

Risk and Resilience Factors Associated with Resident Burnout

Deanna Chaukos¹  · Emma Chad-Friedman¹ · Darshan H. Mehta¹ · Laura Byerly² ·
Alper Celik³ · Thomas H. McCoy Jr¹ · John W. Denninger¹

Received: 7 June 2016 / Accepted: 30 September 2016 / Published online: 27 December 2016
© Academic Psychiatry 2016

Abstract

Objective We investigated hypothesized risk and resilience factors and their association with burnout in first year medicine and psychiatry residents at an urban teaching hospital in order to help guide the development of interventions targeted at reducing burnout.

Methods We administered the Maslach Burnout Inventory (MBI), Perceived Stress Scale-10, Functional Assessment of Chronic Illness Therapy–Fatigue Scale, Penn State Worry Questionnaire, Patient Health Questionnaire-9 (depression symptoms), Revised Life Orientation Test (optimism), Self-Efficacy Questionnaire, Cognitive and Affective Mindfulness Scale, Interpersonal Reactivity Index Perspective-Taking Scale (empathy), and Measure of Current Status-Part A to first year medicine and psychiatry residents prior to initiation of clinical rotations in June.

Results The response rate was 91 % (68 of 75 residents). Nineteen respondents (28 %) met criteria for burnout as measured by the MBI. Residents with burnout scored higher on self-report measures assessing perceived stress (Cohen's $d=0.97$; $p=0.004$), fatigue ($d=0.79$; $p=0.018$), worry ($d=0.88$; $p=0.0009$), and depression symptoms ($d=0.84$; $p=0.035$) and scored lower on questionnaires assessing mindfulness ($d=-0.63$; $p=0.029$) and coping ability ($d=-0.79$; $p=0.003$).

Conclusions In a cross-sectional assessment using self-report measures, we found that nearly a third of first year residents prior to starting their internships experience burnout. They exhibit lower levels of mindfulness and coping skills and higher levels of depression symptoms, fatigue, worry, and stress. These preliminary findings should encourage programs to initiate and study curricula that combine mindfulness and self-awareness coping strategies to enhance or protect against burnout as well as cognitive behavioral coaching strategies to offset symptoms of burnout when present.

Keywords Residents: professional development · Resiliency · Resident burnout · Resident wellness

Burnout, the syndrome characterized by emotional exhaustion, depersonalization, and decreased sense of personal accomplishment [1], occurs in medical training more often than in age-matched non-medical peers [2], and is a widely recognized problem with long-lasting consequences on physicians' careers [3], the healthcare system, and patient care [4]. The learning environment has been shown to be the more potent contributor to resident burnout when compared to individual trainee characteristics [5]; however, burnout is not universal [6], and several studies have attempted to explore individual traits that may be correlated with vulnerability to or protection from burnout. One study of medical students found that those who reported positive perceptions of the learning climate, fewer stressful events, increased social supports, and less fatigue were more resilient to burnout [7]. A study of medicine residents found that calm personality style was inversely correlated with burnout; conversely, disorganized personality type was a possible risk factor [8]. In contrast to larger studies in medical students, this study found no correlation with social supports, financial debt, or psychiatric history.

✉ Deanna Chaukos
dchaukos@partners.org

¹ Massachusetts General Hospital, Boston, MA, USA

² University of California San Francisco, San Francisco, CA, USA

³ University of Massachusetts Medical School, Worcester, MA, USA

Several interventions have been developed and implemented to address physician distress based on models that aim to counteract burnout with resilience skills training (e.g., wellness programs that focus on mindfulness or other mind-body techniques [9], self-awareness [10, 11], empathy training [12], positive psychology approaches, and time management skills). However, to our knowledge, the association of characteristics typically thought to increase resilience (e.g., mindfulness, coping skills, self-efficacy, empathy, and optimism) with burnout has not been empirically investigated in residents. Consequently, our aim was to examine correlates of burnout prior to the start of residency in order to guide development and implementation of interventions to combat burnout and bolster wellbeing.

In prior work (focusing on medical students and practicing physicians), perceived stress [13], depression [14], fatigue [15], and worry [16] have been hypothesized to be risk factors for burnout; similarly, mindfulness [17], coping skills [18], self-efficacy [19], empathy [12], and optimism [20] have been hypothesized to be resilience factors (i.e., potentially protective factors). Using validated self-report measures, we sought to cross-sectionally characterize the association of these hypothesized factors with burnout in PGY1 medicine and psychiatry residents before the start of clinical rotations.

Methods

Setting and Participants

We conducted this cross-sectional study in PGY1 medicine and psychiatry residents at a large urban teaching hospital.

Data Collection and Instruments

The study was approved by the Partners Institutional Review Board, and all study participants provided written informed consent. All the participants were invited to complete a battery of questionnaires at residency orientation, including demographics. Questionnaires were administered electronically via the secure, web-based REDCap data capture tool [21] and completed before the start of clinical duties. The REDCap instrument required residents to complete all questions on each individual questionnaire, though entire questionnaires could be left blank.

The questionnaires were empirically validated instruments, which measured burnout, and the hypothesized risk and resilience factors. The Maslach Burnout Inventory-Human Services Survey (MBI) measures burnout on three subscales: emotional exhaustion (EE), depersonalization (DP), and low sense of personal accomplishment (PA) [22]. To characterize burnout, we used established cutoffs (EE >26, DP >9, and PA <34) to determine if a given resident met criteria for each

subscale. As is convention in studies of medical professionals [1], we defined burnout as meeting criteria on either the EE or DP subscales.

Hypothesized Risk Factors

The hypothesized risk factors were measured using the Perceived Stress Scale (PSS-10, 10 items, range 0–40, higher scores indicate higher stress), the Penn State Worry Questionnaire (PSWQ, 16 items, range 16–80, higher scores indicate more worry), the Patient Health Questionnaire (PHQ-9, 9 items, measures depression symptoms, range 0–27, scores >10 suggest clinical depression), and the Functional Assessment of Chronic Illness Therapy–Fatigue Scale (FACIT, range 0–52, higher scores indicate fatigue more likely to impact quality of life).

Hypothesized Resilience Factors

The hypothesized resilience factors were measured using the Revised Life Orientation Test (LOT-R, 10 items, range 0–24, higher scores indicate higher levels of optimism), the Self-Efficacy Questionnaire Scale (SEQS, 10 items, range 10–40, higher scores represent greater belief in one's ability to perform tasks), the Interpersonal Reactivity Index Perspective-Taking subscale (IRI-PT, measures empathy, range 0–28, higher scores convey a higher tendency to spontaneously adopt the psychological viewpoint of others), the Measure of Current Status-Part A (MOCS-A, 13 items, range 0–100, higher scores indicate greater ability to self-modulate stress), and the Cognitive and Affective Mindfulness Scale (CAMS-R, 12 items, range 12–48, higher scores signify higher levels of everyday mindfulness: attention, awareness, present-focus, and acceptance/nonjudgment).

Outcomes

The main outcomes were association between burnout (defined as being above threshold on either the emotional exhaustion or depersonalization subscales) and depression symptoms, fatigue, stress, worry, mindfulness, optimism, self-efficacy, empathy, and coping skills.

Statistical Analysis

We used Chi squared tests to determine differences between those with or without burnout on demographic characteristics. We used unpaired two-tailed *t* tests with an alpha level of 0.05 to compare mean differences. All statistical analyses were done using R software version 3.2.2.

Results

Response Rates

Seventy-five of 85 residents (88 %) consented to participate in the study. Of the 75 who consented, 68 (91 %) completed more than 90 % of the questionnaires. Because the participants could skip the whole questionnaires but not individual items, there were no item-level missing data.

Burnout

Of 68 residents, 19 (28 %) met our burnout criteria—that is, were above threshold on either the emotional exhaustion or depersonalization subscales of the MBI. Of these, 10 residents (15 %) were above threshold on both the depersonalization and personal accomplishment subscales, and 9 (13 %) were above threshold for all the three burnout subscales. The sample was dichotomized into “burnout” and “no burnout” groups. Chi squared tests showed no statistically significant differences between the burnout and no burnout groups by demographic characteristics. Table 1 shows demographics by burnout status.

Burnout and Hypothesized Risk and Resilience Factors

The burnout group had lower mean scores on measures of hypothesized resilience factors than the no burnout group

(all parenthetical values that follow show mean scores for the burnout vs. no burnout groups, respectively); however, optimism (14.8 ± 4.8 vs. 17 ± 4.2 , $t = -1.8$, $p = 0.09$, $d = -0.5$), self-efficacy (30.6 ± 2.9 vs. 32.1 ± 3.7 , $t = -1.8$, $p = 0.07$, $d = -0.45$), and empathy (16.2 ± 5.6 vs. 17.8 ± 3 , $t = -1.2$, $p = 0.26$, $d = -0.4$) scales were not statistically significant. The burnout group had lower mean scores on the CAMS-R (28.5 ± 6.6 vs. 32.5 ± 6.3 , $t = -2.3$, $p = 0.029$, $d = -0.63$) and MOCS-A (21.5 ± 6.9 vs. 27.7 ± 8.2 , $t = -3.1$, $p = 0.003$, $d = -0.79$), indicating lower levels of mindfulness and coping skills, respectively. The burnout group also had significantly higher levels of all hypothesized risk factors: perceived stress (18.4 ± 6.4 vs. 13 ± 5.2 , $t = 3.2$, $p = 0.004$, $d = 0.97$), fatigue (15.4 ± 9.6 vs. 9.3 ± 6.8 , $t = 2.5$, $p = 0.018$, $d = 0.79$), worry (53.4 ± 10.2 vs. 42.8 ± 12.6 , $t = 3.6$, $p = 0.0009$, $d = 0.88$), and depression symptoms (4.9 ± 5.8 vs. 1.8 ± 2.5 , $t = 2.3$, $p = 0.035$, $d = 0.84$). Box plots for each hypothesized risk and resilience factor by burnout status are shown in Fig. 1.

Discussion

Certain positive psychological characteristics may be protective against burnout (i.e., are hypothesized resilience factors), while certain negative psychological characteristics may predict vulnerability (i.e., are hypothesized risk factors). To our knowledge, this study is the first to examine the relationship of these hypothesized risk and resilience factors to burnout in

Table 1 Characteristics of study cohort: burnout and no burnout groups

Category	Burnout <i>n</i> = 19 (%)	No burnout <i>n</i> = 49 (%)	Total <i>n</i> = 68	<i>p</i> value
Specialty				
Medicine	17 (31)	37 (69)	54	0.34
Psychiatry	2 (14)	12 (86)	14	
Gender				
Male	7 (26)	20 (74)	27	0.88
Female	12 (31)	27 (69)	39	
Undisclosed	0 (0)	2 (100)	2	
Age				
Age 25–30	14 (25)	43 (75)	57	0.3
Age 30–35	5 (45)	6 (55)	11	
Relationship status				
Married	8 (32)	17 (68)	25	0.6
Divorced	1 (50)	1 (50)	2	
Never married	10 (24)	31 (76)	41	
Race				
White	14 (31)	31 (69)	45	0.25
Black	0 (0)	5 (100)	5	
Asian	5 (28)	13 (72)	18	
Hispanic	0 (0)	5 (100)	5	
Family				
Have children	1 (50)	1 (50)	2	

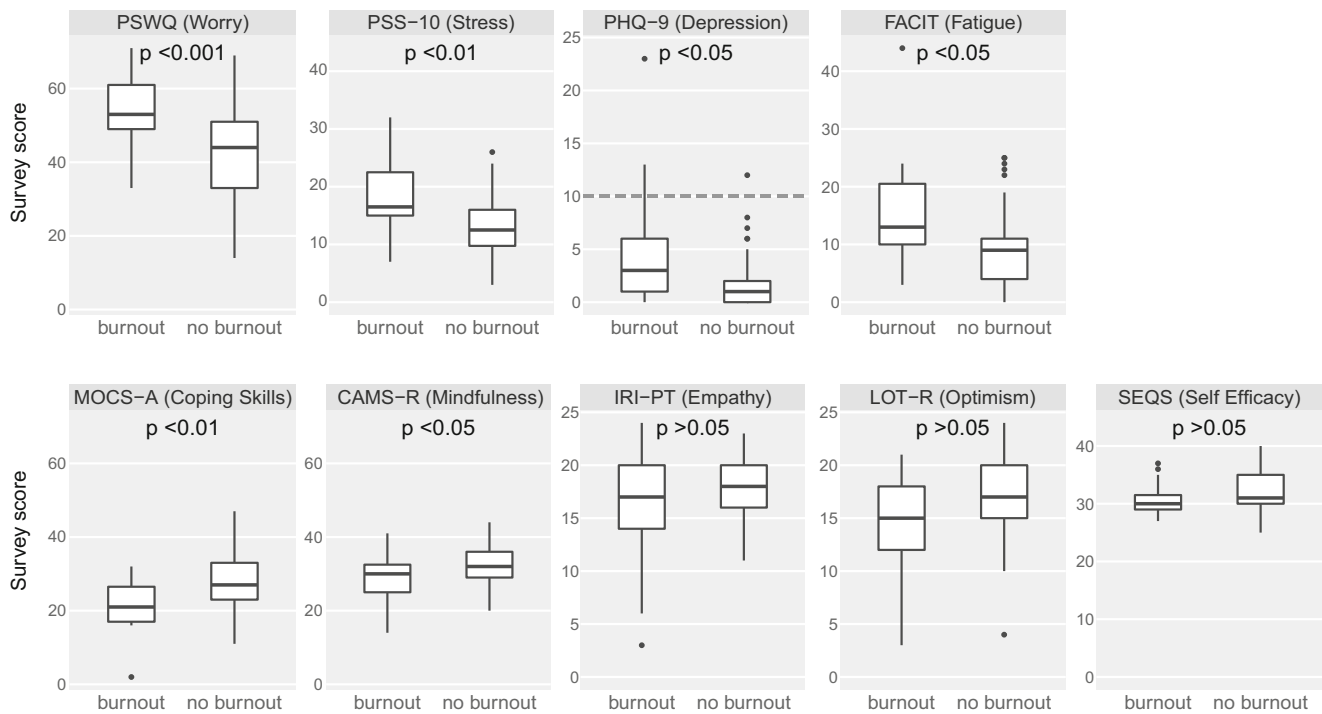


Fig. 1 Differences in risk and resilience factors in residents with burnout compared to those without burnout. The *box plots* show each risk and resilience factor vs. burnout status. The *horizontal line* represents the median, with the *box* outlining the interquartile range, and the line

representing the 5th and 95th percentile. The *dots* represent outliers. For the PHQ-9, the *horizontal dashed line* represents the cutoff for clinical depression

residents prior to starting residency. Here, we found that residents with burnout had significantly lower levels of mindfulness and coping skills and had higher levels of stress, depression symptoms, fatigue, and worry (as measured by the CAMS-R, MOCS-A, PS-10, PHQ-9, FACIT-Fatigue, and PSWQ, respectively).

Analysis of our population's demographics illustrated that residents in this study were similar to those of other residencies assessed for burnout [23] in that there were no statistical differences found for age, marital status, sex, or specialty between the burnout and no burnout groups. Burnout prevalence (28 %) was slightly lower than previously reported in residents during residency or in fourth year medical students at graduation (49–60 %) [24], though comparable to other studies measuring burnout before the start of residency [8].

Interestingly, our data showed that, among the hypothesized resilience factors, only mindfulness and coping skills were significantly different between the burnout and no burnout groups, with self-efficacy trending toward significance. We did not find significant differences in empathy as measured by the IRI-PT, especially surprising given the hypothesized association between burnout and empathy. We chose to study the perspective-taking scale (as compared to empathic concern) because many promising behavioral and mindfulness interventions engage the skill of mentalization, or being able to spontaneously adopt the psychological viewpoint of another, which this scale evaluates. Our population did have

similar empathy values on the IRI-PT to those reported in the literature for incoming interns [25], but there are no comparisons in the literature for incoming interns on mindfulness, coping skills, optimism, or self-efficacy.

Our study observed an inverse relationship between mindfulness and burnout as well as coping skills and burnout in incoming residents. This is consistent with findings in practicing physicians, which demonstrated that mindfulness is inversely correlated with burnout [17]. Mindfulness is thought to enhance the ability to find meaning in one's work through self-awareness; thus, it may be that mindfulness helps counter the depersonalization and emotional exhaustion that contribute to burnout. Studies of mindfulness-based programs in medical students [26] and in practicing physicians [17] are promising. As such, further research to investigate the impact of mindfulness on burnout in the resident population is much needed—including research on the impact of mindfulness interventions.

The inverse relationship between coping skills and burnout seen here speaks to the importance of stress awareness and the ability to self-assess as a protective strategy against burnout. The MOCS-A, which we used to measure coping skills, emphasizes skills for stress modulation—stress awareness, the ability to relax at will, restructure maladaptive thoughts, be assertive about needs, and choose appropriate coping responses (i.e., seek support vs. self-soothe). Given that residents without burnout showed higher levels of coping skills,

further investigation of the impact of programs that teach stress-awareness strategies for burnout will be important in elucidating this relationship. Programs that combine strategies (mindfulness, cognitive reappraisal, and self-reflection), like Mindful Communication [17], have illustrated increases in mindfulness that were associated with decreases in burnout, and overall increased emotional trait stability (resilience). Given this, and our preliminary findings in first year medicine and psychiatry residents, programs that combine mindfulness and coping skills should be adapted for residents, implemented, and studied. It will be important to investigate the impact of such curricula under diverse training conditions, and at the unique career stage that residency represents.

Our study has a number of important limitations. Though comparable in size to other resident studies on burnout, and inclusive of two specialties, our study is small and was done in a single institution, thus limiting its generalizability. It is likely that the small sample size limited our ability to observe significant differences between the burnout and no burnout population for self-efficacy. In our study, we did not observe a significant difference in empathy between the two groups, but this may have resulted from our choice to use only the perspective-taking subscale, which in other studies appears less sensitive to burnout than other subscales of the IRI [25].

Given that this study was cross-sectional, future research should prospectively examine whether mindfulness protects against the development of burnout over the period of residency, which is known to cause burnout [2, 5]. Our study had a low prevalence of burnout, which may be due to the time period we surveyed residents. After a break from the rigors of medical school, the start of residency is a time of high anticipatory anxiety but low work burden. Consequently, we may have had limited ability to detect certain established relationships. For example, the mean depression symptom scores on the PHQ-9 were subclinical for both the groups (burnout and no burnout; see Fig. 1) and less dramatically different than would be expected from prior studies [2]. Ultimately, longitudinal studies, which follow residents in diverse specialties over the course of training, will be required to fully elucidate the relationship between hypothesized risk and resilience factors and burnout.

In conclusion, we found that nearly a third of first year residents prior to starting their internships experience burnout. Those residents with burnout exhibit lower levels of mindfulness and coping skills and higher levels of depression symptoms, fatigue, worry, and stress. These preliminary findings should encourage programs to initiate and study curricula that combine mindfulness and self-awareness coping strategies to enhance or protect against burnout as well as cognitive behavioral coaching strategies to offset symptoms of burnout when present. As the ACGME [27] and the graduate medical education community engage on the issue of physician wellbeing, the obvious cultural and logistical challenges of time and buy-in

for wellness activities are hurdle enough. The targets of these interventions should be associated and antecedent; in other words, interventions should emphasize skills and traits that are causally related to resilience from burnout. The challenging work of empirical testing needs to be done to show that interventions (whether they are mindfulness/self-awareness based or overarching systemic changes to the learning environment) actually accomplish what they purport to.

Acknowledgments The authors would like to thank Dr. Hasan Bazari and Dr. Felicia Smith for their support of this research within the residency training programs in the departments of Medicine and Psychiatry, respectively, at the Massachusetts General Hospital.

Compliance with Ethical Standards

Disclosures Dr. Denninger receives support for unrelated investigator-initiated studies from Onyx Pharmaceuticals. Dr. Denninger receives support from Basis Inc. for materials related to investigator-initiated studies. This does not alter the author's adherence to Academic Psychiatry policies on sharing data and materials.

Funding/Support This pilot project was supported by an APIRE Janssen Resident Award (award recipient is the corresponding author).

Ethical Approval Partners Healthcare IRB review

References

1. Schaufeli WB, Bakker AB, Hoogduin K, Schaap C, Kladler A. On the clinical validity of the Maslach burnout inventory and the burnout measure. *Psychol Health*. 2001;16(5):565–82.
2. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, et al. Burnout among US medical students, residents, and early career physicians relative to the general US population. *Acad Med J Assoc Am Med Coll*. 2014;89(3):443–51.
3. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clin Proc*. 2015;90(12):1600–13.
4. West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA*. 2006;296(9):1071–8.
5. Daskivich TJ, Jardine DA, Tseng J, Correa R, Stagg BC, Jacob KM, et al. Promotion of wellness and mental health awareness among physicians in training: perspective of a national, multispecialty panel of residents and fellows. *J Grad Med Educ*. 2015;7(1):143–7.
6. Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, et al. Burnout and suicidal ideation among US medical students. *Ann Intern Med*. 2008;149(5):334–41.
7. Dyrbye LN, Power DV, Massie F, Eacker A, Harper W, Thomas MR, et al. Factors associated with resilience to and recovery from burnout: a prospective, multi-institutional study of US medical students. *Med Educ*. 2010;44(10):1016–26.
8. Ripp J, Babyatsky M, Fallar R, Bazari H, Bellini L, Kapadia C, et al. The incidence and predictors of job burnout in first-year

- internal medicine residents: a five-institution study. *Acad Med.* 2011;86(10):1304–10.
9. Goldhagen BE, Kingsolver K, Stinnett SS, Rosdahl JA. Stress and burnout in residents: impact of mindfulness-based resilience training. *Adv Med Educ Pract.* 2015;6:525.
 10. Stern TA, Prager LM, Cremens MC. Autognosis rounds for medical house staff. *Psychosomatics.* 1993;34(1):1–7.
 11. Ripp JA, Fallar R, Korenstein D. A randomized controlled trial to decrease job burnout in first-year internal medicine residents using a facilitated discussion group intervention. *J Grad Med Educ.* 2016;8(2):256–9.
 12. Riess H, Kelley JM, Bailey R, Konowitz PM, Gray ST. Improving empathy and relational skills in otolaryngology residents a pilot study. *Otolaryngol Head Neck Surg.* 2011;144(1):120–2.
 13. Firth-Cozens J. Doctors, their wellbeing, and their stress. *BMJ.* 2003;326(7391):670.
 14. Mata DA, Ramos MA, Bansal N, Khan R, Guille C, Di Angelantonio E, et al. Prevalence of depression and depressive symptoms among resident physicians: a systematic review and meta-analysis. *JAMA.* 2015;314(22):2373–83.
 15. Dyrbye LN, Harper W, Durning SJ, Moutier C, Thomas MR, Massie Jr FS, et al. Patterns of distress in US medical students. *Med Teach.* 2011;33(10):834–9.
 16. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. *Acad Med J Assoc Am Med Coll.* 2006;81(4):354–73.
 17. Krasner MS, Epstein RM, Beckman H, Suchman AL, Chapman B, Mooney CJ, et al. Association of an educational program in mindful communication with burnout, empathy, and attitudes among primary care physicians. *JAMA.* 2009;302(12):1284–93.
 18. Brennan J, McGrady A. Designing and implementing a resiliency program for family medicine residents. *Int J Psychiatry Med.* 2015;50(1):104–14.
 19. Rogala A, Shoji K, Luszczynska A, Kuna A, Yeager C, Benight CC, et al. From exhaustion to disengagement via self-efficacy change: findings from two longitudinal studies among human services workers. *Front Psychol.* 2015;6:2032.
 20. Bore M, Kelly B, Nair B. Potential predictors of psychological distress and well-being in medical students: a cross-sectional pilot study. *Adv Med Educ Pract.* 2016;7:125.
 21. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2):377–81.
 22. Maslach C, Jackson SE, Leiter MP. *Maslach burnout inventory.* 3rd ed. Palo Alto: Consulting Psychologists Press; 1996.
 23. Thomas NK. Resident burnout. *JAMA.* 2004;292(23):2880–9.
 24. Dyrbye L, Shanafelt T. A narrative review on burnout experienced by medical students and residents. *Med Educ.* 2016;50(1):132–49.
 25. Bellini LM, Baime M, Shea JA. Variation of mood and empathy during internship. *JAMA.* 2002;287(23):3143–6.
 26. Rosenzweig S, Reibel DK, Greeson JM, Brainard GC, Hojat M. Mindfulness-based stress reduction lowers psychological distress in medical students. *Teach Learn Med.* 2003;15(2):88–92.
 27. Physician Well-Being Initiative. In: The Accreditation Council for Graduate Medical Education. 2016. <http://www.acgme.org/What-We-Do/Initiatives/Physician-Well-Being>. Accessed 20 Aug 2016.