) | 28 (2.8) |
| Missing | 672 | 15 |
| Sex | | |
| Male | 2995 (62.1) | 620 (62.2) |
| Female | 1818 (37.7) | 372 (37.4) |
| Other | 13 (0.3) | 4 (0.4) |
| Missing | 619 | 5 |
| Relationship status | | |
| Single | 570 (11.9) | 116 (11.7) |
| Married | 3951 (82.6) | 822 (82.5) |
| Partnered | 203 (4.2) | 46 (4.6) |
| Widowed or widower | 60 (1.3) | 12 (1.2) |
| Missing | 661 | 5 |
| Have children | | |
| No | 857 (17.9) | 182 (18.2) |
| Yes | 3940 (82.1) | 816 (81.8) |
| Missing | 648 (11.9) | 3 (0.3) |
| Age of youngest child (y) | | |
| <5 | 691 (17.6) | 149 (18.3) |
| 5-12 | 768 (19.6) | 154 (19.0) |
| 13-18 | 633 (16.1) | 136 (16.7) |
| 19-22 | 401 (10.2) | 80 (9.9) |
| >22 | 1432 (36.5) | 293 (36.1) |
| Missing | 1520 | 189 |
| Specialty | | |
| Anesthesiology | 254 (4.7) | 53 (5.3) |
| Dermatology | 136 (2.5) | 29 (2.9) |
| Emergency medicine | 304 (5.7) | 61 (6.1) |
| Family medicine | 415 (7.7) | 74 (7.4) |
| General surgery | 160 (3.0) | 24 (2.4) |
| General surgery subspecialty | 398 (7.4) | 85 (8.5) |
| Internal medicine—general | 425 (7.9) | 63 (6.3) |
| Internal medicine subspecialty | 652 (12.2) | 118 (11.8) |
| Neurology | 195 (3.6) | 41 (4.1) |
| Neurosurgery | 66 (1.2) | 12 (1.2) |
| Obstetrics and gynecology | 195 (3.6) | 29 (2.9) |
| Ophthalmology | 146 (2.7) | 39 (3.9) |
| Orthopedic surgery | 276 (5.1) | 54 (5.4) |
| Otolaryngology | 45 (0.8) | 7 (0.7) |
| Other | 162 (3.0) | 31 (3.1) |
| Pathology | 147 (2.7) | 21 (2.1) |
| Pediatrics—general | 264 (4.9) | 52 (5.2) |
| Pediatric subspecialty | 225 (4.2) | 49 (4.9) |
| Physical medicine and rehabilitation | 131 (2.4) | 24 (2.4) |
| Preventive medicine/occupational medicine | 30 (0.6) | 5 (0.5) |

*Continued on next page*



Mayo Clin Proc. ■ August 2021;96(8):2067-2080 ■ https://doi.org/10.1016/j.mayocp.2021.01.033
www.mayoclinicproceedings.org

**TABLE 1. Continued**

| | All participants (N=5445) | Subsurvey participants (N=1001) |
|---|---|---|
| Specialty, continued | | |
| Psychiatry | 432 (8.1) | 81 (8.1) |
| Radiation oncology | 42 (0.8) | 9 (0.9) |
| Radiology | 225 (4.2) | 34 (3.4) |
| Urology | 35 (0.7) | 4 (0.4) |
| Missing | 85 | 2 |
| Years in practice | | |
| Median (IQR) | 20 (8-30) | 20 (8-29) |
| <5 | 748 (14.5) | 148 (14.9) |
| 5-<10 | 690 (13.4) | 126 (12.7) |
| 10-<20 | 1133 (22.0) | 211 (21.2) |
| 20-<30 | 1237 (24.0) | 262 (26.3) |
| ≥30 | 1350 (26.2) | 248 (24.9) |
| Missing | 287 | 6 |
| Hours worked per week | | |
| Median (IQR) | 50 (40-60) | 50 (40-60) |
| <40 | 961 (18.9) | 159 (16.1) |
| 40-49 | 1053 (20.7) | 210 (21.2) |
| 50-59 | 1245 (24.4) | 270 (27.3) |
| 60-69 | 1084 (21.3) | 194 (19.6) |
| 70-79 | 386 (7.6) | 74 (7.5) |
| ≥80 | 367 (7.2) | 82 (8.3) |
| Missing | 349 | 12 |
| No. of nights on call per week | | |
| Median (IQR) | 1 (0-2) | 1 (0-2) |
| 0 | 1856 (37.4) | 350 (36.4) |
| 1 | 1211 (24.4) | 246 (25.6) |
| ≥2 | 1895 (38.2) | 366 (38.0) |
| Missing | 483 | 39 |
| Primary practice setting | | |
| Private practice | 2474 (48.0) | 478 (48.0) |
| Academic medical center | 1394 (27.1) | 283 (28.4) |
| Veterans hospital | 107 (2.1) | 21 (2.1) |
| Active military practice | 55 (1.1) | 8 (0.8) |
| Not in practice or retired | 169 (3.3) | 18 (1.8) |
| Other | 950 (18.5) | 187 (18.8) |
| Missing | 296 | 6 |

[a]IQR, interquartile range.
[b]Values are reported as number (percentage) unless otherwise indicated.

of participants who completed the subsurvey and that added the self-valuation variable. Emotional exhaustion and depersonalization scores were normed to a scale of 0 to 10 for the multivariable analysis. For all comparisons with the US working population, physician data were restricted to responders who were between the ages of 29 and 65 years and not retired to match the characteristics of the population sample.

## RESULTS

The previously published demographic and professional characteristics of the 5445 physician participants are shown in Table 1.[15] The prevalence of SI in the last 12 months, proportion of physicians who were concerned they had made a recent major medical error or had experienced a recent medical malpractice suit, and scores for burnout and depression are shown in

Table 2. In aggregate, 316 (6.5%) physicians reported having thoughts of taking their own life in the last 12 months. Most physicians indicated that they would either definitely go (1844 [38.2%]) or probably go (1683 [34.8%]) for professional help if they had a serious emotional problem.

### Personal and Professional Factors Associated with Suicidal Ideation

The relationship between personal and professional characteristics and the prevalence of SI is shown in Table 3. Physicians with SI were younger (median age, 50 years vs 53 years; $P<.001$), more likely to be female (prevalence of 7.6% for women vs 5.9% for men; $P=.004$), less likely to be married (prevalence of 11.1% for single vs 5.7% for married; $P<.001$), less likely to have children (prevalence of 10.7% for those with no children vs 5.7% for those with children; $P<.001$), and had been in practice a shorter time (median, 17 years vs 20 years; $P<.001$). No differences in the prevalence of SI were observed by specialty, hours worked per week, number of nights on call per week, practice setting, or whether physicians reported being involved in a medical malpractice suit in the last 2 years. Physicians who believed they had made a major medical error in the last 3 months were nearly 3 times more likely (15.6% vs 5.6%; odds ratio [OR], 3.14; 95% CI, 2.35 to 4.14) to report SI. The population attributable risk of medical errors was 14.7% (ie, 14.7% of physician SI cases could be attributed to medical errors). Although a majority of physicians (3527/4833 [72.9%]) indicated that they would probably or definitely go for professional help if they had a serious emotional problem, physicians with SI were less likely to report that they would go for professional help (203/316 [64.2%]) than physicians without SI (3318/4517 [73.5%]; $P=.001$).

The relationships of SI with burnout, symptoms of depression, and self-valuation are shown in Table 4. Mean scores for emotional exhaustion and depersonalization were higher among those with SI, whereas mean scores for self-valuation were lower. Among physicians with symptoms of depression, 278 of 2010 (13.8%) reported SI compared with 38 of 2812 (1.4%; $P<.001$) physicians without symptoms of depression. A statistically significant relationship between higher quartile of self-valuation score and lower rates of SI among the subgroup of physicians who completed the subsurvey was observed (Figure A). The prevalence of SI was 15.1% for physicians in the lowest quartile of self-valuation compared with 8.8%, 2.8%, and 1.7% among physicians in the second, third, and fourth quartiles, respectively.

On multivariable analysis, adjusting for age, sex, relationship status, children, specialty, years in practice, hours worked per week, practice setting, and recent malpractice suits, the variables independently associated with SI included symptoms of depression (OR, 6.00; 95% CI, 4.09-9.02), emotional exhaustion score (OR, 1.21 for each 1-point increase; 95% CI, 1.12 to 1.32), and recent major medical error (OR, 1.90; 95% CI, 1.36 to 2.63). Depersonalization score and nights on call per week were not statistically significantly associated with suicidal thoughts in the multivariable analysis. When this modeling was repeated in the subset of physicians who completed assessment of self-valuation, symptoms of depression (OR, 4.42; 95% CI, 1.89 to 11.52), emotional exhaustion score (OR, 1.42 for each 1-point increase; 95% CI, 1.17 to 1.74), and self-valuation (OR, 0.84 for each 1-point increase; 95% CI, 0.70 to 0.99) were associated with suicidal thoughts, whereas depersonalization score, nights on call per week, and perceived medical error were not statistically significant.

Given these findings, we evaluated whether self-valuation modified the association of medical errors with SI. Logistic regression with interaction indicated that higher self-valuation was associated with a lower risk of SI independent of whether physicians reported a recent medical error, but the benefit appeared to be attenuated among physicians reporting an error (Figure B). Each 1-point increase in self-valuation was associated with a 35% reduction in the odds of SI among individuals who did not

**TABLE 2. Suicidal Ideation, Well-being and Attitudes Regarding Seeking Professional Mental Health Resources[a]**

| | All participants (N=5445) | Subsurvey participants (N=1001) |
|---|---|---|
| Had thoughts of taking own life in past 12 months | | |
| No | 4517 (93.5) | 916 (92.0) |
| Yes | 316 (6.5) | 80 (8.0) |
| Missing | 612 | 5 |
| Are you concerned you have made a major medical error in the last 3 months? | | |
| No | 4374 (90.5) | 905 (90.8) |
| Yes | 461 (9.5) | 92 (9.2) |
| Missing | 610 | 4 |
| Have you gone through a medical malpractice suit in the last 2 years? | | |
| No | 4388 (90.6) | 906 (91.1) |
| Yes | 453 (9.4) | 89 (8.9) |
| Missing | 604 | 6 |
| If you had a serious emotional problem, would you go for professional help? | | |
| Would definitely go | 1844 (38.2) | 360 (36.2) |
| Would probably go | 1683 (34.8) | 353 (35.5) |
| Would probably not go | 1053 (21.8) | 227 (22.8) |
| Would definitely not go | 253 (5.2) | 54 (5.4) |
| Missing | 612 | 7 |
| Burnout | | |
| Emotional exhaustion score (mean)[b] | 23.25±13.22 | 22.98±13.15 |
| Missing | 584 | 20 |
| Depersonalization score (mean)[c] | 6.84±6.52 | 6.91±6.71 |
| Missing | 563 | 15 |
| Overall burnout[d] | | |
| No | 2746 (56.1) | 576 (58.3) |
| Yes | 2147 (43.9) | 412 (41.7) |
| Missing | 552 | 13 |
| Depression symptoms | | |
| Screen negative | 2832 (58.3) | 572 (57.3) |
| Screen positive | 2022 (41.7) | 426 (42.7) |
| Missing | 591 | 3 |
| Self-valuation score[e] | | 4.81±2.37 |
| Missing | | 5 (0.5) |

[a]Values are reported as mean ± standard deviation or number (percentage).
[b]Scale of 0 to 54 (higher scores unfavorable).
[c]Scale of 0 to 30 (higher scores unfavorable).
[d]High score on either the depersonalization (≥10) or emotional exhaustion (≥27) subscale.[32]
[e]Scale of 0 to 10 (higher scores favorable).

report an error (OR, 0.66; 95% CI, 0.57 to 0.74) and an 11% reduction in the odds of SI among individuals who did report an error (OR, 0.89; 95% CI, 0.68 to 1.14). The two ORs were significantly different, with the latter 1.36-fold (95% CI, 1.01 to 1.81) larger than the former.

We next compared SI and attitudes regarding help seeking in physicians with those of the general US working population. Demographic differences between the samples are reported in Supplemental Table 1 (available online at http://www.mayoclinicproceedings.org). In aggregate,

223 of 5180 (4.3%) workers in other fields reported SI in the last 12 months compared with 279 of 3914 (7.1%; $P<.001$) physicians. Workers in other fields were less likely (3273/5182 [63.2%]) to report that they would "probably" or "definitely" go for professional help if they had an emotional problem than physicians (2821/3917 [72%]; $P<.001$). Unlike among physicians, there was not a statistically significant decrease in the likelihood of intent to seek help among US workers with SI (workers with SI, 132/222 [59.5%]; workers without SI, 3133/4949 [63.3%]; $P=.28$).

On multivariable analyses, both the emotional exhaustion and depersonalization domains of burnout (as continuous variables) and highest level of education were independently associated with SI (Supplemental Table 2, available online at http://www.mayoclinicproceedings.org). With respect to highest level of education, physicians (OR, 2.15; 95% CI, 1.53 to 3.10) and those with a master's degree (1.64; 95% CI, 1.03 to 2.59) but not those with a bachelor's or doctoral degree in a field outside medicine were at increased risk for SI compared with high-school graduates (Supplemental Table 2). On multivariable analyses limited to physicians and US workers with a professional degree or doctoral degree in other fields, physicians were nearly 3 times more likely to report SI (OR, 2.97; 95% CI, 1.47 to 7.09; Supplemental Table 3, available online at http://www.mayoclinicproceedings.org).

## DISCUSSION

In this large national study, roughly 1 in 15 physicians had thoughts of taking their own life in the last year. SI was more common among physicians than US workers in other fields, a finding that persisted on multivariable analysis adjusting for personal and professional characteristics. Among physicians, increased prevalence of SI was observed for women and those who were younger, whereas a decreased prevalence was observed for those who were married and had children. On multivariable analysis of physicians, professional factors associated with SI included occupational burnout and recent medical errors. No relationships between SI and other professional characteristics, such as specialty, work hours, call schedule, practice setting, or the recent experience of a malpractice suit, were observed.

On an encouraging note, most physicians indicated that they would seek help if they experienced a serious emotional problem. Physicians were more likely than US workers in other fields to report that they would seek help for serious emotional problems. Unfortunately, physicians who reported SI were less likely than their colleagues without SI to report that they would seek help. This finding suggests that, although conceptually physicians may be more open to seeking care for mental health disorders than is the population at large, stigma and barriers to access reduce help seeking when distress occurs. This may be due, in part, to the perceived career stakes of seeking help and its potential impact on licensure.[26-28] Indeed, it is particularly concerning that nearly 4 in 10 physicians reporting SI indicated that they would not seek professional help.

Our findings on increased SI in physicians are consistent with prior national studies of US surgeons that also found a relationship between medical errors and SI.[47] Several previous studies of physicians and medical students have also found a relationship between SI and burnout independent of depression.[17,18,47] Notably, as in this study, all of these studies used tools that screened for symptoms of depression rather than instruments assessing depression severity. Studies by members of our investigative team using instruments that do assess depression severity suggest that burnout may increase the risk of SI by increasing the risk of clinical depression rather than by causing SI directly.[19] Notably, that study also found that burnout but not depression was associated with medical errors, suggesting that burnout and depression may have distinct consequences.[19]

To our knowledge, this study is the first to evaluate the relationship between self-valuation and SI in physicians. A dose-

**TABLE 3. Characteristics Among Physicians With and Without SI in the Last 12 Months[a,b]**

| | SI | | Unadjusted odds ratio[c] (95% CI) | *P* value |
|---|---|---|---|---|
| | Yes (n=316) | No (n=4517) | | |
| Age (y) | | | | |
| Median (IQR) | 50 (41-58) | 53 (42-62) | 0.98 (0.97-0.99) | <.001 |
| 25-34 | 29 (9.6) | 273 (90.4) | 1.0 (Reference) | — |
| 35-44 | 80 (7.2) | 1028 (92.8) | 0.73 (0.48-1.16) | .17 |
| 45-54 | 75 (6.9) | 1011 (93.1) | 0.70 (0.45-1.11) | .12 |
| 55-64 | 94 (7.0) | 1256 (93.0) | 0.71 (0.46-1.11) | .12 |
| 65-74 | 25 (3.5) | 684 (96.5) | 0.34 (0.20-0.60) | <.001 |
| >74 | 3 (2.2) | 135 (97.8) | 0.21 (0.05-0.60) | .01 |
| Missing | 10 (7.1) | 130 (92.9) | — | — |
| Sex | | | | |
| Male | 172 (5.9) | 2766 (94.1) | 1.0 (Reference) | — |
| Female | 136 (7.6) | 1657 (92.4) | 1.32 (1.04-1.67) | .02 |
| Other | 3 (23.1) | 10 (76.9) | 4.82 (1.07-15.94) | .02 |
| Missing | 5 (5.6) | 84 (94.4) | — | — |
| Relationship status | | | | |
| Single | 63 (11.1) | 505 (88.9) | 1.0 (Reference) | — |
| Married | 223 (5.7) | 3669 (94.3) | 0.49 (0.37-0.66) | <.001 |
| Partnered | 23 (11.6) | 175 (88.4) | 1.05 (0.62-1.73) | .84 |
| Widowed or widower | 1 (1.7) | 58 (98.3) | 0.14 (0.01-0.65) | .05 |
| Missing | 6 (5.2) | 110 (94.8) | — | — |
| Have any children | | | | |
| No | 91 (10.7) | 761 (89.3) | 1.0 (Reference) | — |
| Yes | 219 (5.7) | 3656 (94.3) | 0.50 (0.39-0.65) | <.001 |
| Missing | 6 (5.7) | 100 (94.3) | — | — |
| Age of youngest child (y) | | | | |
| No children | 91 (10.7) | 761 (89.3) | 1.0 (Reference) | — |
| <5 | 39 (5.7) | 645 (94.3) | 0.51 (0.34-0.74) | <.001 |
| 5-12 | 47 (6.2) | 712 (93.8) | 0.55 (0.38-0.79) | .001 |
| 13-18 | 42 (6.7) | 582 (93.3) | 0.60 (0.41-0.88) | .009 |
| 19-22 | 25 (6.4) | 368 (93.6) | 0.57 (0.35-0.89) | .02 |
| >22 | 65 (4.6) | 1337 (95.4) | 0.41 (0.29-0.57) | <.001 |
| Missing | 7 (5.9) | 112 (94.1) | — | — |
| Specialty | | | | |
| Anesthesiology | 15 (6.5) | 215 (93.5) | 0.92 (0.47-1.74) | .79 |
| Dermatology | 7 (5.8) | 113 (94.2) | 0.81 (0.32-1.82) | .64 |
| Emergency medicine | 21 (8.1) | 238 (91.9) | 1.16 (0.63-2.09) | .63 |
| Family medicine | 31 (8.3) | 343 (91.7) | 1.19 (0.69-2.04) | .54 |
| General surgery | 10 (6.9) | 135 (93.1) | 0.97 (0.44-2.00) | .94 |
| General surgery subspecialty | 16 (4.5) | 340 (95.5) | 0.62 (0.32-1.15) | .14 |
| Internal medicine—general | 27 (7.1) | 354 (92.9) | 1.0 (Reference) | — |
| Internal medicine subspecialty | 27 (4.6) | 557 (95.4) | 0.64 (0.37-1.11) | .11 |
| Neurology | 13 (7.7) | 155 (92.3) | 1.10 (0.54-2.15) | .79 |
| Neurosurgery | 3 (5.0) | 57 (95.0) | 0.69 (0.16-2.04) | .55 |
| Obstetrics and gynecology | 14 (8.0) | 161 (92.0) | 1.14 (0.57-2.20) | .70 |
| Ophthalmology | 7 (5.4) | 122 (94.6) | 0.75 (0.30-1.68) | .52 |
| Orthopedic surgery | 12 (4.8) | 236 (95.2) | 0.67 (0.32-1.31) | .26 |
| Otolaryngology | 4 (9.5) | 38 (90.5) | 1.38 (0.39-3.77) | .57 |
| Other | 13 (9.9) | 118 (90.1) | 1.44 (0.70-2.84) | .30 |
| Pathology | 9 (6.5) | 130 (93.5) | 0.91 (0.39-1.91) | .81 |
| Pediatrics—general | 14 (5.8) | 228 (94.2) | 0.81 (0.40-1.54) | .52 |
| Pediatric subspecialty | 9 (4.4) | 197 (95.6) | 0.60 (0.26-1.25) | .19 |

*Continued on next page*

**TABLE 3. Continued**

| | SI | | Unadjusted odds ratio[c] (95% CI) | *P* value |
|---|---|---|---|---|
| | Yes (n=316) | No (n=4517) | | |
| Specialty, continued | | | | |
| Physical medicine and rehabilitation | 5 (4.3) | 112 (95.7) | 0.59 (0.20-1.44) | .28 |
| Preventive medicine/occupational medicine | 1 (3.8) | 25 (96.2) | 0.52 (0.03-2.63) | .53 |
| Psychiatry | 35 (8.7) | 366 (91.3) | 1.25 (0.75-2.13) | .40 |
| Radiation oncology | 2 (5.4) | 35 (94.6) | 0.75 (0.12-2.65) | .70 |
| Radiology | 17 (8.8) | 177 (91.2) | 1.26 (0.66-2.35) | .48 |
| Urology | 2 (6.5) | 29 (93.5) | 0.90 (0.14-3.23) | .89 |
| Missing | 2 (5.3) | 36 (94.7) | — | — |
| Years in practice | | | | |
| Median (IQR) | 17 (7-25) | 20 (8-30) | 0.98 (0.97-0.99) | <.001 |
| <5 | 49 (7.1) | 639 (92.9) | 1.0 (Reference) | — |
| 5-<10 | 56 (8.8) | 578 (91.2) | 1.26 (0.85-1.89) | .25 |
| 10-<20 | 72 (6.8) | 993 (93.2) | 0.95 (0.65-1.38) | .77 |
| 20-<30 | 83 (7.1) | 1081 (92.9) | 1.00 (0.70-1.45) | >.99 |
| ≥30 | 53 (4.2) | 1195 (95.8) | 0.58 (0.39-0.87) | .007 |
| Missing | 3 (8.8) | 31 (91.2) | — | — |
| Hours worked per week | | | | |
| Median (IQR) | 50 (40-60) | 50 (40-60) | 1.00 (1.00-1.01) | .29 |
| <40 | 56 (6.5) | 812 (93.5) | 1.0 (Reference) | — |
| 40-49 | 52 (5.3) | 933 (94.7) | 0.81 (0.55-1.19) | .28 |
| 50-59 | 79 (6.8) | 1088 (93.2) | 1.05 (0.74-1.51) | .78 |
| 60-69 | 68 (6.6) | 955 (93.4) | 1.03 (0.72-1.49) | .86 |
| 70-79 | 27 (7.4) | 337 (92.6) | 1.16 (0.71-1.85) | .54 |
| >80 | 30 (8.6) | 320 (91.4) | 1.36 (0.85-2.14) | .19 |
| Missing | 4 (5.3) | 72 (94.7) | — | — |
| Nights on call per week | | | | |
| Median (IQR) | 1 (0-3) | 1 (0-2) | 1.02 (0.97-1.08) | .35 |
| 0 | 120 (7.1) | 1575 (92.9) | 1.0 (Reference) | — |
| 1 | 62 (5.4) | 1079 (94.6) | 0.75 (0.55-1.03) | .08 |
| 2+ | 125 (7.0) | 1669 (93.0) | 0.98 (0.76-1.28) | .90 |
| Missing | 9 (4.4) | 194 (95.6) | — | — |
| Primary practice setting | | | | |
| Private practice | 154 (6.6) | 2173 (93.4) | 1.0 (Reference) | — |
| Academic medical center | 75 (5.8) | 1223 (94.2) | 0.87 (0.65-1.15) | .32 |
| Veterans hospital | 10 (9.8) | 92 (90.2) | 1.53 (0.74-2.87) | .21 |
| Active military practice | 6 (11.5) | 46 (88.5) | 1.84 (0.70-4.06) | .17 |
| Not in practice or retired | 7 (5.7) | 116 (94.3) | 0.85 (0.36-1.73) | .69 |
| Other | 59 (6.6) | 841 (93.4) | 0.99 (0.72-1.34) | .95 |
| Missing | 5 (16.1) | 26 (83.9) | — | — |
| Self-perceived medical error last 3 months | | | | |
| No | 243 (5.6) | 4117 (94.4) | 1.0 (Reference) | — |
| Yes | 72 (15.6) | 389 (84.4) | 3.14 (2.35-4.14) | <.001 |
| Missing | 1 (8.3) | 11 (91.7) | — | — |
| Medical malpractice suit in the last 2 years | | | | |
| No | 284 (6.5) | 4091 (93.5) | 1.0 (Reference) | — |
| Yes | 30 (6.7) | 421 (93.3) | 1.03 (0.68-1.49) | .90 |
| Missing | 2 (28.6) | 5 (71.4) | — | — |

[a]IQR, interquartile range; SI, suicidal ideation.

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

[c]Odds ratio for risk for SI in the categorical group relative to the reference group. If there was >1 comparison group (eg, specialty), a reference group (ie, general surgeons) was selected with which all other groups were compared.



Mayo Clin Proc. ■ August 2021;96(8):2067-2080 ■ https://doi.org/10.1016/j.mayocp.2021.01.033
www.mayoclinicproceedings.org

**TABLE 4. Distress in Physicians With and Without SI in the Last 12 Months[a,b]**

| | SI (n=316) | No SI (n=4517) | Effect size[c] | *P* value |
|---|---|---|---|---|
| Burnout | | | | |
| Emotional exhaustion score | 34.83±12.20 | 22.51±12.90 | 0.96 | <.001 |
| Depersonalization score | 11.52±7.70 | 6.54±6.31 | 0.78 | <.001 |
| Overall burnout | | | | |
| No | 65 (2.4) | 2610 (97.6) | — | — |
| Yes | 246 (11.7) | 1858 (88.3) | — | <.001 |
| Missing | 5 | 49 | — | — |
| Depression symptoms | | | | |
| Screen negative | 38 (1.4) | 2774 (98.6) | — | — |
| Screen positive | 278 (13.8) | 1732 (86.2) | — | <.001 |
| Missing | 0 | 11 | — | — |
| Self-valuation score[d] | 3.03±2.02 | 4.96±2.33 | −0.84 | <.001 |

[a]SI, suicidal ideation.
[b]Values are reported as mean ± standard deviation or number (percentage).
[c]Cohen d.
[d]Among individuals in subsurvey; scale of 0 to 10.

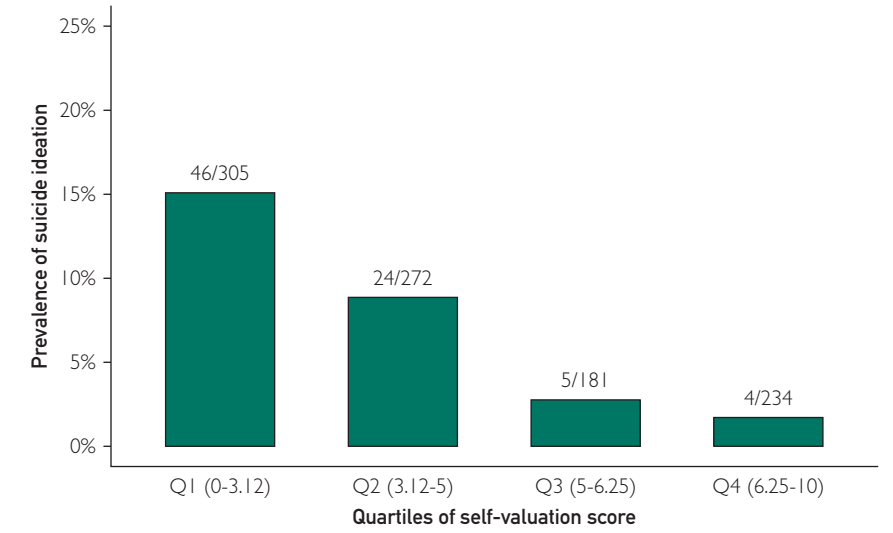
response relationship was observed between self-valuation scores and SI, with the prevalence of SI increasing as self-valuation scores decreased. Previous studies have demonstrated that physicians have lower self-valuation scores than the general US working population, which may be a partial explanation for the increased rates of SI in physicians.[48]

Collectively, all of these findings suggest an urgent need to address the factors in the practice environment that contribute to physician distress[50-52] as well as to provide increased access to emotional support for physicians in distress. Such efforts must be combined with holistic strategies to reduce the stigma associated with accessing help,[23-26] including eliminating the concern that seeking help will have an impact on a physician's license to practice.[26-28] Furthermore, they suggest that comprehensive efforts designed to specifically cultivate self-valuation among medical students, residents, and physicians may be a worthwhile approach to preemptively reduce risk as well as to mitigate the adverse impact of medical errors. The need for these efforts is likely to be more acute than ever, given the impact of the COVID-19 pandemic on the mental health of health care workers.[53,54] The widespread awareness of the psychological impact of the COVID-19 pandemic on health care workers may offer the opportunity to normalize physicians' help seeking for occupational distress.[55-57]

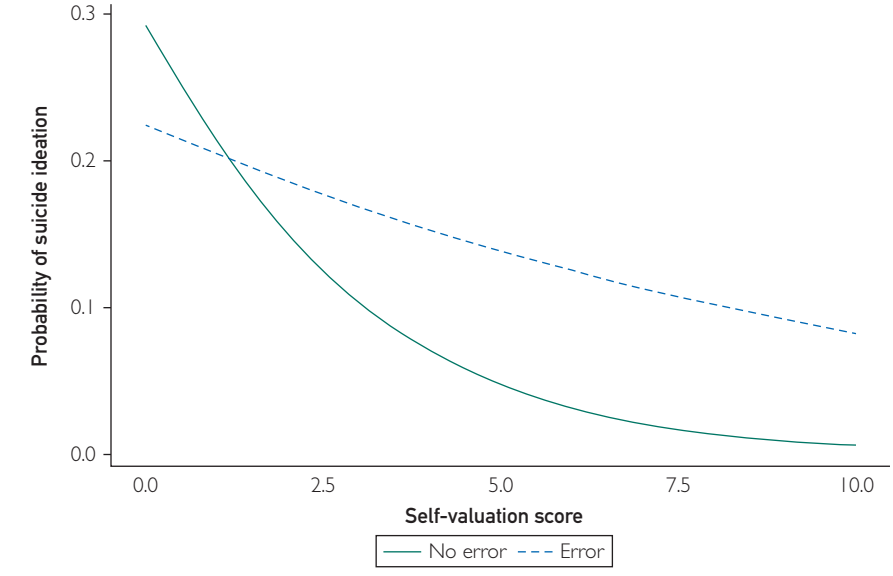
Our study is subject to limitations. First, although secondary surveys of nonresponders suggest that participants were representative of US physicians, the survey participation rate was low. Second, whereas we assessed a number of personal and professional factors (eg, medical errors and malpractice suits) that could contribute to suicidal thoughts, we did not assess all factors. Third, our surveys of physicians and workers in other fields were conducted in 2017 and do not account for the impact of the COVID-19 pandemic. Because the impact of the pandemic on health care professionals and the general population may differ, updated studies will be important.

## CONCLUSION

In this large national study conducted before the COVID-19 pandemic, roughly 7% of US physicians had thoughts of taking their own life in the last year. Suicidal ideation was more common among physicians than among workers in other fields. Although physicians were more likely than workers




A




B

**FIGURE.** Relationship between self-valuation, suicidal ideation, and medical errors. A, Relationship between self-valuation score (x-axis; higher score favorable) and prevalence of suicidal ideation (y-axis) within the previous year. The illustration shows that the prevalence of suicidal ideation decreases with each quartile increase in self-valuation ($P<.001$). The numeric values in parentheses on the x-axis indicate the upper and lower bound for each quartile. B, Relationship between self-valuation, errors, and suicidal ideation. This interaction plot of the logistic regression shows that increasing self-valuation (x-axis; higher score favorable) is associated with lower odds of suicidal ideation (y-axis) among physicians independent of whether physicians reported a recent medical error, but the benefit of self-valuation appeared to be attenuated among physicians reporting an error.

in other fields to report that they would seek help for serious emotional problems, 35% of physicians with SI indicated that they would probably not seek help. Comprehensive efforts are needed to increase access to emotional support for physicians, to reduce



Mayo Clin Proc. ■ August 2021;96(8):2067-2080 ■ https://doi.org/10.1016/j.mayocp.2021.01.033
www.mayoclinicproceedings.org

the stigma associated with seeking help, and to cultivate self-valuation among medical students, residents, and physicians.

## 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:** **MBI** = Maslach Burnout Inventory; **OR** = odds ratio; **SI** = suicidal ideation

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

**Potential Competing Interests:** Drs Shanafelt and Dyrbye 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), and Dr Shanafelt is co-inventor of the Participatory Management Leadership 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. None of these instruments were used in this study.

**Correspondence:** Address to Tait D. Shanafelt, MD, Professor of Medicine, Department of Internal Medicine, 500 Pasteur Dr, Stanford, CA 94305 (tshana@stanford.edu; Twitter: @StanfordWellMD).

**ORCID**

Tait D. Shanafelt: https://orcid.org/0000-0002-7106-5202; Lotte N. Dyrbye: https://orcid.org/0000-0002-7820-704X; Colin P. West: https://orcid.org/0000-0003-1628-5023; Christine Sinsky: https://orcid.org/0000-0003-1101-5761; Mickey Trockel: https://orcid.org/0000-0001-7191-5791

## REFERENCES

1. Center C, Davis M, Detre T, et al. Confronting depression and suicide in physicians: a consensus statement. *JAMA*. 2003;289(23):3161-3166.
2. Lindeman S, Laara E, Hakko H, Lonnqvist J. A systematic review on gender-specific suicide mortality in medical doctors. *Br J Psychiatry*. 1996;168(3):274-279.
3. Schernhammer E. Taking their own lives—the high rate of physician suicide. *N Engl J Med*. 2005;352(24):2473-2476.
4. Schernhammer ES, Colditz GA. Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). *Am J Psychiatry*. 2004;161(12):2295-2302.
5. Gold KJ, Sen A, Schwenk TL. Details on suicide among US physicians: data from the National Violent Death Reporting System. *Gen Hosp Psychiatry*. 2013;35(1):45-49.
6. Shanafelt TD, Balch C, Dyrbye LN, et al. Special report: suicidal ideation among American surgeons. *Arch Surg*. 2011;146(1):54-62.
7. 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.
8. 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.
9. 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.
10. 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.
11. Bilimoria KY, Chung JW, Hedges LV, et al. National cluster-randomized trial of duty-hour flexibility in surgical training. *N Engl J Med*. 2016;374(8):713-727.
12. Desai SV, Asch DA, Bellini LM, et al. Education outcomes in a duty-hour flexibility trial in internal medicine. *N Engl J Med*. 2018;378(16):1494-1508.
13. 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.
14. Shanafelt TD, Hasan O, Dyrbye LN, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014 [erratum appears in *Mayo Clin Proc*. 2016;91(2):276]. *Mayo Clin Proc*. 2015;90(12):1600-1613.
15. Shanafelt TD, West CP, Sinsky C, et al. Changes in burnout and satisfaction with work-life integration in physicians and the general US working population between 2011 and 2017. *Mayo Clin Proc*. 2019;94(9):1681-1694.
16. Shanafelt TD, Sinsky C, Dyrbye LN, Trockel M, West CP. Burnout among physicians compared with individuals with a professional or doctoral degree in a field outside of medicine. *Mayo Clin Proc*. 2019;94(3):549-551.
17. Dyrbye LN, Thomas MR, Massie FS, et al. Burnout and suicidal ideation among U.S. medical students. *Ann Intern Med*. 2008;149(5):334-341.
18. van der Heijden F, Dillingh G, Bakker A, Prins J. Suicidal thoughts among medical residents with burnout. *Arch Suicide Res*. 2008;12(4):344-346.
19. Menon NK, Shanafelt TD, Sinsky CA, et al. Association of physician burnout with suicidal ideation and medical errors. *JAMA Netw Open*. 2020;3(12):e2028780.
20. Tawfik D, Profit J, Morgenthaler TI, et al. Physician burnout, well-being, and work-unit safety grades in relation to reported medical errors. *Mayo Clin Proc*. 2018;93(11):1571-1580.
21. Balch CM, Oreskovich MR, Dyrbye LN, et al. Personal consequences of malpractice lawsuits on American surgeons. *J Am Coll Surg*. 2011;213(5):657-667.
22. Hawton K, Malmberg A, Simkin S. Suicide in doctors. A psychological autopsy study. *J Psychosom Res*. 2004;57(1):1-4.
23. Schwenk TL, Davis L, Wimsatt LA. Depression, stigma, and suicidal ideation in medical students. *JAMA*. 2010;304(11):1181-1190.
24. Guille C, Speller H, Laff R, Epperson CN, Sen S. Utilization and barriers to mental health services among depressed medical interns: a prospective multisite study. *J Grad Med Educ*. 2010;2(2):210-214.
25. Dyrbye LN, Eacker A, Durning SJ, et al. The impact of stigma and personal experiences on the help-seeking behaviors of medical students with burnout. *Acad Med*. 2015;90(7):961-969.
26. Gold KJ, Andrew LB, Goldman EB, Schwenk TL. I would never want to have a mental health diagnosis on my record": a survey of female physicians on mental health diagnosis, treatment, and reporting. *Gen Hosp Psychiatry*. 2016;43:51-57.
27. Miles SH. A piece of my mind. A challenge to licensing boards: the stigma of mental illness. *JAMA*. 1998;280(10):865.

28. Dyrbye LN, West CP, Sinsky CA, Goeders LE, Satele DV, Shanafelt TD. Medical licensure questions and physician reluctance to seek care for mental health conditions. *Mayo Clin Proc*. 2017;92(10):1486-1493.
29. Gabbard GO. The role of compulsiveness in the normal physician. *JAMA*. 1985;254(20):2926-2929.
30. Blum LD. Physicians' goodness and guilt-emotional challenges of practicing medicine. *JAMA Intern Med*. 2019;179(5):607-608.
31. Trockel MT, Hamidi MS, Menon NK, et al. Self-valuation: attending to the most important instrument in the practice of medicine. *Mayo Clin Proc*. 2019;94(10):2022-2031.
32. Maslach C, Jackson S, Leiter M. *Maslach Burnout Inventory Manual*. 3rd ed. Palo Alto, CA: Consulting Psychologists Press; 1996.
33. 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.
34. Leiter M, Durup J. The discriminant validity of burnout and depression: a confirmatory factor analytic study. *Anxiety Stress Coping*. 1994;7(4):357-373.
35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.
42. Crosby AE, Cheltenham MP, Sacks JJ. Incidence of suicidal ideation and behavior in the United States, 1994. *Suicide Life Threat Behav*. 1999;29(2):131-140.
43. Cooper-Patrick L, Crum RM, Ford DE. Identifying suicidal ideation in general medical patients. *JAMA*. 1994;272(22):1757-1762.
44. Mojtabai R, Evans-Lacko S, Schomerus G, Thornicroft G. Attitudes toward mental health help seeking as predictors of future help-seeking behavior and use of mental health treatments. *Psychiatr Serv*. 2016;67(6):650-657.
45. 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.
46. 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.
47. Shanafelt TD, Balch CM, Bechamps G, et al. Burnout and medical errors among American surgeons. *Ann Surg*. 2010;251(6):995-1000.
48. Trockel M, Sinsky C, West CP, et al. Self-valuation challenges in the culture and practice of medicine and physician well-being [published online ahead of print June 10, 2021]. *Mayo Clin Proc*. https://doi.org/10.1016/j.mayocp.2020.12.032.
49. Shanafelt TD, Makowski M, Wang H, et al. Association of burnout, professional fulfillment, and self-care practices of physician leaders with their independently rated leadership effectiveness [erratum appears in *JAMA Netw Open*. 2020;3(9):e2021812]. *JAMA Open*. 2020;3(6):e207961.
50. National Academies of Sciences. *Engineering, and Medicine. Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-being*. Washington, DC: The National Academies Press; 2019.
51. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc*. 2017;92(1):129-146.
52. West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences and solutions. *J Intern Med*. 2018;283(6):516-529.
53. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: a systematic review and meta-analysis [erratum in *Brain Behav Immun*. 2021;92:245. *Brain Behav Immun*. 2020;88:901-907.
54. Knoll C, Watkins A, Rothfeld M. *"I couldn't do anything": the virus and an E.R. doctor's suicide*. The New York Times July 11, 2020.
55. Kelker H, Yoder K, Musey P, et al. Longitudinal prospective study of emergency medicine provider wellness across ten academic and community hospitals during the initial surge of the COVID-19 pandemic. *Res Sq*. 2020 Oct 15. rs.3.rs-87786.
56. Krystal JH. Responding to the hidden pandemic for healthcare workers: stress [erratum appears in *Nat Med*. 2020;26(12):1951]. *Nat Med*. 2020;26(5):639.
57. Bohlken J, Schomig F, Lemke MR, Pumberger M, Riedel-Heller SG. [COVID-19 pandemic: stress experience of healthcare workers—a short current review]. *Psychiatr Prax*. 2020;47(4):190-197.