

Do Mindfulness and Self-Compassion Predict Burnout in Pediatric Residents?

Kathi J. Kemper, MD, MPH, Hilary McClafferty, MD, Paria M. Wilson, MD, MEd, Janet R. Serwint, MD, Maneesh Batra, MD, MPH, John D. Mahan, MD, Charles J. Schubert, MD, Betty B. Staples, MD, and Alan Schwartz, PhD, on behalf of the Pediatric Resident Burnout-Resilience Study Consortium

Abstract

Purpose

Burnout symptoms are common among health professionals. Gaps remain in understanding both the stability of burnout and compassion over time and relationships among burnout, self-compassion, stress, and mindfulness in pediatric residents.

Method

The authors conducted a prospective cohort study of residents at 31 U.S. residency programs affiliated with the Pediatric Resident Burnout-Resilience Study Consortium. Residents completed online cross-sectional surveys in spring 2016 and 2017. The authors assessed demographic characteristics and standardized measures

of mindfulness, self-compassion, stress, burnout, and confidence in providing compassionate care.

Results

Of 1,108 eligible residents, 872 (79%) completed both surveys. Of these, 72% were women. The prevalence of burnout was 58% and the level of mindfulness was 2.8 in both years; levels of stress (16.4 and 16.2) and self-compassion (37.2 and 37.6) were also nearly identical in both years. After controlling for baseline burnout levels in linear mixed-model regression analyses, mindfulness in 2016 was protective for levels of stress and confidence in providing compassionate care in 2017. Self-compassion in 2016

was protective for burnout, stress, and confidence in providing compassionate care in 2017; a one-standard-deviation increase in self-compassion score was associated with a decrease in the probability of burnout from 58% to 48%.

Conclusions

Burnout and stress were prevalent and stable over at least 12 months among pediatric residents. Mindfulness and self-compassion were longitudinally associated with lower stress and greater confidence in providing compassionate care. Future studies are needed to evaluate the effectiveness of training that promotes mindfulness and self-compassion in pediatric residents.

Burnout and stress are now reported by a majority of physicians, including pediatricians.¹⁻³ Burnout is associated with significant personal morbidity (such as substance abuse and suicide), impaired professional behavior (poor communication, higher error rates), and high overall costs to employers and society.⁴⁻⁸ Despite efforts to reduce this distress by regulating duty hours or by offering on-site counseling services, support groups, retreats, and education, rates of burnout and depression continue to rise.^{1,2,9,10} Several professional groups, including the American Academy of Pediatrics and the Accreditation Council for

Graduate Medical Education (ACGME), have called for more systematic approaches to addressing stress and burnout, including the development of wellness and resilience curricula.¹¹⁻¹³ These systematic approaches require solid evidence about the epidemiology of burnout, the risk of experiencing it, and factors amenable to change that protect against it.

Previous research suggests that demographic characteristics and personal experiences are associated with burnout. For example, burnout rates are reportedly higher among women, among those undergoing overnight call rotations, and among those with higher personal debt.¹⁴⁻¹⁹ Some factors may also help protect residents from burnout. These “protective factors” include having training in mind-body skills and having higher scores on standard measures of mindfulness and self-compassion.²⁰⁻²⁵ For the most part, these studies have been conducted at single institutions and are cross-sectional. One uncontrolled, prospective cohort study of palliative care clinicians reported that a curriculum emphasizing mindfulness, loving-kindness, and compassion was associated with greater self-care and

less distress and burnout.²⁶ Similarly, other uncontrolled studies of diverse health professionals who received online training in mind-body skills have found significant improvements in mindfulness, self-compassion, stress, burnout, and confidence in providing compassionate care to patients.²⁷⁻²⁹ (Self-compassion entails treating oneself with kindness, recognizing one’s shared humanity, and being mindful when considering negative aspects of oneself.³⁰) Two studies have shown that mindfulness-based interventions that promote nonjudgmental awareness of whatever is happening in the present moment may increase self-compassion in health professionals and the general population,^{31,32} and single-institution studies have indicated that self-compassion may be protective against burnout.^{21,33} Gaps remain in understanding the most effective strategies for teaching self-compassion or the sustainability of its protective effects on burnout. We have been unable to find large prospective studies that have evaluated the protective effects of mindfulness and self-compassion on stress and burnout scores after controlling for baseline burnout and stress levels in a national sample of pediatric residents.

Please see the end of this article for information about the authors.

Correspondence should be addressed to Kathi J. Kemper, 021 Meiling Hall, College of Medicine, 370 W. 9th Ave., The Ohio State University, Columbus, OH 43210; telephone: (614) 685-9052; e-mail: Kathi.kemper@osumc.edu; Twitter: @MDKathi.

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We aimed to answer three questions through our nationally representative, multisite, prospective, longitudinal study:

1. What is the rate of burnout among pediatric residents nationally, and how stable is it over 12 months?
2. What are the levels of stress, confidence in providing compassionate care, mindfulness, and self-compassion in pediatric residents; how stable are these qualities over one year; and how do they correlate with one another and with burnout?
3. After controlling for burnout rates in 2016, are levels of mindfulness and self-compassion in 2016 predictive of stress, burnout, and confidence in providing compassionate care in 2017 among pediatric residents?

We plan to address additional questions about the relationships among burnout, duty hours, special training tracks, and competencies in future studies using existing and ongoing data collected for this longitudinal survey.

We hypothesized that the rate of burnout would be similar to that found in recent studies: that is, approximately 30% to 70%.^{3,34–36} We hypothesized that rates of stress on the perceived stress scale would be—as reported in other studies—higher in our study participants than in the general population, while levels of mindfulness and self-compassion would be comparable to normative populations. Finally, we hypothesized that after controlling for 2016 levels of burnout, levels of mindfulness and self-compassion in 2016 would be associated with lower scores on stress, burnout, and improved confidence in providing compassionate care in 2017. We planned to use the answers to these questions to develop future evidence-based interventions aimed at decreasing stress and burnout among pediatric residents nationally.

Method

Design

We, the authors, represent the steering committee of the Pediatric Residency Burnout–Resilience Study Consortium (PRB-RSC). The goals of the PRB-RSC are to provide a better understanding of factors related to pediatric resident burnout so as to prevent it.

We conducted an online survey of pediatric residents in spring 2016 and spring 2017. We used the Association of Pediatric Program Directors (APPD)-developed and APPD-owned Longitudinal Educational Assessment Research Network (LEARN) online survey tool. APPD LEARN approved the survey for distribution to all members of pediatric programs involved in the PRB-RSC. Membership in the PRB-RSC was voluntary, and members were solicited on the basis of interest expressed at APPD national meetings. The survey was available from April 1, 2016, through May 30, 2016, and again for a similar period in 2017. Each of the participating institutions sent e-mail reminders to nonresponders.

Participants

Residents were eligible to participate if they were enrolled in a pediatrics residency, a medicine–pediatrics residency, or a combined residency (e.g., pediatrics–psychiatry, pediatrics–neurology, pediatrics–genetics, pediatrics–anesthesia, or pediatrics–rehabilitation) program at one of the PRB-RSC residency programs in both 2016 (n = 34 programs) and 2017 (n = 46 programs). APPD LEARN assigned unique deidentified identification codes to each resident, but linked their responses to their residency program. APPD LEARN did not give program directors (PDs) any names of participants to ensure participants' anonymity, but did provide information about the number of program respondents. We allowed each participating program to determine whether to offer incentives to residents. We provided a financial award of \$500 to the three programs with the highest completion rates in 2016 only. We designated these award funds for resident wellness activities as determined by each of the three programs. We included participants in the analyses only if they completed the survey instrument in both 2016 and 2017.

Survey instrument

Members of the PRB-RSC developed the survey instrument collaboratively over six months of meetings. We based content on previous research^{21,37,38}; PDs' prior experience; and the goal of creating a manageable, easy-to-complete survey instrument. The final online survey instrument included fewer than 150 questions and required less than 15 minutes to complete. Demographic questions

addressed individuals' age, gender, race/ethnicity, marital status, living situation (alone vs. with family or nonrelated others), level of educational debt, current pregnancy status, and parental status.

Primary outcome measures

Burnout. We used the 22-item Maslach Burnout Inventory (MBI), the most widely used measure of burnout in health professionals, to assess burnout.^{39,40} As in previous studies of the prevalence of burnout among medical professionals,^{41,42} we defined burnout as a *dichotomous* variable as having high subscale scores for personal emotional exhaustion (≥ 27) and/or depersonalization (≥ 10). We defined burnout as a *continuous* variable as the total of the emotional exhaustion score plus the depersonalization score. We did not use the continuous variable to determine burnout, as Maslach et al³⁹ have cautioned against this; instead, we used this variable to explore associations between burnout and other variables in bivariate and multivariable regression analyses.

Stress. We measured stress with the Cohen 10-item Perceived Stress Scale (PSS), which has been used in multiple studies of health professionals and the general population.^{43–49} It has good internal reliability and external validity. Scores on the PSS may range from 0 to 40; higher scores indicate higher levels of perceived stress. Scores, which may improve with mindfulness training, range in the general population from 12 to 14, and among health professionals from 14 to 18.^{43–49}

Compassion. We assessed compassion toward patients using the Confidence in Providing Calm, Compassionate Care Scale (CCCS). The CCCS includes 10 items, and potential scores range from 0 to 100 (higher scores indicate greater confidence in ability to provide compassionate care). The CCCS has good internal reliability and correlates in expected directions with standardized measures of mindfulness, empathy, and resilience.⁵⁰ Average scores in other studies of health professionals range from 60 to 80.⁵⁰

Predictive attributes. We measured two predictive attributes: mindfulness and self-compassion. We assessed *mindfulness* using the 10-item Cognitive and Affective Mindfulness Scale, Revised (CAMS-R); the CAMS-R has good internal consistency, and scores are significantly correlated with longer measures of mindfulness,

well-being, clarity of feelings, adaptive regulation, and cognitive flexibility. Potential item scores range from 1 (low or poor mindfulness) to 4 (high or healthy mindfulness); the average item score in normative populations is 2.8 (standard deviation [SD] = 0.5).^{51–53}

We measured *self-compassion* using the Neff 12-item measure of self-compassion. Scores may range from 12 (low self-compassion) to 60 (high self-compassion). In normative populations, the average score is 36 (SD = 7.3), and the average subscale (2-item) score is 5.8 to 6.4.⁵⁴

Because the survey questions were largely basic demographic items and instruments that had been previously validated in earlier research, we did not perform separate validation and pilot testing of the study instrument. Notably, we also asked residents questions about duty hours, as well as about their training track, career satisfaction, health, spirituality, sleeping habits, and empathy. Please contact the authors for a copy of the complete survey.

Statistical analysis

We exported survey data using LimeSurvey (R 3.3.1; LimeSurvey GmbH, Hamburg, Germany) for analysis. We used descriptive statistics to characterize the participants, and we employed binomial tests, chi-square, *t* tests, and analysis of variance to determine whether characteristics were associated with burnout as appropriate by variable type. We used Spearman rank correlations to calculate correlations among variables. We sought to predict 2017 outcomes (burnout, stress, or confidence providing compassionate care) from 2016 measures of self-compassion and mindfulness using mixed linear regression models (for continuous measures) or logistic regression models (for dichotomous measures), controlling for the following: 2016 outcome, resident year of training, and a random effect of residency program. Demographic factors (e.g., age and gender) that were not statistically associated with burnout in the bivariate analysis were not included in the regression analyses.

Ethical approval

The Nationwide Children's Hospital Institutional Review Board (IRB)

approved this study. Each participating program also sought and received local IRB approval, as locally required, using materials supplied by Nationwide Children's Hospital and APPD LEARN.

Results

Of 1,108 potential participants who were postgraduate year (PGY)-1 or PGY-2 residents and completed surveys in 2016, 872 (79%) completed surveys in 2017 as PGY-2 or PGY-3 residents. These 872 residents were from 31 institutions; see List 1 for the names of, and Figure 1 for the geographic distribution of, the 31 residency programs participating in both 2016 and 2017 (see Supplemental Digital Appendix 1 at <http://links.lww.com/ACADMED/A620> for a list of all 46 programs participating in 2016 or 2017). Respondents represented

programs from across the United States: the East and West Coasts, the Midwest, and the South. Respondents in 2017 were significantly more likely than nonrespondents to be first-year residents in 2016 (54% vs. 46%, $P < .001$), but we detected no significant differences between 2017 respondents and nonrespondents in terms of gender, race, marital status, debt level, stress, or burnout in 2016.

Demographic characteristics in 2016 for the 872 residents who completed both surveys are shown in Table 1. Notably, most respondents were female (72%), Caucasian (73%), and married or partnered (55%); most (65%) had debt levels exceeding \$100,000. The average age of 2016 respondents was 28.8 (SD = 3.3) years. For comparison, across the 9,067 pediatricians training at

List 1

Programs With Residents Participating in the Pediatric Resident Burnout-Resilience Study in Both 2016 and 2017

Albert Einstein College of Medicine (Montefiore)
Ann & Robert H. Lurie Children's Hospital of Chicago
Baylor College of Medicine (Houston)
Boston Children's Hospital/Boston Medical Center
Carolinas Medical Center
Case Western Reserve University/University Hospital Case Medical Center/Rainbow Babies and Children's Hospital
Children's Hospital of Philadelphia
Cincinnati Children's Hospital Medical Center/University of Cincinnati College of Medicine
Crozer-Chester Medical Center
Duke University Hospital Medical Center
Inova Fairfax Medical Campus/Inova Children's Hospital
Johns Hopkins University School of Medicine
Mayo Clinic College of Medicine (Rochester)
Medical College of Wisconsin
Nationwide Children's Hospital/Ohio State University
University of Arizona Health Sciences Center
University of California (Davis) Health System
University of California (Los Angeles) Medical Center
University of California (San Diego) Children's Hospital
University of Colorado Denver Children's Hospital
University of Illinois College of Medicine at Chicago
University of Kansas School of Medicine
University of Louisville School of Medicine
University of Michigan Medical Center
University of Minnesota Medical School
University of New Mexico Children's Hospital
University of Oklahoma College of Medicine (Tulsa)
University of Oklahoma Health Sciences Center (Oklahoma City)
University of Washington-Seattle Children's Hospital
University of Wisconsin Hospitals and Clinics
Wright State University

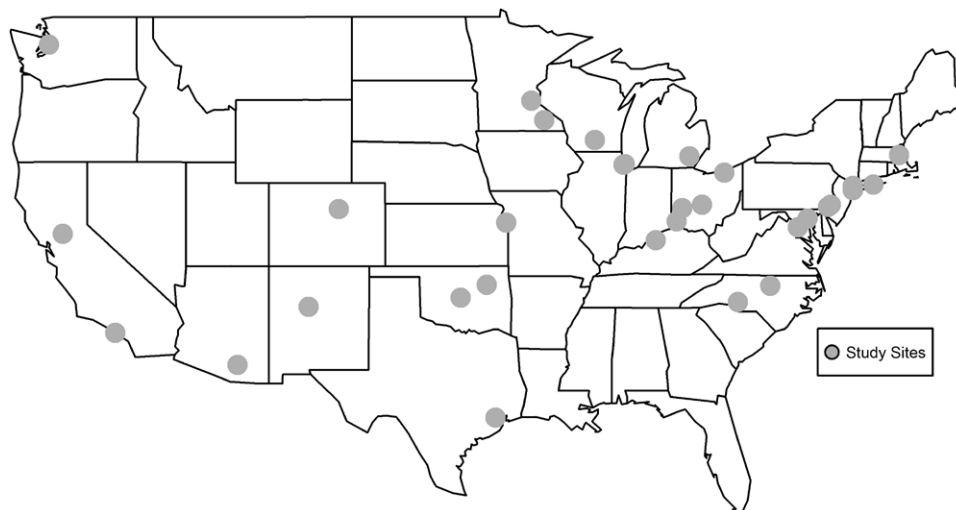


Figure 1 Map of the United States showing the location of the 31 sites where the 872 residents who participated in a study of mindfulness, burnout, and self-compassion in 2016 and 2017 trained. Light gray circles indicate study sites (some sites are geographically near, so a few circles overlap). See List 1 for the names of the 31 institutions.

207 U.S. ACGME-accredited pediatric residency programs in 2016–2017, the average age of PGY-1 residents was 28.6 years, and 67% of residents were female.⁵⁵

Scores for the primary outcomes for 2016 and 2017 are shown in Table 2. Overall, none of the variables’ average values changed significantly between 2016 and 2017. The percentage of residents who met criteria for burnout was 58%, and the average level of mindfulness was 2.8 in both 2016 and 2017. Levels of stress (16.4 and 16.2), confidence in providing compassionate care (60.5 and 61.3), and self-compassion (37.2 and 37.6) were also nearly identical in both years. Notably, residents’ average stress levels were significantly greater than the general population’s levels of 12 to 14 ($P < .001$).^{43,46} Although residents’ item scores on the mindfulness scale were similar to normative values, self-compassion was significantly higher than normative values ($P < .001$).^{51,56}

Correlations between 2016 and 2017 values of the key predictor and outcome variables using paired data are shown in Table 3. Correlations among the same variables in 2016 and 2017 ranged from 0.55 (for the CCCS) to 0.73 (for the Neff self-compassion scale); all were significant at $P < .001$. In both years, stress significantly correlated cross-sectionally with burnout; both stress and burnout were inversely correlated with mindfulness; self-compassion; and confidence in providing calm, compassionate care.

Table 1

Demographic Characteristics of 872 Pediatric Residents From 31 Different Residency Programs Participating in the Pediatric Resident Burnout–Resilience Study Consortium, 2016

Characteristic	No. (% of 872)
Gender	
Female	629 (72)
Male	243 (28)
Race^a	
Caucasian	630 (73)
Asian	123 (14)
Hispanic	43 (5)
African American	25 (3)
Native American/Pacific Islander	6 (1)
Other	40 (5)
Postgraduate residency year	
1	473 (54)
2	399 (46)
Married or partnered	
	479 (55)
Debt level	
< \$50,000	223 (26)
\$50,000–\$100,000	80 (9)
> \$100,000	565 (65)
Those who participated in mind–body skills training in the past three years^{a,b}	
Mindfulness	260 (30)
Yoga	231 (27)
Meditation	169 (19)
Biofeedback	106 (12)
Guided imagery	78 (9)
Compassion meditation	46 (5)

^aRespondents could select more than one answer.

^bTable 1 shows the mind–body training in the past three years reported by at least 5% of respondents. Less commonly reported types of mind–body training included the following: loving-kindness meditation (3%), progressive muscle relaxation (3%), relaxation response (3%), therapeutic or healing touch (2%), hypnosis (1%), yoga nidra (1%), qi gong (0.7%), and tai chi (0.7%).

Table 2
Scores on Predictive and Outcome Variables for 872 Residents Participating in the Pediatric Resident Burnout-Resilience Study in 2016 and 2017

Variable and measure	2016	2017	P ^a
Mindfulness ^b : mean (SD) [range]	2.8 (0.5) [1.3, 4]	2.8 (0.5) [1.3, 4]	0.31
Self-compassion ^c : mean (SD) [range]	37.2 (7) [19, 58]	37.6 (7) [12, 60]	0.76
Stress ^d : mean (SD) [range]	16.4 (6) [0, 36]	16.2 (6.3) [0, 37]	0.82
Burnout ^e : percentage of residents identified as having burnout	58.2	58.3	0.82
Confidence in providing compassionate care ^f : mean (SD) [range]	60.5 (13.6) [16, 94]	61.3 (14.3) [14, 99]	0.38

^aNo differences were significant in paired comparisons.

^bMindfulness was measured using the 10-item Cognitive and Affective Mindfulness Scale, Revised. Normative population item mean is 2.8 with a potential range from 1 (low, poor mindfulness) to 4.

^cSelf-compassion was measured using the Neff 12-item Self-Compassion Scale. Normative population mean is 36 with a potential range from 12 (low self-compassion) to 60.

^dStress was measured using the 10-item Perceived Stress Scale. Normative population means range from 12 to 14 with a potential range from 0 (no perceived stress) to 40.

^eBurnout, a dichotomous measure, was measured using the 22-item Maslach Burnout Inventory.

^fConfidence in providing compassionate care was measured using the Confidence in Providing Calm, Compassionate Care Scale. Normative population means range from 60 to 80 with a potential range of 0 (no confidence) to 100.

Table 3
Correlations (and 95% Confidence Intervals) Between Variables in the Pediatric Resident Burnout-Resilience Study, 2016 and 2017^a

Variable and year	PSS, 2016	PSS, 2017	MBI, ^b 2016	MBI, ^b 2017	CCCS, 2016	CCCS, 2017	CAMS-R, 2016	CAMS-R, 2017	SC, 2016	SC, 2017
PSS, 2016	1.0	—	—	—	—	—	—	—	—	—
PSS, 2017	0.57 (0.52, 0.61)	1.0	—	—	—	—	—	—	—	—
MBI, ^b 2016	0.66 (0.62, 0.69)	0.45 (0.39, 0.51)	1.0	—	—	—	—	—	—	—
MBI, ^b 2017	0.49 (0.44, 0.55)	0.64 (0.59, 0.68)	0.68 (0.64, 0.71)	1.0	—	—	—	—	—	—
CCCS, 2016	-0.31 (-0.37, -0.25)	-0.22 (-0.28, -0.15)	-0.34 (-0.40, -0.34)	-0.29 (-0.36, -0.23)	1.0	—	—	—	—	—
CCCS, 2017	-0.29 (-0.35, -0.22)	-0.34 (-0.41, -0.28)	-0.35 (-0.41, -0.28)	-0.43 (-0.49, -0.37)	0.55 (0.50, 0.60)	1.0	—	—	—	—
CAMS-R, 2016	-0.59 (-0.63, -0.54)	-0.45 (-0.50, -0.39)	-0.44 (-0.49, -0.39)	-0.36 (-0.42, -0.30)	0.37 (0.31, 0.43)	0.32 (0.25, 0.38)	1.0	—	—	—
CAMS-R, 2017	-0.46 (-0.52, -0.41)	-0.67 (-0.71, -0.63)	-0.38 (-0.44, -0.32)	-0.52 (-0.58, -0.47)	0.29 (0.22, 0.36)	0.45 (0.39, 0.51)	0.64 (0.60, 0.68)	1.0	—	—
SC, 2016	-0.59 (-0.63, -0.54)	-0.48 (-0.54, -0.42)	-0.47 (-0.52, -0.41)	-0.40 (-0.46, -0.34)	0.34 (0.28, 0.40)	0.30 (0.24, 0.37)	0.61 (0.56, 0.65)	0.54 (0.48, 0.59)	1.0	—
SC, 2017	-0.49 (-0.54, -0.43)	-0.64 (-0.68, -0.59)	-0.38 (-0.44, -0.32)	-0.52 (-0.57, -0.46)	0.29 (0.23, 0.36)	0.41 (0.35, 0.47)	0.50 (0.45, 0.56)	0.69 (0.65, 0.72)	0.73 (0.69, 0.76)	1.0

Abbreviations: PSS indicates Perceived Stress Scale; MBI, Maslach Burnout Inventory; CCCS, Confidence in Providing Calm, Compassionate Care Scale; CAMS-R, Cognitive and Affective Mindfulness Scale, Revised; SC, Self-Compassion Scale.

^aAll correlations are statistically significant at $P < .001$ using paired data.

^bThe authors determined the MBI score for correlation analyses by adding Emotional Exhaustion and Depersonalization subscales.

Next, we examined how 2016 scores related to 2017 scores (Table 4). After controlling for 2016 burnout scores in a linear mixed-model analysis, we found that self-compassion scores ($P = .03$) but not mindfulness scores ($P = .4$) in 2016 were inversely associated with burnout scores in 2017. After controlling for 2016 stress scores, scores of mindfulness ($P = .01$) and self-compassion ($P < .001$) in 2016 were inversely associated with stress scores in 2017. After controlling for 2016 scores on the CCCS, scores on both the mindfulness scale ($P = .02$) and self-compassion scale ($P = .04$) in 2016 were significantly associated with CCCS scores in 2017. For example, each one-point increase in self-compassion was associated with -0.17 points on the MBI (burnout) score, -0.16 points on the PSS (stress scale), $+0.17$ points on the CCCS, and a 6% reduction in burnout. An increase of 1 SD on the CCCS score was associated with a reduction from 58% to 48% in the probability of burnout.

Discussion

This national study involving over 850 pediatric residents from 31 geographically dispersed residency programs has provided four major findings. First, the prevalence of burnout in pediatric residents was 58% in both 2016 and 2017, confirming our first hypothesis that scores would be stable and comparable to the high rates previously reported

in other smaller studies of pediatric residents.^{3,21,34,35} Second, as hypothesized, pediatric residents' average stress scores were significantly higher than those of the general population, and mindfulness levels were comparable to the general population; however, contrary to our hypothesis, residents' self-compassion scores were higher than those reported for the general population. Third, variables of interest were significantly correlated in expected directions; for example, self-compassion correlated positively with mindfulness but inversely with perceived stress. Finally, after controlling for 2016 levels of stress and burnout, higher mindfulness scores in 2016 were associated with lower stress scores in 2017, and higher scores on self-compassion in 2016 were associated with lower levels of both stress and burnout in 2017. Likewise, after controlling for 2016 levels of confidence in offering compassionate care, higher scores on mindfulness and self-compassion in 2016 were associated with higher scores on the CCCS in 2017. Taken together, these regression analyses suggest longitudinal—not simply cross-sectional—relationships among mindfulness, self-compassion, and outcomes of interest such as burnout.

Our study confirms the high rate of burnout in pediatric residents reported in earlier studies and extends it to a larger, longitudinal sample. Using data from a two-item screen for burnout conducted in 2011, Shanafelt and colleagues⁴²

reported (in 2012) that U.S. physicians had significantly higher rates of burnout compared with a probability-based sample of U.S. working adults (37.9% compared with 27.8%). When this study was repeated in 2014 using the full MBI, the rates of burnout had increased for all specialties and had increased significantly in pediatrics from 35.3% to 46.3%.⁵⁷ Notably, residents and fellows reported higher burnout rates than early-career physicians.⁵⁷ In another study, Pantaleoni et al³ followed pediatric residents longitudinally at the Lucile Packard Children's Hospital from 2010 to 2012 and found a significant increase in burnout between the start of residency and six months into the internship year. Further results showed that burnout rates among residents remained stable throughout the second and third years of residency at just under 50%.³

Other investigators have conducted research on what—if anything—may ameliorate burnout. Attempts at mitigating burnout through duty hours restrictions have had mixed results.^{58,59} Investigators conducting a study with residents from 13 specialties noted that lower burnout was associated with using meditation, relaxation, massage, and other wellness strategies.⁶⁰ West and colleagues⁶¹ conducted a systematic review and meta-analysis of interventions implemented to prevent and reduce physician burnout; their findings revealed that both individual and organizational strategies

Table 4

Regression Analysis Showing Whether Mindfulness, Self-Compassion, or Residency Year Predict Burnout, Stress, or Compassionate Care

Measure or variable	Mixed linear models for burnout, stress, and confidence in providing compassionate care scores in 2017			Mixed logistic model for 2017: Dichotomous burnout score
	Burnout score in 2017	Stress score in 2017	Confidence in compassionate care score in 2017	
Number of residents in analysis	739	744	732	740
Being a PGY-2 resident in 2016 (vs. PGY-1)	-2.13 (0.84) ^a	-0.61 (0.37)	1.44 (0.88)	-0.38 (0.18) ^a
Mindfulness score in 2016	-1.00 (1.06)	-1.23 (0.49) ^a	2.49 (1.10) ^a	-0.18 (0.22)
Self-compassion score in 2016	-0.17 (0.08) ^b	-0.16 (0.04) ^b	0.17 (0.08) ^a	-0.06 (0.02) ^b
Burnout score in 2016	0.66 (0.03) ^b	—	—	—
Stress score in 2016	—	0.42 (0.04) ^b	—	—
Confidence in compassionate care score in 2016	—	—	0.52 (0.03) ^b	—
Burnout (vs. not; dichotomous variable)	—	—	—	1.96 (0.18) ^b
Intercept	23.1	18.9	16.0	2.3
SD of program random intercept	1.32	0	0	0.24

Abbreviations: PGY indicates postgraduate year; SD, standard deviation.

^aRelationship significant at $P < .05$.

^bRelationship significant at $P < .001$.

are critical. Individual-focused strategies that were effective were mindfulness-based approaches and stress management training.⁶¹ Results of another review align with West and colleagues' findings: Mindfulness and stress management must be cultivated in trainees because learning to be sensitive and to cope with stress are essential skills for health care workers.⁶²

We confirmed our earlier observation that mindfulness and self-compassion are strongly correlated with each other, positively associated with confidence in providing compassionate care, and protective against burnout.^{20,21} Previous research has linked greater mindfulness to less burnout in health professionals,^{24,49,63–65} which has important implications for patient care because more mindful clinicians provide more patient-centered care.⁴ To illustrate, Dobkin and colleagues⁶⁶ showed that mindfulness training improved clinicians' mindfulness and well-being and that patients perceived the clinicians who scored higher on one measure of mindfulness as providing more patient-centered care.

Our research suggests that cultivating self-compassion in trainees may be a helpful approach because compassion fatigue is, in essence, a form of burnout and our longitudinal data suggest that self-compassion is protective.⁶⁷

We conducted this study in pediatric residencies whose PDs had shown strong interest in burnout. The results may not be generalizable to residency programs in other specialties whose PDs have different priorities. Our sample had a slightly higher percentage of female respondents than the percentage of female respondents across U.S. pediatric residency programs during this period, and this difference may have affected our results in ways that limit generalizability. We conducted our study across a very limited time period and did not assess the impact of residency or institution-level interventions that may have been concurrent or longitudinal. Future studies should assess the effect of individual, unit-level, and institution-level interventions. We did not examine the impact of burnout or stress on patient care in this study, though other studies have suggested deleterious effects on patient care. Future studies would be strengthened by including patient-level outcomes. We did not measure

stress and burnout in nursing staff or faculty, though both could well affect residents' levels of stress and burnout. Future studies should consider a more comprehensive systems-based, ecological approach that includes other disciplines.

Conclusions

In this national study, we found that stress and burnout are common and not improving despite national calls to action. Mindfulness and self-compassion appear to be promising interventional targets for trainees because of their longitudinal associations with lower stress and burnout. Pediatric residency PDs can use these data to design and evaluate training in mindfulness and self-compassion to potentially mitigate the effects of stress and burnout on their trainees.

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The 46 participating residency programs listed in Supplemental Digital Appendix 1 (available at <http://links.lww.com/ACADMED/A620>) are all members of the Pediatric Resident Burnout–Resilience Study Consortium and participated in one or both years of the study. Each institution had one or more site principal investigator(s) who served as collaborators for this study and this report. They are listed in Supplemental Digital Appendix 1 by name and with their institution.

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K.J. Kemper is founding director, Center for Integrative Health and Wellness, and professor of pediatrics, The Ohio State University, Columbus, Ohio.

H. McClafferty is director, Pediatric Integrative Medicine in Residency Program, and codirector, Fellowship in Integrative Medicine, University of Arizona Center for Integrative Medicine, University of Arizona College of Medicine, Tucson, Arizona.

P.M. Wilson is assistant professor, Division of Emergency Medicine, Children's Hospital of Pittsburgh and University of Pittsburgh, Pittsburgh, Pennsylvania.

J.R. Serwint is professor emeritus of pediatrics, Johns Hopkins University, Baltimore, Maryland.

M. Batra is associate program director, Pediatric Residency Program, and associate professor of pediatrics, Seattle Children's Hospital and University of Washington, Seattle, Washington.

J.D. Mahan is director, Pediatric Residency Program, and professor of pediatrics, Nationwide Children's Hospital and The Ohio State University, Columbus, Ohio.

C.J. Schubert is professor of pediatrics, Cincinnati Children's Hospital Medical Center and University of Cincinnati, Cincinnati, Ohio.

B.B. Staples is director, Pediatric Residency Program, and associate professor of pediatrics, Duke University Medical Center, Durham, North Carolina.

A. Schwartz is Michael Reese Endowed Professor of Medical Education and director of research, University of Illinois College of Medicine, Chicago, Illinois, and data analyst, Association of Pediatric Program Directors Longitudinal Educational Assessment Research Network.

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Teaching and Learning Moments

A Show of Emotion



On the first night of my labor and delivery rotation, I watched a story unfold that reminded me of medicine's potential to arouse our innermost humanity. The emotional response these events elicited from my preceptor affected me as deeply as the experience itself.

My patient Zoey was a 20-year-old Spanish-speaking woman from rural North Carolina. She was 21 weeks pregnant and presented with vaginal bleeding and contractions. Further workup revealed an intraamniotic infection, which had caused her fetal membranes to rupture prematurely. I discussed the case briefly with my preceptor, and she confirmed my fears. If we used medications to delay labor until the age of fetal viability, the fetus would surely die from the infection. At this point, our primary goal was to save Zoey's life.

I entered Zoey's room to find a young girl lying uncomfortably in bed. "*Como se siente?*" I asked her. How do you feel?

She described a dull pain in her lower abdomen and asked when I thought the baby would come. I glanced at the bags of fluid dripping into her IV. Oxytocin should quicken the process, I explained. In all honesty, though, I had no idea whether it would be minutes, hours, or days.

Before long, her contractions began to accelerate. Only five minutes passed between each cringe of intense pressure. Through heavy breaths, Zoey requested that a neonatologist be there when the baby was born. I soon realized that she had hope, even the expectation, that the fetus would be viable.

Unsure of how to navigate this delicate situation and handicapped by my broken Spanish, I withdrew to the hall

and alerted the team. Moments later we were back in Zoey's room with a brigade of health care professionals—my OB/GYN preceptor, two residents, a neonatologist, a nurse, a chaplain, and an interpreter. In a flurry of activity, the semisterile drapes were placed, and the stage was set for the delivery. Amidst the chaos, my preceptor tried to explain to Zoey that any efforts to resuscitate the baby would be futile.

Shortly after midnight, Zoey delivered a baby girl she named Sophia. Pale with tiny fingers and toes, squinting eyes, and a faint heartbeat, Sophia was beautiful. But she was not breathing. "*Latido del corazón pero no respira,*" the interpreter said in a soft voice. Her hearts beats but she does not breathe.

We placed the baby on her mother's breast and stood around her, somber. I gently touched Zoey's arm and prayed in silence. When I opened my eyes, I glanced at my preceptor across the bed. There were tears dampening her face.

I was moved by the sight of my preceptor in that moment, for she was a veteran of the hospital and had seen her fair share of tragedy. To know that she was still touched by a moment such as this one was, in all sincerity, refreshing. When I witnessed suffering in the hospital, I instinctively wanted to open my heart to those patients, to meet them on common ground. But there exists a great tension in medicine between emotional vulnerability and your perceived role as a provider.

After six months of being on the wards for my third-year clerkships, I had begun to notice a blunting of my once-vivid emotions. It had become easier to brush aside the patient in the emergency department who was screaming out in

pain, eyes frantically scanning the hall for a sympathetic face. Or the woman with pneumonia who felt depressed after a recent divorce and really just needed someone to talk to. It was so easy to get caught up in the next task—scanning UpToDate for answers, preparing an oral presentation for rounds, or charting progress notes. But my experience with Zoey was a wakeup call, and it reminded me of why I chose medicine in the first place—the extraordinary moments of humanity we experience when we are present with patients.

As a medical student, I look to my preceptors as role models for patient care. Their interactions with patients provide a framework for how I conceptualize my own future practice. My OB/GYN preceptor that day showed me that it is possible to express emotion and still be an excellent doctor. While important boundaries exist between patients and providers, they are more nuanced than I once imagined. For the sake of my future patients and my own humanity, I hope that I can find that sweet spot.

Less than an hour after Sophia passed away, we brought a new life into the world via cesarean section. As the baby wailed its first breath, I heard the mother gush out in joy from behind the blue curtain. I looked over at my preceptor and, between her surgical cap and mask, her eyes were beaming. This time, it was I who felt the surge of tears.

Nicholas R. Lenze

N.R. Lenze is a fourth-year MD and MPH student, University of North Carolina Chapel Hill School of Medicine, Chapel Hill, North Carolina; e-mail: nicholas_lenze@med.unc.edu; ORCID: <https://orcid.org/0000-0002-2126-6663>.

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