Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
The impact of the COVID-19 pandemic on fellowship training: A national survey of pediatric otolaryngology fellowship directors

Jared Johnson, Michael T. Chung*, James Stathakios, Nathan Gonik, Bianca Siegel

Wayne State University, Department of Otolaryngology, Detroit, MI, USA

ARTICLE INFO

Keywords:
COVID-19
Pandemic
Fellowship
Education
Pediatric otolaryngology

ABSTRACT

Objectives: To gain a better understanding of the effects the COVID-19 pandemic has had on current and future pediatric otolaryngology fellowship training, as well as how the application process was impacted this past year. Methods: An anonymous web-based survey consisting of 24 questions was sent to all fellowship directors. The survey questions were designed to gain a better understanding of the effects of the current COVID-19 pandemic on the surgical and clinical experience of current, to characterize the types of supplemental educational experiences that fellowship directors had incorporated into the curriculum to compensate for the decreased surgical and clinical workload, and highlight differences based on geographic location. Results: Overall, 22 of 36 fellowship directors responded to our survey, for a total response rate of 61%. The Midwest had the highest response rate at 72.7%, followed by the Northeast (71.4%), the West (50%), and the South (50%). The vast majority of fellowship directors (77.2%) reported the COVID-19 pandemic had a “significant impact” on overall pediatric otolaryngology fellowship training. 86.3% of fellowship directors reported that their programs were still performing some surgical operations, but with decreased overall volume. Interestingly, 13.6% of fellowship directors reported that their fellows had been pulled to medicine or ICU services to assist with the COVID-19 pandemic. Of these programs that had a fellow pulled to the ICU or medicine service, 2 out of 3 were located in the Northeast, with the remaining fellow being from a program in the South. Conclusion: Overall, pediatric otolaryngology fellowship directors reported the COVID-19 pandemic has had a significant impact on the overall fellowship experience within the field of pediatric otolaryngology, with the majority feeling that both their fellows surgical and clinical experience have been significantly impacted.

1. Introduction

The novel coronavirus disease 2019 (COVID-19) pandemic has led to unprecedented changes within the healthcare system over the last several months. Despite guidance for the general public to “stay at home” and to practice “social distancing”, COVID-19 has proven to be readily transmissible and has spread quickly throughout the United States [1–4]. The rampant spread of disease has led to a heavy burden on the healthcare system, and has required a number of changes to normal hospital operations, which have presented unique challenges to residency and fellowship programs with regards to educational and training opportunities [5]. This is especially true in surgical fields, such as otolaryngology, where one’s training relies heavily on operative experience [5]. At the advice of numerous oversight committees, such as the Center for Disease Control and Prevention (CDC), elective and non-urgent surgical cases have been cancelled in order to limit the potential further spread of disease and to comply with the “stay at home” orders [7,8]. Additionally, for patients that do not have urgent health issues, clinic visits have frequently been cancelled or are performed via telehealth [9]. Otolaryngology fellowship programs have had to adapt to ensure that fellows are still able to optimize this time, and the academic otolaryngology community has come together in an unprecedented way to help ensure this via numerous online learning opportunities. Similar challenges have also been encountered across multiple fellowships in the field of otolaryngology, including within pediatric otolaryngology.

The pediatric otolaryngology fellowship match was first established in 1999. The majority of fellowships in pediatric otolaryngology are one year in length, while 2 programs offer two-year fellowships. In 2019, there were 36 pediatric fellowship programs that participated in the match, with 49 total spots being offered through the San Francisco match. Interviews are traditionally carried out from February through

* Corresponding author, Wayne State University School of Medicine, Department of Otolaryngology, 5E UHC, 4201 St Antoine, Detroit, MI, 48201, USA.
E-mail address: michael.chung@wayne.edu (M.T. Chung).

https://doi.org/10.1016/j.ijporl.2020.110217
Received 10 May 2020; Received in revised form 18 June 2020; Accepted 18 June 2020
Available online 23 June 2020
0165-5876/© 2020 Elsevier B.V. All rights reserved.
April, with match results being released in May. Given the unprecedented nature of the current COVID-19 pandemic, the effects on fellowship training are currently unknown. By conducting a web-based survey of all pediatric otolaryngology fellowship directors, our study looked to gain a better understanding of the effects the COVID-19 pandemic has had on current and future pediatric otolaryngology fellowship training, as well as how the application process was impacted this past year.

2. Methods

A web-based survey was developed consisting of 24 questions. At the time the survey was created, there were 36 pediatric otolaryngology fellowship directors identified. Electronic letters were sent to all fellowship directors requesting their participation and reminders letters were also sent out periodically. In addition, the survey was approved by the American Society of Pediatric Otolaryngology (ASPO) for distribution to all fellowship directors. The survey was distributed and responses were collected from April 22, 2020 through May 1, 2020.

The survey questions were designed to gain a better understanding of the effects of the current COVID-19 pandemic on the surgical and clinical experience of current and future fellows, as well as to identify any challenges experienced during the interview process for fellowships set to begin in July 2021. The survey also looked to characterize the types of supplemental educational experiences that fellowship directors had incorporated into the fellowship curriculum to compensate for the decreased surgical and clinical workload resulting from the COVID-19 pandemic. Demographic information, including program location, was also gathered and fellowship directors were given the opportunity to share any additional comments on the effects of COVID-19 on fellowship training if they wished. All data was collected anonymously using Qualtrics (Provo, UT) and results were analyzed using Microsoft Excel (Microsoft Corp., Redmond, WA).

3. Results

Overall, 22 of 36 fellowship directors responded to our survey, for a total response rate of 61%. After breaking down the United States into regions defined by the Census Bureau, it was found that the Midwest had the highest response rate at 72.7%, followed by the Northeast (71.4%), the West (50%), and the South (50%) (Fig. 1). Total survey responses included 8 programs from the Midwest, 6 from the South, 4 from the Northeast, and 4 from the West. The vast majority of fellowship directors (77.2%) reported that they thought the COVID-19 pandemic had a “significant impact” on overall pediatric otolaryngology fellowship training. Additionally, the same proportion (77.2%) reported that the pandemic had “significantly impacted” the normal day-to-day operations for their fellow(s) (Table 1). Fellowship directors in different regions of the United States did report different degrees of effect on their fellows though. 80% of fellowship directors from the Southern United States reported the pandemic had a “significant impact” on their fellows training experience, followed by the Midwest (62.5%), Northeast (60%), and Western United States (50%) (Table 2). At the time of survey distribution, 86.3% of fellowship directors reported that their programs were still performing some surgical operations, but with decreased overall volume (Table 3). The decreased surgical volume led all fellowship directors to report that their fellow’s surgical experience was at least “mildly impacted” and 59% reported the changes in volume “significantly impacted” their fellow’s surgical experience (Table 1).

Fellowship directors also reported a significant rise in the number of hours fellows have had to pursue academic endeavors. 59% of fellowship directors reported that prior to the COVID-19 pandemic, their fellows had between “0–5” hours for academic time each week and no fellowship director reported an allotment of more than 10 h of academic time per week (Table 3). Since the outbreak of the COVID-19 pandemic, 41% of fellowship directors reported that their fellow had “20+” hours of academic time per week and another 22.7% of fellowship directors reported their fellow had “16–20” hours per week (Table 3).

Additionally, 68.2% of fellowship directors reported that they thought the changes caused by the COVID-19 pandemic could have either a “mild” or “moderate impact” on their fellow’s ability to become a “well trained pediatric otolaryngologist”, while 27.2% thought it would have “no impact” (Table 1). Most fellowship directors also believed that the COVID-19 pandemic would have effects that extended to the incoming class of fellows in July 2020, with 45.5% of fellowship directors reporting the effects would be either “moderate” or “significant” in nature (Table 3). Despite this, most fellowship directors (72.7%) believed that fellowships would start on time in July 2020, as potential delays in start date for incoming fellows could be a prominent impact of the pandemic. Interestingly, 13.6% of fellowship directors reported that their fellows had been pulled to medicine or ICU services to assist with the COVID-19 pandemic. Of these programs that had a fellow pulled to the ICU or medicine service, 2 out of 3 were located in the Northeast, with the remaining fellow being from a program in the South. (Table 3).

4. Discussion

The COVID-19 pandemic has led to changes within our world that would have seemed unfathomable just months ago. The pandemic has created a heavy burden on our healthcare system and led to numerous changes in the day-to-day operations within hospitals throughout the United States. With the numerous oversight organizations, such as the CDC and ACS, recommending that elective surgical cases and in-person office visit be cancelled or postponed during the pandemic, residency and fellowship programs have had to adapt to ensure that the future doctors of our country are adequately trained. Others have reported on the changes that residency programs have made to ensure that residents
clinical experience, only 22.7% of fellowship directors reported that their fellows are occasionally involved with telehealth. This could reflect an overall low use rate among pediatric otolaryngology fellowship directors that their fellows are regularly involved in telehealth, while 18.1% reported that their fellows had been removed from their pediatric otolaryngology duties; thus significantly altering both their understanding of the fellowship application process, including within the field of pediatric otolaryngology [9–11]. To date there have been no reports on the impact this global pandemic has had on the fellowship application process and training experience.

Overall, pediatric otolaryngology fellowship directors reported the COVID-19 pandemic has had a significant impact on the overall fellowship experience within the field of pediatric otolaryngology, with the majority feeling that both their fellows’ surgical and clinical experience have been significantly impacted. Significant decrease in surgical volume within residency training due to the Covid-19 pandemic has been reported in the otolaryngology literature [12], and similar reductions have likely been felt throughout the country in regards to fellowship surgical experience [12]. One unique consideration when comparing the effects of the COVID-19 pandemic on residency versus fellowship training, is the duration, as the vast majority of pediatric fellowships are only one year in length. The fact that most fellowships, particularly oral and maxillofacial, face the longest surgery delays due to pandemic-related restrictions, are getting additional educational experiences to supplement the current decreased surgical and clinical volumes [4]. To develop a better understanding of the effects and ways fellowship directors have worked to ensure adequate training during these times, we distributed a survey to all pediatric otolaryngology fellowship directors. Surveys distributed to fellowship directors have been used in the past to gain a better understanding of the fellowship application process, including within the field of pediatric otolaryngology [9–11]. To date there have been no reports on the impact this global pandemic has had on the fellowship application process and training experience.

Furthermore, surgical and clinical volume led most fellowship directors to believe that the ability of their fellows to become a “well trained pediatric otolaryngologist” has been at least mildly impacted. In addition, it appears that the effects of the pandemic have been felt throughout the United States, not just in harder hit areas of the country, as at least 50% of fellowships directors in all regions of the country reported that the overall experience of their current fellow was “significantly impacted” by COVID-19, with the highest rate reported among programs in the Southern United States (Table 2).

Additionally, as has been reported in residency programs, fellowship directors reported that fellows have had a significant increase in academic and personal time [6]. Fellowship directors reported a variety of opportunities their fellows have had to help supplement their education. Nearly all fellowship directors (95.5%) reported that their fellows have participated in at least one of the online lecture series currently being offered to otolaryngology trainees. This highlights the remarkable response of the academic otolaryngology community during these trying times. Upwards of 8 h of live daily lectures from experts in a variety of otolaryngology disciplines have been offered since the start of the pandemic. ASPO has also developed a “COVID-19 Fellow Lecture Series” on a variety of particularly relevant topics for pediatric otolaryngology fellows. Similar supplemental lectures have also been offered by the Otolaryngology Consortium through University Hospitals in Cleveland, Ohio, and by the Corona Educational Initiative in Otolaryngology through the University of Kentucky. In addition to online lectures, nearly all fellowship directors (81.8%) reported their fellows were engaging in research and self-study, with some (27.2%) also reporting fellows using surgical videos to supplement a reduction in operating room volume.

While the long-term effects of the COVID-19 pandemic are uncertain, the majority of fellowship directors reported the current pandemic would have at least a mild impact on the fellows starting in July 2020. Additionally, pediatric otolaryngology fellowship interviews typically run from February through April with rank lists being submitted and the match occurring in May. The timing of the interview process led many programs (72.7%) to report that they had to alter their normal interview process including some programs having to transition to online interviews rather than the typical in-person format. It is plausible that disruptions in the normal interview process could alter both the order of applicant and fellowship program ranks lists and also lead to changes in overall match statistics.

Our study is limited by a variety of factors including the concern for recall bias, as our data was gathered via an online survey. Also, while our response rate was similar to other studies distributed to pediatric otolaryngology fellowship directors, this only represents a 61% response rate [10]. The COVID-19 pandemic has also affected certain areas (“hotspots”) of the country more so than others, and this could bias our overall results. Additionally, due to the current COVID-19 pandemic being unlike anything our country has seen in at least the last century, the long-term effects of the COVID-19 pandemic on trainees’ education are unknown and primarily speculation. Despite these limitations, our study is the first to report on the impacts of COVID-19 on otolaryngology fellowship training, and in this case, pediatric otolaryngology fellowship training.

5. Conclusions

This paper will hopefully help begin the discussion on the overall potential impacts of COVID-19 on fellowship training. In the future, examining how the fellows themselves feel the pandemic has effected their surgical and clinical skills as well as how confident they are in their ability to become competent attending’s would be interesting. Also, given that residents now will have had several months of less rigorous training due to the significantly reduced overall surgical and clinical volume during the current pandemic, examining whether more residents will decide to pursue fellowship to compensate for this lost time would

Table 2

| Region of United States | The degree to which fellowship directors believe their fellow has been impacted by the COVID-19 pandemic |
|-------------------------|--------------------------------------------------------------------------------------------------|
|                         | Significantly Impacted | Moderately Impacted | Mild Impact | No Impact |
| Northeast               | 60%                   | 0%                  | 20%         | 20%       |
| Midwest                 | 62.5%                 | 25%                 | 12.5%       | 0%        |
| South                   | 80%                   | 20%                 | 0%          | 0%        |
| West                    | 50%                   | 25%                 | 25%         | 0%        |

Table 3

| Questions                                         | Program Director Response |
|--------------------------------------------------|---------------------------|
| Had a fellow pulled for ICU or medicine services  | 13.6%                     |
| COVID-19 had impact on fellow interview process  | 72.7%                     |
| Do not anticipate delay in start of July 2020 fellows | 59.1%                     |
| Fellow has participated in online lecture series | 90.9%                     |
| Fellows do not participate in telehealth          | 59.1%                     |
| Program still performing some surgical cases      | 86.3%                     |
| Prior to COVID-19, fellow had between 0 and 5 h of academic time | 54.5%                     |
| Prior to COVID-19, fellow had between 6 and 10 h of academic time | 45.5%                     |
| During COVID-19, fellow had between 16 and 20 h of academic time | 22.7%                     |
| During COVID-19, fellow had 20+ hrs of academic time | 40.9%                     |
also be something to consider in the future. Overall, this paper will hopefully help the academic community gain a better understanding of the early impact of the pandemic on fellowship training, and also help fellowship directors work together to continue to optimize the educational experiences for current and future fellows.

Funding

None of the authors have a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

References

[1] Y. Bai, L. Yao, T. Wei, et al., Presumed asymptomatic carrier transmission of COVID-19, JAMA 323 (14) (2020) 1406–1407, https://doi.org/10.1001/jama.2020.2565.
[2] A.J. Kucharski, T.W. Russell, C. Diamond, et al., Early dynamics of transmission and control of COVID-19: a mathematical modelling study, Lancet Infect. Dis. 20 (5) (2020) 553–558.
[3] J. Riu, C.L. Althaus, Pattern of early human-to-human transmission of Wuhan 2019 novel coronavirus (2019-nCoV), December 2019 to January 2020, Euro Surveill. 25 (4) (2020).
[4] How to Protect Yourself & Others, Centers for Disease Control and Prevention, http://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html. Published April 24, 2020, Accessed May, 2020.
[5] M.J. Schull, T.A. Stukel, M.J. Vermeulen, et al., Effect of widespread restrictions on the use of hospital services during an outbreak of severe acute respiratory syndrome, CMAJ (Can. Med. Assoc. J.) 176 (13) (2007) 1627–1632.
[6] I. Tola, G.T. Feyissa, W.G. Jeldu, Managing Resident Workforce and Residency Training amid COVID-19 Pandemic: Scoping Review of Adaptive Approaches, 2020, https://doi.org/10.21203/rs.3.rs-35777/v1.
[7] G. Iacobucci, Covid-19: all non-urgent elective surgery is suspended for at least three months in England, BMJ 368 (2020) m1106.
[8] Online March 24 2020, COVID-19: Elective Case Triage Guidelines for Surgical Care, American College of Surgeons, https://www.facs.org/covid-19/clinical-guidance/elective-case. Accessed May, 2020.
[9] R. Elsharawi, J. Johnson, M.T. Chung, H. Rayess, H. Hojat, R. Eckert, M. Carron, Fellow selection protocols in facial plastic surgery: a national survey of facial plastic surgery program directors, Facial Plast. Surg, & Aesth. Med. (2020), https://doi.org/10.1089/fpsam.2020.0085.
[10] R. Chan, D. Preciado, D.J. Brown, R. Elluru, S.L. Ishman, J. Kerschner, C. Sulman, Choosing a fellow or fellowship: a survey of pediatric otolaryngologists, JAMA Otolaryngol. Head & Neck Surg. 140 (2) (2014) 102–105.
[11] K.C. Yung, M.S. Courey, Factors important in laryngology fellow and laryngology fellowship selection, Laryngoscope 125 (11) (2015) 2543–2546.
[12] D.L. Crosby, A. Sharma, Insights on Otolaryngology Residency Training during the Covid-19 Pandemic. Otolaryngology-Head and Neck Surgery, 2020.
[13] J.E. Hollander, B.G. Carr, Virtually perfect? Telemedicine for covid-19, N. Engl. J. Med. 382 (18) (2020) 1679–1681.