

CLINICAL RESEARCH ARTICLE


Compassion fatigue, burnout, and compassion satisfaction in pediatric subspecialists during the SARS-CoV-2 pandemic

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BACKGROUND: The aim of this study was to explore factors contributing to compassion fatigue (CF), burnout (BO), and compassion satisfaction (CS) during the severe acute respiratory syndrome coronavirus-2 pandemic in pediatric subspecialists.

METHODS: The Compassion Fatigue and Satisfaction Self-Test (CFST) and a questionnaire of personal/professional characteristics were distributed electronically to pediatric subspecialists.

RESULTS: There were no significant differences in pre- and early-pandemic CF, BO, and CS scores. Nearly 40% of respondents felt their contributions to the pandemic were not valued by their institutions. Higher CF scores were significantly associated with: higher BO score; "I have put myself at increased risk through my work"; working in one's specialty >50% of time; distress about mental health and/or future uncertainty. Higher BO scores were significantly associated with: higher CF score; "Self-care is not a priority"; emotional depletion. Higher CS scores were significantly associated with: "My institution values my contribution to the COVID-19 crisis"; workplace debriefs; pet therapy.

CONCLUSIONS: The pandemic has only increased the need for physicians to receive social/emotional support from their institution and to feel their workplace contributions are valued. Successful pre-pandemic workplace interventions may not adequately support physicians during the pandemic. Further study is needed to identify supports that best counter the pandemic's unprecedented challenges.

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IMPACT:

- The sentiment "My institution has valued my contribution to the Covid-19 crisis" was the only significant factor associated with lower BO scores and was also associated with higher CS scores in pediatric subspecialists.
- This study is the first comparison of pre- and early-pandemic CF, BO, and CS scores in a national cohort of pediatric subspecialists.
- When considering interventions to promote CS and mitigate CF and BO for pediatric subspecialists during and after the pandemic, institutional leadership must offer wellness programming focused on social/emotional supports and prioritize a culture that explicitly recognizes and values every physician's contributions.

INTRODUCTION

The global pandemic of coronavirus disease 2019 (Covid-19) caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has forced physicians to rapidly adapt clinical practices and their personal lives to meet unprecedented professional demands. Physicians have been redeployed to provide clinical care outside their specialties, worked extra shifts and longer hours, and faced devastating outcomes among patients, colleagues, and loved ones. In addition, by virtue of their work environment, physicians are at high risk of acquiring SARS-CoV-2 and transmitting it to patients, colleagues, and family members. The heightened personal and professional tolls of practicing medicine during the pandemic are well-documented.^{1–4} Healthcare workers globally are reporting increased levels of

depressive symptoms, acute stress, burnout (BO), and exhaustion, with clinical demands and lack of control over practice cited as major contributors.^{3,5,6} At the same time, healthcare providers may also be experiencing shared pandemic stressors of socioeconomic inequalities, unemployment, limited support services, and child-care/schooling issues.⁴

Professional distress in physicians can manifest as compassion fatigue (CF) and/or BO.^{7–9} CF is defined as vicarious traumatic stress experienced by medical caregivers with chronic exposure to patient and family suffering.¹⁰ BO is occupational distress characterized by emotional exhaustion and feelings of depersonalization and low personal achievement.¹¹ The long-term corollaries of CF and BO in physicians, including stress in personal relationships, low morale, decreased productivity, decreased

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patient satisfaction, substance abuse, and suicide, are well-documented and have only been exacerbated by the SARS-CoV-2 pandemic.^{8,12–18} Despite this, physicians have persevered, demonstrating courage, selflessness, and compassion. Compassion satisfaction (CS) is work-related fulfillment related to providing patient care and feeling supported and productive in professional endeavors. CS is often described as a protective factor against CF and BO.¹⁹

We have previously described CF, BO, and CS in national cohorts of neonatologists (NICU), palliative care physicians (PC), pediatric critical care physicians (CC), pediatric emergency medicine physicians (EM), and pediatric hematology-oncology physicians (HO).^{20–24} In the current study, we explored CF, BO, and CS scores in these pediatric subspecialties during the early months of the pandemic, and compared them to pre-pandemic scores. We hypothesized that early-pandemic CF and BO scores would increase and CS scores would decrease when compared with pre-pandemic scores. We also hypothesized that geographic differences in CF, BO, and CS scores would emerge during the pandemic.

METHODS

The modified Compassion Fatigue and Satisfaction Self-Test (CFST), which contains 54 statements, with 18, 13, and 23 items on the CF, BO, and CS scales, respectively (Supplemental Table 1), was used to assess physician CF, BO, and CS.^{20–24} Email addresses for physicians in selected pediatric subspecialties (compiled in our prior studies of CF, BO, and CS^{20–24}) were utilized to contact potential subjects for the current study. A brief description of the study, with a hyperlink to the CFST and questionnaire of personal demographic information (Supplemental Material 2: sex, age, race, members of household, changes in living situation in the setting of the pandemic, pre-existing conditions that increase the risk of contracting Covid-19, current feelings of distress, and self-care activities) and professional details (Supplemental Table 2: pediatric subspecialty, setting and location of clinical practice, professional roles/responsibilities during the pandemic, available institutional support/programs for physician wellness), was distributed anonymously via SurveyMonkey® to potential study participants on June 9, 2020. Geographic regions were determined

using workplace zip code and defined by US census designations. The invitation to participate was re-sent to nonresponders on June 23 and July 14. This project was designated as exempt human research by the Institutional Review Board at the Icahn School of Medicine at Mount Sinai.

Individual survey responses were downloaded, coded, and entered into SPSS Statistics, version 24 (IBM, Armonk, NY). Participants reflected on the sentiments “I have put myself at significant risk as part of my clinical work” and “My institution has valued my contribution to the Covid-19 crisis” using a 5-point Likert scale (0 = strongly disagree, 1 = disagree, 2 = neutral, 3 = agree, 4 = strongly agree). Responses were dichotomized into “agree” (scale options 2, 3, or 4) or “disagree” (scale options 0 or 1). As in our prior work, subscale scores for CF, BO, and CS were summed.^{20–24} For each subscale, internal reliability was evaluated using Cronbach α , and normality was assessed with histogram analysis. Descriptive statistics were calculated for subscale score and questionnaire responses. The Pearson r was used to examine correlations between subscales and to identify relationships between study variables.

Univariate analyses across subspecialties were performed using independent t tests. One-way between-group analyses of variance were performed to explore the impact of subspecialty on CF, BO, and CS scores. Linear regression models for CF, BO, and CS scores as a function of subspecialty and other risk factors significant at $p < 0.05$ in univariable analyses were constructed. For each phenomenon, standardized coefficients (β values), t statistics, and adjusted R^2 were determined across models.

One-way between-group analyses of variance were performed to compare our previously published, pre-pandemic (2016–2019) CF, BO, and CS scores in physicians in selected subspecialties^{20–24} with early-pandemic scores collected in June and July 2020.

RESULTS

Characteristics of the study population

A total of 499 surveys were included in our analysis (26% response rate) (Fig. 1). The majority of participants self-identified as white and female, and practiced at academic medical centers (Table 1). The distribution of participants across subspecialties was fairly equal, with the exception of PC. The majority of participants were from the Northeast and Southern United States. Nearly all participants reported feeling distressed about some aspect of

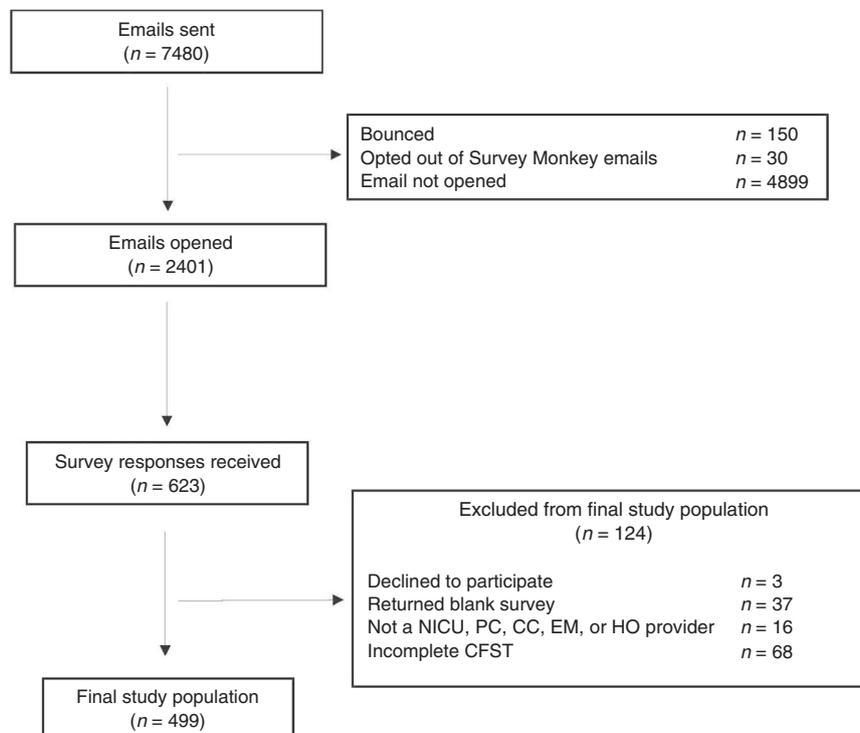


Fig. 1 Survey response and population.

Table 1. Characteristics of the study population, June–July 2020 (*N* = 499).

	<i>n</i> (%)
Gender, female (<i>N</i> = 486)	318 (65.4)
Age (yr) (<i>N</i> = 484)	
30–40	113 (23.3)
41–50	180 (37.2)
51–60	125 (25.8)
≥61	64 (13.2)
Race (<i>N</i> = 476)	
White	380 (79.6)
Black	11 (2.3)
Latinx	21 (4.4)
Asian	59 (12.4)
Other	6 (1.3)
US region where employed (<i>N</i> = 484)	
Northeast	134 (27.7)
Midwest	103 (21.3)
South	166 (34.3)
West	81 (16.7)
Pediatric subspecialty (<i>N</i> = 499)	
NICU	115 (23)
Palliative care	22 (4.4)
Pediatric critical care	122 (24.4)
Emergency medicine	130 (26.1)
Hematology-oncology	110 (22)
Pandemic effect on clinical practice environment (<i>N</i> = 498)	
Work in my own specialty ≥50% of the time	375 (75.3)
Redeployed outside of specialty	32 (6.4)
Work from home ≥50% of the time	216 (43.3)
Furlough/unemployed	18 (3.6)
Pay cut	10 (2)
Working more frequently/longer hours	158 (32)
“My clinical work has placed me at increased risk” (<i>N</i> = 480)	278 (57.9)
“My institution appreciates my contribution to the pandemic” (<i>N</i> = 477)	289 (60.6)
Currently distressed about (<i>N</i> = 498)	
My health	87 (17.5)
My mental health	166 (33.3)
Family health	287 (57.6)
Economic uncertainty	170 (34.2)
Working outside one’s own specialty	16 (3.2)
Witnessing frequent patient suffering/death	46 (9.2)
Uncertain future	329 (66.1)
Social isolation	233 (46.8)
Childcare/schooling	146 (29.3)
Work-related issues	15 (3)
Current self-care activities (<i>N</i> = 497)	
Exercise	333 (67.1)
Outdoor activities	372 (74.8)
Engage in creative arts	177 (35.6)
TV/Netflix	345 (69.4)
Reading	278 (56)

Table 1 continued

	<i>n</i> (%)
Social media	144 (29)
Socialize with family/friends (in person or virtual)	187 (37.6)
Spiritual practice	125 (25.2)
Holistic practice	57 (11.5)
Mental health care	47 (9.5)
Engage in negative habits	61 (12.3)
Self-care is not a priority	27 (5.4)

their personal or professional lives on the day of the survey. When participants were asked to indicate which factors were causing them distress in the 3 months prior to the survey, the most frequently selected causes were concerns about “family health,” “economic uncertainty,” and an “uncertain future.” When asked to reflect on the sentiment “I have put myself at significant risk as part of my clinical work,” nearly 60% of participants affirmed this concern. When asked to evaluate the statement “My institution has valued my contribution to the Covid-19 crisis,” 60% felt their efforts had been appreciated. Self-care activities of participants are listed in Table 1.

Comparison of early- and pre-pandemic scores

An overview of the pre- and early-pandemic CFST results is presented in Table 2. The previously published, pre-pandemic cohort was a combined population of 1876 pediatric subspecialists (NICU = 479, PC = 150, CC = 475, EM = 393, HO = 379); 59% of this group was female and 79% was white.^{20–24} Cronbach α values were 0.9, 0.8, and 0.9 for CF, BO, and CS scales, respectively, which suggested internally reliable scales. There were no significant differences in CF, BO, and CS scores across the subspecialties under investigation during the early months of the pandemic (Table 2). There were also no significant differences in pre- and early-pandemic CF, BO, and CS scores across these subspecialties. Prior to the pandemic, there were statistically significant differences in CF, BO, and CS scores across subspecialties (CF: $F(4, 1871) = 5.26, p < 0.000$; BO: $F(4, 1871) = 3.33, p < 0.01$; CS: $F(4, 1871) = 7.12, p < 0.000$), although the actual differences in mean scores between groups were small (effect size: $\eta^2 = 0.01$ for each scale) (Table 2). Post hoc comparisons indicated that prior to the pandemic, mean CF scores were significantly different between NICU and CC ($p < 0.000$) and between CC and HO ($p < 0.015$), with the CC mean score higher in both instances. Mean BO scores were also significantly different between PC and CC ($p < 0.006$), with CC mean score higher than PC. Finally, mean CS scores were significantly different between NICU and CC ($p < 0.001$), PC and CC ($p < 0.000$), PC and EM ($p < 0.010$), and CC and HO ($p < 0.023$), with CC and EM mean scores lower in all instances. There were no significant differences in CF, BO, or CS scores across geographic regions in the United States.

Early-pandemic CF analyses

Based on linear regression models, the following personal and professional factors were significant independent predictors of higher CF score: higher BO score; the sentiment “I have put myself at increased risk through my work”; working in one’s own specialty at least 50% of the time; distress about “my mental health” and/or about an “uncertain future” (Table 3A). In contrast, a higher CS score was the sole significant independent predictor of a lower CF score.

Early-pandemic BO analyses

The following factors were each significant predictors of higher BO score: higher CF score; the sentiment “Self-care is not a priority for me”; and emotional depletion (Table 3B). In contrast, the sentiment “My institution has valued my contribution to the

Table 2. Characteristics of the study instrument across pediatric subspecialties before SARS-Cov2 pandemic and in June–July 2020.

	Pre, N	Pre, mean ± SEM	Pre, median (IQR)	Pre, min ^a	Pre, max ^b	Early, N	Early, mean ± SEM	Early, median (IQR)	Early, min ^a	Early, max ^b
Compassion fatigue subscale										
NICU	479	16.9 ± 0.5	14 (13)	0	80	115	17.9 ± 1.0	16 (14)	0	43
PC	150	18.0 ± 0.8	16 (12)	2	59	22	16.2 ± 1.5	15 (12)	8	30
CC	475	20.1 ± 0.5	18 (16)	0	70	122	19.2 ± 0.9	17.5 (12)	0	56
EM	390	19.0 ± 0.6	17 (13)	1	75	131	18.3 ± 1.0	16.1 (12)	0	76
HO	363	17.6 ± 0.6	15 (15)	0	69	110	19.6 ± 1.3	16 (21)	0	67
Burnout subscale										
NICU	433	19.2 ± 0.4	17 (11)	2	52	114	19.5 ± 0.7	18 (10)	3	40
PC	150	17 ± 0.7	17 (11)	1	41	20	20.9 ± 1.7	20 (12)	7	35
CC	475	20.5 ± 0.4	19 (12)	2	49	122	21.2 ± 0.9	20 (13)	0	51
EM	390	19.8 ± 0.5	18 (12)	1	59	129	18.1 ± 0.7	19 (11)	2	47
HO	363	19.8 ± 0.5	19 (12)	1	51	106	20.3 ± 0.8	19 (11)	3	44
Compassion satisfaction subscale										
NICU	433	87.7 ± 0.7	90 (19)	33	115	114	85.1 ± 1.3	86.5 (22)	52	115
PC	150	89.8 ± 1.0	91 (19)	53	115	20	85.3 ± 3.1	87 (19)	55	105
CC	475	83.8 ± 0.7	85 (19)	42	115	122	83.5 ± 1.3	84.5 (19)	38	114
EM	390	85.0 ± 0.8	87 (22)	28	115	129	86.6 ± 1.4	89 (22)	48	114
HO	363	86.9 ± 0.7	89 (18)	28	114	106	83 ± 1.6	84.5 (23)	39	115

SEM standard error of the mean, IQR interquartile range, NICU neonatology, PC palliative care, CC critical care, EM emergency medicine, HO hematology-oncology.

^aMinimum achievable score on each subscale = 0.

^bMaximum achievable score on Compassion fatigue subscale = 90; Burnout subscale = 65; Compassion satisfaction subscale = 115.

Covid-19 crisis" was the only significant independent predictor of lower BO scores.

Early-pandemic CS analyses

The following factors were significant independent predictors of higher CS score: the sentiment "My institution has valued my contribution to the Covid-19 crisis," and availability of workplace debriefs and pet therapy (Table 3C). In contrast, higher BO score and distress about "my mental health" and "physical exhaustion" were significant independent predictors of lower CS scores.

DISCUSSION

We present the first comparison of pre- and early-pandemic data on CF, BO, and CS scores in a national cohort of pediatric subspecialists. Although we expected to find increases in CF and BO in the early-pandemic scores, no such differences were observed. There were some changes in scores when comparing subspecialists, although these did not follow patterns from which we can draw clear conclusions. For example, prior to the pandemic, CF scores in CC physicians were significantly higher than in NICU or HO. In the early pandemic, however, CF scores for CC physicians had decreased sufficiently to make the differences between these groups not statistically significant. One possible explanation is that the pandemic may have had an equalizer effect, such that universal causes of distress (e.g., concerns about an uncertain future, the health of family members, social isolation) diminished prior differences driven by subspecialty. Given these observations and difficult to distill trends, which likely mirror the complex and dynamic impact of pandemic-related stressors on physicians, personal and professional factors associated with an increase or decrease of CF, BO, and CS may help illuminate trends for further research.

Factors impacting CF score

Higher CF scores were associated with the sentiment, "I have put myself at increased risk through my work." The chronic stress of working at increased personal risk is both physically and emotionally exhausting.^{1,5} A sense of duty to care for patients and the related inability to extricate oneself from these risky situations may further contribute to CF. This lack of control or agency may also be reflected in the fact that distress regarding "uncertainty about the future" was significantly associated with a higher CF score. This is not surprising given the unclear duration of new norms created by the pandemic.⁶ A higher CS score was the only factor associated with lower CF scores, which suggests that CS is an important target for intervention.

Factors impacting BO score

Emotional depletion was significantly associated with a higher BO score, as was the sentiment "Self-care is not a priority for me." Chronic exposure to SARS-CoV-2, the uncertain course of the pandemic, and the resultant fatigue may drive such emotional exhaustion.^{2,25} Given the altered and unpredictable demands during the pandemic, participants may also have difficulty prioritizing self-care that might mitigate BO.^{20,26,27} The sentiment "My institution has valued my contribution to the Covid-19 crisis" was the sole significant factor associated with lower BO scores. It was also associated with higher CS scores, and may provide an important point of intervention for institutions.

Prior to the pandemic, higher BO scores in our cohort of pediatric subspecialists were associated with distress about "administrative/academic issues" and/or "coworkers".^{20–24} These associations were not seen in our current study during the early pandemic. This may be due to changes in academic pediatricians' work during the pandemic, with mutable schedules, work from home, and changing administrative demands potentially shifting sources of distress.

Table 3. Significant predictors of compassion fatigue, burnout, and compassion satisfaction scores in pediatric subspecialists during the early-pandemic (linear regression models).

Factor	B	SE B	β	t	p
3A. Compassion fatigue subscale^a					
Burnout score	0.67	0.06	0.50	11.0	0.000
Compassion satisfaction score	-0.11	0.03	-0.14	-3.1	0.002
"I have put myself at significant risk as a part of my clinical work"	2.00	0.83	0.09	2.4	0.017
Work in one's own specialty at least 50% of time	2.58	0.94	0.10	2.7	0.006
Distress about my mental health	4.22	0.92	0.17	4.6	0.000
Distress about uncertain future	1.82	0.83	0.07	2.2	0.030
Cope using mental health services	3.04	1.37	-0.08	-3.3	0.002
3B. Burnout subscale					
Compassion fatigue score	0.42	0.03	0.56	13.2	0.000
"My institution has valued my contribution to the Covid-19 crisis"	-3.33	0.78	-0.16	-4.2	0.000
"Self-care is not a priority for me"	3.72	1.38	0.10	2.7	0.007
Emotional depletion	3.24	0.78	0.17	4.1	0.000
3C. Compassion satisfaction subscale					
Burnout score	-0.85	0.08	-0.48	-10.7	0.000
"My institution has valued my contribution to the Covid-19 crisis"	6.53	1.50	0.18	4.3	0.000
"Distress about my mental health"	-3.35	1.34	-0.10	-2.5	0.013
Workplace programming: debriefs	2.60	1.18	0.09	2.2	0.03
Workplace programming: pet therapy	4.83	2.29	0.08	2.1	0.03
Exhaustion	-4.66	1.39	-0.14	-3.4	0.001

B unstandardized coefficient, SE B standard error of B, β standardized coefficient, t t-statistic.

^aCovariates significant in univariate analyses included in the compassion fatigue regression modeling that did not reach statistical significance: female; working more/longer hours; distress about "own health," "family health," "economic issues," "witnessing frequent patient suffering/death," and/or "social isolation"; cope via "outdoor activities"; workplace support in the form of "peer-to-peer support"; "holistic programs" and/or "team building events"; feelings of "physical exhaustion" and/or "emotional depletion"; and the sentiment "My institution has valued my contribution to the Covid-19 crisis."

^bCovariates significant in univariate analyses included in the burnout regression modeling that did not reach statistical significance: female; working more/longer hours; distress about "own health," "mental health," "family health," "economic issues," "social isolation," and/or "work-related issues"; cope via "mental health care"; workplace support in the form of "debriefs," "peer-to-peer support"; "holistic programs," "mental health programs," and/or "team building events"; feelings of "physical exhaustion"; and the sentiment "I have put myself at significant risk as part of my clinical work."

^cCovariates significant in univariate analyses included in the compassion satisfaction regression modeling that did not reach statistical significance: female; academic medical center; age; working more/longer hours; distress about "social isolation" and/or "child care"; cope via "outdoor activities," "mental health care," and/or "negative" habits; workplace support in the form of "peer-to-peer support"; "holistic programs," "mental health programs," and/or "team building events"; feelings of "emotional depletion"; and the sentiment "My institution has valued my contribution to the Covid-19 crisis."

Factors impacting CS score

As previously noted, the sentiment "My institution has valued my contribution to the Covid-19 crisis" was the sole significant factor associated with lower BO scores; notably, it was also significantly associated with higher CS scores. However, nearly 40% of participants expressed that they did not feel that their contribution was valued by their institution. This is an important finding for institutional leadership, as interventions aimed at making physicians feel valued can have a far-reaching impact.²⁸ How institutional leadership expresses employee value and shows appreciation is not "one-size-fits-all" and requires meticulous attention.^{1,18} Prior to the pandemic, pediatric subspecialists reported wanting more social and emotional support from their institutions.²⁸ That need has increased exponentially with the unpredictable demands of the pandemic. We need to understand how well-established, pre-pandemic institutional social/emotional supports translate to the virtual platform.^{26,29} If the essence of social/emotional support requires our physical presence together, how can we modify existing virtual platforms to provide what is needed? Finally, acknowledgement and exploration of positive emotions may galvanize joy and meaning in medicine and foster resilience.³⁰ Our findings suggest potential targets for intervention to mitigate the negative impact of catastrophe and to amplify any potential positive outcomes.

Limitations

There are several limitations to our study. The survey response rate was relatively low, although it did fall within the range of response rates of our previous surveys on these phenomena, and for web-based surveys in subspecialist physicians.^{20-24,31} As with all survey studies, there is a risk of nonresponse bias.³¹ It is not possible to compare variables between those who responded to the survey and those who did not; it may well be that individuals at greatest risk for CF or BO did not participate in our studies, or alternatively, the reverse may be true. The generalizability of our findings may be limited by the fact that the majority of participants were white and female. Given the rapidly changing nature and protracted duration of the pandemic, our study represents one snapshot—albeit an important one—in time. Lastly, our findings are observed associations to which causality cannot be applied.

CONCLUSION

The personal and professional aftershocks of the current SARS-CoV-2 pandemic for physicians will likely persist well into the foreseeable future. Our results suggest that institutions may be able to mitigate these effects using targeted interventions aimed at conveying to physicians that they are valued. When considering

interventions to promote CS and mitigate CF and BO for pediatric subspecialists during and after the pandemic, a “one-size-fits-all” approach is inadequate. Institutions must prioritize an institutional culture that provides social/emotional supports and explicitly recognizes and values providers’ contributions. Additional work is needed to develop and test interventions and to better understand their impact on CF, BO, and CS.

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AUTHOR CONTRIBUTIONS

S.M.K., J.L.G., K.F.G., E.D.W. and A.S.W. made substantial contributions to study conception and design; S.M.K. and J.L.G. to data acquisition; A.S.W. to data analysis; S.M.K., J.L.G. and A.S.W. to writing the first draft of the manuscript; K.F.G. and E.D.W. to critical revision of the manuscript for important intellectual content. All authors approved the final manuscript as submitted, and agree to be accountable for all aspects of the work.

CONSENT STATEMENT

Subject consent was not required for this study.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

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