

## Article

# The Impact of COVID-19 and Racial Injustices on Resilience of Incoming Medical Students

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**Abstract:** Medical students (MS) are at higher risk for depression than their peers. Incoming U.S. MS completed a survey that included the validated RS-14, which measures resilience and its two subcomponents: self-assuredness and drive. Surveys were administered before classes started in 2019 (pre-pandemic-cohort; n = 178) and 2020 (pandemic-cohort; n = 181). Resiliency, self-assuredness, and drive were not different between cohorts. Demographic subgroup analyses revealed that under-represented in medicine (URiM) MS in the pre-pandemic-cohort scored higher on drive ( $p = 0.007$ ) than non-URiM MS ( $6.07 \pm 1.00$  vs.  $5.59 \pm 0.97$ ); however, this difference was not significant in the pandemic-cohort. Additionally, students in the pandemic-cohort were more likely to agree that peer discussions about emotional challenges would be beneficial ( $p = 0.014$ ). Qualitative analysis revealed that 45.9% of pandemic-cohort respondents felt more motivated to pursue medicine. This is the first study to report differences in drive between URiM MS cohorts matriculating before and during a pandemic, a positive correlation between multiple-mini-interview (MMI) scores and drive, and a negative correlation between MCAT scores and drive. Collectively, these results suggest that the circumstances of 2020 may have negatively influenced the drive of URiM students, positively impacted the receptivity of MS to peer discussions, and motivated students to pursue medicine.

**Keywords:** COVID-19; resilience; medical students; URiM; mental health



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## 1. Introduction

Researchers have consistently demonstrated the devastating impact of the COVID-19 pandemic on healthcare workers. In an early study of healthcare workers in February 2020 in Wuhan, China (n = 5062), 29.8% of respondents reported stress, 24.1% reported anxiety, and 13.5% reported symptoms of depression. Many of these healthcare workers have also cited fear for themselves or their families, with 56.9% of respondents stating they fear for their own lives due to possible infection and 92.1% of respondents stating they are fearful their loved ones may become infected. Furthermore, while this study was conducted early into the pandemic, 8 and 10 February 2020, 10.1% of respondents cited thoughts of resigning from the medical field due to the pandemic [1]. Medical students (MS) were particularly vulnerable because of interruptions in medical education, which included an abrupt transition to electronic learning, suspended clinical rotations, decreased career exploration opportunities, and a high risk of infection and transmission to loved ones [2]. Most U.S. medical schools abruptly halted clinical training and transitioned to an electronic learning environment [3,4]. Digital learning has been associated with mental health deterioration and increased levels of cynicism among MS [4].

Researchers have reported that MS have higher rates of burnout and lower quality of life than age-matched populations [5–7]. These trends continue as students transition to residency and become practicing physicians [8]. Unfortunately, despite relative plateaus in burnout rates amongst other working professionals, they have continued to rise among U.S. physicians [9]. Chronic stressors experienced by healthcare workers contribute to burnout rates, leading to clinician attrition and negative impacts on patient care [6,10–15].

### 1.1. Resilience

Understanding positive wellness factors, such as resilience, is necessary when considering MS' well-being. In alignment with the definition put forth by Forycka et al. (2022) and Howe et al. (2012), we define resilience as a dynamic process involving both adaptability and flexibility, in which one effectively bounces back from negative experiences and adapts to new stressful situations [16,17]. Resilient people are more likely to respond constructively to stress by furthering self-improvement despite challenges. Resilience positively affects well-being while decreasing burnout and perceived stress [18–21]. Encouraging a growth mindset, the belief that people can positively change and adapt to obstacles and challenges, supports increased resilience [22,23]. One study found that most MS had low measures of resilience and higher burnout during the pandemic. Importantly, those with higher resilience levels maintained better attitudes toward electronic learning and exhibited lower rates of burnout, exhaustion, and cynicism [16].

Resilience has been assessed through various scales and metrics [24]. The Resilience Scale (RS-14) is a validated 14-item survey with Cronbach's alphas ranging from 0.89 to 0.96 that has been licensed to measure resilience [25,26]. The RS-14 is relatively efficient while maintaining high validity and reliability and has been used to study resilience in MS globally [23,27–30]. The RS-14 has been significantly positively correlated with measures of positive concepts, including optimism, self-efficacy, and gratitude, and negatively correlated with indices of psychological distress [31].

### 1.2. Racial Injustices in the United States

Racial injustices that took place in the summer of 2020, including the murders of Breonna Taylor, Ahmaud Arbery, and George Floyd, led to protests across the U.S. and in over 60 countries [32]. It is important to consider that MS may have been impacted by these events, particularly those who have self-categorized via AMCAS as under-represented in medicine (URiM). Data from the 2016–2017 Association of American Medical Colleges Graduation Questionnaire showed that URiM students were more likely to feel exhausted by the pressures of medical school [33]. In another multi-institutional study conducted prior to COVID-19 ( $n = 3080$ ), URiM students reported that their race/ethnicity had adversely affected their medical school experiences (11% vs. 2%;  $p < 0.001$ ), citing various causative factors, including racial discrimination, prejudice, feelings of isolation, and contrasting cultural expectations [34]. In the current study about resilience, it is critical to consider the impact of these events amidst the COVID-19 pandemic, especially on incoming URiM students.

This study assessed resilience in MS matriculating before and during the COVID-19 pandemic and racial injustices of 2020 (as they cannot be separated). In addition, we assessed the attitudes of incoming MS toward discussing resilience with peers and their feelings about pursuing a medical career amidst a pandemic. We also aimed to determine if any relationships exist between resiliency scores and admission metrics, including MMI, Casper, and MCAT scores. Findings from this study may support an understanding of incoming MS' well-being and resilience and could help us understand whether admissions tools effectively assess elements of resiliency.

## 2. Materials and Methods

A voluntary, anonymous, cross-sectional study was conducted. An electronic survey was administered during the New York Medical College (NYMC) first-year MS orientation

in August 2019 to the entire MS Class of 2023 (pre-pandemic-cohort) and September 2020 to the entire MS Class of 2024 (pandemic-cohort). The Qualtrics survey included the validated RS-14 questions and three school-specific Likert scale questions about tools of resilience, benefits of open discussion, and resilience as a teachable skill (Appendix A.1). The initial purpose of the survey, prior to the pandemic, was to measure resiliency over the course of a four-year medical school program; however, the survey was amended for the incoming pandemic-cohort to include seven questions related to COVID-19 (Appendix A.2). Participation was voluntary. An electronic consent form appeared prior to the survey; if a MS declined, the survey was not administered.

The RS-14 uses a Likert scale with seven possible responses for each item ranging from 1 (strongly disagree) to 7 (strongly agree); higher scores indicate greater resilience [35]. Burgis-Kasthala (2019) confirmed the validity of the RS-14; exploratory factor analysis suggested two latent factors: “self-assuredness” and “drive.” Self-assuredness relates to nine items on the RS-14 scale, while drive relates to three items [36].

AMCAS demographic subgroup categories included the following: sex, URiM, fee assistance program (FAP) participation, and socioeconomically disadvantaged (SED) status. Accommodation status, defined as having registered with the institution’s disability office within the first year of medical school, as well as MCAT, multiple-mini-interview (MMI), and Computer-based Assessment for Sampling Personal Characteristics (Casper) scores were explored for relationships with resilience measures.

### 2.1. Quantitative Data Analysis

The Mann–Whitney–Wilcoxon tests assessed differences in overall resilience, self-assuredness, and drive between cohorts. Classes were stratified by sex, URiM, FAP, SED, and accommodation status. We performed demographic subgroup stratified analyses and examined possible differences between subgroups in overall resilience, self-assuredness, and drive with univariate analysis of variance (UNIANOVA). Asymptotic significance *p*-values (two-tailed) were used when exact significance values were unavailable.

### 2.2. Qualitative Data Analysis

A qualitative analysis of the survey’s open responses was performed using inductive analysis [37] through open coding, category creation, and abstraction. Open coding was conducted by reading participants’ responses and noting repeated themes to create categories. Subsequently, all team members reviewed and agreed on suggested categories. (Appendix B.1) The process of abstraction was performed, combining categories to develop succinct, specific categories that included each response. Again, all team members reviewed and agreed on the combined categories.

This study was reviewed and approved by the NYMC IRB (14107).

## 3. Results

The survey was emailed to the incoming pre-pandemic (*n* = 215) and pandemic-cohorts (*n* = 217). Of those invited, 178 pre-pandemic MS (82.8%) and 181 pandemic MS (83.4%) participated (Table 1).

**Table 1.** Characteristics of entering medical student participants by class.

	CO23 (Pre-Pandemic)	CO24 (Pandemic)
Total study participants/Total students	178/215	181/217
Female, <i>n</i> (%)	101 (56.7%)	95 (52.5%)
URiM students, <i>n</i> (%)	29 (16.3%)	37 (20.4%)
FAP participants, <i>n</i> (%)	22 (12.4%)	13 (7.2%)
SED by self-report, <i>n</i> (%)	18 (10.1%)	38 (21.0%)
Accommodation status, <i>n</i> (%)	15 (8.4%)	20 (11.0%)

### 3.1. Quantitative Analysis

In aggregate, the RS-14 overall resilience scores did not differ significantly between the two MS cohorts ( $p = 0.938$ ; Table 2). Additionally, there was no significant difference in self-assuredness ( $p = 0.796$ ) or drive ( $p = 0.983$ ). Demographic subgroup analyses between class years by sex, URiM, FAP participant, and SED status revealed no significant differences in overall resilience or self-assuredness (Table 2). Similarly, accommodation status showed no significant differences in overall resilience or self-assuredness. In subgroup analyses of drive, URiM pre-pandemic MS were found to have significantly higher drive than URiM MS in the pandemic-cohort ( $p = 0.011$ ). In comparative analyses between URiM and non-URiM by class, URiM MS scored significantly higher in drive in the pre-pandemic cohort ( $6.07 \pm 1.00$  vs.  $5.59 \pm 0.97$ ,  $p = 0.007$ ), whereas no significant difference was found in the pandemic-cohort (Table 3).

**Table 2.** Differences in resilience, self-assuredness, and drive: **a.** in the overall cohorts and **b.** in the demographic subcategories. **c:** Likelihood of agreeing with the open-response questions between the CO23 and CO24. Mann–Whitney U tests were performed in cohort comparisons (with  $z$  corresponding to effect size), and UNIANOVA was performed in demographics subcategory comparisons. UNIANOVA values are represented as mean (SD), except for  $p$  values. Statistically significant  $p$  values are marked with an asterisk.

Comparison of Cohorts	Overall Resilience			Self-Assuredness			Drive			
	Mann–Whitney U	z	p	Mann–Whitney U	z	p	Mann–Whitney U	z	p	
	All students CO23 vs. CO24	16,032.5	−0.08	0.938	16,088	−0.02	0.983	15,856	−0.26	0.796
Comparison by demographic subcategories	Overall Resilience			Self-Assuredness			Drive			
	CO23	CO24	p	CO23	CO24	p	CO23	CO24	p	
	Female	78.76 (13.24)	79.85 (9.23)	0.578	5.55 (0.96)	5.59 (0.77)	0.687	5.68 (1.04)	5.82 (0.78)	0.22
	FAP	81.23 (8.783)	85.15 (6.53)	0.388	5.72 (0.64)	5.99 (0.53)	0.382	5.91 (0.99)	6.10 (0.55)	0.631
	UriM	81.76 (14.45)	79.54 (13.513)	0.304	5.79 (1.07)	5.65 (1.01)	0.459	6.07 (1.00)	5.54 (1.26)	0.011 *
	SED	76.78 (15.44)	79.97 (9.04)	0.38	5.46 (0.99)	5.58 (0.73)	0.641	5.74 (1.38)	5.81 (0.77)	0.822
Comparison of Cohorts	“I currently have the tools to be resilient and maintain my mental health in medical school.”			“I would benefit from open discussion with fellow students about the emotional challenges of medical school.”			“Resiliency is a skill that can be taught.”			
	Mann–Whitney U	z	p	Mann–Whitney U	z	p	Mann–Whitney U	z	p	
	All students CO23 vs. CO24	15,299.5	−0.85	0.395	13,755	−2.46	0.014 *	15,369	−0.78	0.438

Three school-specific questions were analyzed for agreement between the two entering classes. There were no significant differences in responses to the questions about having tools to maintain resilience and mental health ( $p = 0.395$ ; Table 2) or whether resilience is a skill that can be taught ( $p = 0.438$ ). However, pandemic-cohort MS were significantly more likely than pre-pandemic MS to agree that it would be beneficial to have open peer discussions about the emotional challenges of medical school ( $p = 0.014$ ).

The relationship of overall resilience, self-assuredness, and drive with other factors was further analyzed. Drive was statistically positively correlated with the multiple mini-

interview score ( $p = 0.020$ ) and statistically negatively correlated with the MCAT score. There was no significant relationship between any of the resilience measures and Casper.

**Table 3.** Self-assuredness and drive in URiM vs. non-URiM students in the CO23 and CO24. Mann–Whitney U tests were performed, and effect size ( $z$ ) and  $p$ -values are reported. Statistically significant  $p$  values are marked with an asterisk.

	URiM vs. Non-URiM	Mann–Whitney U	$z$	$p$
CO23	Self-assuredness	1769.5	−1.54	0.123
	Drive	1481	−2.69	0.007 *
CO24	Self-assuredness	2422	−0.85	0.394
	Drive	2658.5	−0.02	0.984

### 3.2. Qualitative Analysis

Of 181 survey respondents in the pandemic cohort, 157 (86.7%) responded to the open-response question regarding how the pandemic changed their attitude toward becoming a physician or raised new concerns about entering the healthcare workforce. Responses comprised five categories: (1) indifference, (2) attitude unchanged with acknowledgment of how the pandemic has changed the field, (3) increased fear or anxiety due to the pandemic, (4) more motivation, and (5) more motivation with apprehension about the field (Appendix B.2).

While the pandemic had varying impacts on each student's attitude toward becoming a physician, nearly half (45.9%, 72/157) reported being more motivated, with or without apprehension. Specifically, of all respondents, 30.6% (48/157) expressed increased motivation without caveat, and 15.3% (24/157) indicated more motivation in addition to apprehension. While 22.3% (35/157) stated the pandemic led to increased anxiety and fear toward entering medicine, 24.2% (38/157) noted an indifference toward the pandemic, and 7.6% (12/157) reported their attitude was unchanged.

Those expressing increased motivation without caveat discussed excitement around enacting positive change in medicine and a sense of duty to combat challenges presented by the pandemic. One respondent encapsulated this experience:

“No, it has strengthened my desire to be a part of emergent solutions to new and long-standing problems in healthcare” (R150).

Those who expressed motivation with apprehension wrote about their sense of duty in taking on major health crises. However, they also expressed uncertainty regarding their self-efficacy in taking on the challenges presented by the pandemic. The students who showed increased anxiety and fear cited new concerns about the future of the field, while those with unchanged attitudes believed the pandemic would have lasting effects on the medical field without personally affecting them. The students expressing indifference toward the pandemic clarified in open responses that they did not feel it would have long-lasting effects on the medical field.

## 4. Discussion

This is the first study to measure the resilience of incoming MS before and during a pandemic and to report differences in the drive of URiM students between cohorts. While the overall resilience of incoming MS was not significantly different across cohorts, we observed significantly higher drive in the pre-pandemic cohort URiM students compared to non-URiM students; we did not observe the same trend in the pandemic cohort. The loss of this trend has led us to hypothesize that the drive of URiM students was disproportionately affected during the pandemic and accompanying racial injustices. Studies have explored the relationship between peer support of URiM in medical school, arguing that a lack of peer support contributes to feelings of isolation in URiM MS [38]. Furthermore, studies have also shown that among URiM MS, discussion of social justice and community are impactful

for URiM MS [39]. When comparing the school-specific survey responses, pandemic students were significantly more likely to believe they would benefit from open discussions with peers about the emotional challenges of medical school. In addition, despite the rising anxiety of general and healthcare professional populations during COVID-19 [40,41], nearly half of the pandemic-cohort respondents reported feeling more motivated to enter the healthcare field. Notably, this is the first study to report a positive correlation between drive and MMI score and a negative correlation between drive and MCAT score.

Resilience scores across cohorts were consistent with existing literature that suggests entering MS have high baseline resilience [42]. Studies exploring the pandemic's impact on student well-being, burnout, or resilience have reported mixed results [4,43]. One study using the RS-14 scale reported lower MS resilience during the pandemic [16]. It is important to note that our research surveyed two separate student cohorts before starting medical school, so the results do not reflect the lived experience of students attending medical school during the pandemic.

One longitudinal study examined U.S. MS resilience before and throughout their first year of medical school using the Brief Resilience Scale; MS' resilience significantly decreased during the first year [44]. However, this study occurred before the pandemic, and results suggested that attending medical school negatively impacted resilience. Another longitudinal study published in 2021 used the Perceived Medical School Stress Instrument (PMSS) to evaluate German MS and reported that perceived stress significantly increased during the first two years [45]. Our findings, in conjunction with current literature, suggest that further research is needed to determine what factors impact students' resilience during medical school. Initiatives for promoting MS' resilience and decreasing stress have improved MS and resident well-being in a few settings [17,46,47]. The NYMC Resiliency Curriculum aims to improve MS' resilience [48,49]. Future work will examine the efficacy of this curriculum and its impact on MS' resilience.

In this study, we also examined demographic subgroups within each cohort and found no significant difference in resilience based on sex. However, other studies have demonstrated increased psychological distress in female MS, with resilience being inversely proportional to psychological distress and decreased mental health [50,51]. Disproportionately poor mental health in university female students has been demonstrated both before [52] and during the pandemic [53–56]. In addition, our study found no difference in the overall resilience of SED students between cohorts. However, studies of university students have shown that SED status was associated with decreased wellness before and during the pandemic [51,52]. Further research is needed to explore how medical school may impact female and SED students' resilience and wellness.

When comparing the school-specific survey responses of both classes, pandemic-cohort MS expressed an increased desire for open discussions with peers about the emotional challenges of medical school. We propose that several factors may have contributed. Firstly, incoming students in August 2020 likely felt particularly isolated as they moved to a new community during a quarantine. Even before the pandemic, studies have shown that MS suffer from feelings of isolation and loneliness, which can contribute to distress [57,58]. During the pandemic, one study reported that 58.8% of MS respondents reported experiencing social isolation; students expressed that quarantine contributed to missing interactions with peers and teachers [59]. Prior to the pandemic, researchers reported that creating a peer belonging program significantly decreased social isolation scores in MS [60]. Given that quarantining and medical school are both independently associated with feelings of isolation, MS who matriculated during a quarantine were likely feeling especially isolated and looking for opportunities to have discussions with peers. In fact, among the MS who submitted qualitative answers, a recurrent theme was that students felt a desire to have their "feelings (of anxiety and isolation) validated in 'student led discussions'" or some form of support groups that fostered connections between students. Consequently, stakeholders increased peer-to-peer discussion opportunities available remotely and on campus.

In our study, pre-pandemic URiM students entered medical school with higher drive than their classmates. In the class entering during the pandemic, however, no differences in drive were observed between URiM and non-URiM students. While we cannot make a direct comparison as they represent different cohorts, this finding is compelling given the escalation of racial injustices in the US in 2020, which drew attention to the impact of systemic oppression and racism on URiM students and physicians [61–63]. Pre-pandemic, URiM MS were at greater risk of depression due to poor diversity and inclusion climates, alienation, and lack of peer and faculty support [62–66]. Another pre-pandemic study demonstrated that URiM students felt that their race and ethnicity had negatively affected their medical school experience (11% vs. 2%;  $p < 0.001$ ) [34]. The barriers URiM students face in medical school were intensified by the events of 2020, which may have impacted differences in drive in the incoming URiM pandemic cohort.

The MMI score's positive correlation with drive suggests that the MMI score is a useful admission tool to assess drive, one of the important subcomponents of resiliency, whereas the MCAT (which demonstrated a negative correlation with drive) is not. This further bolsters the importance of using the MMI as part of a holistic approach to admissions by identifying candidates who are more likely to exhibit strong drive.

Surprisingly, in our study, nearly half of the incoming CO24 reported feeling more motivated to enter the healthcare field. Qualitative analysis revealed that students felt a strong obligation to become physicians to positively impact others. This is mirrored by another recent study [67], which found that most pre-med student participants were more motivated to pursue medicine in the face of the pandemic. Similarly, MS volunteers during COVID-19 reported that their motivation to volunteer stemmed from a greater sense of duty [68].

While many students in our study felt more motivated to pursue medicine, some (22.3%; 35/157) reported feeling hesitant. This subgroup cited various factors, including feelings of stress and dangers related to virus exposure. Another major theme involved fear surrounding the apparent public distrust of the healthcare field, specifically referring to political movements such as “anti-vaccine” and general “anti-science” mentalities. To our knowledge, no studies have examined how these movements have impacted MS or healthcare workers.

While the pandemic and the period of racial unrest during this time were unusual circumstances, we believe this study can be viewed as a model for potential consequences during a time when there are limited opportunities for peer support. Studies have shown that a lack of peer support contributes to feelings of isolation [39,69]. This type of isolation is not uncommon in the medical field; many studies demonstrate that among physicians who experience burnout, peer support is an integral part of improving mental health [70–72]. Furthermore, many URiM MS value discussions of social injustice; hence, it is imperative to endeavor to communicate support for our colleagues in the medical profession [38,39]. As such, while the pandemic may fade in relevance in peoples' minds, we hope to learn from this period to further bolster our understanding of mental health and resilience during a time of decreased peer support and racial injustice.

This study has several limitations. First, our study cohorts are not directly comparable as they were distinct incoming classes. In addition, each cohort's resilience was not measured over time, thereby limiting the scope of the study to resilience upon matriculation. Students were not obligated to complete the free-response questions, creating a potential bias towards students with stronger feelings. Finally, findings in the analysis of stratified subgroups are limited by the sample size and single institution methodology.

## 5. Conclusions

Although no significant difference was found between the overall resilience of incoming MS cohorts before and during the pandemic, URiM students' drive was significantly higher than non-URiM MS in the pre-pandemic-cohort. No such difference was found in the pandemic-cohort. Furthermore, pandemic MS demonstrated an increased desire

for open discussions with peers regarding the emotional challenges of medical school and reported feeling an increased motivation to practice medicine. Notably, the MMI score's positive correlation with drive, alongside the MCAT's negative correlation with drive, further bolsters the importance of using the MMI as part of a holistic approach to admissions.

Future work includes studying whether the resilience of each cohort changes during medical school and whether the NYMC resilience curriculum improves student resilience and overall well-being. Additional studies should examine how current events impact student resilience, which could support the targeted development of support resources. Finally, multi-institutional studies are needed to analyze trends in larger student populations to reduce institutional and geographic bias and improve external validity.

**Author Contributions:** The contributions of this work are as follows: conceptualization was performed by K.H.P., R.Y., C.B., and D.P.A. Methodology was created by K.H.P., Y.M., and C.B. No software was developed for this work as all data was analyzed in "R." Formal analysis was performed by K.K.P., K.H.P., Y.M., and C.B. The investigation was performed by Y.M. and C.B. Data curation was performed by Y.M. and K.H.P. Writing original draft presentation and writing review and editing were performed by K.H.P., Y.M., R.S., C.B., K.K.P., and D.P.A. Visualization was completed by Y.M. and C.B. Project supervision, administration, and funding acquisition were performed by K.H.P. All authors have read and agreed to the published version of the manuscript.

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**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of New York Medical College (protocol code 14107, approved 16 July 2020).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study after IRB approval. Those who responded to the survey in 2019 were contacted by email three times and given the opportunity to opt out.

**Data Availability Statement:** Dataset available on request from the authors.

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**Conflicts of Interest:** The authors declare no conflicts of interest.

## Appendix A

### Appendix A.1

#### RS-14 Resilience Scale

	Strongly Disagree					Strongly Agree	
	1	2	3	4	5	6	7
I usually manage one way or another.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel proud that I have accomplished things in my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually take things in stride.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am friends with myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I can handle many things at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am determined.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can get through difficult times because I've experienced difficulty before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have self-discipline.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I keep interested in things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually find something to laugh about.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My belief in myself gets me through hard times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In an emergency, I'm someone people can generally rely on.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My life has meaning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm in a difficult situation, I can usually find my way out of it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Questions specific to the NYMC Resiliency Curriculum

	Strongly Disagree					Strongly Agree	
	1	2	3	4	5	6	7
I currently have the tools to be resilient and maintain my mental health in medical school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would benefit from open discussion with fellow students about the emotional challenges of medical school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resiliency is a skill that can be taught	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Figure A1.** Survey Administered to the CO23.

## Appendix A.2

With respect to the impact of the COVID-19 pandemic:

	Greatly Decreased			Greatly Increased	
	1	2	3	4	5
My interest in a curriculum meant to build resiliency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My personal sense of resiliency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My sense of connectedness to medical student peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My general level of nervousness/anxiety when seeing news about COVID-19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rank the following COVID-19 related issues in the order in which they have most affected your mental health since the pandemic started. (If none of these apply, please leave blank.)

☐ Social Distancing

☐ Fears about contracting COVID-19 myself

☐ Fears about friends or family contracting COVID-19

☐ News coverage about the pandemic

☐ Effects on my medical education (being pulled from clinic, uncertainty around Step exams and the match, etc...)

☐ Other

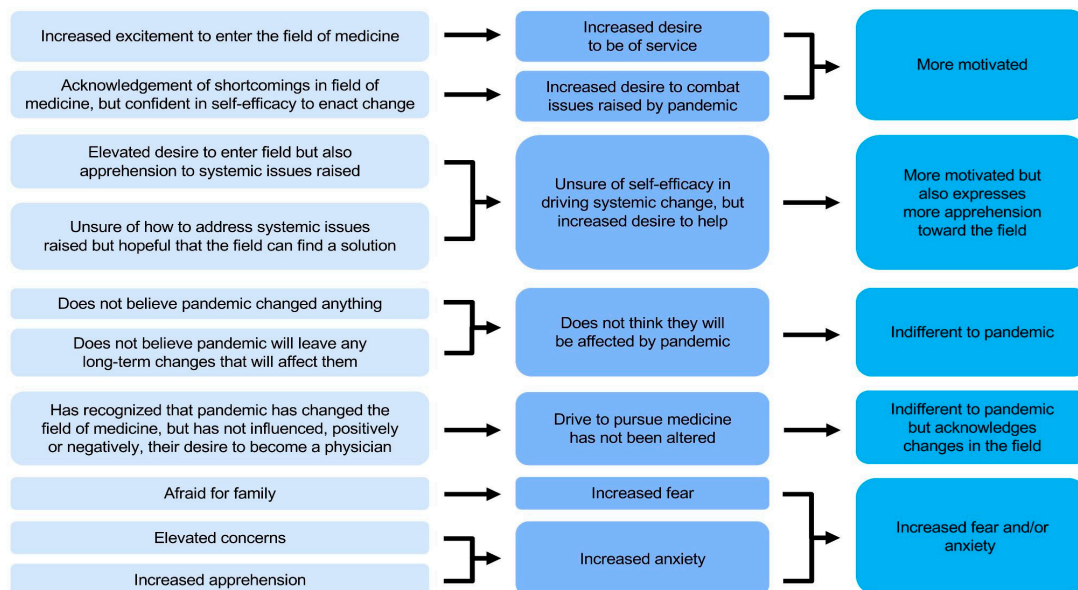
Has the pandemic changed your attitude towards your goal to become a physician or raised new concerns about entering the healthcare workforce?

What types of mental health resources would benefit you the most during this time?

**Figure A2.** COVID- Related Questions Added to the Questionnaire above and Administered to the CO24.

## Appendix B

### Appendix B.1



**Figure A3.** Open Coding Was Used to Analyze Responses to: “Has the Pandemic Changed Your Attitude towards Your Goal to Become a Physician or Raised New Concerns about Entering the Healthcare Workforce?”.

### Appendix B.2

**Table A1.** Criteria Used to Place Open Responses in Each Response Category.

Response Category	Criteria for Placement
Indifferent	The pandemic has not influenced participants’ opinions about entering the medical field.
Indifferent with caveat	The pandemic has not influenced participants’ personal opinions about entering the medical field, but acknowledges the change brought about by the pandemic.
Increased fear and/or anxiety	The pandemic has heightened the participants’ fear and/or anxiety about entering the medical field.
More motivated	The pandemic has increased the participants’ motivation to enter the medical field, often citing a desire to address issues the pandemic has highlighted or caused within the medical field.
More motivated with caveat	The pandemic has increased the participants’ motivation to enter the medical field, but participants are unsure of their capacity to enact positive change.

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