One Year into the COVID-19 Pandemic: an Update on Medical Student Experiences and Well-being

J Gen Intern Med
DOI: 10.1007/s11606-022-07835-4

INTRODUCTION

The COVID-19 pandemic has profoundly affected medical students' academic and personal experiences. Early pandemic studies found a decline in US medical student well-being.[1] In a Spring 2020 study of US medical students from 22 schools, our team found high rates of stress, burnout, and loneliness.[2] Black, Asian, and other racial minority students reported higher rates of stress and burnout, likely reflecting underlying inequalities exacerbated by the pandemic.[2] Few studies examined ongoing pandemic effects on student well-being. In this follow-up study, we aim to (1) compare student burnout, stress, and loneliness in Spring 2020 vs. 2021 and (2) explore student experiences in Spring 2021.

METHODS

Of 22 schools included in the 2020 study, 14 participated in the follow-up survey. From March to July 2021, all enrolled students were emailed a 90-item survey, including questions on demographics (age, gender, race/ethnicity etc.), pandemic experiences (personal experiences with COVID-19 diagnoses, racism, financial strain) and three scales measuring components of distress (Maslach Burnout Inventory, Perceived Stress Scale, and UCLA Loneliness Scale).[2] Chi-squared and *t*-tests compared 2020 vs. 2021 burnout, stress, and loneliness scores. One-way ANOVAs and odds ratios examined differences in 2021 burnout, stress, loneliness, and student experiences between race/ethnicity groups and school year. All analyses were performed in R (3.6.1). The institutional review board at the University of Chicago (IRB17-1095) and all participating schools approved the study.

Previous Presentations *Oral presentation at the Society of General Internal Medicine National Meeting, April 2022 and the Academy of Professionalism in Health Care, June 2022.*

Received June 20, 2022
Accepted September 29, 2022

RESULTS

The response rate was 23% (1547/6836). Except for higher female representation in our study, respondent characteristics were representative of national medical school enrollment data (Table 1).[3]

Comparing 2020 to 2021 results, burnout was unchanged (50% vs. 53%, $p = 0.06$), stress was lower (18.9 vs. 18.3, $p =$

Table 1 Characteristics of US Medical Student Respondents from Surveys on Medical Student Well-being During the Early Phase and One Year into the Pandemic, 2020 and 2021

Characteristics	Survey 1: Early phase of pandemic (*n*= 3762 students; *n*=22 medical schools)	Survey 2: One year into pandemic (*n*= 1561 students, *n*= 14 medical schools)
Age, mean (SD)	26.1 (2.8)	25.8 (2.9)
Gender, no. (%)		
Female	2,327 (62%)	960 (62%)
Male	1,391 (37%)	559 (36%)
Other*	21 (1%)	23 (2%)
Missing	23	19
Race and ethnicity		
Hispanic	395 (11%)	149 (10%)
White	2,045 (55%)	890 (57%)
Asian	812 (22%)	293 (19%)
Black	236 (6%)	92 (6%)
Other†	263 (7%)	118 (8%)
Missing	11	19
Year in medical school		
M1	1,039 (28%)	530 (34%)
M2	843 (22%)	279 (18%)
M3	955 (25%)	377 (24%)
M4	735 (20%)	317 (21%)
Other‡	190 (5%)	43 (3%)
Missing	0	15
Path to medical school		
Traditional§	1,197 (32%)	554 (36%)
Non-Traditional	2,565 (68%)	991 (64%)
Missing	0	16
Medical school type, no. (%)		
Public	2,136 (57%)	939 (61%)
Private	1,626 (43%)	608 (39%)
Missing	0	14
AAMC region, no. (%)		
Northeast	1,410 (37%)	661 (43%)
Southern	903 (24%)	365 (23%)
Central	880 (23%)	415 (27%)
Western	569 (15%)	106 (7%)
Missing	0	14

**Other includes students who identified as non-binary or preferred not to say*
†Other includes students who identified as multiracial, American Indian/Alaska Native/Native Hawaiian, or "other"
‡Other includes students in the PhD portion of MD/PhD or pursuing a year-off (masters, JD, etc.)
§Traditional was defined as students who matriculated into medical school directly after graduating from college

Published online: 20 October 2022

Table 2 Student Distress Scales (Burnout, Stress and Loneliness)* and Life Experiences of US Medical Student Respondents from a Survey on Medical Student Well-being One Year into the Pandemic, 2021

Experience	No. (%)	OR (CI)	P value
Student distress measures: burnout, stress, and loneliness scales			
Burnout†	704 (53%)		
Sex			0.33
Male	250 (51%)	0.9 (0.72, 1.12)	
Female	440 (53%)	Ref	
Race			0.38
Black	41 (55%)	1.14 (0.71, 1.84)	
Hispanic	68 (55%)	1.15 (0.78, 1.68)	
Asian	137 (58%)	1.28 (0.96, 1.72)	
Other	49 (48%)	0.86 (0.57, 1.29)	
White	409 (51%)	Ref	
Year in school			< .001
M1	243 (54%)	Ref	
M2	141 (58%)	1.2 (0.88, 1.65)	
M3	187 (58%)	1.19 (0.89, 1.59)	
M4	109 (39%)	0.55 (0.40, 0.74)	
Perceived stress scale‡	18.3 (7.0)†		
Sex			< .001
Female	19.0 (6.6)†		
Male	17.2 (7.2)†		
Race			< .001
Black	19.4 (6.6)†		
Hispanic	19.9 (7.1)†		
Asian	19.3 (6.9)†		
Other	17.9 (7.0)†		
White	17.8 (7.0)†		
Year in school			< .001
M1	18.6 (6.8)†		
M2	18.9 (6.8)†		
M3	19.0 (7.0)†		
M4	16.2 (6.7)†		
Loneliness scale§	739 (55%)		
Sex			0.002
Female	476 (58%)	Ref	
Male	246 (50%)	0.73 (0.58, 0.91)	
Race			0.006
Black	44 (59%)	1.32 (0.82, 2.16)	
Hispanic	72 (58%)	1.29 (0.88, 1.90)	
Asian	152 (64%)	1.65 (1.23, 2.23)	
Other	60 (58%)	1.30 (0.86, 1.98)	
White	411 (52%)	Ref	
Year in school			< 0.001
M1	301 (67%)	Ref	
M2	143 (59%)	0.72 (0.53, 1.00)	
M3	154 (48%)	0.46 (0.34, 0.62)	
M4	115 (41%)	0.35 (0.26, 0.47)	
Life experiences			
Personal experience with COVID-19§§	721 (47%)		
Race/ethnicity			<0.001
Black	54 (59%)	1.37 (0.89, 2.14)	
Hispanic	84 (56%)	1.25 (0.88, 1.78)	
Other	57 (48%)	0.91 (0.62, 1.33)	
Asian	74 (25%)	0.33 (0.24, 0.44)	
White	452 (51%)	Ref	
Financial strain	425 (27%)		
Race/ethnicity			0.002
Hispanic	61 (41%)	1.91 (1.33, 2.73)	
Black	30 (33%)	1.34 (0.83, 2.10)	
Other	34 (29%)	1.12 (0.72, 1.70)	
Asian	63 (22%)	0.76 (0.55, 1.03)	
White	237 (27%)	Ref	
Racism/bias related to COVID-19	158 (10%)		
Race/ethnicity			0.02
Asian	93 (32%)	20.04 (12.31, 34.19)	
Black	16 (17%)	9.13 (4.47, 18.41)	
Other	21 (18%)	9.37 (4.88, 18.09)	
Hispanic	8 (5%)	2.49 (1.00, 5.61)	
White	20 (2%)	Ref	

*Please refer to the methods section of the 2020 study for more details on the scales and how they were used[2]
†Burnout was assessed using the 22-item MBI-HSS scale. Burnout on the MBI-HSS scale is indicated by a score of 27 or higher on the Emotional Exhaustion subscale and/or a score of 10 or higher on the Depersonalization subscale[2]
‡Stress was measured using the PSS-10 scale; scores range from 0 to 40, with higher scores indicating greater stress
§Loneliness was measured using the 3-item UCLA Loneliness Scale. High loneliness on the UCLA Loneliness Scale is indicated by a score ≥ 6/9[2]
§§Personal experience defined as a COVID-19 diagnosis in the student and/or a family member, and/or having a loved one die from COVID-19

0.007) and loneliness was higher (50% vs. 55%, $p < 0.001$). In Spring 2021, Asian, Hispanic, and Black students were more likely to experience burnout compared to White students (OR=1.28 (0.96, 1.72), OR=1.15 (0.78, 1.68), OR=1.14 (0.71, 1.84) respectively). M2s and M3s were more likely to be burned out compared to M1s (OR=1.2 (0.88, 1.65), OR=1.19 (0.89, 1.59) respectively).

Mean stress scores were highest among Hispanic (19.9 (7.1)) and Black (19.4 (6.6)) students ($p < 0.001$), and M2s and M3s ($p<0.001$). Compared to White students, Asian students were more likely to report high loneliness (OR=1.65 (1.23, 2.23)), and M1s had the highest loneliness scores ($p < 0.001$). Compared to White students, Hispanic and Black students were more likely to experience financial strain (OR=1.91 (1.33, 2.73), OR=1.34 (0.83, 2.10) respectively), and Asian and Black students were more likely to experience COVID-related racism (OR=20.04 (12.31, 34.19), OR=9.13 (4.47, 18.41) respectively). Results are summarized in Table 2.

DISCUSSION

Compared with early in the pandemic, burnout rates were unchanged at the 1-year time point, while loneliness rates were higher and stress scores were lower. Students of color remained disproportionately affected. While M2s and M3s reported the highest stress and burnout, M1s who entered school during the pandemic had the highest loneliness scores.

Changes in the medical threat of the virus, public health interventions, and the social climate may have contributed to the changes in student distress between Spring 2020 and Spring 2021. Vaccine distribution dampened the threat of the virus and likely decreased student stress. However, paralleling well-documented unintended consequences and negative effects of public health interventions nationally, ongoing social distancing likely contributed to increased loneliness.[4] This ongoing isolation combined with persistence of racial injustice and the rise in Asian hate crimes likely contributed to the persistence of well-being disparities.[5,6]

Limitations of the study include a low overall response rate and potential for non-response bias. Furthermore, concurrent national events and differing institutional policies limit the ability to isolate individual factors.

As the pandemic progresses, medical schools should focus efforts on community building to address loneliness and implement flexible policies for impacted students. Participating schools have worked to address the disparate toll of the pandemic and implemented emergency financial assistance programs and anti-racism initiatives. National medical organizations and other stakeholders should advocate for broad implementation of similar initiatives. The COVID-19 pandemic has taught us that public health crises themselves and subsequent government and institutional responses have the potential to impact learner distress. In the future, institutions should anticipate the immediate and long-term effects of crisis response policies on students' well-being and adapt their learning environments to mitigate harm.

Acknowledgements: *The authors wish to thank all students who completed the survey and the Medical Student Well-being Research Consortium members:*

Jason Burrows, MD
Yuan Fang
Megan Fiorillo
Lauren J. Germain, PhD, MEd
Elizabeth Goodman, MD
Melissa Held, MD
Haneme Idrizi, MD
Brady J Janes
Conrad Krawiec, MD
Allyson McDermott, MD
Myo Thwin Myint, MD
Kaushal B. Nanavati, MD
Jody Lack, MD
Michelle Lizotte-Waniewski, PhD
Maria Noel
Adam E Perrin, MD
RohanRao
Mary Rzeszut, MSW, LCSW
Jenna Scholl
Stephen S. Smith, PhD
Torrence Tran, MD
Samantha A Vergano, MD
Karen Weissbecker, LMSW, Ph.D.

Tanios Dagher, BSE[1]
Maria A. Alkureishi, MD[2]
Omar R. Vayani, BSA[1]
Kristen Chalmers, BS[1]
Mengqi Zhu, MS[3]
James N. Woodruff, MD[1,4]
Wei Wei Lee, MD MPH[1,3,4]

[1]Pritzker School of Medicine, University of Chicago, Chicago, IL, USA
[2]Section of Academic Pediatrics, University of Chicago Medical Center, Chicago, IL, USA
[3]Department of Medicine, University of Chicago, Chicago, IL, USA
[4]Section of General Internal Medicine, University of Chicago Medical Center, Chicago, IL, USA

Corresponding Author: *Wei Wei Lee, MD MPH; Department of Medicine, University of Chicago, Chicago, IL, USA (e-mail: wlee6@uchicago.edu).*

Funding *This work was supported by the University of Chicago Bucksbaum Institute for Clinical Excellence.*

Declarations:

Ethics Approval: *This study has been approved by the University of Chicago Institutional Review Board and respective IRBs of all participating schools.*

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

REFERENCES

1. **Nikolis L, Wakim A, Adams W, Bajaj P.** Medical student wellness in the United States during the COVID-19 pandemic: a nationwide survey. BMC Med Educ. 2021;21(1):401.
2. **Alkureishi ML, Jaishankar D, Dave S, Tatineni S, Zhu M, Chretien KC, Woodruff JN, Pincavage A, Lee WW.** Medical student well-being being research consortium. Impact of the early phase of the COVID-19 Pandemic on medical student well-being: a multisite survey. J Gen Intern Med. 2022;37(9):2156-2164.
3. Table B-3:Total U.S. MD-Granting Medical School Enrollment by Race/Ethnicity (Alone) and Sex, 2017-2018 through 2021-2022 - 2021 FACTS: Enrollment, Graduates, and MD/PhD Data - AAMC. https://www.aamc.org/data-reports/students-residents/interactive-data/2021-facts-enrollment-graduates-and-md-phd-data. Accessed 26 Aug 2022.
4. **Bavli I, Sutton B, Galea S.** Harms of public health interventions against covid-19 must not be ignored. BMJ. 2020;371:m4074.
5. **Stowers JA, Desrosiers S, Zeleke K, Bakare O, Seifi A.** The life of a Black Medical Trainee in the United States: past, present, future. J Natl Med Assoc. 2021;113(1):43-45.
6. **Kormendi NM, Brown AD.** Asian American mental health during COVID-19: a call for task-sharing interventions. SSM Ment Health. 2021;1:100006.