Plastic Surgery Training During Coronavirus Disease 2019 Pandemic: A Quantitative Study on Trainees’ Wellness and Education

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Purpose: Coronavirus disease 2019 (COVID-19) pandemic has had far reaching impacts on all aspects of the healthcare system, including plastic surgery training. Due to reduction in the number of elective surgery cases and need for social distancing, plastic surgery education has shifted from the operating room to the virtual learning environment. Although these changes have been qualitatively described, the authors present a quantitative analysis of plastic surgery training changes due to the COVID-19 pandemic. Our study has identified residents’ greatest impediments and inquired about suggestions for further improvements. Our goal is to help residency programs through the COVID-19 pandemic era and contribute to future guidelines when residency education encounters additional unexpected changes.

Methods: An institutional review board approved anonymous survey using Qualtrics was forwarded on April 23, 2020 to US plastic surgery program directors to be distributed to plastic surgery residents and fellows. Questions centered on the impact of COVID-19 on residents’ well-being, education and career plans results were collected for data analysis. Residents were given the option to be in a raffle to win a $50 amazon gift card. Completion of the survey was both anonymous and voluntary.

Results: A total of 69 trainees responded (52 integrated residents and 17 independent fellows) from 18 states. Fifty-one percent were male and 49% were female. Fifty-six percent of trainees and 17 independent fellows) from 18 states. Fifty-one percent had far reaching impacts on all aspects of the healthcare system, including plastic surgery training. Due to reduction in the number of elective surgery cases and need for social distancing, plastic surgery education has shifted from the operating room to the virtual learning environment. Although these changes have been qualitatively described, the authors present a quantitative analysis of plastic surgery training changes due to the COVID-19 pandemic. Our study has identified residents’ greatest impediments and inquired about suggestions for further improvements. Our goal is to help residency programs through the COVID-19 pandemic era and contribute to future guidelines when residency education encounters additional unexpected changes.

Conclusions: Results from our survey demonstrated that the overwhelming majority of plastic surgery residents have had reductions in operative times and widespread curriculum changes during the COVID-19 pandemic. These recent changes have increased residents’ stress levels and adversity affected their future career plans. Additionally, COVID-19 has heralded an increase in virtual conferences and learning modules. Plastic surgery trainees expressed a preference for virtual educational platforms and interest in continuing virtual didactics in the future.

Key Words: COVID-19, pandemic, plastic surgery, surgical education, wellness

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The American Society of Plastic Surgeons (ASPS), The Center for Medicare and Medicaid Services, and the American Medical Association recommended that elective, nonessential surgeries and procedures be delayed and postponed during the COVID-19 outbreak. Although critically important to assist in “flattening the curve,” this poses significant challenge to traditional trainee education models. Resultant reductions in operative time and face-to-face clinical learning may affect trainees’ academic and professional development. Adaptive measures threaten trainee’s preparedness and paralyze their innovative leadership during future pandemics as they are involved in the decision-making process. The effect of delayed plastic surgery training will uncover with time.

Although elective surgeries were delayed, both trauma and craniofacial surgeries were sustained through the onset of the pandemic. The University of Washington piloted navigating OMS service guidelines to maintain the health of patients and protect providers and staff from unnecessary risk. All operative procedures were limited to urgent or emergent cases, also requiring a negative PCR test 72 hours before surgery. Concurrently, UW defined “urgency”, those in which the patient’s health outcome would be adversely affected within a 2- to 4-week timeline. Telehealth consults were implemented to determine degree of urgency and for postoperative appointments. The pediatric surgical population is most notably tied to heightened urgency, especially with craniofacial surgery. State guidelines were sparse, but hospitals managed to implement their respective protocols to preserve health and safety of patients and providers, as much as possible.

In response to these challenges, the Accreditation Council for Graduate Medical Education urged that the unnecessary transmission risks associated with educational activities should be avoided and advocated the adoption of remote learning educational activities. These virtual learning activities represent a paradigm shift in surgical training, designed to mitigate the loss of “hands-on” training that require in-person presence and learning opportunities to thereby supplement resident learning. Surgical trainees are facing many difficulties in regards to increasing demand for managing workload and providing additional support to their healthcare colleagues, whereas navigating the impact of COVID-19 on their wellbeing, family, community, and patients. To our knowledge, there is no current literature to suggest how this abrupt shift in training, schedule, and professional expectations will impact plastic surgery trainees and their well-being. This study attempts to capture the impact of these changes on the overall plastic surgery resident experience.

A total of 69 trainees (52 integrated residents and 17 independent fellows) from 18 states responded. Fifty-one percent were male, 49% were female. Fifty-six percent of trainees plan to complete a fellowship program after graduation. Thirty-one percent will join private practice. Fifty-six percent of integrated trainees planned to pursue fellowship programs. Sixty-three percent independent trainees reported pursuing private practice. Nine percent of trainees stated changes in postgraduate plans due to the pandemic, 67% were senior residents/fellows. Of those whose plans changed due to COVID-19 pandemic, 56% opted to pursue additional fellowship training because of reduced operative time and cancelations of elective surgeries (50%), the limited availability of private practice jobs (37.5%), and financial reasons (12.5%) shown in Figure 1. [MOU4] Ninety-seven percent of trainees reported having reduction in their operative time during the COVID-19 pandemic, utilizing the nonoperative time for online education modules (84%), educational readings (82%), research (80%), leisure activities (74%), self-care (74%), home chores (71%), family (40%), and mentoring (17%) as displayed in Figure 2. [MOU5] Twelve percent reported being concerned about not meeting necessary requirements to finish their residency and graduate on time. Seventy-six of trainees expressed concerns about the health and safety of themselves.

RESULTS

Between April 23rd and May 10th, 103 survey responses were submitted. Of those, 69 were completed and included in the analysis. A total of 69 trainees (52 integrated residents and 17 independent fellows) from 18 states responded. Fifty-one percent were male, 49% were female. Fifty-six percent of trainees plan to complete a fellowship program after graduation. Thirty-one percent will join private practice. Fifty-six percent of integrated trainees planned to pursue fellowship programs. Sixty-three percent independent trainees reported pursuing private practice. Nine percent of trainees stated changes in postgraduate plans due to the pandemic, 67% were senior residents/fellows. Of those whose plans changed due to COVID-19 pandemic, 56% opted to pursue additional fellowship training because of reduced operative time and cancelations of elective surgeries (50%), the limited availability of private practice jobs (37.5%), and financial reasons (12.5%) shown in Figure 1. [MOU4] Ninety-seven percent of trainees reported having reduction in their operative time during the COVID-19 pandemic, utilizing the nonoperative time for online education modules (84%), educational readings (82%), research (80%), leisure activities (74%), self-care (74%), home chores (71%), family (40%), and mentoring (17%) as displayed in Figure 2. [MOU5] Twelve percent reported being concerned about not meeting necessary requirements to finish their residency and graduate on time. Seventy-six of trainees expressed concerns about the health and safety of themselves.

METHODS

An institutional review board application was requested and approved from the University of Miami. A 35-question survey was prepared and distributed using the University of Miami Qualtrics online interface. Survey was subdivided into 2 separate surveys: the first 1 was focused on Resident Exposure and Telemedicine and was followed by the second survey on Resident Wellness and Education. This paper reports only the survey on Resident Wellness and Education. Seventeen questions centered on the impact of COVID-19 on residents’ well-being, education and career plans. Results were collected for data analysis as shown in Supplementary Digital Content, Table 1, http://links.lww.com/SCS/D620. Survey included a consent script, which included the purpose of the study and an agree button to indicate participation in the study. Failure to complete the consent script terminated participation.

FIGURE 1. Factors that impacted residents’ decision to change their postgraduation plans.
family and loved ones. Forty-nine percent of trainees reported increased levels of stress since the onset of the pandemic as shown in Supplementary Digital Content, Table 2, http://links.lww.com/SCS/D620.

Plastic surgery trainees learned about national webinars through emails from professional society (83%), co-resident/fellow (77%), program director emails (74%) and social media (22%).

Participation was mostly through virtual platform modalities. Zoom and Webex were the most preferred. Less interactions with colleagues and faculty was the biggest barrier to adopting virtual conferences. Despite this, 72% agreed that having grand rounds, didactics and journal clubs online increased attendance. Even though 88% of respondents expressed interest in attending professional society sponsored virtual grand rounds in the future, only 12% reported that these grand rounds were made mandatory by their program.

FIGURE 2. Activities performed by residents during nonoperative time.

DISCUSSION

Coronavirus disease 2019 pandemic and its widespread impact on healthcare significantly impacted the training and well-being of plastic surgery trainees. In order to mitigate the effect of transmission of the virus among healthcare workers, multiple academic institutions restructured their clinical curriculum with the goal to minimize exposure to COVID-19 and protect both patients and the surgical resident workforce. Although these changes have been qualitatively described, our study reports (to our knowledge) the first quantitative analysis of plastic surgery training changes due to the COVID-19 pandemic.

Consequences of Reducing Operative Time

Residents’ operative experiences were curtailed due to wide cancellations of elective surgery cases. Ninety-seven percent of surveyed plastic surgery residents reported a significant reduction in operative experience, in accordance with guidance from ASPS, American College of Surgeons, American Medical Association, and Centers for Medicare & Medicaid Services.2–4 These guidelines, although aimed to limit exposure of healthcare workers and mitigate acute PPE shortage, will irreversibly impact the landscape of surgical education.

Certification by the American Board of Plastic Surgery has rigorous standards.29 Required prerequisite trainings for residents include abdominal, oncologic/breast, pediatric, transplant, and vascular surgery, surgical critical care, surgical oncology, and trauma management. Suggested prerequisite experiences include oculoplastic, orthopedic, and oral and maxillofacial surgery, acute burn management, anesthesia, and dermatology. Requisite training follows, including experience in congenital defects of the head and neck, head and neck surgery, craniomaxillofacial trauma, aesthetic surgery, plastic surgery of the breast, lower extremities, trunk, and genitaiia, surgery of the hand/upper extremity, burn reconstruction, microsurgical techniques, reconstruction by tissue transfer, and surgery of benign and malignant lesions of skin and tissue. Trainees entering integrated training programs must complete all requisite trainings, and frequently are exposed to an array of prerequisite trainings, as well.

A significant question is how residents will respond to such decrease in surgical volume due to the pandemic. Notably, residents gained other valuable skills and experiences through navigating the COVID-19 pandemic. Responses from our survey showed that trainees invested their nonoperative time in educational reading, online modules, research, leisure and self-care activities.

Some (28%) residents expressed either agreement or an unknown sentiment about concerns of completing residency training. Surgical case numbers are not the sole determinant of physician competence or ability to graduate from training. Rather, fitness for graduation and practice is determined by competence in all the required realms of plastic surgery. Failure to achieve case minimums is a critical aspect when determining program accreditation.18 Disruptions may impact case minimums or exposures, especially those more difficult to fulfill by residents. In response to such disruptions, the American Board of Medical Specialties declared necessity to provide flexibility with training and program adaptations.60

Consistent with results from an accompanying survey, trainees were asked to cover shifts outside the scope of their practice or join a COVID-19 team, such as assistance in ICU or patient admitting, possibly reducing operative time. Plastic surgeons widened their scope of practice to cover roles traditionally delegated to general surgery. This was necessary to allow ICU trained general surgeons focus attention on ICU care.

We cannot rule out possibility that some institutions ignored guidelines to reduce elective procedures. A study by Wang et al16 at the Shanghai Jiao Tong University School of Medicine in China published their experiences with infection control measures, advocating for a careful balance between potential risk of infection and continuing medical service. Regardless, the nationwide halt on elective procedures raises questions about the adherence to national guidelines and which institutions allowed their residents to continue operating.

Although urgent procedures, such as pediatric craniofacial and trauma procedures, continued, further research suggests that healthcare providers who work in the head and neck region are disproportionately impacted by severe respiratory infection caused by COVID-19.15 Though long-term implications of deterring surgical procedures have not been reported, it is probable that this tactic preserved the safety of healthcare providers.

New Models of Learning

Traditional in-person conferences and learning sessions transitioned to remote through the use of new electronic virtual platforms.11 Previously reported benefits to virtual learning in-
include capacity to revisit recorded sessions, user-friendly accessibility to both clinical material and key articles, and the ability to interact with learners globally. Plastic surgeons are seen by other specialties as imaginative, original, and inventive, seen in complexity and diversity of procedures and less-frequent standardized protocols. In fact, national virtual ground rounds may lend benefit to standardize procedures with experts sharing knowledge on a global level. In response to the COVID-19 pandemic, majority of residents (> 80%) reported attending virtual grand rounds from ASPS, Aesthetic Surgery Journal, and their home institution. Additionally, most residents reported either virtual attendance or recommendation of the Aesthetic Society Traveling Professor webinar series, shown in Supplementary Digital Content, Table 3, http://links.lww.com/SCS/D620. This reflects effort to supplement education despite minimized opportunities to gain equal exposure to in-person surgical training. Despite difficulties, half of trainees preferred these sessions over in-person. It appears to increase attendance.

Attempts to increase virtual exposure included Aesthetic Surgery Journal with the Division of Plastic and Reconstructive Surgery at Emory University School of Medicine hosting weekly Virtual Grand Rounds via Zoom and the ASPS and the International Microsurgery presented multiple Grand Round Series with attendance reaching up to 520 participants from all over the world. These platforms may provide learning opportunities for educators to adapt when formal traditional education is disrupted.

RESIDENTS’ WELLBEING

It is imperative for leaders to be mindful of the impact of COVID-19 pandemic on residents’ wellbeing. Reported increasing stress levels of residents (76% report increased concern) shed light on the wide scope of effect. Surgical educators should provide residents with the resources, time and space to acclimate to this rapidly evolving new environment. Finding a balance between setting productivity goals and allowing time for processing is essential for wellbeing.

Our study has several limitations. Most obvious was non-responding bias. This contributed to our small sample size of 69 respondents. Low response rate likely resulted from overload of surveys, stress from the pandemic, resume academics duties amidst changing schedules, and voluntariness of completion. Additionally, some program directors might not have distributed the survey to their residents. Second, the survey was written based on the authors consensus and was not validated. Third, our results reflect responses from residents during a particular time of the pandemic. As the situation continues to evolve, it is possible that residents’ perceptions and concerns have changed. Fourth, the data are based on residents’ self-reports. Percentages may be an overreported or underreported attributing to differing perceptions of the changes according to the geographic region and the level of trainees’ education. Because most of the respondents were integrated residents, our study may represent the perceptions and experiences of integrated plastic surgery residents. Study participation by independent residents was low compared to integrated residents, presumably because the number of independent programs compared to the integrated programs.

CONCLUSIONS

Results from our survey demonstrated that the overwhelming majority of plastic surgery residents have had reductions in operative times and experienced widespread curriculum changes during the COVID-19 pandemic. These recent events have increased residents’ stress levels and affected their future career plans. Additionally, COVID-19 has heralded an increase in virtual conferences and learning modules. Plastic surgery trainees expressed a preference for virtual educational platforms and interest in continuing such didactic activities in the future. This may irreversibly change the landscape of plastic surgery training. Further research is needed to determine the long-term effect of the pandemic on surgical education and residents’ health.

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