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ORIGINAL RESEARCH

"*Am I even a med-student anymore?*" A Mixed-Methods Study of the Impact of the Initial Disruptions Caused by the COVID-19 Pandemic on Medical Student Professional Identity Formation

Abigail A. Luman[1] · Madison Bagley[1] · Jorie M. Colbert-Getz[2] · Todd Christensen[1] · Janet E. Lindsley[3] · Candace J. Chow[2]

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Abstract

Purpose Developing a professional identity requires learners to integrate themselves into the medical profession and take on the role of doctor. The impact of COVID-19 on medical education has been widely investigated, but little attention has been paid to the impact of students' professional identify formation (PIF). The goal of this study was to investigate the impact that the onset of the COVID-19 pandemic had on medical students' PIF.

Materials and Methods An embedded mixed-methods design was utilized. Focus groups were conducted with a subset of year 1–4 students and coded using thematic analysis. Year 1–2 students were surveyed about their professional identity integration in the spring of 2020. Responses were analyzed using descriptive statistics and Wilcoxon signed rank and Mann–Whitney *U* tests.

Results Qualitative data were organized into six themes that touched on losses and challenges, reflection, and reevaluation of the physician career. Roughly 50% of MS1s and MS2s reported a change in their professional identity integration, but this was not statistically significant.

Conclusions Medical education does not occur in isolation and is influenced by disruptive local and global events. Students perceived challenges when in-person community interaction and hands-on clinical experiences were interrupted. Additionally, students reflected upon their own role and their future career goals.

Keywords Professional identity formation · COVID-19 · Undergraduate medical education · Professional identity

Practice Points
- Challenges medical students faced were often related to a lack of in-person learning.
- The medical student to physician transition was metaphorically viewed as a transition from being non-essential to essential.
- COVID-19 increased student prioritization of personal well-being.
- The impact of COVID-19 on professional identity integration was felt differently among individual students.
- Medicine does not occur in isolation and global events impact medical student PIF.

✉ Candace J. Chow
Candace.Chow@hsc.utah.edu

[1] School of Medicine, University of Utah, Salt Lake City, UT, USA

[2] Department of Internal Medicine, University of Utah School of Medicine, Rm 210.23, 27 S Mario Capecchi Dr, Salt Lake City, UT 84113, USA

[3] Department of Biochemistry, University of Utah School of Medicine, Salt Lake City, UT, USA

Introduction

The initial shutdowns initiated in response to the COVID-19 pandemic in March 2020 had a multitude of impacts on the medical student experience. At the University of Utah School of Medicine (UUSOM), 3rd- and 4th-year medical students were removed from clinical rotations while 1st- and 2nd-year students were transitioned to an online curriculum. Unless extracurricular activities could be completed in compliance with physical distancing, students were unable to participate. It was unclear how these disruptions would impact the professional identity formation (PIF) of medical students. Given the necessity to continue training physicians in the midst of a global health emergency, it is important to understand these impacts in order to foster the identity development of future physicians, particularly ones who are prepared to respond to global events.

One previous disruption to medical education was the emergence of SARS in 2003, resulting in medical students being temporarily removed from clinical rotations in Malaysia, Toronto, and Hong Kong [1, 2]. In 2005, Hurricane Katrina resulted in a closure of Tulane Medical School and subsequent temporary relocation of trainees to Texas [3]. Much of the research to understand how COVID-19 is impacting learners is focused on medical education development and adaptation [4, 5]. To date, fewer studies have examined the effect of major disruptions, including COVID-19, on professional identity formation. A study by Harries et al. found that at the start of the pandemic, US medical students felt their education was disrupted but they maintained a desire to remain in clinical environments even with the risk of infection [6]. At the University of Geneva, Sophie et al. found that students endorsed changes in their future career plans and emphasized the importance of work-life balance and interprofessional teamwork [7].

The development of a medical student into a physician is a relational process that requires the learner to integrate themselves into the profession of medicine while embracing the identity as part of their own over time [8–10]. Factors that influence the PIF of medical students include role modeling, encounters with patients, societal expectations, and hidden and formal curricula [11]. Cruess et al. offer a valuable conceptual framework with which to analyze medical student PIF [12]. It emphasizes the roles that personal identities and socialization within communities of practice play in influencing PIF [12]. Our study aims to investigate the impact that the *initial* shutdown from the COVID-19 pandemic had on medical student PIF. Using a mixed-methods approach, we examined if the start of the pandemic altered how students viewed the integration of personal and professional identities, how the disruptions caused by the pandemic altered their medical school experience, and the implications these changes had on their understanding of being a physician in training and the role of physicians during a global emergency.

Materials and Methods

Study Design and Participants

We conducted a mixed-methods study utilizing a concurrent embedded design [13]. At the UUSOM in Salt Lake City, UT, on March 13, 2020, all year-one and year-two course sessions were moved to a virtual format. At the end of the academic year 2019–2020 (shortly into the pandemic), we asked first- and second-year students to identify the degree to which their personal and professional identities were integrated. No incentives were given for survey participation. Additionally, in spring 2020, we conducted zoom-based focus groups with first- through fourth-year students (MS1–MS4) to understand how the onset of the COVID-19 pandemic impacted their experience as a student and their understanding of being a physician-in-training. A total of 20 students participated. Focus group participants were given the option of accepting a meal voucher for their participation or donating the meal to a healthcare worker; 7 students donated their meals. This study was deemed exempt by the University of Utah Institutional Review Board. Of note, the first and second authors, AL and MB, were current MD students at the time of project completion.

Survey Collection and Analysis

Professional identity questions from Buck et al.'s study were adapted and added to spring 2020 end-of-course surveys (Fig. 1) [14]. Students indicated the degree to which their personal and professional identities overlapped by selecting one of five Venn diagrams. Students were asked to indicate the degree of integration at the time they completed the survey (mid-April for MS2s early May for MS1s; which was different because the last course of the year ended on different dates). Students were also asked to retrospectively indicate the degree of integration in February 2020 (pre-COVID). Responses to end-of-course surveys are anonymous. MS3s and MS4s were not surveyed due to logistical limitations. Descriptive statistics were used to examine student responses. Wilcoxon signed rank tests and Mann–Whitney *U* tests were used to compare survey responses within and between the medical school year.

Focus Groups and Coding Process

A recruitment email was sent to all medical students at the UUSOM through class list serves asking students to participate in focus groups. Twenty students responded. The first and second authors (AL and MB) conducted all focus groups over Zoom during the last week of April 2020. One group was scheduled for each class year. Four MS1s, seven MS2s, four MS3s, and five MS4s participated. The focus groups lasted one hour. Focus group facilitators asked students the same seven questions in the same order and facilitated subsequent discussion. Questions focused on how students perceived being a physician in training before and after the pandemic. They were also asked about how the onset of the pandemic impacted their experience in medical school (Appendix A).

Focus groups were recorded and transcribed verbatim using Descript version 3.6.1 (San Francisco, CA). Using thematic analysis to guide our approach to analysis, we began the coding process by using Microsoft Word to open code the first two transcripts. CJC, an experienced qualitative researcher, provided training in coding to TC, MB, and

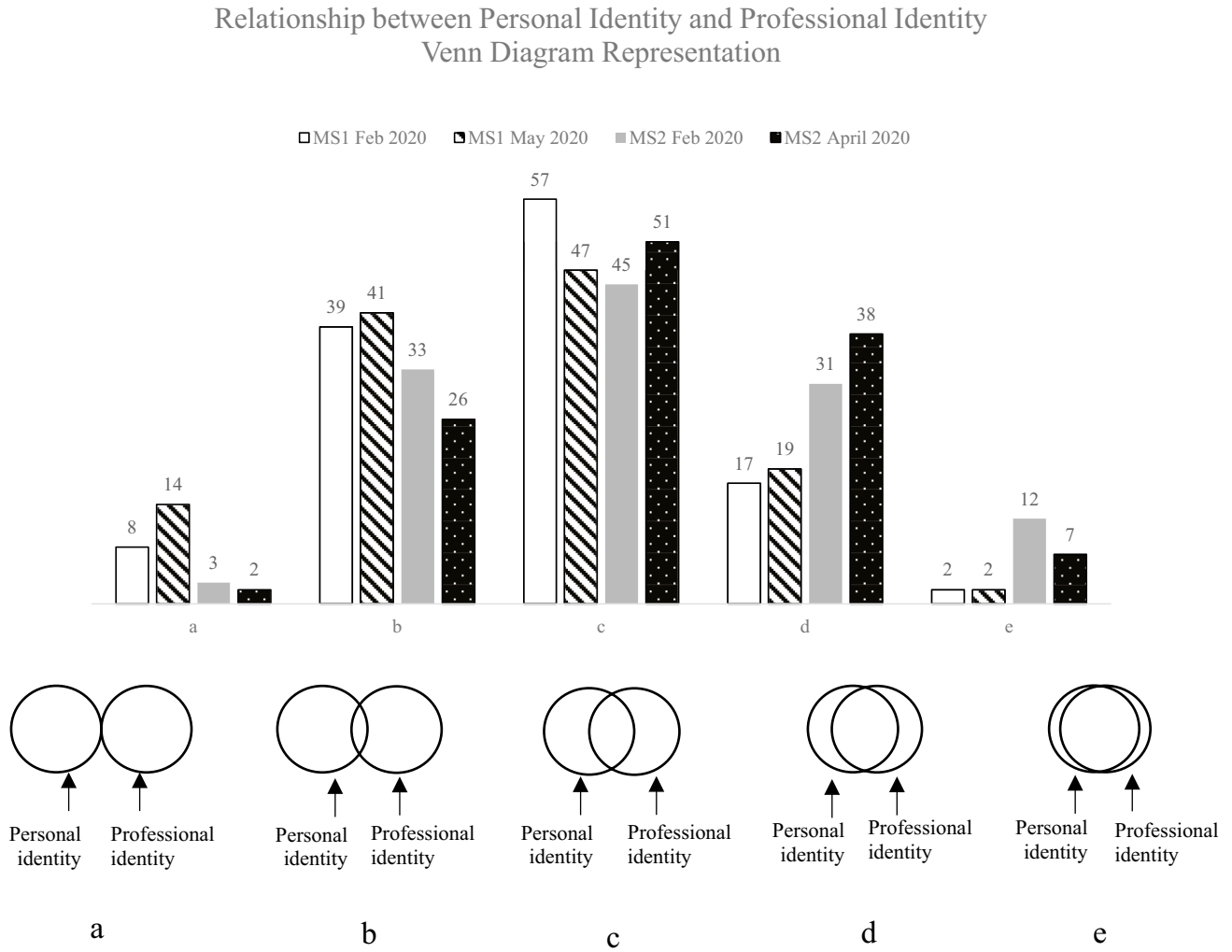

Fig. 1 Personal and professional identity integration for UUSOM year 1–2 students pre- and post-COVID onset in spring 2020

AL. The first two transcripts were used to create a preliminary codebook in Dedoose [15]. We then imported all transcripts into Dedoose for coding. MB and TC used the initial codebook to code each transcript individually so that each transcript was coded twice, to ensure that multiple interpretations of the data were explored. AL, MB, and TC met to review and compare codes to further refine the codebook. Using this refined codebook, AL and MB reviewed each transcript to ensure that data were accurately described and to ensure that a saturation of codes was achieved [16]. AL and MB met over multiple sessions to organize codes into themes. Transcripts were reviewed again to ensure their alignment with a given theme. The conceptual framework developed by Cruess et al. was used as a lens to develop themes, with consideration given to how the impact of COVID-19 might have contributed to reinforcement or an alteration of the previously described socialization process [12].

Results

Survey Results

Ninety-eight percent (123/125) of MS1s and (124/127) of MS2s completed the survey. Figure 1 shows a graphical

Table 1 One hundred and twenty-three University of Utah School of Medicine students' self-reported ratings of the relationship between personal and professional identity in February and May 2020 of year 1 of medical school

		Feb 2020 Personal & Professional Identity Relationship				
		A	B	C	D	E
Early May 2020 Personal & Professional Identity Relationship	A	5	3	4	1	1
	B	3	16	17	5	0
	C	0	19	24	3	1
	D	0	1	10	8	0
	E	0	0	2	0	0

Overall Comparison of Answers from Feb to May 2020	Decrease in Integration	No Change in Integration	Increase in Integration	Total % Change
	28% (35/123)	43% (53/123)	28% (35/123)	57% (70/123)

representation of the responses that MS1s and MS2s had at both time points.

Table 1 shows that 57% (70/123) of MS1s indicated a shift in the relationship between their personal and professional identity between both time points. Most MS1s (46%, 57/123) indicated in February 2020 that their personal and professional identities overlapped a moderate degree. Twenty-eight percent (35/123) of MS1s indicated that their identity overlap decreased while the same number indicated that their identity overlap increased after the onset of the pandemic. As a group, MS1s' identity did not become significantly more or less integrated 4–6 weeks into the COVID-19 pandemic ($p = 0.317$, Wilcoxon signed rank tests).

Table 2 shows a total of 44% (54/124) MS2s indicated a shift in the relationship between their personal and professional identity between both time points. Most MS2s (44%, 54/124) indicated in February 2020 that their personal and professional identities overlapped a moderate degree. Twenty-three percent (28/124) of MS2s indicated that their identities overlapped to a lesser extent and a slightly smaller number, 21% (26/124), indicated that their identity overlap increased after the onset of the pandemic. Similar to MS1s, MS2s' identity did not become significantly more or less integrated 4–6 weeks into the COVID-19 pandemic ($p = 0.546$, Wilcoxon signed rank tests).

Figure 2 shows the percentages of MS1s and MS2s by the 3 categories of no difference, less integrated, and more integrated identity overlap. Forty-three percent (53/123) of MS1s and 56% (70/124) of MS2s indicated no change in how they viewed their identity integration. There was no difference in distributions of no difference, less, or more integrated between MS1s and MS2s ($p = 0.865$, Mann–Whitney U test). MS2s reported significantly more integration of their personal and professional identities than MS1s for both time points ($p < 0.001$, $p < 0.001$, Mann–Whitney U test).

Focus group results

Codes were organized into the following themes:

1. Losses and challenges were experienced.
2. Essential status is earned.
3. Reevaluation of physician role.
4. Current events shape medical education.
5. Time for reflection and self-care.
6. New variables were introduced when developing career goals.

Table 2 One hundred and twenty four University of Utah School of Medicine students' self-reported ratings of the relationship between personal and professional identity in February and May 2020 of year 2 of medical school

		Feb 2020 Personal & Professional Identity Relationship				
		A	B	C	D	E
Early May 2020 Personal & Professional Identity Relationship	A	1	1	0	1	0
	B	1	17	10	5	0
	C	0	7	28	10	0
	D	0	1	11	18	1
	E	0	0	2	4	6

Overall Comparison of Answers from Feb to May 2020	Decrease in Integration	No Change in Integration	Increase in Integration	Total % Change
	23% (28/124)	56% (70/124)	21% (26/123)	44% (54/124)

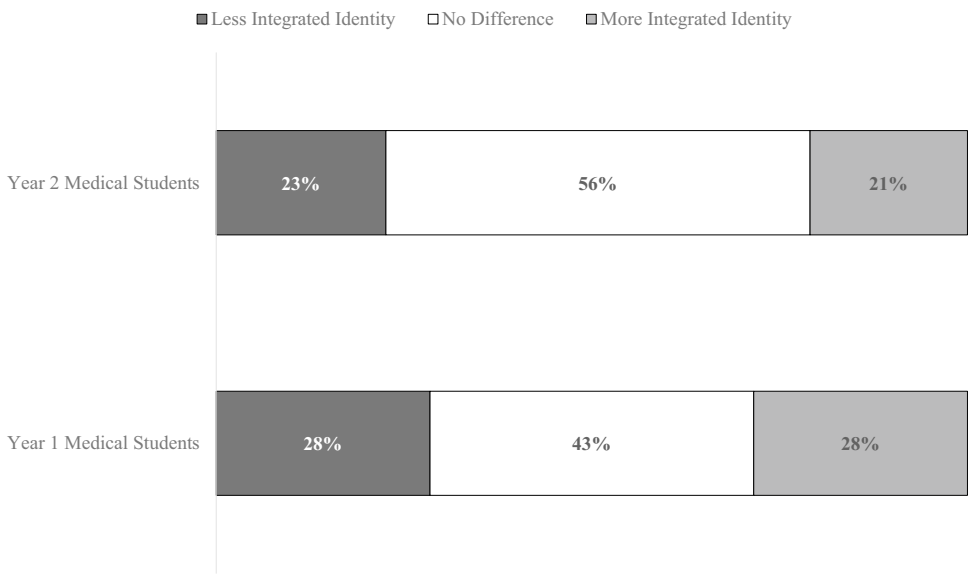

Fig. 2 Comparison of changes in survey answers for MS1s and MS2s. There was no significant difference between the percentages of MS1 and MS2 by these 3 categories (no difference, less integrated, more integrated), $p = 0.865$ (Mann–Whitney U test)

1. Losses and challenges were experienced

The theme *losses and challenges were experienced* captures the hardships that medical students experienced at the start of the pandemic. These losses included loss of community. "*I definitely miss that piece where we're building the connections with our classmates…*" (MS1) In the context of a loss of in-person school activities, students mentioned feeling a sense of isolation: "*It's made me feel sort of like I'm just in a sea floating by myself.*" (MS1) Students also described a loss of practical experience and/or informal learning: "*I feel like the more time we're not in clinic, the less capable we're going to be at being good third year medical students.*" (MS2) The loss of in-person learning also translated to a loss of purpose: "*I felt a lot more connected to, I guess, a deeper purpose with seeing why we're doing* [the work of medical school] *before.*" (MS2) Students, especially those in their 4th year, endorsed a loss of rites of passage such as match day celebrations and "getting a graduation photo with all your friends," (MS4) and the lasting impact this might have. "*And it's gonna be something that's gonna be irrecoverable for people in our position.*" (MS4) Finally, students reflected on whether they would be able to regain all that they had lost. "*What would I have learned during that time and can I make it up somehow?*" (MS3).

2. Essential status is earned

The theme *essential status is earned* encompasses how students reflected on the process of becoming a physician and how this changed in the context of the COVID-19 pandemic. Students reflected on how unmooring it was to exist in a middle space between wanting to help but not having enough experience to do much. *"I wish that I was two years ahead and was already in intern year.*" (MS3) Gaining the training necessary to help was expressed as valuable: "*The desire to help is there. I'm just not in a position to do it right now. So, hopefully, I can do that in my career.*" (MS4) Although students expressed understanding of their "non-essential" status, this caused discouragement for some. "*It's kind of a sad thing to realize how non-essential medical students are.*" (MS2) However, students expressed a trust in the process of medical education to help them become physicians who had an "essential" status to care for patients. "*You know, the way that it's set up makes a lot of sense, because we learn a lot of, you know, book knowledge during medical school, and then our residency is really the time to put that knowledge to practice in treating real patients.*" (MS4).

3. Reevaluation of the physician role

For the theme *reevaluation of the physician role*, students discussed how the pandemic made them reflect on physician roles in society, how difficult this job could be, and what responsibilities accompanied being a physician during a pandemic. Some of the responsibilities mentioned include the role of physicians in advocacy and health sciences communication: "*Physicians should be writing articles and sharing reputable information and working on educating the public.*" (MS1) Similarly, one student said physicians should: "*be community leaders and also sort of step out of the clinical role and advocate for like the general population health.*" (MS3) The physician role on a care team was questioned by some, "*I feel like it's become more apparent that, to me in*

this situation, that physicians don't play the overarching role that I once thought they played." (MS1) Whether physicians lose their civilian status during a global health emergency was brought up. "*My* [attending professor] *said that when this kind of like thing happens, physicians are not citizens. We're not citizens. We're not civilians.*" (MS2).

4. Current events shape medical education

The theme *current events shape medical education* encompasses how students viewed the impact that the consequences of COVID-19 and other global issues had on their medical education. The connection between health disparities with other societal disparities was "brought to light" (MS3). Students also mentioned that the pandemic had opened their eyes to societal tensions. "*In my entire life growing up, I've never seen so many hate crimes being afflicted on Asian-Americans, not even Chinese Americans. And that is a really big loss.*" (MS3) Students expressed that in light of the challenges that COVID-19 brought on, it also opened up opportunities for positive change, and that "*we have to do better.*" (MS3) "*The curtain's been pulled back and now the, um, system is right on display and it's really an opportunity for us to advocate for big change.*" (MS1) These reflections extended to potential for changes within medical school curriculum design with an emphasis on well-being and individualization. "*It'll be really interesting to see how this new curriculum runs and if we can promote wellbeing within medical school.*" (MS3).

5. Time for reflection and self-care

The theme *time for reflection and self-care* highlighted that by being pulled from in-person learning, students had more time to devote to non-school activities. This extra, non-scheduled time also allowed students increased time for reflection. "*This has been a really nice time to….time to breathe*." (MS3) "*Right now we're finding that taking this time to reflect ourselves is critical.*" (MS3) The increased time allotted for participation in well-being-focused activities had positive impacts on student mental health. "*Okay, I can bake bread and give it away to somebody. I don't know how it's gonna help my physician training, but it's gonna help my mental health.*" (MS1) Students brought up re-prioritizing relationships that had fallen to the wayside because of the demands of school. "*I feel like I've just been much more intentional about relationships in my life…*" (MS1) Reflections included, "*what are my goals as a physician*," (MS4) and extended to views of personal identities. "*It's been the most wonderful time for people to reengage with who they actually are at their core and not just who they are on paper.*" (MS3).

6. New variables were introduced when developing career goals

The theme *new variables were introduced when developing career goals* captured how the COVID-19 pandemic impacted students' future career plans. Generally, students endorsed having new things to consider regarding their future. "*There's more variables that I feel like I'm inputting into my decision algorithm.*" (MS1) Some students reported that the pandemic made certain specialties more appealing. "*I've been thinking about neurology and infectious disease. So this has made me even more interested in infectious disease*." (MS2) Other students endorsed that their specialty choices were unchanged or reaffirmed. Students also found inspiration to pursue additional training in public health. "*It's made me look more at like including public health into my practice somehow. Or maybe going and getting a masters*." (MS2) In addition, new priorities centered around wellness and mental health at one's workplace emerged. "*I am going to prioritize places that have that understanding and have like a healthy culture.*" (MS3) This was in contrast to a sense of fear regarding the uncertainty of pursuing a career in medicine at the time. "*Thinking about what a future in healthcare looks like right now is a lot scarier for me than it was six months ago.*" (MS1).

Discussion

To investigate how the onset of the COVID-19 pandemic impacted the PIF of medical students at the UUSOM, we utilized a mixed-methods approach to capture both quantitative and qualitative insights. We hoped to capture data at a unique point in the pandemic that cannot be replicated—months after the onset and during shelter-in-place mandates. When MS1s and MS2s were asked about their personal and professional identity integration before and after the onset of COVID, approximately half of the students indicated a change in their identity integration. However, a consistent pattern of the overall direction of this change (i.e., more or less integration) did not emerge. When considering the qualitative data, medical students from all four years identified challenges that arose as a consequence of social distancing and reflected on how their "non-essential" status would eventually be become "essential." Additionally, students reflected on the roles and responsibilities of a physician during a global health emergency. The pandemic either changed or reinforced specialty choices for students and increased interest in public health and health communication. Finally, the increased time away from in-person learning allowed students to devote more time to self-care activities.

Professional Identity Integration

The professional development of a medical student into a physician is a challenging, transformational, and fluid process by which an individual, with their unique personal identities, is socialized into the profession of medicine [8–10, 12, 17]. Although averaged responses regarding professional and personal identity integration did not significantly change pre-COVID to during COVID for both MS1 and MS2s, approximately 50% of the students changed their answer, with nearly equal numbers of students indicating increased integration as indicated decreased integration. In other words, our data suggest that the onset of the pandemic impacted individual students differently. Indeed, Frost et al. have outlined that physician PIF has a point of tension between increasing diversity, increased recognition of the value of diversity, and the expectations that students grow to integrate themselves into the traditionally homogenous culture of medicine [18]. The complexity of these competing discourses may be reflected in students' differing responses, especially as the students surveyed were in an earlier point of training. In contrast to Buck et al.'s findings of a lack of difference between cohorts using their identity integration assessment tool, when comparing MS1s and MS2s, MS2s significantly indicated further integration of their personal and professional identities at both time points of the survey [14]. This supports that a temporal relationship of increasing professional identity integration from MS1 to MS2 years exists.

Qualitative Themes

Many of the losses and/or challenges students reported under *theme 1* were a result of physical distancing limiting interaction with the larger medical education community and direct patient contact. This is similar to the findings of Kelly et al., who found that students described missing out on in-person clinical learning at the onset of the pandemic as a negative experience [4]. The importance of direct patient contact for learners is captured well by Cruess et al., "*experience gained from direct encounters with patients and their families is foundational to the identity of a physician*." [12]. Our findings support the critical nature of relationships formed between classmates, faculty, and patients to help maintain PIF. What is concerning is that some students went as far as to describe a "*loss of purpose*," as a result, which may be related to the findings described in *theme 2*. In *theme 2*, students described the tensions of wanting to help during the pandemic but felt they had not gained enough skill to be of use to the larger medical community, which aligns with the experience of students elsewhere [19, 20]. Badger et al. described the positive impact that an emergency volunteering program for medical students had for those participating at the Imperial College School of Medicine [21]. Our data supports that there may be a benefit to maintaining a structure for keeping medical students involved during a crisis—at a skill-appropriate level, which may help relieve internal tensions of being deemed "non-essential" [19, 22]. Indeed, maintaining a welcoming community for medical students has been cited as a key component to supporting their PIF during times of disruption [23, 24].

In *theme 3*, students reflected on the roles and responsibilities of a physician in a pandemic—pointing to ideas such as a "loss of civilian status" and an increased need for physicians to take the lead in public health efforts and patient advocacy. Students brought up the responsibility of both physicians and medical students to ensure accurate scientific information is communicated to the public. Indeed, misinformation during the COVID-19 pandemic has been referred to as an "infodemic," and as the pandemic has progressed, physicians with a large social media following have reported that they view it as part of their role to dispel misinformation [25, 26]. Students mentioning that physicians have a moral obligation to respond to the pandemic, even if it means putting oneself at risk of illness, reflects upon a topic of discussion within medical ethics for some time [27–29].

Given that students were viewing the roles of physicians differently at the onset of the pandemic, this suggests that global events influence their socialization, and thus their PIF. This is highlighted by both *theme 3* and *theme* 4. In *theme 4*, students' increased awareness of social and health disparities and the pandemic inspired them to think about changes to our health systems that need to occur. Therefore, we propose that the global environment and/or current events ought to be considered when thinking about medical student PIF. Further, coming to terms with uncertainty has been documented as a component of PIF [30, 31]. It can then be extrapolated that larger, even global, disruptions causing uncertainty in medical education systems would also impact individual students' PIF.

Medical students and residents learn to cope with disruption and uncertainty throughout their training in various ways [32]. Over time, these adaptations facilitate personal and professional growth and, as such, contribute to PIF [32, 33]. The detrimental impact that COVID-19 has had on healthcare worker mental health is evident [34, 35]. Interestingly, in *theme 5*, we found that medical students utilized their increased free time for self-care activities. Students reported an increased awareness of the need for self-care efforts in the midst of the pandemic. Students have been found to view living a healthy lifestyle and maintaining personal well-being as a professional responsibility, regardless of the presence of a pandemic [36]. This overlaps with *theme 6*, where students mentioned that finding a residency that emphasized wellness was a new variable to consider when submitting applications. Generally, in *theme 6*,

students reflected on how the pandemic altered their career goals. Similar to the findings of Byrnes et al., who found that COVID impacted the specialty choice of only 1/5 of the students they surveyed, only some students in our focus groups reported that COVID may change their future specialty choices. While many, particularly in the MS4 class, reported that COVID had reaffirmed their specialty choice [37]. Similar to Kelly et al., we found that students had increased interest in public health [4].

Limitations

We acknowledge limitations in our study. There was a lack of clinical student (MS3–MS4) input in our survey data, which was due to logistical limitations of when end-of-course surveys are sent out. Additionally, our findings are only from one institution, which may limit the generalizability of our findings. We had a small number of participants in our focus groups, $n = 20$, which were all students who volunteered to participate. This self-selection may represent a portion of the student body that is not representative of all students. Students were surveyed and participated in focus groups *after* the onset of the pandemic, and were asked to elaborate on their remembered experiences, potentially introducing recall bias. Also, at the time of writing this manuscript, we are 2 years into the pandemic. Our results only provide a snapshot of how the pandemic impacted students shortly after its onset (spring 2020).

Future Directions

It has been suggested that the COVID-19 pandemic has acted as a catalyst for a transformative era for medical education [38]. More research is needed to understand how to best maintain positive PIF during global disruptions like the COVID-19 pandemic.

Conclusions

Our study found that the onset of the COVID-19 pandemic had an impact on the PIF of medical students. When considering professional identity integration, individual students reported almost equal amounts of decrease and increase of integration, suggesting each student was impacted differently. Students perceived that medical education is process-oriented and that it suffers when in-person community interaction and hands-on clinical experiences are interrupted. When medical students perceive that physician roles change, they reflect upon how this changes their own role in medicine and their future career goals. Finally, medical education does not occur in isolation. Thus, medical student PIF is influenced by global events.

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Author Contribution AL, JL, CC, JCG: conceptualization; CC, JL, JCG: methodology; AL, MB, TC: data collection; AL, MB, TC, CC, JCG: data analysis; AL, MB: writing—original draft preparation; AL, JL, CC, JCG, TC: critical manuscript revisions.

Declarations

Ethical Approval This project was deemed exempt by the University of Utah's Institutional Review Board. Data was originally collected for education quality improvement purposes. The students who participated in the focus groups gave consent by responding to a recruitment email and agreeing to participate.

Conflict of Interest The authors report there are no competing interests to declare.

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