"Play How We Practice": A Residency Program's Snapshot of Pediatric Resident Perspectives on Education During the COVID-19 Pandemic

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ABSTRACT

OBJECTIVES: Our objective was to understand the perspectives of current and recently graduated pediatric residents concerning the impact of the COVID-19 pandemic, and subsequent curriculum changes, to their education.

INTRODUCTION: Residency programs have experienced unprecedented alterations to education in the form of changing expectations, schedules, and opportunities during the COVID-19 pandemic. Little is known regarding resident perceptions of how these changes impact their education and ultimate career preparation.

METHODS: An anonymous and voluntary electronic IRB exempt survey was sent to pediatric residents at a mid-sized residency program in the mid-Atlantic in August of 2020. This cross-sectional study survey consisted of a series of multiple choice questions with optional short answer responses.

RESULTS: Twenty-two pediatric residents across all training years completed the survey for a response rate of 36%. The majority of residents, 59.1%, were interested in directly caring for COVID + patients; however, the minority (36%) felt prepared to care for COVID + patients. Most residents (63%) responded that graduate medical education programs should not have authority to exclude residents from taking care of patients with certain diagnoses and 95% of respondents indicated that they would prefer an opt out system instead.

CONCLUSION: The majority of resident respondents had a strong interest in caring for COVID + patients and report that they value frequent updates from program leadership to guide their patient care. Residents also overwhelmingly support an opt out system when caring for future patients with particular infectious diagnoses rather than a mandated exclusion approach.

KEYWORDS: Resident education, resident wellness, career readiness, COVID-19 impact on resident education

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Introduction

The Coronavirus 2019 (COVID-19) pandemic had a profound impact on healthcare, and our home institution and region were not immune. While approximately 5% of patients were admitted for COVID in August of 2020 in our state of Pennsylvania, that number would climb to almost 30% by year's end.[1] Our particular region in southern/central Pennsylvania shouldered a COVID case rate of approximately 7880 per 100 000 residents, one of the lower in the state during this timeframe.[2] This includes not only the delivery of care to patients, but the education of medical students, residents, and fellows. Pediatric resident education has not been immune to the modifications caused by the pandemic and while changes were more pronounced during the height of the pandemic, many remain in place. There have been various learning environment alterations such as fewer direct interactions with patients and interdisciplinary teams as well as less formal synchronized education sessions.[2] Some benefits were retrospectively appreciated. To limit both personal protective equipment (PPE) usage and exposure time, patients were evaluated in a smaller, more structured fashion, lending to increased opportunities for independent assessment by the learner.[2] There was also an increased need for learners to become effective communicators and foster relationships from afar through telehealth, intercoms, or two-way radios, all of which limited direct patient encounters.[2] Residents and residency program leadership had to be creative in promoting synchronous and asynchronous learning.[2] The COVID-19 pandemic fostered these types of successful and innovative solutions to educational gaps. This study aims to examine resident views regarding the changes implemented at a single institution during the COVID-19 pandemic.

While alterations to medical education were universal across institutions, the protocols put in place to mitigate these changes varied widely. One commonly used protocol was programs precluding residents from seeing COVID + patients or persons under investigation (PUIs) to protect their safety, such was the case at our home institution across all Undergradute Medical Education (UME) and Graduate Medical Education

(GME) programs. Similarly, some institutions implemented a platooning system to keep groups of residents home in order to maintain a healthy workforce.[3] Both of these solutions caused residents to have less patient interaction. While health and safety were the focus of these decisions, some residents felt these policies had a negative impact on their education. Respondents in a pediatric emergency medicine survey across multiple institutions reported that residents were often restricted from intubations and codes as well as from treating persons with known or suspected COVID in order to conserve PPE and promote trainee safety.[4] Another survey study found that 72% of residents felt trainees are essential personnel and should not have had alterations made to their patient contact.[4] It is unknown whether residents would have preferred the option to participate directly in the care of COVID + patients. Interestingly, in a paper from JAMA in 2023, 4511 physicians between the ages of 45–84 years of age died from COVID and its complications; younger physicians (which would include residents) were excluded because of low death rates (<5 deaths per month).[5]

Trainee wellness was also greatly impacted by the pandemic itself and the myriad of changes to resident protocols and education. Studies have shown that during the COVID-19 pandemic, providers have experienced increased levels of stress, anxiety, depression, and insomnia.[4] A study of pediatric anesthesiology fellows found that 14% of their total respondents (n = 75) reported experiencing newly diagnosed (or worsening of previously diagnosed) mental health issues that required additional care due to COVID-19. Nearly all respondents (97.3%) in the same study reported experiencing life stressors due to the pandemic.[6]

While many studies have examined different aspects of resident life and changing education, little has been reported concerning the specific opinions of residents on decisions which precluded them from direct care of certain patients. Little has also been published regarding resident opinion of the future impact of the various changes to their medical education during COVID19 on their future in fellowship or as attending physicians. The objective of this study was to identify resident perspectives on various aspects of the changes implemented to their education secondary to the COVID-19 pandemic. The longer term goal is that the results of this study influence future decision regarding resident participation in future pandemics, when they arise.

Methods

This cross-sectional study was conducted in August 2020 as an electronically distributed survey (Supplment 1) at the Penn State Health Milton S. Hershey Medical Center in Hershey, PA. Study was reviewed by the institutional Internal Review Board and deemed not human subject research and was exempt from full review. The survey was voluntary and anonymous and included both multiple choice scale responses as well as opportunity for further free text response comments. A REDCap (Research Electronic Data Capture) was used to create the survey as well as store the data. The survey was distributed by the Pediatric Residency program director to all current pediatric residents and 2020 graduates (n = 61). All pediatric residents were included and given the option to complete the survey; residents were excluded if they failed to respond to survey requests. Responses were submitted throughout a 5-week period during which two follow-up emails were sent. Informed consent was implied by voluntary survey completion; written consent was not obtained. Data was analyzed in REDCap as well as using Microsoft Excel (Microsoft Corporation). Where appropriate responses were reported as simple percentages and number of respondents.

Statistical Analysis

Results data includes total number of residents completing our survey as well as the gross percentage of residents responding for each survey question broken down by PGY year.

Results

A total of 22 pediatric residents completed the survey with a response rate of 36%. There was a relatively even distribution between classes in those who completed the survey with 27.3% (n = 6) PGY-1, 22.7% (n = 5) PGY-2, 13.2% (n = 4) PGY-3, and 31.8% (n = 7) 2020 pediatric resident graduates. These residents had the unique perspective of initially being excluded from caring for COVID positive patients at the beginning of the pandemic.

Interest and preparedness

Residents were asked about their interest to care for COVID positive patients, how prepared they felt to care for these patients, and factors influencing each. As seen in Figure 1, the majority of respondents, 59.1%, were interested in caring for COVID positive patients. Of those interested, the reasons included 53.8% for making a positive difference in the community, 30.8% for supporting patients and their families, and 15.4% were intrigued by the novelty of the disease. Of those disinterested, it was due to fear for their personal safety and health. Although most residents were interested in caring for COVID positive patients, Figure 1 demonstrates that the majority felt unprepared to care for COVID patients at the start of the pandemic. 100% (n = 6) of the PGY-1 class respondents felt unprepared and other class years had a mixed response in their feelings of preparedness. When asked what factors contributed most to their preparedness, 68.2% said communication and education from their residency office, 22.7% said their own personal research and self-education about the virus, 4.5% communication and education from the hospital leadership, and the remaining 4.5% a mixture of all the above. When asked what could have improved their preparedness in taking care of

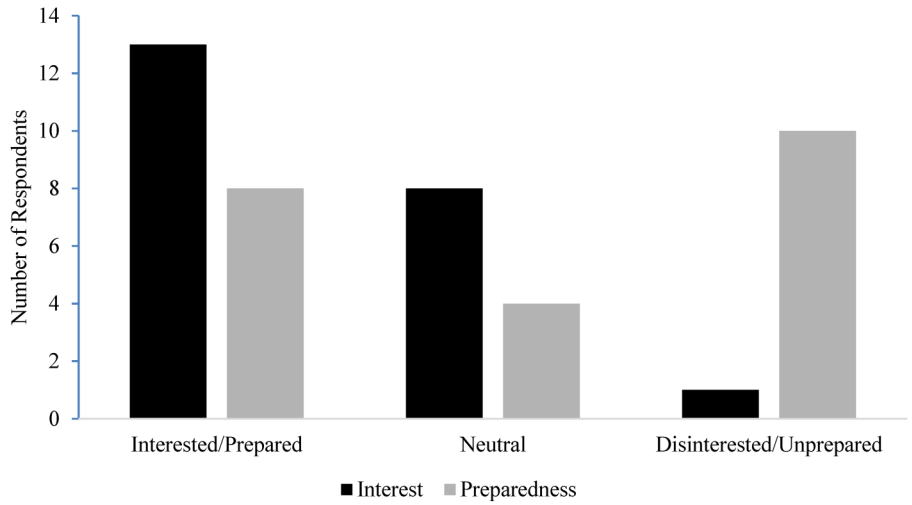

Figure 1. Pediatric resident interest and preparedness in caring for COVID + patients.

COVID positive patients, the three most selected choices were improvement in resources available for learning about COVID-19 and recommended care for patients with COVID-19, educational training sessions such as PPE usage, and frequent communication from their residency office, respectively.

Training and education

At the time of the survey, 59.1% of residents who responded had provided care to COVID + patients. Although most respondents indicated that they did not feel like the pandemic made them more or less prepared to be an attending, there was no correlation between this and residents who had the opportunity to care for COVID + patients. For those who were unable to provide care, there was a 50:50 divide of whether or not this impacted their training. One resident responded in free text reporting, *"It limited my ability to be a physician in that I took care of patients without ever seeing them. Seemed like I was doing paperwork but not actually medicine."* As demonstrated by Figure 2, 63.6% (n = 14) percent said they felt that excluding residents from caring for patients with certain conditions would make them less prepared to handle situations as an attending physician. One respondent commented, "*We play how we practice. We should see as much now as possible."*

Throughout the pandemic and at the time of this survey there was a PPE shortage. When residents were asked if the limit of PPE impacted their education and involvement in caring for patients with SARS-CoV-2, 72.7% responded yes as demonstrated by Figure 3. The majority at 72.7% felt there should be a compromise of residents sometimes providing direct care and other times indirect care of COVID + patients, depending on the severity of illness and PPE required. Other residents mentioned how lack of PPE impacted more than just their experiences with COVID + patients, as limited PPE also affected residents' ability to enter any clinical settings that required N95 masks, such as the delivery room, or their ability to perform certain procedures such as intubations.

Opt in versus opt out

At the beginning of the pandemic, the institution began a protocol to preclude residents from seeing COVID + patients or PUIs. 63.6% of residents believed that GME programs should not have the authority to exclude residents from taking care of patients with certain diagnoses, Figure 2. As seen in Figure 4, the majority believed residents should be able to opt out of care both if they have a high-risk medical condition or for any personal reason. Of those who believed residents should be able to opt out of care only if they have a high-risk medical condition 80% were PGY-3 or 2020 resident graduates. 72.7% of respondents who believed residents should be able to opt out for any reason were either PGY-1 or PGY-2 residents.

Wellness and habit changes

When residents were asked how the initial exclusion from patient care made them feel, 37.5% felt angered for reasons including feeling unable to make a difference in their community and lost educational experience. An equal percentage felt relieved for reasons including the virus being a true threat to their health and having little knowledge and comfort caring for patients with COVID-19. The remaining 25% had neutral feelings towards the policy.

Residents who were quarantined, on home back up, or who had an elective rotation canceled were asked how this impacted their wellness. Of those quarantined (n = 8), the majority (62.5%) felt this worsened or greatly worsened their wellness, 25% felt it improved their wellness, and the remainder felt it had no direct impact. Of those on home back up or who had

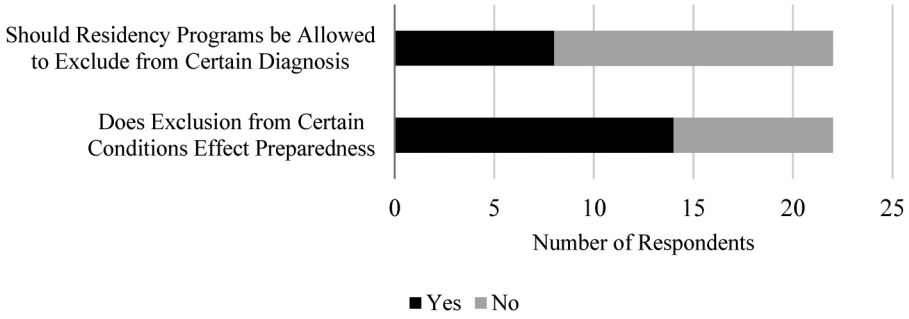

Figure 2. Program ability to exclude residents from care and impact on preparedness.

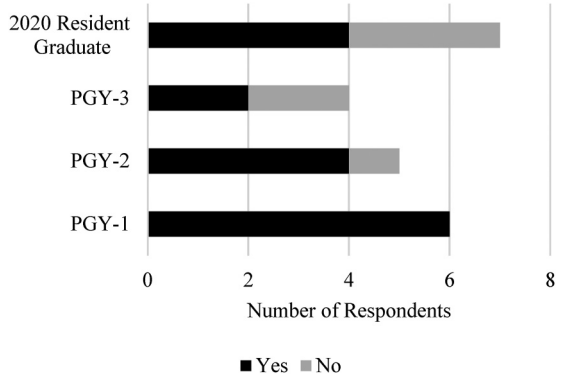

Figure 3. PPE shortage and yes/no response to impact on education by class year.

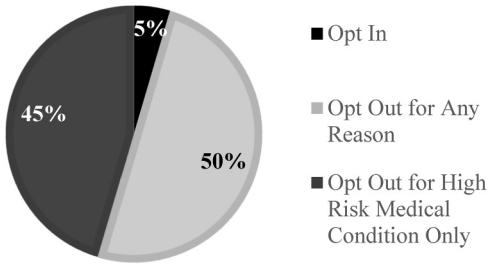

Figure 4. Should COVID + patient care require opt in or opt out.

Table 1. Other factors comments of factors that improved wellness.

- More time outdoors, hiking - Streaming Mass services online - Free movies/apps/products - Video chat/phone calls to family and friends - Gratitude practice - More time to review materials/study due to less patients - Knowing safety precautions in place - Social events with responsible social distancing

an elective canceled (n = 15), 40% felt it worsened their wellness, 40% did not believe it impacted their wellness, and 20% responded that it improved their wellness. In both groups, reasons for worsening wellness included it created a sense of anxiety of becoming ill/developing symptoms, increased feelings of social isolation, and limited ability (secondary COVID shutdowns and restrictions) to perform daily and routine activities such as grocery shopping, physical activity, and attending spiritual or religious events. For those who were quarantined, it also created a sense of anxiety that they may spread the virus. Of those on home back up or who had a rotation canceled, residents felt guilty for not being able to work. Reasons for improved wellness in both groups included improved sleep schedule, reduced burnout due to less workload, increased time to do the "housekeeping" aspects of work, increased time for other educational endeavors (eg, research, personal learning), and increased time for personal activities outside of work. Other factors residents found improved their personal wellness are listed in Table 1.

Discussion

There is not an aspect of healthcare that has remained unchanged during the COVID-19 pandemic, medical education included. Residency programs made a variety of adjustments in order to best keep their learners safe, conserve PPE, and continue to promote the educational goals of their residents. Many of these changes caused residents to have less direct patient care in general, including being precluded from seeing COVID19 + patients. At our home institutions, all GME and UME programs were prohibited from caring for any COVID or PUI patient; attending physicians cared for all of these patients. As the pandemic peaked and PPE become more readily available, adult GME programs gradually reintroduced residents to patient care for COVID patients. The same became true for Pediatric GME programs, with UME students being the final group allowed to care for such patient as the pandemic finally crested. As each group was gradually reintroduced back into clinical care, education sessions, notably appropriate PPE use and patient isolation policies, was offered and reviewed. Previous studies have shown that residents feel as though they are essential personnel and should not have had restrictions to which patients they could see.[4] Our data supports this notion as the majority of residents felt that GME programs should not exclude them from seeing

patients with certain diagnoses, in this case patients with COVID 19. There was little previously published data regarding resident opinions on how residency programs should structure resident care for specific patient populations. Our data reveals that the overwhelming majority of residents (>95%) were in favor of an opt out system in which residents could either opt out for any reason or only for a high-risk medical condition. PGY-3 residents and recent residency graduates were more likely to select that residents should only be able to opt out for a high-risk medical condition. This potentially reflects training time and the shift in mentality as training years progress. Other studies demonstrate that residents feel the pandemic has negatively impacted their training and caused increased anxiety about competency after resident completion.[7] This includes some residents believing the decrease in patient care negatively impacted their procedural and clinical skills.[8] A study by Rana et al found that senior residents (≥PGY-3) felt the pandemic was more disruptive on residency training when compared to junior residents (PGY-1 and PGY-2). They hypothesized this may be because seniors lost opportunities to perform certain tasks more independently while juniors have more time to make up for any lost experiences.[9] Although only assumed by our study team, it would seem intuitive that residents close to graduation felt they should not be excluded from caring for any patient population in which they may become the attending physician for in the coming months.

One reason the opt out, rather than opt in, approach was favored by these residents may be due to the majority of residents having interest in caring for COVID + patients and PUIs. However, even with this interest, our results demonstrate that the majority felt unprepared. This was particularly notable in the first-year class where 100% of participants felt unprepared to care for COVID + patients. This is likely due to being new interns and having less time with direct care of patients during their medical school training. When the Association of American Medical Colleges and Liaison Committee on Medical Education recommended the suspension of medical students' participation in activities that involve direct patient contact in March of 2020,[10] many students were pulled from their rotations or prevented from seeing COVID + patients. In a study of 713 interns who were fourth-year medical students when the pandemic hit, Winn et al reported that 42–52% of students indicated their clinical experiences were completely canceled as the pandemic became more widespread from April to June.[11] According to this study, only 2–6% had in-person clinical rotations during that time and 5.5% of respondents had cared for a COVID + patient before entering residency.[11] This lack of experience with COVID + patients is likely a contributing factor to why all interns in our study felt unprepared to care for COVID + patients. Our findings show that the feelings of unpreparedness may be partially alleviated through frequent, direct communication and education from the residency office and program leadership. This is consistent with other literature that found healthcare workers desired visible leadership[12] and that clear communication and support from an organization decreases the likelihood of healthcare workers developing mental health problems during pandemics.[13]

Most residents believed that exclusion from seeing certain medical conditions would affect their preparedness as future physicians. This was compounded by the PPE shortage which the majority of residents felt impacted their education. The impact was most noticeable within the PGY-1 class, of which the respondents unanimously felt limited PPE directly impacted their education. This may be a result of their exclusion in caring for COVID + patients and removal from rotations during medical school partially due to PPE shortage and concerns for safety. Additionally, as some respondents mentioned, certain PPE (eg, N-95 masks) are not only necessary in caring for COVID + patients but also required in other settings. While impacting their ability to see the COVID + patient population, it also limited experience in the delivery room and performing certain procedures. Residency programs may consider a better balance of resource allocation versus learner experience for future situations. Despite these significant alterations, the majority of residents felt neutral or positive regarding the pandemic's impact in their preparation for the future as a fellow or attending. This may be due to the relatively short period of time where these alterations were in full effect and quick accommodations made by residents and residency programs.

As previous literature demonstrated, the COVID-19 pandemic had significant impacts on resident wellness.[8,12–14] The current study further supports this as the fear of unnecessarily exposing others to the COVID-19 virus weighed on many and created a sense of isolation. This was compounded by in person lectures being moved to a virtual format, lack of in person social gatherings, mandatory quarantines, home backup platooning, or having rotations canceled. Although most residents who had to quarantine or were put on home backup felt the pandemic worsened their wellness, some found that their wellness improved, and many respondents found different outlets for wellness as seen in Table 1.

There are several limitations to this study. This was a small, single-center cross-sectional study of one residency program. T residents surveyed were from a pediatric residency program at an academic hospital and therefore the results may not be generalizable to other specialties. Furthermore, the specific policies at this hospital may not hold true for other institutions. The sample size was small, n = 22, and therefore opinions stated may not be reflective of all residents at this program; however, there was a fairly equal distribution of respondents from each class giving different perspectives from multiple years of training. Power was not calculated given our small sample size. Finally, our survey tool was developed and edited by the study team and not pilot tested prior to use.

Table 2. Summary of recommendations derived from the results of this study for use in future similar situations.

- Balance PPE resources with maximizing continued direct care for residents (because residents want the clinical experience) - Utilize an opt out system for seeing patients with novel infectious diagnoses. Avoid total exclusion or opt in requirements - Provide regular didactics regarding current best practices for treatment of a novel disease (because residents feel underprepared) - Ensure frequent disease/pandemic-specific communication directly from program leadership and residency office - Acknowledge/monitor trainee wellness difficulties and implement mitigation strategies

This study has elucidated several resident concerns, perceptions, and opinions regarding the COVID + pandemic and its impacts on medical education. As the pandemic continues and with the possibility of other pandemic surges in the future, it is important to recognize that trainee wellness and education may be strained for a variety of reasons. Therefore, we developed a summary of recommendations, Table 2, based on results from this study that may be utilized to better optimize trainee preferences, preparedness, and wellness during future surges of COVID-19 or other pandemics in the future.

Conclusions

Three conclusions can be drawn from our work. Residency programs should consider an opt out system rather than an opt in system for having residents care for certain diagnoses to maximize direct patient care while balancing the availability of PPE. Direct communication from the residency office should be used frequently as it alleviates resident anxieties and feelings of under preparedness. Finally, resident wellness should continue to be prioritized during times of increased changes and stress.

Contributions

Amanda Williams and Derika Schlueter were the primary researchers. They were involved with IRB writing and submission, editing the survey, data analysis, and writing the manuscript. Dr Justen Aprile and Dr Jennifer Miller were involved in editing the IRB, survey, and manuscript. Dr Kelly Patterson created the survey and was involved in editing the IRB and manuscript. Dr Aaron Shedlock oversaw the research process and acted as the principal investigator.

Ethics statement

Study was reviewed by the institutional Internal Review Board and deemed not human subject research and was exempt from full review.

Informed consent

Informed consent was implied by voluntary survey completion for this study

Prior presentations

A portion of this work was presented as a poster at the 2021 Pediatric Hospital Medicine Meeting.

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Supplemental material

Supplemental material for this article is available online.

REFERENCES

1. Yilmaz A, Hermane A. Impact of the COVID-19 pandemic on Pennsylvania and its healthcare system. *Health Sci Rep*. 2022;5(3):e615. doi: 10.1002/hsr2.615
2. Chiel L, Winthrop Z, Winn AS. The COVID-19 pandemic and pediatric graduate medical education. *Pediatrics*. 2020 Aug;146(2):e20201057. doi: 10.1542/peds.2020-1057. Epub 2020 May 20. PMID: 32434764.
3. Tolu L, Feyissa GT, Ezeh A, Gudu W. Managing resident workforce and residency training amid COVID-19 pandemic: scoping review of adaptive approaches. *Adv Med Educ Pract*. 2020 Aug 10;11:527-535. doi: 10.2147/AMEP.S262369. PMID: 32848492; PMCID: PMC7428317.
4. Walker DM, Tolentino VR. COVID-19: the effects on the practice of pediatric emergency medicine. *Pediatr Emerg Med Pract*. 2020 Jun 19;17(Suppl 6-3):1-15. PMID: 32549038.
5. Kiang MV, Carlasare LE, Thadaney Israni S, Norcini JJ, Zaman JAB, Bibbins-Domingo K. Excess mortality among US physicians during the COVID-19 pandemic. *JAMA Intern Med*. 2023;183(4):374-376. doi: 10.1001/jamainternmed.2022.6308
6. Kazmerski TM, Friehling E, Sharp EA, et al. Pediatric faculty and trainee attitudes toward the COVID-19 pandemic. *Hosp Pediatr*. 2021 Feb;11(2):198-207. doi: 10.1542/hpeds.2020-001990. Epub 2021 Jan 11. PMID: 33431427.
7. Fero KE, Weinberger JM, Lerman S, Bergman J. Perceived impact of urologic surgery training program modifications due to COVID-19 in the United States. *Urology*. 2020 Sep;143:62-67. doi: 10.1016/j.urology.2020.05.051. Epub 2020 Jun 6. PMID: 32512110; PMCID: PMC7274971.
8. Robertson JC, Woodfin M, Bonomo L, Feng S, Shinohara MM. The impact of the COVID-19 pandemic on US dermatology resident training and wellness. *Int J Dermatol*. 2021 Sep; 60(9):e338-e340. doi: 10.1111/ijd.15572. Epub 2021 Apr 26. PMID: 33899925; PMCID: PMC8239880.
9. Rana T, Hackett C, Quezada T, et al. Medicine and surgery residents' perspectives on the impact of COVID-19 on graduate medical education. *Med Educ Online*. 2020;25(1):1818439. doi: 10.1080/10872981.2020.1818439
10. Whelan A, Prescott J, Young G, Catanese V. Guidance on medical students' clinical participation: Effective immediately. Accessed 16 Aug 2021. https://lcme.org/wp-content/uploads/filebase/March-17-2020-Guidance-on-Mediical-Students-Clinical-Participation.pdf.
11. Winn AS, Weaver MD, O'Donnell KA, et al. Interns' perspectives on impacts of the COVID-19 pandemic on the medical school to residency transition. *BMC Med Educ*. 2021;21(1). 2021 Jun 7;21(1):330. doi: 10.1186/s12909-021-02777-7. PMID: 34098966; PMCID: PMC8184261.
12. Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA*. 2020;323(21):2133. doi: 10.1001/jama.2020.5893
13. De Brier N, Stroobants S, Vandekerckhove P, De Buck E. Factors affecting mental health of health care workers during CORONAVIRUS disease outbreaks (sars, mers & COVID-19): a rapid systematic review. *PLOS ONE*. 2020;15(12):e0244052. doi: 10.1371/journal.pone.0244052
14. Shih G, Deer JD, Lau J, et al. The impact of the COVID-19 pandemic on the education and wellness of U.S. Pediatric anesthesiology fellows. *Pediatric Anesthesia*. 2021 Mar;31(3):268-274. doi:10.1111/pan.14112. Epub 2021 Jan 18. PMID: 33341983.