ORIGINAL RESEARCH

Evolving Needs of Critical Care Trainees during the COVID-19 Pandemic

A Qualitative Study

Jamuna K. Krishnan[1], Joseph K. Shin[2], Maha Ali[2], Meredith L. Turetz[1], Bradley J. Hayward[1], Lindsay Lief[1], Monika M. Safford[2], and Kerri I. Aronson[1]

[1]Divison of Pulmonary and Critical Care Medicine and [2]Division of General Internal Medicine, Weill Cornell Medicine, New York, New York

ORCID IDs: 0000-0002-1460-5276 (J.K.K.); 0000-0001-5587-5427 (K.I.A.)

ABSTRACT

Background: Critical care trainees were integral in the coronavirus disease (COVID-19) pandemic response. Several perspective pieces have provided insight into the pandemic's impact on critical care training. Surveys of program directors and critical care trainees have focused on curricular impact. There is a lack of data from the trainee perspective on curricular enhancements, career development, and emotional and well-being needs to succeed in a critical care career in the ongoing COVID-19 pandemic.

Objective: Our objective was to elicit perspectives from critical care trainees on their personal and professional needs as they continue to serve in the COVID-19 pandemic.

Methods: This was a hypothesis-generating qualitative study. Individuals in a U.S. critical care training program during the COVID-19 pandemic participated in either focus groups or semistructured interviews. Interviews were conducted between July 2020 and March 2021 until data saturation was achieved. Audio recordings were professionally transcribed and analyzed using qualitative content analysis. A codebook was generated by two independent coders, with a third investigator reconciling codes when there were discrepancies. Themes and subthemes were identified from these codes.

Results: Thirteen participants were interviewed. The major themes identified were as follows: *1*) Curricular adaptation is necessary to address evolving changes in trainee needs; *2*) COVID-19 impacted career development and highlighted that trainees need individualized help to meet their goals; *3*) receiving social support at work from peers and leaders is vital for the sustained well-being of trainees; *4*) fostering and maintaining a sense of meaning and humanity in one's work is important; and *5*) trainees desire assistance and support to process their emotions and experiences.

Conclusion: The needs expressed by critical care trainees are only partially captured in conceptual models of physician well-being. The need for multilevel workplace social networks and identifying meaning in one's work have been magnified in this pandemic. The themes discussing curricular gaps, career development needs, and skills to process work-related trauma are less well captured in preexisting conceptual models and point to areas where further research and intervention development are needed.

Keywords:
training; coronavirus disease (COVID-19); well-being; medical education

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Caring for the overwhelming number of critically ill patients during the coronavirus disease (COVID-19) pandemic has led to challenges for medical trainees. Critical care trainees face unique challenges compared with others; the goals of their education in managing respiratory failure align with the needs of patients during the pandemic (1). However, given the sheer volume of patients compared with available resources, these trainees are placed in situations in which practices of triaging, resource allocation, and ethical decision making may differ vastly from usual critical care practices (2).

Prior studies have begun to outline implications of COVID-19 on medical education and have focused primarily on resident and student training. These studies have described curricular adaptation, transitioning to remote and hybrid approaches to education, and burnout. These findings may not readily translate to critical care trainees, given their unique skill set, training goals, and unique clinical responsibilities (3–5). Limited literature examining the impact of the COVID-19 pandemic on critical care trainees has included survey studies and perspective pieces (6–8). A global survey including critical care trainees reported primarily on the perceived negative impact on curricular aspects of training (8). Another survey of pulmonary and critical care medicine (PCCM) program directors highlighted less exposure to outpatient medicine and bronchoscopy (7). Few groups have systematically addressed the multidimensional impact of this pandemic on critical care trainees with regard to their professional and personal lives, career development, and well-being.

Given that there is no precedent for how to educate and support critical care trainees during and after a pandemic, it is important to have a conceptual understanding of their experiences to develop meaningful and impactful programming. This study aims to address the knowledge gap within the preexisting literature by qualitatively eliciting the needs of critical care fellows as they continue to work during the pandemic.

METHODS

Participants

Individuals were eligible for the study if they were in a U.S. critical care training

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Correspondence and requests for reprints should be addressed to Jamuna K. Krishnan, M.D., M.B.A., M.S., Division of Pulmonary and Critical Care Medicine, Weill Cornell Medicine, 1305 York Avenue Y-1047, Box 96, New York, NY 10021. E-mail: jkk9002@med.cornell.edu

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program. Participants were recruited through word of mouth, e-mails from their program directors, and social media posts advertising the study. Participants were either PCCM or CCM fellows enrolled in a U.S. training program and must have treated or must be currently treating patients diagnosed with COVID-19 by the time of study onset in July 2020. Physicians enrolled in international training programs were excluded. All participants provided written informed consent and received a $25 gift card for participation. The study was approved by the institutional review board of Weill Cornell Medicine (protocol 20-04021969).

Data Collection

A combination of focus groups and one-to-one semistructured interviews were conducted between July 2020 and March 2021. The option to participate in a one-to-one interview was provided to accommodate constrained schedules. Interviews were conducted by the coauthors of this paper who had prior qualitative research training (J.K.K., K.I.A., and J.K.S.). Because of social distancing measures in place during the pandemic, all interviews and focus groups were conducted using Zoom video conferencing.

A topic guide was structured on the basis of the Critical Incident Stress Debriefing model (9). This model proposes debriefing after traumatic events starting with factual retelling of the experience, followed by eliciting participant thoughts and reactions. Additional topic guide questions related to training and career development were created on the basis of discussion with trainees during study planning. The topic guide is presented in the supplementary material (*see* Table E1 in the data supplement). Participants also completed a demographic survey and the Stanford Professional Fulfillment Index (PFI). The PFI captures both work exhaustion and interpersonal disengagement related to burnout and professional fulfillment in physicians (10). Saturation was achieved after the 12th participant interview, and one additional interview was conducted in which no new codes or themes were identified (11) (Figure E1).

Data Analysis

All focus groups and interviews were audio-recorded and professionally transcribed verbatim. Transcripts were analyzed using conventional qualitative content analysis and NVivo software (QSR International) (12). Two investigators (J.K.K. and M.A.) read the transcripts for two semistructured interviews and one focus group. Open coding was applied to the transcripts, and the investigators met to compare codes and develop a codebook. Any discrepancies in coding were resolved by consensus with a third investigator (K.I.A.). An additional focus group and two individual interviews were coded together by J.K.K. and M.A., and the codebook was further refined. The remaining three individual interviews were then coded independently using the codebook. Similar codes were grouped into categories, which were analyzed to generate themes. Categories and emerging themes were then presented to all the investigators for review. The conduct and analysis of the study adhered to the Consolidated Criteria for Reporting Qualitative Research (13). The complete Criteria for Reporting Qualitative Research checklist is provided in Table E2.

RESULTS

Fourteen individuals were consented for the study, and 13 completed interviews.

We conducted two focus groups consisting of three participants each and seven one-to-one interviews. Forty-six percent of the participants were women, and 54% were men. The majority (92%) of the participants were in a PCCM training program. Study participants varied in marital status, years in training, and geographic locations. Results of the PFI showed that 75% of the participants reported professional fulfillment, 92% reported work exhaustion, and 83% reported interpersonal disengagement (Table 1). Analysis of the data yielded five themes (Table 2) relating to our central question, which are summarized below.

Theme 1: Curricular Adaptation Is Necessary to Address the Evolving Changes in Trainee Needs

Many participants identified gaps in their training, such as being removed from planned rotations to meet the rising clinical demand. The gaps identified varied by participant and ranged from procedural training, specifically bronchoscopies and intubations, to gaining exposure to a variety of pulmonary conditions that would be seen in a typical PCCM training period. In addition to these tangible gaps in the curriculum, trainees pointed out that because of the scarcity of resources and visitation restrictions, practicing and learning about standards of intensive care unit care and communication with families were compromised.

> *"I think some of it is going to be trying to figure out how best to utilize the rest of my training time to catch up on aspects of my training that I really didn't get as much exposure to outside of COVID. Particularly in the pulmonary world … typically in our fellowship … we will try to build more of that in with subspecialty clinics that we'll go to for a little bit to gain more experience and different electives and stuff … and all of that got tabled with COVID."*

Participants frequently discussed the value of learning to be autonomous. They described that adapting to the pandemic made many of them step into attending-like roles sooner than normal. Trainees expressed the need to incorporate more opportunities to truly function autonomously such that there was some separation between themselves and the attending. The balance of being autonomous but knowing there was attending support when needed was vital.

A final category related to curricular adaptation was related to the new role of technology in both health care and delivery of the critical care curriculum. Fellows expressed interest in formal training related to telemedicine and conducting effective video visits. They also discussed both the positive and negative aspects of Zoom educational conferences. Trainees stated that, on the one hand, Zoom conferences were isolating in that they took away some of the informal socializing and networking that occurs at in-person conferences. On the other hand, continuing Zoom-based conferences increased opportunities to attend.

Theme 2: COVID-19 Impacted Career Development and Highlighted That Trainees Need Individualized Help to Meet their Goals

Trainees universally believed that COVID-19 had impacted their career development, though the specific impact varied among trainees. One category was the impact on shaping their scope of clinical practice. Trainees reconsidered their plans to pursue further subspecialty training, the proportion of their future career that would consist of clinical care, and whether they would remain in medicine at all. Although some trainees in combined PCCM fellowships reconsidered how much critical care time they wanted to have in the future, others expressed that

Table 1. Characteristics of the study participants

Variable	Distribution
Age, yr, median [interquartile range]	32 [31–32.5]
Sex, *n* (%)	
Female	7 (46)
Male	6 (54)
Type of critical care program, *n* (%)	
Pulmonary critical care	12 (92)
Critical care	1 (8)
Year in fellowship, *n* (%)	
1–2 yr	6 (46)
3–6 yr	7 (54)
Marital status, *n* (%)	
Single	8 (62)
Married or civil partnership	5 (38)
Location of fellowship, *n* (%)*	
West	1 (17)
Northeast	4 (67)
Southwest	1 (17)
PFI scores[†]	
Mean professional fulfillment scale score (SD)[‡]	82.6 (10.2)
Mean work exhaustion scale score (SD)[§]	63.0 (23.3)
Mean interpersonal disengagement scale score (SD)[‖]	64.4 (28.2)
Number reporting professional fulfillment, *n* (%)[‡]	9 (75)
Number reporting burnout, *n* (%)[¶]	10 (83)

Definition of abbreviations: PFI = Stanford Professional Fulfillment Index; SD = standard deviation.
*Based on 6 of 13 responses to location.
[†]Based on the responses of 12 of 13 participants.
[‡]Based on responses to items 1–6 of the 16-item PFI. Items are scored from 0 to 4 and multiplied by 25 to create a score ranging from 0 to 100. Higher scores indicate increased fulfillment. An individual is dichotomized as having professional fulfillment if their average item score for items 1–6 is greater than 3.
[§]Based on responses to items 7–10 of the PFI. Scores range from 0 to 100. Higher scores are indicative of increased work exhaustion.
[‖]Based on responses to items 11–16 of the PFI. Scores range from 0 to 100. Higher scores indicate increased disengagement.
[¶]An individual is dichotomized as having burnout if the average item score for items 7–16 is greater than 1.3.

Table 2. Representative quotations

Themes and Subthemes	Representative Quotations
Theme 1: Curricular adaptation is necessary to address the evolving changes to trainee needs	
Curricular gaps	"I think procedurally, our bronchoscopy numbers dropped off precipitously, as the pandemic happened. So, I'm less comfortable with that, even though we've done a few, like quite a few, it's still like, when you don't do something for a while, you're a little less comfortable doing it." "I don't think I learned any helpful medical knowledge during that time. … I think the patterns of patient care were detrimental, that we didn't know their names, we didn't know their families, that were like 'Somebody else figure out their code status, just deal with it. … ' I think that all that … those were bad patterns."
Autonomy	"I think the fact that this was my first time alone leading a team was very unnerving … , but you're it, and on rounds, what you say goes, and questions just go to you." "Like I said, there were times when I felt like I was a bit out of my league, where I was just a second-year fellow, but trying to act like an attending and making decisions like an attending would on these separate popup ICUs. Like I said, I always, if I had a question, I always had someone to go back to."
Telemedicine and technology	"I think perhaps the medical curriculum should change to cover televisits, because I don't really know how to do one." "So, I mean, hopefully, if anything that could be gained from this, I think maybe for people that might not be able to attend a lecture in-person, having the Zoom option going forward, which should maybe, hopefully stick around."
Theme 2: COVID-19 impacted career development and highlighted that trainees need individualized help to meet their goals	
Scope of clinical practice	"It made me realize that, hey, doing 100% clinical is not sustainable as a whole career, maybe for just a few years postfellowship. But I think it just proved that to me." "I had a long talk with my family probably sometime this summer and said, 'I don't know if I want to be a doctor anymore. I don't think I can help anyone. I'm just hurting everyone.' And had this long discussion that if I wasn't ready to apply for jobs when the time came, that was okay. And if I left medicine, that was okay. So, I was coming from a not good place because of the horrors."
Shaped opinion of critical care	"I think it made me realize that being a critical care physician is unsustainable, for sure. Always had that good idea in my mind that it would be unsustainable, but now I think you know for sure it's unsustainable." "So, I am going to be a critical care focused attending. It hasn't made me question that career path."
Barriers to scholarly work	"Most of the research projects for the people in my year have kind of been uprooted, whether it's because of limitations on how many people could be in a lab at a time, whether it's because people aren't able to do studies in the same way that they were planning on because of limitations, or whether it's because we've been intermittently deployed throughout this whole year. My research has become kind of a joke." "My mentor availability has been pretty diminished. … I have one of the mentors who tries to be more responsive than probably some of the others in our department, and still it's been pretty hit or miss. And that's understandable because everyone's workload has just ballooned."
Theme 3: Social support at work from peers to leaders is vital for the sustained well-being of trainees	
Camaraderie	"I don't know. That sounds kind of cheesy and like a slogan. But it just felt like everyone was doing the best they could and in this together. And I felt like the mood, even though it was a lot of work, it was a very close-knit—it felt like a close-knit group. Everyone was going through the same things."

Table 2. *Continued*.

Themes and Subthemes	Representative Quotations
Cohesion	"I just think the fact that everyone kind of really pulled together…. I think every day, we would have daily sessions where we would talk about management, and what's the best approach with all these patients. And then, we'd have relatively informal guidelines on what to do.… [A]ll of those things did help"
Co-fellow peer support	If we're talking about what kept us going, I think just being around each other. I think that probably, even being on nights, you come in and you finish a night shift and then you're just like, a lot of times we all stuck around for about, like, an hour or so just to joke around about stuff and just decompress." "I think one thing that we all experienced is, maybe a couple months into COVID, you sort of realize that you spent the last 4 or 5 months at this heightened level of anxiety and stress every single day. And I think toward, at a certain point, I think my co-fellows and I really started to actually talk about it. And I think, thankfully, we really started using each other as a group therapy, essentially. And I think normalizing the fact that this is not normal, we do not feel okay, it's okay to not be okay."
Attending support	"I think, also, I mean, a thing unique for our program, at least, in my experience, is I look around, and I see who are my role models, who are the leaders in our division. And none of them are afraid to express emotions and particularly so around trainees, which I think is really important." "I also want to give a lot of credit to our department, because it seems like having people who—like [Dr. X] and [Dr. Y] coming back to the ICU after, like, 5 years of not doing it and [Dr. Z] working, like, 36 h straight.… I think that meant the most from a morale standpoint because it basically said to us, like, "Hey, we're not asking you to do anything we're not willing to do." I remember when [Dr. A] came in in scrubs, ready to go.… And it was fantastic. So, I think everyone in the division [was] just willing to pick up the pieces and lead by example, I thought was phenomenal."
Leadership presence	"And I would say the one thing that did a lot for, at least, my morale was every day I saw [leadership].… And I thought that was great because that showed that, you know what? Listen, they actually care, even if it was for 5 minutes. They'd just say, like, "Hey, how are you doing today?" And I think that meant a lot to me, just from a mental mindset that, hey, our department … leadership isn't afraid to be here."
Theme 4: Fostering and maintaining a sense of meaning and humanity in one's work is important	
Focusing on patient care	"During the height of the pandemic, we were really just taking care of patients because we wanted to do something better." "It definitely felt like you were doing something really important and something that was really impacting people's lives."
Making a difference	"But I know that all my colleagues also tried really hard to have patients see their family members in one way or another, and would FaceTime family members from their personal cell phones through a baggie so that your cell phone didn't get COVID on it and things like that. So, I felt really proud of my colleagues for that. And I know that that was something that made a difference." "Literally at the end of the week, the patients are the exact same as I started the week. And it's very frustrating. And I feel like I did nothing for that patient the whole week. So that's a very frustrating sensation, where you feel like you're not helping anyone. So now it's a lot of like the long-haul COVIDers, so that's just a difficult group of patients to take care of, as opposed to the initial, more active patients, where you felt like you were doing something for them.… It's an interesting phenomenon about, this feeling of almost futility … when I leave the MICU on Fridays, it's exactly the same as I found it on Monday. So, it's like I wasn't even here the whole week, so why am I doing this?"
Empathy	"I think I felt really proud of our group because I could tell that everyone was working really hard … and that everyone was functioning at their most empathetic self." "I think some things that I'm definitely probably having more difficulty now with is maybe my empathy level is not where it used to be at."

Table 2. *Continued*.

Themes and Subthemes	Representative Quotations
Theme 5: Trainees desire assistance and support to process their emotions and experience	
Mixed positive and negative emotions	"I think that's what I would go with, sadness—pride with a foundation of overwhelming sadness." "There was a lot to fear from the virus, but also pride in your work."
Emotional numbness	"If you really started thinking about it, it's a little bit disturbing how normal it started to be, just kind of like all these people dying. And then you're kind of going into work every day, kind of risking everything and risking your own personal health. And then you just kind of get used to it. And that, to me, I guess when I think about it now, I find it to be a little bit troubling."
Perceived trauma	"Yeah. When you're coding someone, and then you have to step over a dead body to code someone, that's very, very jarring, right? Because they didn't have enough room in the morgue … that kind of shit fucks you a little bit on the inside."
Difficulty processing	"I would say the biggest thing I noticed in not a good way was I felt very detached from my regular life. And I think that seems to be a consequence of just not being able to explain it entirely or wanting to explain it entirely, what was going on." "I guess, one of those things is, is that it was like maybe running a marathon. So, you start off, you're like, 'Why am I doing this?' Like, 'Oh my God.' And then you hit a rhythm and then you're just like, "Okay I feel great. I feel great.' And then you finish and you're like, 'I can't believe it's over.' And then you come down, and it's like, the next day, you're very sore, you know what I'm saying? Because then it finally—once it calms down, it finally registers to you, everything that you did, everything that you went through. And I would say the comedown is probably—I don't know about you guys, but maybe a little worse than being in it."
Processing experiences in training	"That definitely makes a lot of sense in terms of not just the medical training, but thinking about giving us the sort of emotional tools to cope with these things because right now, obviously, we experienced this on an incredible scale. But even before this, we were still experiencing these same things on a more micro level and over a longer, more spread out time."

Definition of abbreviations: COVID = coronavirus disease; ICU = intensive care unit.

COVID-19 reaffirmed their decision to go into critical care.

Critical care fellows expressed an inability to build skills and experiences that would make them more marketable during their job search. Despite being highly motivated to participate in research and having many research questions related to COVID-19 stemming from their clinical experience, fellows faced significant issues in maintaining productivity.

> *"I think the terrifying thing from a fellow's perspective is you look at it and say, obviously, everyone knows that the pandemic happened, but is that going to translate to how people view what you were or weren't able to accomplish during fellowship … ? My fellowship was in COVID and severe [acute respiratory distress syndrome], and I know how to do that really well and that consumes a large portion of when I normally would've had a lot more time to focus on research productivity. … How sympathetic will people be to that? You're going to sit in a job interview, and you're going to say, 'What did you do during your fellowship?' And your answer is COVID, I did COVID."*

When they were able to spend time on academic pursuits, feelings of guilt were expressed for not being there to help their colleagues on the front line. Because of the clinical demands at all levels and difficulties networking due to remote education, trainees also had trouble finding mentors who could guide them.

Theme 3: Receiving Social Support at Work from Peers and Leaders Is Vital for the Sustained Well-Being of Trainees

The overarching message was that a sense of camaraderie and cohesion is vitally important to sustaining effort and energy through unprecedented demands. Fellows were inspired and comforted by the willingness of their colleagues to step up and pitch in to provide the necessary care for patients.

> *"I think the most important things that really helped me get through it was really my coworkers. And I felt such a great bond with my coworkers. And if I didn't have such great co-fellows and attendings and people that I could just talk to all the time, it would have been a completely different experience. And I think that was really the thing that helped me the most with all the trauma and everything that we saw. I think that if we didn't have that, if we didn't have as positive a work environment that we have, we'd be in a different place now. And I can't imagine what it would be like if I didn't have that."*

Fellows also felt supported in situations where their division came together and formally discussed evolving guidelines and data related to COVID-19 and developed consensus on the approach to patients.

Coworkers served as an essential support for trainees at all levels, from peers to attendings to divisional and departmental leaders. Being able to talk to co-fellows helped individuals decompress; discuss the feelings they were having; and, through conversation, normalize those feelings. Routine clinical tasks such as change of shift and patient handoffs became opportunities to talk to and check in with each other. Attendings served as role models in multiple ways. Fellows recalled emulating the leadership styles of their attendings when having to manage teams on their own and in expressing their emotions openly. On the one hand, multiple trainees also discussed the significance of having divisional and departmental leaders present alongside them as a sign of solidarity. On the other hand, situations in which leaders were less visible but making policies that directly impacted clinical practice were frustrating.

Theme 4: Fostering and Maintaining a Sense of Meaning and Humanity in One's Work Is Important

Multiple fellows reflected in depth about experiencing a sense of fulfillment while taking care of patients during the initial surge of COVID-19. During this time, many administrative and documentation requirements were relaxed, and trainees felt reinvigorated by the ability to focus on direct patient care. This heightened sense of purpose that COVID-19 brought to trainees was largely expressed in reference to the initial surge in March 2020. In addition, multiple trainees discussed the need to keep this sense of having a meaningful impact on patients' lives into their future careers.

> *"We just got to be doctors. We didn't have to document a ton. We didn't have to deal with a lot of the annoying parts of our job. We just ran around and saw people and took care of them. And there was something nice about that."*

However, trainees expressed considerable distress during situations in which they believed they were unable to make an impact. This was discussed particularly in reference to later phases of the pandemic, when patients were in prolonged respiratory failure. Throughout all of this, trainees expressed a sense of pride in their ability to be empathetic and feelings of distress when they perceived themselves to be emotionally numb.

Theme 5: Trainees Desire Assistance and Support to Process Their Emotions and Experiences

The emotions described by trainees included anger, pride, numbness, feeling disheartened, sense of drowning, depressing, hopeless, hurt, eerie, anxious, apathy, fear, and broken. In addition, there were multiple references in the interviews to feeling mixed positive and negative emotions. Trainees also described distress related to feeling a lack of emotion and emotional numbness. These emotions stemmed from the volume of death and dying they were witnessing and the severity of illness. Multiple trainees described that during the surges of COVID-19 in the hospital, they were fueled by an "adrenaline rush," but then later, when they had had time to think and review what they were feeling and seeing, there was considerable distress related to the processing of these emotions. Trainees did not know how to process these emotions and expressed the fact that a career in critical care, even in nonpandemic circumstances, exposes individuals to traumatic circumstances, and there needs to be more focused attention on how to support clinicians as they think through their experiences.

> *"If anything, we're less prepared for the fact that COVID and the pandemic, especially in pulmonary critical care or emergency medicine, is not the first or last time that we deal with things like trauma. And I think that's not discussed in our training. And I think the impact of that on people is also not something we can just guess. And I think that should probably—in retrospect now, when I look at this situation, I think that should be part of our dialogue, regardless of a pandemic."*

The majority of study participants endorsed that the time and opportunities to talk through feelings was helpful, but the context in which this occurs was highly individualized. For example, some participants expressed that talking to family and loved ones was a significant source of comfort, whereas others found this to be emotionally taxing. Some trainees mentioned time away from the hospital was helpful, whereas others emphasized the importance of the social support network among coworkers. Some trainees found formal group "therapy"–type sessions organized by the program to be helpful, whereas others expressed that they were ineffective.

DISCUSSION

To our knowledge, this is the first qualitative study assessing the needs of critical care trainees as they continue to serve during the COVID-19 pandemic. This study highlighted several opportunities to improve education and support for trainees, both now and in the future. Key findings from our study are that curricular adaptations and further support relating to career development are needed. In addition, supporting positive social networks and a sense of meaning is important for trainee success. Increased attention and future research are needed to identify methods to assist trainees in processing the myriad of emotions and possible trauma related to working during the pandemic and in critical care medicine in general.

Conceptual models developed to understand physician well-being focus on both external and internal factors, emphasizing that well-being is not just the responsibility of the individual. Significant contribution is derived from organizational factors. Three models of interest are the Rosenberg model, the Shanafelt model, and the National Academy of Medicine model. The Rosenberg model identifies three major components of well-being: external resources (professional peer

support, social support outside of medicine, sharing experiences with colleagues), internal resources (personal traits, process of adaptation, and learned skills related to stress management), and existential resources (identifying meaningful work) (14). The Shanafelt model proposes that there are seven drivers that, when optimized, lead to physician engagement and, with deficits, lead to burnout. These are efficiency and resources, workload and demands, control and flexibility, work–life integration, social support and community at work, organizational culture and values, and meaning in work. All drivers have individual factors, organizational factors, and national factors that are important to take into account (15). Similar to these two models, the National Academy of Medicine model comprehensively identifies individual and external factors, which influence clinician well-being. Internal factors include healthcare role, personal factors, and skills and abilities. External factors include sociocultural factors; regulatory, business, and payer environment; organizational factors; and learning/practice environment (16).

Theme 3 (social environment) and theme 4 (meaning in work) that we uncovered in this study are represented well in these three conceptual models (Table 3). All levels of the workplace social environment, from peers to leadership, are important to sustaining well-being and even more so under the extreme stress of COVID-19. Trauma literature demonstrates that higher levels of social support were associated with lower post-traumatic stress disorder severity in meta-analyses (17). A Mayo Clinic study found that high leadership scores of the division or department chair are associated with higher satisfaction and less burnout (18). Our results add to this body of knowledge and stress the importance of enhancing cohesion among trainees, possibly through team-building activities, consideration of collegiality during fellowship selection, and actively selecting program administrators with a track record of strong leadership skills.

The importance of finding meaning in one's work (theme 4) is uniquely highlighted in the early phases of the pandemic. Trainees reported that the sole focus on patient care made them feel like they had returned to their original motivations for becoming a physician, leading to a sense of fulfillment. The detrimental effects of the clerical burden placed on physicians to document details that have little clinical significance have been discussed in the past (19, 20). The early phase of the pandemic response highlighted that even when working in a time of significant stress, fulfillment is possible when administrative burden is minimized. This natural experiment should be one that reinvigorates the national conversation on offloading healthcare workers so that their role focuses on providing meaningful clinical care.

Themes 1 (curricular gaps), 2 (career development), and 5 (emotional processing) are not adequately captured in prior conceptual models. These are both unique to the COVID-19 pandemic and to trainees and require specific attention moving forward. Themes 1 and 2 suggest the need for focused and proactive assessment of trainee needs with regard to perceived gaps in skill, knowledge, and career development. Recent survey studies report a more global decrease in pulmonary training, an increase in critical care training opportunities, decreased supervision, and reductions in didactic learning (7, 8). Our qualitative study emphasizes that

Table 3. Concordance between themes and prior conceptual models

	Theme 1 Adapting the PCCM Curriculum Is Needed to Address the Evolving Changes to the Skills and Abilities Needed by Trainees	Theme 2 COVID-19 Impacted Career Development, and Trainees Need Individualized Help to Meet their Goals	Theme 3 Work Social Support, from Peers to Leaders, Is Vital for the Sustained Well-Being of Trainees	Theme 4 Fostering and Maintaining a Sense of Meaning and Humanity in One's Work Is Important	Theme 5 Trainees Desire Assistance and Support to Process Their Emotions and Experience
Rosenberg model	*	*	External resources†	Existential resources†	Internal resources†
Shanafelt model	*	*	Social support and community at Work, culture, and values†	Meaning in work†	*
National Academy of Medicine model	Skills and competency, learning and practice environment (autonomy)†	Learning and practice environment Organizational factors‡	Learning and practice environment (collaborative environment)†	Personal factors Regulatory, business, and payer environment†	Skills and abilities (coping)†

Definition of abbreviations: COVID-19 = coronavirus disease; PCCM = pulmonary and critical care medicine.
*This theme is not well captured in the corresponding conceptual model.
†The theme is well captured in the corresponding conceptual model.
‡The conceptual model partially incorporates this theme.

gaps are highly individualized and vary from trainee to trainee and depend on ultimate trainee career goals. Fellows desire additional mentorship from their program directors and faculty to personalize a training plan which ensures that their training and career development goals are met.

Theme 5 relates to a specific skill set that trainees identify as missing in their curriculum: the exposure to a high volume of death and dying in their daily work, but no specific skills that are taught regarding how to cope with these complex emotions. Forms of psychological distress in the intensive care unit have been described previously (21). However, our novel finding is that along with this distress can be feelings of fulfillment that are difficult to process and further distressing.

Given the difficulties in emotional processing, program directors can start by implementing methods that have previously been described at the trainee level. Costa and colleagues described interventions that are needed on an individual (mindfulness), interprofessional (supported storytelling), and systems level (explicit training) (21). Developing narrative competence is a compelling method to help process emotions and was recently described by Awdish and colleagues (22). Narrative training is based on several educational theories and includes facilitated group discussion with an emphasis on recounting stories or reflecting on already written work.

Beyond narrative competence, there is a need to identify individuals who are struggling with their mental health because of the ongoing and continuous exposure to trauma in critical care training, even outside of the pandemic. In a single-center survey study of residents and fellows at Northwestern Medical Center, an astounding 61% of trainees responded that they would have benefited from psychiatry referral, and, of those, 64% never sought care because of

numerous professional and personal barriers (23). These data, combined with the results of this qualitative study, suggest that there is a need for proactive and confidential universal screening for mental health conditions among critical care trainees. Waiting for trainees to seek care themselves may result in severe underuse of needed mental health care resources. The role of program directors, who are often the first point of contact for trainees, in systematically screening for mental health disorders is unknown and needs to be further developed. Training programs for critical care program directors to address these sensitive topics have not been well researched, developed, and widely implemented. There is also a need for advocacy to destigmatize mental health care by removing questions about prior mental health conditions and treatment in licensing paperwork. Despite the high risk for suicide among physicians, these questions continue to exist and have been cited as a major barrier among residents and fellows for seeking mental health care (23).

Limitations of our study include that interviews were conducted between July 2020 and March 2021. Therefore, the prolonged effects of the pandemic as it continues in this third year may not be fully captured in the themes. We only had data for the geographic location for 6 of 13 participants, though these participants represented different medical centers from different regions. Demographic data were obtained to facilitate a representative sample across the country. We were surprised by the lower-than-expected response rate to the questions about training region. During the time that these interviews were conducted, many physicians were facing consequences for speaking candidly about their experiences. We hypothesize that this may have contributed to a lower response rate.

An additional limitation is that both focus group and individual interviews were used, and each method can provide different responses. Focus groups benefit from the richness of discussion with participant interaction, whereas individual interviews may increase participant comfort with sharing sensitive information. A final limitation is that the type of individual who may want to participate in a qualitative interview–based study may make results less generalizable, though this serves to be hypothesis generating.

Conclusions

In summary, we elicited important themes regarding the needs of critical care fellows to succeed in their careers. These include the need for leadership and peer support, finding ways to enhance a sense of meaning in their work, curriculum and career development planning, and ways to process their trauma both from the pandemic and from seeing day-to-day severe illness and dying as part of a job in critical care. These needs highlighted by critical care trainees were magnified during the COVID-19 pandemic and require an individualized approach that involves both organization-level and individual interventions.

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REFERENCES

1. Fessler HE, Addrizzo-Harris D, Beck JM, Buckley JD, Pastores SM, Piquette CA, *et al.* Entrustable professional activities and curricular milestones for fellowship training in pulmonary and critical care medicine: report of a multisociety working group. *Chest* 2014;146:813–834.

2. Griffin KM, Karas MG, Ivascu NS, Lief L. Hospital preparedness for COVID-19: a practical guide from a critical care perspective. *Am J Respir Crit Care Med* 2020;201:1337–1344.

3. Wietlisbach LE, Asch DA, Eriksen W, Barg FK, Bellini LM, Desai SV, *et al.* Dark clouds with silver linings: resident anxieties about COVID-19 coupled with program innovations and increased resident well-being. *J Grad Med Educ* 2021;13:515–525.

4. Castro MRH, Calthorpe LM, Fogh SE, McAllister S, Johnson CL, Isaacs ED, *et al.* Lessons from learners: adapting medical student education during and post COVID-19. *Acad Med* 2021;96:1671–1679.

5. Dedeilia A, Sotiropoulos MG, Hanrahan JG, Janga D, Dedeilias P, Sideris M. Medical and surgical education challenges and innovations in the COVID-19 era: a systematic review. *In Vivo* 2020;34:1603–1611.

6. Farrell CM, Hayward BJ. Ethical dilemmas, moral distress, and the risk of moral injury: experiences of residents and fellows during the COVID-19 pandemic in the United States. *Acad Med* 2022;97:S55–S60.

7. Matta A, Adamson R, Hayes MM, Carmona H, Soffler MI, Benzaquen S, *et al.* Impact of the COVID-19 pandemic on US pulmonary and critical care medicine fellowship training. *ATS Scholar* 2021;2:556–565.

8. Wahlster S, Sharma M, Çoruh B, Town JA, Lewis A, Lobo SM, *et al.* A global survey of the effect of COVID-19 on critical care training. *ATS Scholar* 2021;2:508–520.

9. Campfield KM, Hills AM. Effect of timing of critical incident stress debriefing (CISD) on posttraumatic symptoms. *J Trauma Stress* 2001;14:327–340.

10. Trockel M, Bohman B, Lesure E, Hamidi MS, Welle D, Roberts L, *et al.* A brief instrument to assess both burnout and professional fulfillment in physicians: reliability and validity, including correlation with self-reported medical errors, in a sample of resident and practicing physicians. *Acad Psychiatry* 2018;42:11–24.

11. Hennink MM, Kaiser BN, Marconi VC. Code saturation versus meaning saturation: how many interviews are enough? *Qual Health Res* 2017;27:591–608.

12. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15: 1277–1288.

13. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care* 2007;19:349–357.

14. Rosenberg AR. Seeking professional resilience. *Pediatrics* 2018;141:e20172388.

15. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc* 2017;92:129–146.

16. Brigham T, Barden C, Dopp AL, Hengerer A, Kaplan J, Malone B, *et al.* Discussion paper: A journey to construct an all-encompassing conceptual model of factors affecting clinician well-being and resilience. *NAM Perspectives*. Washington, DC: National Academy of Medicine; 2018.

17. Zalta AK, Tirone V, Orlowska D, Blais RK, Lofgreen A, Klassen B, *et al.* Examining moderators of the relationship between social support and self-reported PTSD symptoms: a meta-analysis. *Psychol Bull* 2021;147:33–54.

18. Shanafelt TD, Gorringe G, Menaker R, Storz KA, Reeves D, Buskirk SJ, *et al.* Impact of organizational leadership on physician burnout and satisfaction. *Mayo Clin Proc* 2015;90:432–440.

19. Downing NL, Bates DW, Longhurst CA. Physician burnout in the electronic health record era: are we ignoring the real cause? *Ann Intern Med* 2018;169:50–51.

20. Schwenk TL. What does it mean to be a physician? *JAMA* 2020;323:1037–1038.

21. Costa DK, Moss M. The cost of caring: emotion, burnout, and psychological distress in critical care clinicians. *Ann Am Thorac Soc* 2018;15:787–790.

22. Awdish RLA, Hayes MM, Cooper AZ, Hosey MM, Trainor A, Weatherston R, *et al.* A way forward in the COVID-19 pandemic: making the case for narrative competence in pulmonary and critical care medicine. *ATS Scholar* 2022;3:188–196.

23. Aaronson AL, Backes K, Agarwal G, Goldstein JL, Anzia J. Mental health during residency training: assessing the barriers to seeking care. *Acad Psychiatry* 2018;42:469–472.