

Work-Family Conflict and the Sex Difference in Depression Among Training Physicians

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← Invited Commentary

IMPORTANCE Depression is common among training physicians and may disproportionately affect women. The identification of modifiable risk factors is key to reducing this disease burden and its negative impact on patient care and physician career attrition.

OBJECTIVE To determine the presence and magnitude of a sex difference in depressive symptoms and work-family conflict among training physicians; and if work-family conflict impacts the sex difference in depressive symptoms among training physicians.

DESIGN, SETTING, AND PARTICIPANTS A prospective longitudinal cohort study of medical internship in the United States during the 2015 to 2016 academic year in which 3121 interns were recruited across all specialties from 44 medical institutions.

MAIN OUTCOMES AND MEASURES Prior to and during their internship year, participants reported the degree to which work responsibilities interfered with family life using the Work Family Conflict Scale and depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9).

RESULTS Mean (SD) participant age was 27.5 (2.7) years, and 1571 participants (49.7%) were women. Both men and women experienced a marked increase in depressive symptoms during their internship year, with the increase being statistically significantly greater for women (men: mean increase in PHQ-9, 2.50; 95% CI, 2.26-2.73 vs women: mean increase, 3.20; 95% CI, 2.97-3.43). When work-family conflict was accounted for, the sex disparity in the increase in depressive symptoms decreased by 36%.

CONCLUSIONS AND RELEVANCE Our study demonstrates that depressive symptoms increase substantially during the internship year for men and women, but that this increase is greater for women. The study also identifies work-family conflict as an important potentially modifiable factor that is associated with elevated depressive symptoms in training physicians. Systemic modifications to alleviate conflict between work and family life may improve physician mental health and reduce the disproportionate depression disease burden for female physicians. Given that depression among physicians is associated with poor patient care and career attrition, efforts to alleviate depression among physicians has the potential to reduce the negative consequences associated with this disease.

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JAMA Intern Med. doi:10.1001/jamainternmed.2017.5138
Published online October 30, 2017.

Depression is common among training physicians, with 25% to 30% of trainees experiencing elevated depressive symptoms.¹ In addition to the individual disease burden associated with depression, depression among physicians in training is associated with poor quality of patient care, medical errors, and career attrition.²⁻⁵

The burden of depression among physicians may fall disproportionately on women.⁶⁻⁸ A subset of studies^{9,10} investigating depression among training physicians have found higher rates among female physicians, but the majority of studies^{11,12} have not investigated sex differences in depression. Furthermore, specific factors that explain sex differences in depression have not been identified.

One factor that may affect female and male physicians differently is work-family conflict, where work obligations negatively impact family roles. Despite the increased presence of women in the medical workforce, female physicians take on significantly more household and childcare duties than their male counterparts.¹³ Because of this unequal division of domestic labor, female physicians are more likely to report limitations in their career for family reasons.¹⁴ The competing, often incompatible, pressures associated with these work and family responsibilities can result in the experience of work-family conflict.

For female physicians, work-family conflict is significantly correlated with burnout^{15,16} and emotional exhaustion.^{17,18} These findings suggest that understanding work-family conflict may be important in understanding sex differences in physician mental health.

With long work hours and a low degree of job autonomy and control, medical internship is a particularly challenging time for balancing work and family responsibilities. To our knowledge, no studies have yet examined whether sex differences in work-family conflict exist among training physicians, nor to what extent these differences contribute to a sex disparity in depressive symptoms. The aims of this study are to: (1) determine the presence and magnitude of a sex difference in depressive symptoms and work-family conflict; and (2) determine if work-family conflict impacts any sex difference in depressive symptoms among training physicians.

Methods

Study Design and Participants

Following the 2015 to 2016 national residency match, email addresses for medical students matching into residency programs across all specialties throughout the United States were gathered from program directors, medical school administrators, and publicly available databases (Box). Eligible participants, including 5150 medical students, were sent an email 2 months prior to commencing internship inviting them to participate in the study. Of 5150 invitees, 3121 (61%) agreed to participate and were asked to complete online assessments 2 months prior to the start of the internship year and at 6 months into the internship year. The institutional review board at the University of Michigan approved the study and granted a waiver of signed informed consent. Participants were provided a \$25

Key Points

Questions Does depression disproportionately affect female physicians compared with male physicians during the internship year, and does work-family conflict impact the sex difference in depressive symptoms among training physicians?

Findings Women experience a greater increase in depressive symptoms compared with men during their internship year; however, when work-family conflict is accounted for, the sex disparity in depressive symptoms is reduced by more than one-third (36%).

Meaning Systemic modifications to alleviate conflict between work and family life may improve physician mental health and, in turn, improve patient care and reduce physician career attrition.

gift certificate after completing the baseline survey and a \$25 gift certificate after completing the follow-up survey.

Data Collection

All data were collected through secure online surveys using Qualtrics survey software. Potential participants were emailed a brief description of the study with a link to the online informed consent where they could “agree” or “not agree” to take part in the study. Those who agreed were directed to the baseline survey. No further contact was made if the individual declined participation. If no response was provided to the online informed consent, 2 reminder emails were sent 1 week apart. One final email reminder was sent 2 weeks prior to the start of the internship year if there was no response to the second email reminder. An email with a link to the follow-up survey was sent to consenting participants 6 months into the internship year. If the survey was not submitted, the participant received 2 reminder emails 1 week apart.

Survey data was coded with a unique nondecodable identification and no other identifying information. The link between the participant’s email address and identification was kept in a separate password-protected electronic file that could only be accessed by study personnel so that the follow-up survey could be sent. Following completion of the study, the link between an individual’s email address and nonidentifiable code was destroyed.

Initial Assessment

Prior to the start of the internship year, participants reported general demographic information (age, sex, ethnicity, number of children, relationship status), depressive symptoms through the Patient Health Questionnaire (PHQ-9), and conflict between work and family roles through the Work and Family Conflict Scale.

The PHQ-9 is the self-report component of the PRIME-MD (Primary Care Evaluation of Mental Disorders) inventory designed to screen for depressive symptoms. For each of the 9 DSM-V (*Diagnostic and Statistical Manual of Mental Disorders* [Fifth Edition]) depressive symptoms, participants indicated whether, during the previous 2 weeks, the symptom had bothered them “not at all,” for “several days,” for “more than half the days,” or “nearly every day.” Each item yields a score

Box. Intern Recruitment Institutions

Bridgeport Hospital
 Brown University
 Cleveland Clinic
 East Carolina University
 Emory University
 Greenwich Hospital
 Indiana University-Purdue University Indianapolis
 Massachusetts General Hospital
 Mayo Clinic
 Medical University of South Carolina
 Mercer University
 Northwestern University
 Ohio State University
 Pennsylvania State University
 Southern Illinois University
 St George's University
 SUNY Upstate Medical University
 Tulane University
 University at Buffalo
 University of Cincinnati
 University of Colorado, Denver
 University of Connecticut
 University of Illinois, Chicago
 University of Illinois, Rockford
 University of Iowa
 University of Kansas
 University of Massachusetts
 University of Michigan
 University of Minnesota
 University of Missouri, Kansas City
 University of North Carolina
 University of South Alabama
 University of South Carolina
 University of South Florida
 University of Southern California
 University of Texas, Galveston
 University of Texas, Houston
 University of Texas Southwestern
 University of Vermont
 University of Virginia
 Vanderbilt University
 Virginia Commonwealth University
 Washington University St Louis
 Yale University

of 0 to 3, so that the PHQ-9 total score ranges from 0 to 27. A score of 10 or greater on the PHQ-9 has a sensitivity of 88% and a specificity of 88% for the diagnosis of major depression.¹⁹

Diagnostic validity of the PHQ-9 is comparable to clinician-administered assessments.²⁰

The Work and Family Conflict Scale was designed to evaluate potential aspects of work and family conflict based on strain, time, and behavioral factors. "Family" is defined from the participant's perspective. The Work and Family Conflict Scale measures the conflict that arises when work responsibilities undesirably affect family roles and includes 5 items. Respondents rate their level of agreement with each item on a 7-point Likert scale from 1 (very strongly disagree) to 7 (very strongly agree). Scores can range from 5 to 35 points. The Work and Family Conflict Scale has strong concurrent validity and demonstrates high internal consistency (>.90) and reliability.²¹

Six-Month Assessment

Participants were contacted via email 6 months into their internship year and asked to complete an online survey including the PHQ-9 and the Work and Family Conflict Scale.

Statistical Analysis

Baseline differences between men and women and between responders and nonresponders to the 6-month survey with respect to demographics and history of depression were assessed using χ^2 tests and independent sample *t* tests. Changes in work-family conflict scores over time were assessed using paired *t* tests, and sex differences in change in work-family conflict scores were assessed using independent sample *t* tests. A Pearson correlation was used to quantify the association between changes in work-family conflict and depression symptoms.

To investigate the extent to which depressive symptoms changed over the first 6 months of the internship year and whether sex differences exist in these changes, 2 general linear mixed models were constructed. These models are ideal for modeling longitudinal data, as they are able to incorporate all available data, even for participants who only responded to the first (preinternship) survey. First, a model was fit on the PHQ-9 scores as the dependent variable, using sex, time, and the interaction between sex and time as independent variables, along with age, relationship status (engaged or married vs other), children (yes/no), and history of depression; this model was referred to as the minimally adjusted model, or model 1. The model incorporated random intercepts for participants to account for the fact that an individual participant's responses over time tend to be correlated. Next, to determine the extent to which sex differences were confounded by work-family conflict, a model was constructed that was similar to the minimally adjusted model but also included the time-varying covariates of work-family conflict score and all 2- and 3-way interaction terms involving work-family conflict score with time and sex. This second model was referred to as the fully adjusted model, or model 2. Comparing the sex difference estimates in the minimally adjusted and fully adjusted models helped provide a sense of the extent to which the sex differences observed over time were confounded by changes in work-family conflict. The fully adjusted model was also used to illustrate how PHQ-9 scores changed among participants whose work-family conflict scores increased dramatically during internship (ie, from the 25th per-

Table 1. Medical and Surgical Specialties of Interns

Specialty	Participants, No.
Anesthesiology	124
Child neurology	18
Dermatology	49
Emergency medicine	235
ENT/otolaryngology	43
Family medicine	240
General surgery	252
Internal medicine	771
Other	22
Pediatrics	71
Primary care	32
Neurological surgery	25
Neurology	60
OB/GYN	206
Ophthalmology	20
Orthopaedic surgery	100
Pediatrics	390
Plastic surgery	26
Psychiatry	155
Radiology	29
Surgery-other	16
Transitional	65
Urology	10
Other	17
Missing	145

Abbreviations: ENT, ear, nose, and throat; OB/GYN, obstetrics and gynecology.

centile, corresponding to a work-family conflict score of 15, to the 75th percentile, corresponding to a work-family conflict score of 23). All analyses were performed using SAS statistical software, version 9.4 (SAS Institute Inc).

Results

Students matching into 23 medical and surgical specialties at 341 US institutions completed the preinternship assessment (Table 1). Mean (SD) participant age was 27.5 (2.7) years, and 1571 participants (49.7%) were women. In comparison to women, men were more likely to be married or engaged (42.4% vs 36.7%; $P = .001$) and have children (9.8% vs 6.5%; $P = .001$). Women were more likely than men to report having a history of depression (49.3% vs 41.8%; $P < .001$) (Table 2). A total of 2108 participants (68%) completed the 6-month survey.

Compared with those who did not respond to the 6-month survey, responders were more likely to be women (51.7% vs 45.5%; $P = .001$) and be married or engaged (40.9% vs 36.9%; $P = .04$) but were not different with respect to age and were equally likely to have had children or have reported a history of depression. Preinternship work-family conflict scores were slightly lower among responders compared with nonresponders (mean [SD], 18.8 [5.5] vs 19.3 [5.4]; $P = .01$).

Sex Differences in Work-Family Conflict

Among responders to the 6-month survey, mean (SD) work-family conflict scores increased 19% from preinternship to month 6 of the internship year (from 18.78 [5.53] to 22.54 [5.59]; $P < .001$). Prior to the start of the internship year, there were no significant differences in mean (SD) work-family conflict scores between women and men (19.0 [5.4] vs 18.6 [5.7], respectively; $P = .08$); however, 6 months into the internship year, mean (SD) work-family conflict scores were modestly but significantly higher for women (22.8 [5.5]) compared with men (22.2 [5.7]) ($P = .01$). The average increases over time in work-family conflict scores were similar ($P = .4$) between women (increases of 3.9 ± 6.1 points) and men (increases of 3.7 ± 6.3 points).

Sex Differences in Changes in Depression Scores Over Time

Results of the minimally and fully adjusted general linear mixed models are presented in Table 3. The models demonstrate that preinternship depression scores were similar between men and women, with women's average scores just slightly higher than men's scores. For example, model 1 indicates that women's preinternship mean PHQ-9 depression scores were just 4% higher than men's (2.79 vs 2.68), and when work-family conflict is accounted for in model 2, this difference was essentially negligible, with women's adjusted mean scores just 2% higher (2.96 vs 2.91). For both men and women, depression symptoms increased substantially after 6 months of internship. Model 1 indicated that this increase was equivalent to 2.50 points (a 93% increase) on the PHQ-9 score among men, and 3.20 points (a 115% increase) among women. Increases in work-family conflict scores were statistically moderately correlated with increase in PHQ-9 depression scores ($\rho = 0.28$; $P < .001$). After adjusting for the potential confounding effect of changes in work-family conflict in model 2, the increases in PHQ-9 scores were slightly attenuated, with the percent increase among men and women being estimated to be 58% (1.69 to 2.91) and 72% (2.13 to 2.96), respectively. Next, both models indicated that the increases during the internship year in mean depression scores were significantly higher for women when compared with men. Specifically, the estimated sex-by-time interaction in model 1 indicated that the increase among women was 0.70 points higher (95% CI, 0.37-1.04) than the increase among men (3.20 vs 2.5; $P < .001$). Even after adjusting for changes in work-family conflict, the estimated sex-by-time interaction term in model 2 indicated that the increase in depression scores among women (2.13 points) was still significantly higher (ie, 0.45 points higher; 95% CI, 0.11-0.78; $P < .01$) than among men (1.69 points). By comparing the sex difference estimates (ie, the sex-by-time interaction terms) in models 1 and 2, adjusting for work-family conflict scores helped explain the sex difference in changes in depression scores; specifically, the estimated sex difference was 36% lower in model 2 (0.70 points vs 0.45 points).

The fully adjusted model also confirmed that increases in work-family conflict during internship corresponded to significant increases in PHQ-9 depression scores. Interestingly, women whose work-family conflict score increased from 15 to 23 (ie, from the baseline 25th percentile to the 75th percen-

Table 2. Sample Demographics at Baseline

Characteristic	No. (%)		P Value
	Men (n = 1550)	Women (n = 1571)	
Age, mean (SD), y	27.6 (2.9)	27.3 (2.5)	<.001
Married or engaged	665 (42.4)	566 (36.7)	.001
Have children	154 (9.8)	100 (6.5)	<.001
History of depression	656 (41.8)	764 (49.3)	<.001

Abbreviation: SD, standard deviation.

Table 3. Estimated Mean PHQ-9 Scores and 95% CIs Stratified by Sex and Time

Model	Men (n = 1550)			Women (n = 1571)			Sex Difference in Change (Women Change-Men Change)
	Preinternship	After 6 Months of Internship	Change	Preinternship	After 6 Months of Internship	Change	
Model 1 (minimally adjusted model) ^a	2.68 (2.50-2.85)	5.17 (4.95-5.39)	+2.50 (2.26-2.73)	2.79 (2.60-2.97)	5.98 (5.77-6.19)	+3.20 (2.97-3.43)	0.70 (0.37-1.04)
Model 2 (fully adjusted model) ^a	2.91 (2.74-3.08)	4.59 (4.38-4.80)	+1.69 (1.45-1.92)	2.96 (2.79-3.13)	5.09 (4.87-5.30)	+2.13 (1.89-2.37)	0.45 (0.11-0.78)

^a Model 1 uses sex, time, and the interaction between sex and time as independent variables, along with age, relationship status, children, and history of depression. Model 2 is similar but also includes time-varying effects associated with work-family conflict.

tile) had, on average, a 3.8-unit corresponding increase in their PHQ-9 score. On the other hand, men whose work-family conflict score increased to a similar degree had, on average, only a 3.3-unit increase in their PHQ-9 score. This interaction between sex, time, and work-family conflict scores, however, was moderately significant, providing further justification for its inclusion in the fully adjusted model.

Sensitivity Analysis

Sensitivity analyses of the mixed models revealed that having a partner and/or children did not impact the magnitude of the relationship between work-family conflict and the sex difference in depressive symptoms.

Discussion

This study is the first that we know of to prospectively investigate sex differences in depressive symptoms and how work-family conflict may impact the sex disparity in depressive symptoms during the internship year. Prior to the start of their internship year, men and women experience similar levels of depressive symptoms and work-family conflict. For men and women, depressive symptoms and work-family conflict increase over the first 6 months of the internship year, and work-family conflict is associated with elevated depressive symptoms. Women, in comparison with men, experience a greater increase in depressive symptoms during the internship year; however, when work-family conflict is accounted for, the sex disparity in depressive symptoms is reduced by more than one-third (36%). These findings highlight the positive association between work-family conflict and depressive symptoms and may partly explain the sex disparity in depressive symptoms among training physicians.

Studies explicitly examining sex differences in work-family conflict have produced contradictory findings. Some studies^{18,22,23} identify greater work-family conflict among female physicians compared with male physicians, while other

studies²⁴⁻²⁶ have found no sex effects. Differences in study findings may be due to variation in study design, geographic region, or stage of career. Only 1 prior study¹⁸ that we know of has examined the role of work-family conflict among physicians practicing in the United States. This cross-sectional study¹⁸ indicated that female surgeons experience greater conflict between work and family roles, which was associated with more burnout and depression compared with men. Our findings build on this work by prospectively demonstrating that sex differences in depressive symptoms emerge during the first 6 months of the internship year, and that work-family conflict is associated with higher levels of depressive symptoms, particularly for female physicians.

These findings suggest that changes to the medical system that reduce work-family conflict have the potential to reduce depression among physicians. Given the consequences of depression in physicians,^{1,6-9} any reduction in the depression burden could have broad benefits to both physicians and their patients. Suicide, the most tragic consequence of depression, is more common in physicians compared with the general population. Male physicians are 1.41 times and female physicians are 2.27 times more likely to die by suicide than their counterparts in the general population.⁸ Interventions that reduce depression and suicide among physicians are sorely needed.^{6-8,27}

Prior work suggests that both depression and work-family conflict can adversely impact physicians' careers. Depressed physicians are more likely to leave the medical profession, reduce work hours, and change their specialty.⁵ Work-family conflict among physicians correlates strongly with low job satisfaction and increased burnout, which, in turn, adversely impacts patient care and increases physicians' attrition from the workforce.^{15,16,28} Given that patients of female physicians have lower readmission and mortality rates than patients of male physicians,²⁹ efforts to reduce work-family conflict may support retention of women in medicine and improve patient outcomes. Further, the emergence of sex disparities in depression during the internship year may be one

reason why the representation of women decreases precipitously as physicians progress up the academic ladder from medical school (51%) to full-time faculty (38%) to full professor (21%), department chair (15%), and dean (16%).³⁰ Efforts to reduce work-family conflict have the potential to help with the retention and advancement of women in medicine as well as reduce depression among female physicians.

Pilot programs designed to ease work-family conflicts among physicians through providing free home-delivered meals, childcare, and housecleaning are in their infancy.³¹ Our findings suggest that these programs should be expanded in scope and number and that they should be rigorously tested to see if they not only reduce work-family conflict but also depression and its consequences, such as physician suicide, poor quality of patient care, medical errors, and career attrition.^{2-5,8}

Limitations

There are limitations to our study. Depressive symptoms were assessed through a self-report inventory rather than a diagnostic interview. We chose this method based on previous data demonstrating that anonymity is necessary to accurately ascertain depressive symptoms among medical professionals.³² Nonetheless, it would be important to validate these findings using in-person interviews. Self-reported rates of lifetime history of depression, as defined by the *DSM-V*, among female and male interns were 49.3% and 41.8%, respectively. These estimates are quite high and may reflect the limitations of self-

report assessments. Only 61.0% of invited interns agreed to take part in our study, and among those, 68.0% completed the follow-up assessment. While it is possible that the response pattern biases our results, we do not find substantial differences in demographic or mood-related variables between responders and nonresponders. Furthermore, our baseline and follow-up survey response rates are similar to or higher than those of prior studies^{3-5,11,15,18} of interns and residents.

Conclusions

Our study demonstrates that depressive symptoms increase substantially during the internship year for men and women, but that this increase is greater for women. The study also identifies work-family conflict as an important potentially modifiable factor associated with elevated depressive symptoms in training physicians. Interventions aimed at reducing work-family conflict may be an important step in reducing depressive symptoms in physicians. Medical internships were designed over 50 years ago, when aspiring physicians were predominately men and often without family responsibilities. Although women account for half of medical interns today, the fundamental structure and function of medical training has not changed.³³ More explicit consideration of work and family responsibilities may be helpful in constructing a medical education system that allows for rigorous medical training and promotes good mental health.

ARTICLE INFORMATION

Accepted for Publication: August 2, 2017.

Published Online: October 30, 2017.

doi:10.1001/jamainternmed.2017.5138

Author Contributions: Dr Guille had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Guille, Frank, Zhao, Sen. **Acquisition, analysis, or interpretation of data:** All authors.

Drafting of the manuscript: Guille, Frank, Zhao, Nietert.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Guille, Zhao, Kalmbach, Nietert, Mata.

Obtained funding: Sen.

Administrative, technical, or material support: Zhao, Frank.

Study supervision: Guille, Sen.

Conflict of Interest Disclosures: None reported.

Funding/Support: This work was funded by the National Institute on Drug Abuse (career development award No. 1K23DA039318-01), the National Institute of Mental Health (grant No. R01MH101459), and the National Center for Advancing Translational Sciences (grant No. U11-TRO01450).

Role of the Funder/Sponsor: The funders/sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review,

or approval of the manuscript; and decision to submit the manuscript for publication.

Additional Contributions: We would like to acknowledge and thank the interns taking part in this research. Without their efforts this study would not be possible.

REFERENCES

- Mata DA, Ramos MA, Bansal N, et al. Prevalence of depression and depressive symptoms among resident physicians: a systematic review and meta-analysis. *JAMA*. 2015;314(22):2373-2383.
- Fahrenkopf AM, Sectish TC, Barger LK, et al. Rates of medication errors among depressed and burnt out residents: prospective cohort study. *BMJ*. 2008;336(7642):488-491.
- 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.
- 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.
- Williams ES, Konrad TR, Scheckler WE, et al. Understanding physicians' intentions to withdraw from practice: the role of job satisfaction, job stress, mental and physical health. *Health Care Manage Rev*. 2001;26(1):7-19.
- Frank E, Dingle AD. Self-reported depression and suicide attempts among U.S. women physicians. *Am J Psychiatry*. 1999;156(12):1887-1894.
- Center C, Davis M, Detre T, et al. Confronting depression and suicide in physicians: a consensus statement. *JAMA*. 2003;289(23):3161-3166.
- Schernhammer ES, Colditz GA. Suicide rates among physicians: a quantitative and gender assessment (meta-analysis). *Am J Psychiatry*. 2004;161(12):2295-2302.
- Sen S, Kranzler HR, Krystal JH, et al. A prospective cohort study investigating factors associated with depression during medical internship. *Arch Gen Psychiatry*. 2010;67(6):557-565.
- Fried EI, Nesse RM, Zivin K, Guille C, Sen S. Depression is more than the sum score of its parts: individual DSM symptoms have different risk factors. *Psychol Med*. 2014;44(10):2067-2076.
- Bellini LM, Baime M, Shea JA. Variation of mood and empathy during internship. *JAMA*. 2002;287(23):3143-3146.
- Tyssen R, Røvik JO, Vaglum P, Grønbold NT, Ekeberg O. Help-seeking for mental health problems among young physicians: is it the most ill that seeks help?—A longitudinal and nationwide study. *Soc Psychiatry Psychiatr Epidemiol*. 2004;39(12):989-993.
- Jolly S, Griffith KA, DeCastro R, Stewart A, Ubel P, Jagsi R. Gender differences in time spent on parenting and domestic responsibilities by high-achieving young physician-researchers. *Ann Intern Med*. 2014;160(5):344-353.
- Sobecks NW, Justice AC, Hinze S, et al. When doctors marry doctors: a survey exploring the professional and family lives of young physicians. *Ann Intern Med*. 1999;130(4 Pt 1):312-319.

15. Adám S, Györfy Z, Susánszky E. Physician burnout in Hungary: a potential role for work-family conflict. *J Health Psychol*. 2008;13(7):847-856.
16. Langballe EM, Innstrand ST, Aasland OG, Falkum E. The predictive value of individual factors, work-related factors, and work-home interaction on burnout in female and male physicians: a longitudinal study. *Stress Health*. 2011;27(1):73-87.
17. Ahmad A. Work-family conflict among junior physicians: its mediating role in the relationship between role overload and emotional exhaustion. *J Soc Sci*. 2010;6(2):265-271.
18. Dyrbye LN, Shanafelt TD, Balch CM, Satele D, Sloan J, Freischlag J. Relationship between work-home conflicts and burnout among American surgeons: a comparison by sex. *Arch Surg*. 2011;146(2):211-217.
19. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001;16(9):606-613.
20. Spitzer RL, Kroenke K, Williams JB. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *JAMA*. 1999;282(18):1737-1744.
21. Haslam D, Filus A, Morawska A, Sanders MR, Fletcher R. The Work-Family Conflict Scale (WAFCS): development and initial validation of a self-report measure of work-family conflict for use with parents. *Child Psychiatry Hum Dev*. 2015;46(3):346-357.
22. Wallace JE, Lemaire J. On physician well being—you'll get by with a little help from your friends. *Soc Sci Med*. 2007;64(12):2565-2577. doi:10.1016/j.socscimed.2007.03.016
23. Adám S, Györfy Z, László K. High prevalence of job dissatisfaction among female physicians: work-family conflict as a potential stressor [in Hungarian]. *Orv Hetil*. 2009;150(31):1451-1456. doi:10.1556/OH.2009.28582
24. Fuss I, Nübling M, Hasselhorn HM, Schwappach D, Rieger MA. Working conditions and work-family conflict in German hospital physicians: psychosocial and organisational predictors and consequences. *BMC Public Health*. 2008;8:353.
25. Knecht M, Bauer GF, Klaghofer R, Buddeberg-Fischer B, Stamm M, Hämmig O. Work-life conflicts and health among Swiss physicians—in comparison with other university graduates and with the general Swiss working population. *Swiss Med Wkly*. 2010;140:w13063.
26. Mache S, Bernburg M, Vitzthum K, Groneberg DA, Klapp BF, Danzer G. Managing work-family conflict in the medical profession: working conditions and individual resources as related factors. *BMJ Open*. 2015;5(4):e006871. doi:10.1136/bmjopen-2014-006871
27. Mann JJ, Apter A, Bertolote J, et al. Suicide prevention strategies: a systematic review. *JAMA*. 2005;294(16):2064-2074.
28. Dumelow C, Littlejohns P, Griffiths S. Relation between a career and family life for English hospital consultants: qualitative, semistructured interview study. *BMJ*. 2000;320(7247):1437-1440.
29. Tsugawa Y, Jena AB, Figueroa JF, Orav EJ, Blumenthal DM, Jha AK. Comparison of hospital mortality and readmission rates for Medicare patients treated by male vs female physicians. *JAMA Intern Med*. 2017;177(2):206-213.
30. Carnes M, Morrissey C, Geller SE. Women's health and women's leadership in academic medicine: hitting the same glass ceiling? *J Womens Health (Larchmt)*. 2008;17(9):1453-1462.
31. Schulte B. Time in the bank: a Stanford plan to save doctors from burnout. *The Washington Post*. August 20, 2015. <https://www.washingtonpost.com/news/inspired-life/wp/2015/08/20/the-innovative-stanford-program-thats-saving-emergency-room-doctors-from-burnout/>. Accessed May 31, 2016.
32. Levine RE, Breitkopf CR, Sierles FS, Camp G. Complications associated with surveying medical student depression: the importance of anonymity. *Acad Psychiatry*. 2003;27(1):12-18.
33. Schwenk TL. Resident depression: the tip of a graduate medical education iceberg. *JAMA*. 2015;314(22):2357-2358.