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“What are you signing up for?”: Pre-medical students’ perception of physicians’ risk and responsibility during COVID-19[☆]

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ARTICLE INFO

Keywords:

Physician socialization
Medical education
Medical training
Pre-med
Physicians
COVID-19

ABSTRACT

Though there has been growing attention to the impact of the coronavirus pandemic on the career trajectories of current health care workers, research remains sparse on how those in earlier stages of medical education have been affected by the pandemic. To better understand the pandemic’s influence on pre-medical students’ professional trajectories, this study draws on 48 interviews with freshmen and sophomore pre-medical students at a private university in the northeastern United States. For many students, witnessing physicians’ role during the pandemic made them more aware of both the vulnerability of physicians and the limits of their power in the medical field and society at large. Notably, students primarily explained the risks that physicians confronted as an individual professional expectation rather than a structural concern in the medical system. Despite acknowledging these risks, students emphasized that the pandemic had reinforced their interest in becoming a physician by validating their perception of the vital role that physicians play in society. Additionally, they expressed greater concern about meeting expectations for admission to medical school in light of additional barriers due to COVID-19. This study builds upon existing literature on the medical profession by both centering earlier stages of education and examining processes of socialization during times of crisis. More broadly, these findings indicate a need for greater attention to the normalization of health care workers’ sacrifices, as well as the potential exacerbation of existing inequities in pre-medical education during the pandemic.

1. Introduction

From coordinated clapping for health professionals at 7:00 p.m. to viral videos that follow a nightmarish 24 h in the ER, the coronavirus pandemic has centered the medical profession in the popular imagination. As physicians have occupied much of the spotlight given to essential workers and “health care heroes” during the pandemic, both the positive and negative aspects of this career path have come into clear focus for observers. While the general public has honored and praised health care workers for their tireless efforts, they have also become increasingly aware of these workers’ vulnerabilities, such as their lack of access to adequate personal protective equipment (PPE), their reduced power under hospital administrators, and the sacrifices that they make for their job – including their health, well-being, and even for some, their lives.

As news segments and social media posts depict physicians struggling on the front lines, those at earlier stages of their careers in medicine have seen what was once a predictable career path turned upside

down. Some have been launched into their careers early. To help ease the strain on the health care system, over 20 medical schools offered some or all of their fourth-year students the opportunity to graduate early and join their colleagues in supporting the massive influx of patients (Terry, 2020). Yet others have been slowed down, with the cancellation of clinical rotations and other valuable in-person educational opportunities for students in earlier years. Even beyond its immediate impact, the pandemic may also be shaping students’ longer-term plans. Notably, in a survey of over 1600 medical students, approximately a fifth of students reported that the pandemic would influence their choice of specialty (Byrnes et al., 2020). Both the career itself and the process of getting there have changed dramatically in under a year.

Yet what about those still deciding whether or not to commit to a career in medicine? Though there has been growing attention to the impact of the COVID-19 pandemic on the career trajectories of medical students, research remains sparse on how the paths of pre-medical students may or may not have shifted in response to the pandemic. With

[☆] The author is immensely grateful for feedback and guidance from Alex V. Barnard, Michelle Cera, Merlin Chowkwanyun, Zarrin Tasnim, and Claire Sieffert as well as financial support from the New York University Department of Sociology.

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<https://doi.org/10.1016/j.socscimed.2021.114320>

Received 9 January 2021; Received in revised form 24 June 2021; Accepted 13 August 2021

Available online 14 August 2021

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growing concerns about burnout among health care workers (Cooper et al., 2002; West et al., 2018; Kannampallil et al., 2020) and the threat of a physician shortage, some have emphasized the importance of ensuring that future generations are motivated to pursue careers in medicine. However, the pandemic has clearly displayed both the best and worst aspects of the medical profession, raising the question of how aspiring physicians are coming to understand their chosen career. During a time when physicians are widely seen to be vital – and vulnerable – in U.S. society, have pre-medical students' perceptions of their future profession changed in any way?

To better understand the influence of the coronavirus pandemic on pre-medical students, I conducted 48 interviews with freshmen and sophomore pre-medical students at a private university in the north-eastern United States. These interviews aimed to understand whether the pandemic had influenced students' own motivation to pursue a career in medicine, their impression of the medical field more broadly, and their understanding of the social role of physicians. For many students, seeing how physicians' role in the pandemic was portrayed made them more aware of both the vulnerability of physicians and the limits of their power in the medical field and society at large. Yet overwhelmingly, students emphasized that the pandemic had reinforced their interest in becoming a doctor by validating their perception of physicians' vital role in society. These findings underscore a growing tension between awareness of physicians' loss of autonomy within the 21st-century medical system itself even as society more broadly may romanticize their sacrifices.

2. Background

Even before the era of COVID-19, scholars had long been working to understand how several decades of major change in the medical field had influenced physicians' role in society. Sociologists of the mid-to late-20th century were largely fixated on how physicians had constructed and maintained their immense professional authority (Friedson, 1975; Berlant, 1975; Starr, 1982). Much of this research aimed to explain how despite their lack of legitimacy in the 19th century, physicians were able to develop substantial power and authority in U.S. society by the middle of the 20th century. By strengthening the role of licensing and other necessary qualifications, reforming medical education, and reducing competition, the medical profession actively worked to control the supply of physicians, increasing physicians' financial security and broader societal power (Starr, 1982; Timmermans and Oh, 2010).

Yet despite physicians' efforts to establish themselves as an elite profession through the 20th century, more recent changes to the medical profession since the 1980s have increasingly threatened their social status and power. Near the turn of the century, scholarly attention to the medical profession began to shift towards physicians' decline in status. These shifts are analyzed by McKinlay and Marceau (2002), who refer to the 21st century as “the end of the golden age of doctoring.” They identify several factors contributing to the decline of physicians' status, including the loss of state support for and corporatization of doctoring, competition from other health care workers, physician oversupply, and the American Medical Association's (AMA) loss of power and influence (2002:409). In addition to pressures experienced within the profession, other findings also pointed to growing distrust of physicians' authority. By 2000, surveys revealed a decrease in positive attitudes and an increase in negative attitudes towards physicians among the general public, despite still maintaining fairly high confidence in physicians (Pescolido et al., 2001).

The COVID-19 era has revealed tension between physicians' vulnerability in their work environment and a widespread perception of them as “health care heroes,” making this a crucial time to consider what our image of physicians may look like moving forward. Though previous studies on physicians' role in society have tended to focus on either physicians' own reflections and experiences or public opinion, this

project draws upon the unique perspective of those somewhat in-between: pre-medical students. Though pre-med students are by definition not fully embedded in the profession, they have developed some understanding of its mores and norms through their academic and extracurricular experiences.

Existing research on the pipeline of medical education and training has helped to explain how eager and idealistic students are socialized into a high-stress, high-prestige profession. While this career path arguably begins as early as elementary school science classes, research on the pipeline of medical training has primarily focused on medical school and residency (Light, 1982; Brooks and Bosk, 2012; Szymczak and Bosk, 2012; Jenkins, 2020), overlooking the critical role that pre-medical education may play in shaping one's interest and success in the medical field. Many of the foundational studies in this subfield that do focus on the experiences of pre-medical students (Conrad, 1986; Light, 1988) are decades old, though in recent years, there has been renewed attention to this critical stage in the pipeline of medical education (Lin et al. 2013, 2014; Olsen, 2016; Grace 2017, 2019; Michalec et al., 2018).

Existing research on pre-medical education has largely focused on how characteristics such as gender and class (Fiorentine and Cole, 1992; Grace 2017, 2019) influence students' success in entering a career in medicine. Previous studies have also explored the spectrum of support and competition among pre-medical students (Conrad, 1986; Lovecchio and Lauren, 2002). Interview studies with pre-medical students have supported previous findings that stereotypes of pre-medical students as cutthroat and competitive may not be true (Conrad, 1986; Lin et al., 2014). Still, many of these studies remain focused on refuting or affirming stereotypes of pre-medical students, or look primarily at differential experiences along race, gender, and class lines, with less attention to students' values, motivations, and lived experiences.

This study aims to build upon previous work by delving more deeply into these aspects of the pre-med experience, examining how the pandemic has influenced students' personal aspirations in medicine and understanding of the profession. While previous work has provided valuable insight into how the status quo of physicians' day-to-day experiences shapes their socialization into the medical profession (Light, 1982; Jenkins, 2020), this study examines how the process of socialization is influenced by what Ann Swidler (2001:282) refers to as “unsettled times.” Unlike our everyday studies or work, unsettled times force us to more deeply search for meaning to make sense of our changing world and how to act within it. While recent literature has started to examine the impact of COVID on analogous steps in later years of medical education (Ferrel and Ryan, 2020; Lucey and Johnston, 2020), there has been less attention to the challenges that students at earlier stages are confronting, which this study helps to illuminate. For those looking towards a future in medicine, how, if at all, have the rapid social changes of the COVID-19 era influenced their perception of their chosen career?

3. Methods

To gain insight into the experiences of pre-medical students during the era of COVID-19, I interviewed first- and second-year pre-medical students attending a private university in the northeast. In-depth interviewing gave students the space to describe their experiences during COVID and perceptions of the pandemic. In order to reach eligible participants, I circulated a survey to pre-medical students in introductory biology, chemistry, and psychology courses, as these are the courses that sophomore and freshmen pre-medical students are instructed to take. As students do not have to formally declare their intention to be pre-med until they apply to medical school, there was no comprehensive list of pre-medical students to draw upon; therefore, sampling through mandatory pre-med courses was the best available way to reach all eligible students. Recruitment primarily targeted students in their sophomore year of pre-medical coursework, as they have substantial

academic and extracurricular experiences to draw upon, but may be less committed to the path than students in later years. Students' responses to the survey were used to identify any additional key themes to be incorporated into the interview guide.

A total of 234 people responded to the survey, from which a total of 70 students were randomly selected and contacted via e-mail to participate in the interview. Of the students contacted, 48 responded and agreed to be interviewed. Recruitment stopped at this point as interviews approached thematic saturation. Participants for this study were selected as a nested sample from a larger longitudinal project on pre-medical student socialization that drew from the remainder of survey respondents. Given the timing of the pandemic, this sub-sample of participants offered a valuable opportunity to gain insight into the perspectives of the pre-medical student population on issues related to COVID and the medical field. Both the survey and interview portions of the project received approval from the New York University Institutional Review Board.

Interviews took place on Zoom from September through December of 2020 and were audio recorded with participants' consent. All interviews utilized a semi-structured interview guide and lasted between an hour and 2 h, averaging approximately 90 min. These conversations focused on three key themes: students' experiences in pre-med education and professionalization (i.e. internships, volunteering, and research experiences), students' values and philosophical approach to health and medicine (i.e. motivating factors, personal aspirations, and awareness of social and political issues in medicine), and students' lived experience of health and illness. All interviewees received a \$20 gift card as compensation for their time.

The demographics of the students interviewed were reflective of those who responded to the survey, but included a greater proportion of women (80%) and more racial diversity than the university's general student body. 27% (n = 13) of those interviewed identified as East Asian, 19% (n = 9) identified as Black/African-American, 19% (n = 9) identified as White, 15% (n = 7) identified as Latinx/Hispanic, 10% (n = 5) identified as South/Southeast Asian, 8% (n = 4) identified as multi-racial, and 2% (n = 1) identified as Middle Eastern/North African. The vast majority (92%) were in their sophomore year. Though students came from a variety of academic backgrounds, the most common majors were biology, chemistry, neural science, and public health.

Interviews were transcribed by the researcher and coded and analyzed using Atlas.ti. A flexible coding approach (Deterding and Waters, 2021) was utilized. In this method, initial index codes were created based on the relevant questions from the interview. After index coding, more focused analytic codes were applied to indexed data to identify and elaborate on key themes and concepts. As the research question explored in this paper is a sub-analysis of a longitudinal interview project on pre-medical students' experiences, coding and analysis focused primarily on interviewees' responses to a few questions specific to the pandemic, namely, the impact that the pandemic has had on both their own aspirations and their perceptions of the medical profession more broadly. Codes thus captured both individual-level and bigger-picture impacts of the COVID era on students' understanding of the medical field.

4. Results

Interviews revealed that the coronavirus pandemic has shaped pre-medical students' understanding of both the medical profession at large as well as their personal trajectories. Students identified how the pandemic underscored the important social role of physicians and other health care workers. Even as many did point to ways that the pandemic had revealed physicians' vulnerability, the overwhelming majority of participants were not deterred from their own path towards becoming a physician. On the contrary, most participants felt that the pandemic had validated their long-term goal of becoming a doctor, even as it created short-term challenges.

4.1. Recognizing risk

Though the pandemic did not dissuade the vast majority of students from pursuing a career in medicine, it did force many to reconsider what one student described as their "rosy picture of the life of a physician." For example, one student reflected on how physicians had been neglected by both the health care system and society at large:

I know a lot of doctors didn't have adequate PPE at the very beginning of the pandemic. Or nurses also – if they were outside in scrubs, people were like, trying to stay away from them, or attacking them, because they thought they were contagious or contaminating spaces. I remember reading about a doctor who had a three-week-old son and he lived in their garage, didn't live in their house, and didn't interact with that child or any of his other kids, 'cause he didn't want to infect them.

Listing the ways that health care workers had been unable to access much-needed equipment, social support, and life outside of medicine, she concluded that health care workers had to make "tremendous sacrifices, and there isn't always infrastructure in place to adequately protect them." Yet despite recognizing these risks, she and most other students did not express discouragement about a career in medicine.

In reflecting on physicians' vulnerability during the pandemic, some likened the conditions that physicians faced to workplace hazards in careers generally associated with less power and prestige. For example, one described how the pandemic had planted new concerns about her future career in her mind, saying, "I've been faced with a lot of fear that my career could have work hazards – the same way that a construction worker could fall from a building, a doctor could get COVID and die." Yet like the above student, increased awareness of the possible occupational hazards had not influenced her own desire to become a doctor. "I don't believe it's dissuaded me any more than Organic Chemistry has. I don't know if that says more about the pandemic or Organic Chemistry," she added, laughing. Though her comparison to a notoriously-challenging pre-med course was primarily in good fun, it also reveals how those early on in their careers have processed the pandemic as just one of many challenges that physicians must face.

In addition to this lack of material and social support, many students also drew attention to the reports of burnout and other mental health issues that physicians had experienced during the pandemic. However, only a couple of students felt affected by the treatment of physicians during the pandemic to the point that they had started to re-consider – or even simply doubt – their decision to become a physician. "Hearing about physician burnout and the mental health impact of being a physician has been really discouraging," one student said. "I take my mental health seriously, so I guess trying to place that in my mind of, okay, is this worth going through eight years of school?"

Another expressed greater ambivalence about her future in medicine, weighing how the pandemic had made her appreciate the valuable role of physicians in society, yet had also led her to question whether a career in medicine would truly make her happy. She described wanting balance in her future career, "wanting to live life and ... find something that makes me feel just as good about myself without killing myself every day over something." For her, seeing the dangerous conditions and demands that physicians faced during the pandemic made her doubt whether she could find this balance in medicine. "I don't know if it's gonna end up making me more or less [happy] by pursuing it, by putting all the work into it. Is the outcome gonna be worth it for me?" she questioned. Still, even as they acknowledged high rates of burnout and concerns about physicians' mental health, meaningfully questioning their chosen career path was uncommon among interviewees.

4.2. Signing up for sacrifice

The majority of students emphasized how the pandemic had shown

them that being a physician comes with extreme commitment, including the willingness to make great sacrifices. When reflecting on the news coverage she had seen, one student said, “It really makes you more seriously consider, are you willing to do this for patients? [...] I had never thought about, like, would I be willing to get sick or would I be willing to put myself in a dangerous position?” Some students went even further when considering these sacrifices, with one saying, “It’s not just like, I’m doing this for fun ... You have to be willing to sacrifice your life in order to save others as well.” For many students, the pandemic was the first time they had truly imagined just how much they might be asked to sacrifice in their future career.

Overwhelmingly, even students who were deeply aware of physicians’ sacrifices during the pandemic described feeling more grounded in their decision to pursue medicine. Some students even expressed skepticism towards those who dwelled on the ways that physicians were vulnerable, suggesting that people who were not willing to make these sacrifices were not going into medicine for the “right reasons.” Discussing a news segment that interviewed doctors and nurses after a long shift working with COVID patients, one student recalled:

Some clip went around where I saw this nurse saying, ‘This isn’t what I signed up for.’ When that came around, I remember someone said, ‘If this isn’t what they signed up for, what did they sign up for?’ I think the pandemic really brought out, are you choosing this career path because you genuinely want to help people and put your own life at stake for others, or are you choosing it for other reasons?

To this student, the experiences of health professionals during the pandemic showed that sacrifice was a necessary part of what it means to be a physician, and she was already willing to make such sacrifices herself. She had wanted to go shadow and volunteer in hospitals over the summer; however, she ultimately could not because her parents were concerned about her and their own safety. Her awareness of her own desire to step up grounded her in knowing this was the right path, as she asserted, “I would be willing to do that, I’m ready to just go forth and do that. I was really willing – I definitely wanted to do that.” She was not only willing to make the sacrifices she saw, but also deeply wanted to do so. Far from scaring them away from medicine, in many cases, portrayals of frontline physicians served to both normalize such sacrifices to future generations of physicians and represent facing them as a matter of individual choice.

4.3. Praise, power, and politics

If the pandemic has led pre-medical students to see their chosen career as one that demands sacrifice, what encourages them to continue this path? For most, their commitment to becoming a physician was rooted in a sense of greater awareness of the valuable role that they felt physicians play in society. Many students resonated with the way that they saw physicians and other health care workers stepping up during the pandemic, and described how they identified the same qualities within themselves.

A student aspiring to a career in emergency medicine and global health expressed wishing that she “had already gone to medical school” so she could be of use during the pandemic. “This is what I want to do. It’s just reassured me that this is something I want to do. The whole time I was home, I was just thinking, ‘I want to be doing something, I wish I could,’” she said. Another student described reaching out to hospitals to ask if there was any way she could help out, though she acknowledged that she did not yet have the knowledge or training to contribute very much. While she was disappointed that there was not more that she could do, she said, “It definitely did positively influence me in that I just want to help, always, no matter what, even when it comes to the whole pandemic thing.” Being stuck studying organic chemistry at home when they felt that they could – and wanted to be – of use helped some students to feel even more certain that they were going in the right

direction.

A small number of students were indeed able to find ways to help out during the pandemic. One student explained how she felt inspired by physicians’ efforts, describing them as “the most important people during the pandemic.” She continued, “In order to be a doctor, you must know that you are the person who needs to help the community when this kind of pandemic happens.” After seeing how physicians had served their communities, she decided to volunteer doing food distribution at a local shelter throughout the summer, an experience that helped her to feel like she was also helping in some way. “I volunteered because I wanted to feel like how a doctor should feel during this time,” she added.

Though many students emphasized the importance of doctors’ role in society, they also conveyed newfound awareness of the limits of their power and influence. When reflecting on the pandemic more broadly, many students expressed disappointment with the way it had been handled in the U.S., particularly emphasizing what they saw as the unwillingness of the broader public to listen to scientific fact and medical authorities. “In many ways, it’s depressing how America has handled the coronavirus situation compared to some other places in the world,” one commented. Comparing the U.S. to other countries where she saw residents simply following the recommendations of health professionals, she said, “It’s become so politically involved. I knew it in my head to an extent, before this happened, but I didn’t realize how involved political decisions were in affecting health.” In their perspective, students felt that political interests and scientific findings had collided in the U.S., in contrast to how they saw health professionals’ leadership being highly valued in other countries.

Amidst political dynamics that dismissed the value of science, some of these students described becoming more aware of the relative lack of power that physicians have in shaping public opinion. Though students felt medical professionals ought to play a central role in communicating health-related information, the pandemic revealed that they have little control over who listens. Discussing the importance of medical experts during the pandemic, one student said, “I feel like quite a few people are seeing that it’s important to listen to medical experts, but there are quite a few people who don’t. I just wish more people listened to medical experts.” This student and many others puzzled over why people wouldn’t listen to this advice “for their own good,” and remained unsure as to why this was the case. Echoing this confusion and frustration, another student described how he became increasingly aware of the politicization of medicine over the past several months as he watched doctors, nurses, and other frontline workers attempt to convince their communities to follow public health guidelines. He expressed concern that these efforts might be fruitless, saying, “No matter how hard health care responders can work, it doesn’t matter if the American people aren’t doing what they need to.”

A small number of students – many of whom had been working in health care during the pandemic – described how they observed the value and limits of physicians’ role on the micro level. One student had volunteered in a particularly overcrowded and under-resourced hospital during the pandemic, primarily providing mental health support to health care workers. Describing her work, she expressed surprise and admiration that people had continued to come in to work even under such horrible circumstances. She reflected on the very real exhaustion – and resilience – that she observed as part of her job, which underscored to her the value of health care workers to society:

Imagine that one day, none of the nurses, none of the doctors, showed up to work in the middle of a pandemic. I mean, they get a lot of praise – like, “Oh, the health care heroes!” But ... it just highlights how important the health care system is for the functioning of society, and sometimes people take it for granted ... If everybody at the business office downtown don’t show up one day, everything’s gonna go fine. The world won’t end. If all the people at the hospital don’t show up one day, you get people dying.

From her perspective on the ground, it seemed that society would fall apart without the labor of health care workers. However, while she acknowledged that health care workers were getting “a lot of praise” and being portrayed as “heroes,” she also recognized that “some people take it for granted.” Both appreciation and neglect were on display during the pandemic, as small gestures of appreciation – free meals, banners of gratitude lining hospital corridors, evening clapping rituals – attempted to fill in for the more systemic neglect that physicians and other health care workers experienced.

Another student who had been working as both a medical assistant in an urgent care clinic and as an EMT went even further in his critique of the praise that medical professionals received, saying, “It’s superficial. It’s a PR stunt, at best.” Reflecting on his experience working in overcrowded hospitals with long wait times during the peak of the pandemic, he emphasized, “They don’t give a shit about health care workers. I’m not paid a good wage, they don’t push policies about paying people better, they don’t provide compensation.” Though he did appreciate the general public’s gratitude, he was aware that it did not come with any material changes to the circumstances of health care workers. Yet even with acute awareness of this harsh reality, he felt even more determined to become a physician. “I thought, hey, if I’m willing to continue doing it during this kind of time – for free, even, at one point, exposing myself and putting myself at risk to help other people. It was a reinforcing experience. Because I knew if I would do this then, I think I’m in the right direction.” During even the worst times, he believed that he was making an invaluable contribution to society.

4.4. Obstacles, old and new

A minority of students did feel neutral about the pandemic’s impact on their own aspirations, primarily because they were planning on pursuing specialties such as plastic surgery that were largely removed from the front lines of COVID-19 patient care. However, even those who described feeling unaffected in terms of their longer-term career identified ways that the pandemic had influenced their more immediate path in medicine. Keeping up in their pre-med coursework, completing extracurricular requirements such as shadowing and research, and getting the necessary guidance to stay on track became much more difficult for many students during the pandemic.

For example, one student who said that the pandemic had not influenced her own desire to become a physician continued on to acknowledge, “It has made it harder to keep the motivation, though. The short-term goals are harder to connect to the long-term. It’s harder to make that connection when I’m doing it from home.” Many students similarly described struggling to keep up with their Organic Chemistry coursework or understand laboratory assignments outside of the hands-on setting of a course. Sources of motivation such as friends and other peers were also less accessible to students, particularly those who did not have pre-existing study groups or pre-med friends on campus. Yet despite the increased difficulty of seeing how her present work connects to her future as a physician, she noted that “that long-term goal is still there,” suggesting that the challenges of remote learning were not powerful enough to deter students completely.

Outside of schoolwork, many students expressed anxiety surrounding being able to keep up with what is expected of pre-medical students outside of school. In addition to taking a heavy science course load, medical schools expect students to engage in research, shadow physicians, and gain clinical experience through volunteer or internship opportunities. Competing for limited research and clinical positions was already challenging prior to the pandemic; however, with increased restrictions in both laboratory and hospital settings, many students described difficulties finding new positions and losing offers they already had.

For a couple of students, the demands of the pandemic did enable them to be involved in the medical field in ways that they may not have been able to previously. A student who was able to volunteer over the

summer testing people for COVID said that the pandemic had brought him “extra work” and “new opportunities.” “It’s a nice thing that, while this pandemic has taken so much, I also got a little something back, because I was able to help and expand my professional and academic experience,” he reflected.

However, more commonly, students perceived a loss of opportunities during the pandemic, which forced some to reconsider the pace of their next steps, such as their timeline for applying to medical school. One current sophomore who had not yet started his research or volunteer work expressed concern that he would have to take a gap year after graduating in order to meet these extracurricular requirements. “Once the pandemic started, I was worried, because I don’t want to take a gap year, so I have to finish everything by the end of my junior year ... [Sophomore and junior year] were the two years that I was supposed to be doing a lot of work.” Though he acknowledged that these struggles are common, he also recognized that the barrier is not equally high for everyone. “I’ve had to remind myself that there’s a pandemic so nobody else is doing anything, but there’s still some people that are. There’s still some people that have really good connections that are finding ways to do it anyway.” Indeed, the fact that many more students described a lack of opportunities than being able to find new ones as a result of the pandemic underscores this student’s concern that the pandemic contributed to new forms of inequality.

5. Discussion

Despite widespread concern about the toll of the COVID-19 pandemic on physicians, attention to the impact of the pandemic on those who may one day come to work alongside them has been limited. Those not on the front lines have witnessed both the vulnerability and resilience of health care workers when they were most needed, and for students looking towards careers in medicine, observing the role of physicians and the medical field in this moment could be both discouraging and motivating. By focusing on pre-medical students’ experiences of and responses to a global health crisis, this study’s findings fill a major gap in both current and past research on medical professionals and early socialization into the medical field.

For the vast majority of students who I spoke with, the effect of the pandemic on their careers has been more motivating than discouraging. Seeing physicians step up to work under exceptionally trying circumstances has reinforced students’ understanding of the valuable role that medical professionals play in society, particularly in moments of crisis. However, many students have interpreted the immense sacrifices they saw – including the willingness to risk one’s own life – as a necessary aspect of what it means to be a physician. Notably, the proportion of interviewees who talked about the importance of one’s willingness to sacrifice was far greater than those who drew attention to the preventable dangers that physicians faced during the pandemic, including the lack of PPE and understaffed overtime shifts. Even as students increasingly recognized the broader social and political limitations that physicians confront, they largely interpreted the occupational hazards of the pandemic as an individual choice, with only a few noting how system-level decisions had put physicians into a position of increased risk. These findings reveal how professional expectations can be established early on – indeed, earlier than much existing research has accounted for – in one’s socialization into the medical field. Building upon literature that has explored why certain norms of medical labor are resistant to change (Kellogg, 2011), this study underscores the need for further attention to both when and how these norms are instilled in order to shift them.

While most pre-medical students’ aspirations in medicine may not have wavered, their stories do raise several more immediate concerns regarding the expectations they are currently juggling. On top of the stress of trying to learn organic chemistry via Zoom, many students expressed concern that the pandemic may prevent them from fulfilling the extracurricular volunteering and shadowing expectations that are

informally required for applicants to medical school. Pre-medical students who are a few years ahead have already come up against similar barriers, most notably as MCAT exam dates were pushed back several times (Frellick, 2020).

However, the challenge of meeting these requirements and engaging in extensive unpaid labor is not unique to the era of COVID-19. Such requirements tend to select against students who may not have connections in the medical field or who may not be able to dedicate such a large amount of time to often-unpaid work. As such requirements have increasingly faced critique for the class-based barriers they create to entering the medical field (Goldberg, 2019), perhaps the need to figure out how to account for these limitations during the pandemic offers an opportunity to make lasting changes to the pre-med track. Even though the question guiding this study was how the pandemic may have influenced how pre-medical students understood what it means to be a doctor, these concerns suggest that a more immediately relevant question may be what it means to be a pre-med.

A few limitations of these findings should be recognized, in particular, their attention to the experiences of only a very specific population of students. Because both survey and interview recruitment relied on students' willingness to volunteer, it is possible that the sample may be biased towards students who are more enthusiastic about their identity as a pre-medical student. Conversely, one could also argue that students who volunteered to participate may have had more grievances with their experience in pre-medical education. However, students' responses in the interviews suggest that the sample is not primarily comprised of either of these extremes.

Further, despite the diverse socioeconomic and racial backgrounds of the students described here, they all currently attend a high-ranking university and may not share the same concerns as students at less well-resourced institutions. Additionally, because pre-medical students are under different pressures from year to year, the impact of the pandemic on early-stage pre-meds like the sophomores and freshmen interviewed for this study likely differ from students who may be closer to the application stage. Many students at this stage do not yet have as much clinical experience to draw upon when considering their future in medicine, so some of the questions explored here may be more hypothetical for students in these early years.

6. Conclusion

The students profiled here reveal that despite the challenges that physicians confronted during the coronavirus pandemic, there is perhaps even greater enthusiasm among aspiring physicians to pursue a career in medicine. However, despite the determination of these students to continue to pursue a career in medicine, their responses underscore the need to be cautious of how health care workers' sacrifices have become normalized as an essential aspect of what it means to be a physician. To ensure the sustainability of careers in medicine, current and future health care workers must receive not just symbolic, but also material support from those they serve. Such changes are needed at all professional stages of medicine, whether it's providing those on the front lines with the PPE they need or working to remove the barriers that pre-medical students have long confronted in their training.

Credit author statement

Jenny Leigh: Conceptualization, Methodology, Formal Analysis, Investigation, Writing, Project Administration.

Declaration of competing interest

The author declares that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

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