Virtual Interviews for the Independent Plastic Surgery Match: A Modern Convenience or a Modern Misrepresentation?

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OBJECTIVE: The virtual interview for residency and fellowship applicants has previously been utilized preliminarily in their respective processes. The COVID-19 pandemic forced many programs to switch to a virtual interview process on short notice. In the independent plastic surgery process, which was underway when the pandemic started, applicants had a heterogeneous experience of in-person and virtual interviews. The purpose of this study was to assess if applicants prefer a virtual interview experience to an in-person interview as well as determine if virtual interview applicants had a different opinion of a program compared to the in-person interview applicants.

DESIGN/SETTING/PARTICIPANTS: The 2019 to 2020 applicants who interviewed at the Indiana University Independent Plastic Surgery program were administered an anonymous online survey about their interview experience at our program.

RESULTS: Our survey response was 60% (18/30). The in-person interview group ($n = 10$) rated their overall interview experience higher than the virtual interview group ($n = 8$) 8.8 vs 7.5 ($p = 0.0314$). The in-person interview group felt they became more acquainted with the program, the faculty, and the residents more than the virtual group (4.7 vs 3.25, $p < 0.0001$) (4.3 vs 3.25, $p = 0.0194$) (4.3 vs 2.75, $p < 0.0001$). The majority of applicants favored in-person interviews (16/18, 88.9%). The in-person interview group spent significantly more money on their interview at our program compared to the virtual interview group ($587 vs $0, $p < 0.0001$).

CONCLUSION: Our study demonstrated that the virtual interview process was an efficient process for applicants from both a financial and time perspective. However, the virtual interview process left applicants less satisfied with their interview experience. The applicants felt they did not become as acquainted with the program as their in-person counterparts. The virtual interview process may play a large role in residency and fellowship applications in the future, and programs should spend time on how to improve the process. (J Surg Ed 000:1−10. © 2020 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: COVID-19, fellowship match, plastic surgery match, residency match, virtual interviews

COMPETENCIES: Professionalism, Interpersonal and Communication Skills, Systems-Based Practice

INTRODUCTION

The novel coronavirus COVID-19 pandemic has affected all facets of life in the United States since its first confirmed case in Washington State in January 2020.[1] Mitigation efforts such as institutional travel restrictions and social distancing rules have forced residency and fellowship graduate medical programs to rapidly adapt from the traditional in-person interviews to a virtual interview process.

One affected cohort were the 2020 applicants to Independent Plastic Surgery Residency Programs via the SF Match who were part way through the interview process when the restrictions began. When the restrictions were introduced, some programs had already finished

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in-person interviews while others had not completed interviews. This forced programs and applicants to convert interviews from in-person to virtual on short notice. Applicants were also left with a heterogeneous experience of in-person and virtual interviews.

An advantage of using a virtual interview is the potential cost savings and convenience to the applicants. Surgical residency and fellowship match processes can be expensive and require clinical training time loss.[2] Vining et al recently reported a successful implementation of the virtual interview process with positive feedback from surveyed applicants and interviewers for their surgical oncology fellowship program.[3] However, virtual interviews lack the direct personal connections with faculty which may be important in assessing the "fit" of a program. For example, it is not known whether the virtual interview process positive benefits are seen across all surgical subspecialties such as plastic surgery. Given the cost and time required in plastic surgery resident selection by both the programs and applicants, there has been investigation into how to improve the process and how to make it more efficient.[4-6]

The Indiana University plastic surgery residency program had conducted 1 of 2 interview dates for the independent in-person prior to social distancing and the second interview date virtually after the onset of travel restrictions. The purpose of this study was to assess if applicants prefer a virtual interview experience to an in-person interview as well as determine if virtual interview applicants had a different opinion of a program compared to the in-person interview applicants.

METHODS

Study Design

This survey study was approved by the Institutional Review Board at Indiana University and the San Francisco Match. Applicants for interview were selected based on criteria set forth by the Indiana University Plastic Surgery Residency selection committee. Two interview dates were made available, with the intent for in-person interview sessions at each date. Selection for each date was at the discretion of the applicant on a first come, first serve basis. The first session was completed in-person prior to the pandemic restrictions. The interview experience included an informal social event with the current residents the night before the interviews followed by interviews with faculty and selected chief residents the following day. The interview day included a general presentation, lunch, interviews, and a campus tour. The second interview date was transitioned to a video platform (Zoom, San Jose, CA) due to the COVID-19 pandemic. The video interview day included a general presentation, interviews, virtual tour as well as a resident-only video room as replacement for the informal night-before dinner. All applicants who completed an interview with our program were invited to participate in a survey after rank list were due.

A secure, anonymous online survey was generated using Research Electronic Data Capture (REDCap).[7] The survey link was distributed via e-mail to all applicants who had completed either an in-person interview or a video interview session with our Plastic Surgery Independent Residency program. The survey link was distributed after final rank-list selections had been made by both the applicants and the program. Survey links and responses were not linked to the applicants to ensure confidentiality and anonymity of their answers.

The survey consisted of 24 questions and required approximately 5 minutes to complete. Ten questions collected demographic data including whether the completed an in-person of video platform interview with our institution, age, sex, current or completed residencies, clinical year, dedicated research time, total number of interviews completed, total number of virtual interviews completed and total number of in-person interviews completed. Remaining questions focused on their numerical rating of the overall interview experience, ability to assess the staff, institution and residency as a whole. The subjects also asked to provide information about the financial impact of interviews as well as the required time away from their residency (Fig. 1).

Data Collection

Study data were collected and managed using REDCap electronic data capture tools hosted at Indiana University.[7] REDCap is a secure, web-based application designed to support data capture for research studies, providing (1) an intuitive interface for validated data entry; (2) audit trails for tracking data manipulation and export procedures; (3) automated export procedures for seamless data downloads to common statistical packages; and (4) procedures for importing data from external sources.

Statistical Analysis

All analyses were performed within SPSS Statistics version 19 (IBM Corporation, Chicago, IL). Two-tailed values of $p < 0.05$ were considered significant.

RESULTS

The survey was sent to 30 applicants who interviewed at our program with a response rate of 60% (18/30). Of the 18 who completed the survey, 10 had completed an in-

Virtual Interview Survey

Please complete the survey below. It will take less than 5 minutes and help us understand plastic surgery residency interview processes better.

Thank you!

1)	Sex	◯ Female ◯ Male ◯ Other
2)	What is your current age?	_____
3)	What residency are you currently in?	◯ None. I already graduated ◯ General Surgery ◯ Otolaryngology ◯ Oral Surgery ◯ Orthopedic Surgery ◯ Neurosurgery ◯ Vascular Surgery ◯ Thoracic Surgery ◯ Plastic Surgery
4)	What residency have you completed?	☐ None ☐ General Surgery ☐ Oral Surgery ☐ Orthopedic Surgery ☐ Otolaryngology ☐ Urology ☐ Neurosurgery ☐ Thoracic Surgery ☐ Vascular Surgery
5)	What CLINICAL year are you currently?	◯ 1. Fourth Year Medical Student ◯ 2. 1st Year Resident ◯ 3. 2nd Year Resident ◯ 4. 3rd Year Resident ◯ 5. 4th Year Resident ◯ 6. 5th Year Resident ◯ 7. 6th Year Resident ◯ 8. Residency Graduate
6)	Did you complete a research fellowship/dedicated research time?	◯ Yes ◯ No
7)	Which interview did you complete at Indiana University Plastic Surgery	◯ In-person ◯ Virtual/Video
8)	How many interviews did you complete for plastic surgery?	_____
9)	How many virtual/video interviews did you complete?	_____
10)	How many in-person interviews did you complete?	_____
11)	How would you rate your overall interview experience with Indiana University Plastic Surgery? (1 being terrible, 4-5 being neutral, 10 being awesome)	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10
12)	How well did you feel you got to know the Indiana University Plastic Surgery program?	◯ Not at all ◯ A little ◯ Somewhat ◯ Well ◯ Very well

FIGURE 1. Survey administered to independent plastic surgery applicants via email and anonymous responses.

13)	How well did you get to know the faculty at Indiana University?	◯ Not at all ◯ A little ◯ Somewhat ◯ Well ◯ Very well
14)	How well did you get to know the residents at Indiana University?	◯ Not at all ◯ A little ◯ Somewhat ◯ Well ◯ Very well
15)	Compared to interviews at other programs of the same type (i.e. other virtual or other in-person interviews), how would you rate your overall interview experience with Indiana University?	◯ Much worse than other programs ◯ Worse than other programs ◯ The same as other programs ◯ Better than other programs ◯ Much better than other programs
16)	Compared to interviews at other programs of the same type (i.e. other virtual or other in-person interviews), how would you rate your experience with faculty at Indiana University compared to other programs	◯ Much worse than other programs ◯ Worse than other programs ◯ The same as other programs ◯ Better than other programs ◯ Much better than other programs
17)	Compared to interviews at other programs of the same type (i.e. other virtual or other in-person interviews), how would you rate your experience with residents at Indiana University compared to other programs	◯ Much worse than other programs ◯ Worse than other programs ◯ The same as other programs ◯ Better than other programs ◯ Much better than other programs
18)	Do you prefer in-person or virtual interviews?	◯ In-person ◯ Virtual ◯ I do not have a preference
19)	Which statement do you agree with?	◯ An in-person interview allows me a better chance to match at a program. ◯ A virtual interview allows me a better chance to match at a program ◯ Neither in-person nor virtual interviews have a match advantage over each other
20)	Select the statements you agree with	☐ Virtual interviews would have allowed me to go on more interviews ☐ In person interviews would have allowed me to go on more interviews ☐ I would prefer to do a preliminary virtual interview followed by an in-person interview
21)	Approximately, how much did you spend for your interview at Indiana University including travel, lodging, and meals?	_____
22)	Approximately, how much did you spend on the whole Plastic Surgery interview process? (not including SF Match fees and American Board of Plastic Surgery fees)	_____
23)	Did your program require you to use vacation for in-person interviews?	◯ Yes ◯ No
24)	Did your program require you to take vacation for virtual interviews?	◯ Yes ◯ No

FIGURE 1. Continued.

TABLE 1. Baseline Demographics of In-Person and Virtual Applicants to Our Independent Plastic Surgery Program

	In-Person Interview (n = 10)	Virtual Interview (n = 8)	p Value
Male	4	7	0.195
Female	6	1	
Age	30.7	31.5	0.1324
Dedicated research time	10% (1)	25% (2)	0.396
Current fourth-year general surgery resident	100% (10)	100% (8)	-
Total number of plastic surgery interviews	14.7	16.5	0.3908
Number of in-person interviews	8.7	9.1	0.7882
Number of virtual interviews	5.6	7.5	0.1769

person interview, and 8 had completed a virtual interview. None of the applicants were in prerequisite residency training at Indiana University. Females were the majority of the in-person interview group (60%, 6/10) while most virtual interviewees were male (87.5%, 7/8; p = 0.195). The average age in the in-person and virtual interview groups were 30.7 and 31.5, respectively (p = 0.1324). All applicants were fourth-year general surgery residents (n = 18). In the in-person interview group, 10% (1/10) had taken dedicated research time during residency, whereas in the virtual interview group, 25% (2/8) had taken dedicated research time (p = 0.396; Table 1).

The average number of total interviews attended were 14.7 in the in-person interview group and 16.5 in the virtual interview group (p = 0.3908). The in-person interview group had completed an average of 5.6 virtual interviews at other programs while the virtual interview group had completed an average of 7.5 virtual interviews (p = 0.1769; Table 1).

The in-person interview group (n = 10) rated their overall interview experience at our plastic surgery program an average of 8.8 (±0.92) on a scale of 1-10 (1 = The worst, 10 = The best). The virtual interview group (n = 8) rated their overall interview experience at an average of 7.5 (±1.41; p = 0.0314). The applicants were asked how well informed they became about our plastic surgery training program (1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Well, and 5 = Very well). The in-person interview group rated their experience at 4.7 (±0.48) while the virtual group rated their experience at 3.25 (±0.71; p < 0.0001). The applicants were asked how well they became acquainted with our plastic surgery faculty. The in-person group rated their experience at 4.3 (±0.67)

TABLE 2. Survey Responses From Our Independent Plastic Surgery Applicants Grouped by In-Person and Virtual Interview Groups

	In-Person Interview (n = 10)	Virtual Interview (n = 8)	p Value
How would you rate your overall interview experience with Indiana University Plastic Surgery?	8.8	7.5	0.0314
How well did you feel you got to know the Indiana University Plastic Surgery program?	4.7	3.25	<0.0001
How well did you get to know the faculty at Indiana University?	4.3	3.25	0.0194
How well did you get to know the residents at Indiana University?	4.3	2.75	<0.0001
Compared to interviews at other programs of the same type (i.e., other virtual or other in-person interviews), how would you rate your overall interview experience with Indiana University?	4.2	4	0.5493
Compared to interviews at other programs of the same type (i.e., other virtual or other in-person interviews), how would you rate your experience with faculty at Indiana University compared to other programs	4	3.625	0.2105
Compared to interviews at other programs of the same type (i.e., other virtual or other in-person interviews), how would you rate your experience with residents at Indiana University compared to other programs	4	3.125	0.0248

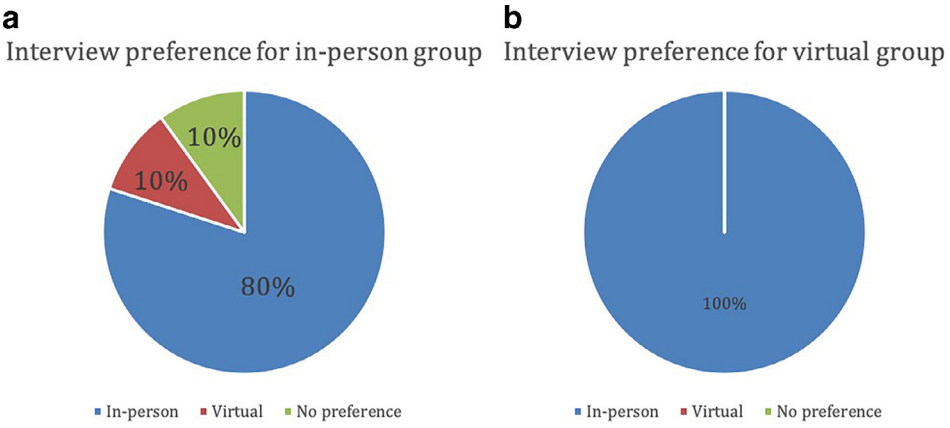

FIGURE 2. Interview preferences for (a) in-person and (b) virtual interview groups.

while the virtual group rated their experience at 3.25 (±1.04; p = 0.0194). The applicants were asked how well they got to know our plastic surgery residents. The in-person group rated their experience at 4.3 (±0.67) while the virtual group rated their experience at 2.75 (±0.46; p < 0.0001; Table 2).

We asked the interviewees to compare their interview experience at our program compared to interviews of the same type at other programs (1 = Much worse than other programs, 2 = Worse than other programs, 3 = The same as other programs, 4 = Better than other programs, and 5 = Much better than other programs). The in-person interview group rated their interview experience at 4.2 while the virtual interview group rated their experience at 4 (p = 0.5493). We asked applicants to compare their experience with the faculty at our program to interviews at other programs of the same type. The in-person group rated their experience at 4 while the virtual group rated their experience at 3.625 (p = 0.2105). We asked applicants to compare their experience with the residents at our program to interviews at other programs of the same type. The in-person group rated their experience at 4 while the virtual group rated their experience at 3.125 (p = 0.0248; Table 2).

When asked about interview type preference, 80% (8/10) of the in-person group preferred in-person interviews, 10% (1/10) preferred virtual, and 10% (1/10) had no preference. In the virtual interview group, 100% (8/8) preferred in-person interviews (Fig. 2). None of the survey respondents thought virtual interviews gave a better chance to match at a program while 50% (5/10) of the in-person group and 75% (6/8) of the virtual group

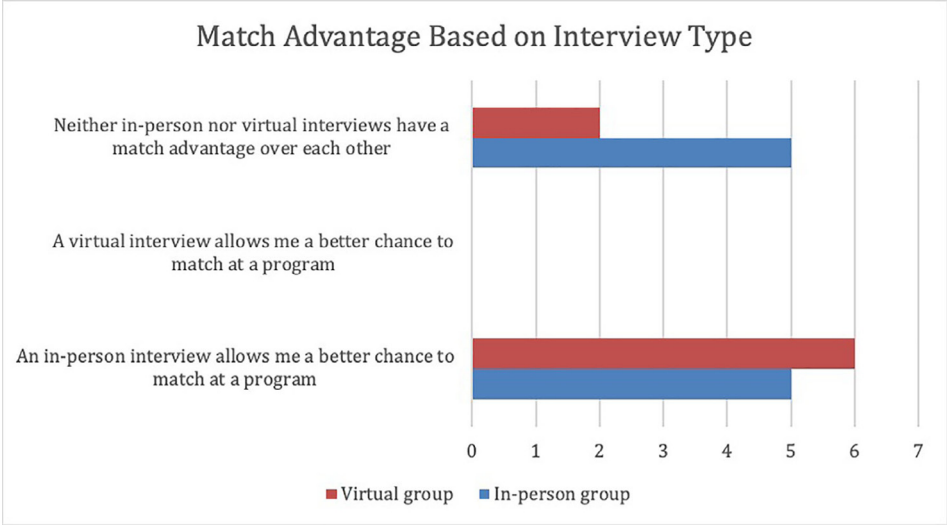

FIGURE 3. Match advantage question results from survey of independent plastic surgery applicants.

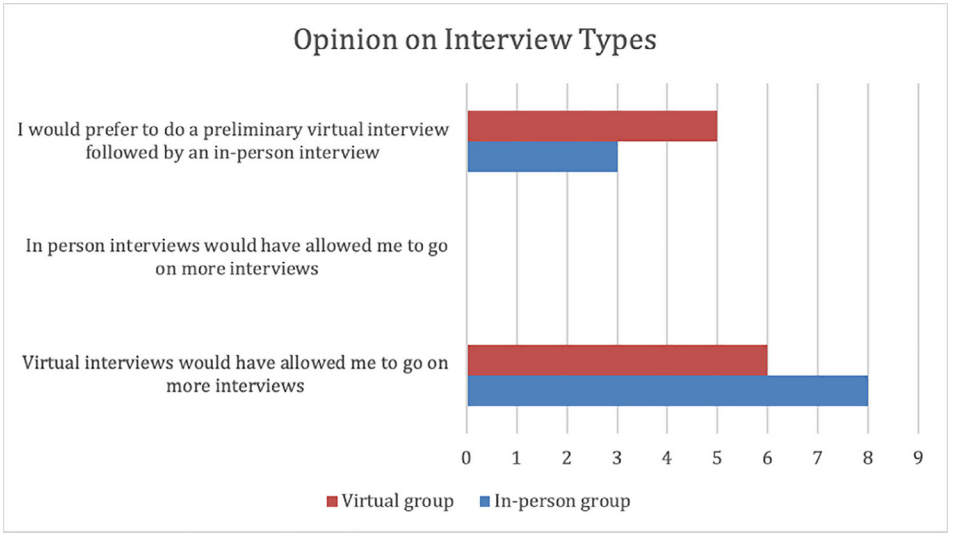

FIGURE 4. Interview preference question results from survey of independent plastic surgery applicants.

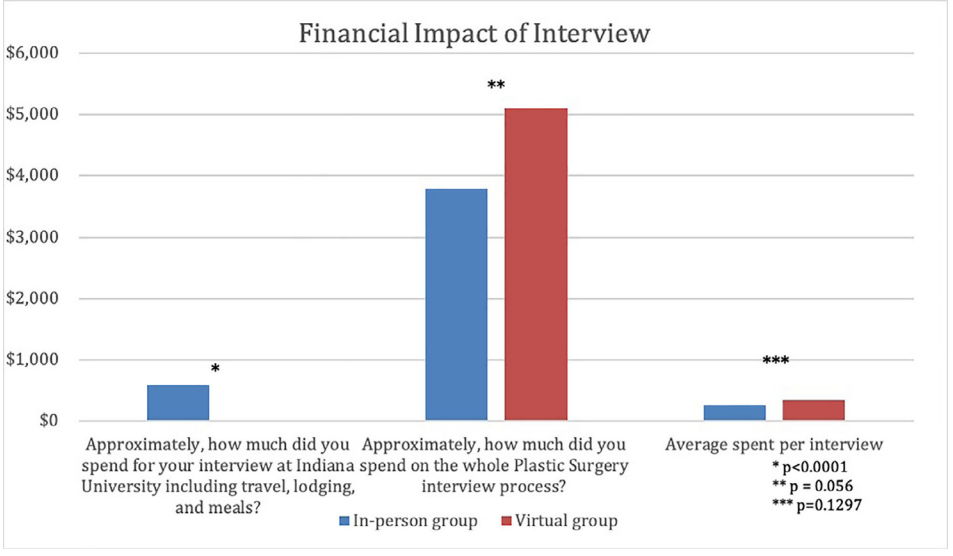

FIGURE 5. Interview financial question results from survey of independent plastic surgery applicants.

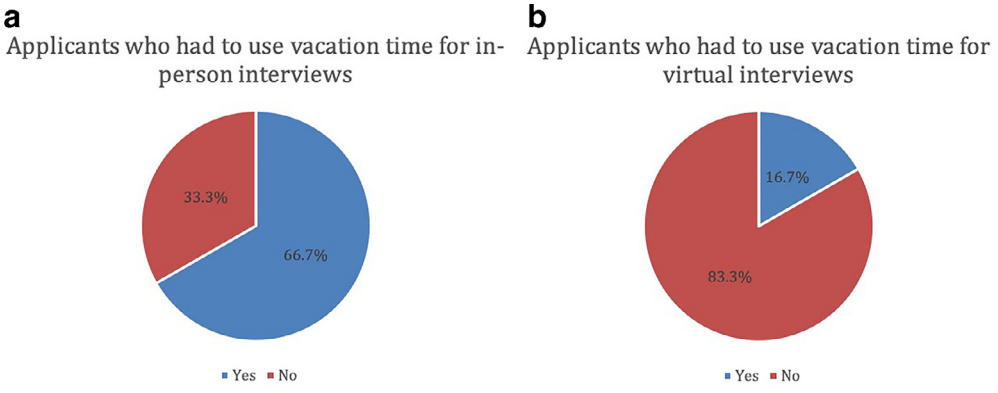

FIGURE 6. Time off for interview question results from survey of independent plastic surgery applicants. (a) In-person interviews and (b) virtual interviews.

thought in-person interviews allowed them a better chance to match at that particular program (Fig. 3). Most respondents agreed that virtual interviews allowed the applicant to go on more interviews (77.8%, 14/18). A significant minority of respondents were in favor of a preliminary virtual interview followed by an in-person interview (44.4%, 8/18) (Fig. 4).

The in-person interview group spent significantly more money on their interview at our program compared to the virtual interview group ($587 vs $0, $p < 0.0001$). The virtual interview group spent less on their interviews despite going on more interviews ($3787.50 vs $5100.00, $p = 0.056$), but this was not statistically significant. The average cost per interview of any type was similar between the in-person and virtual groups ($271.35 vs $343.47, $p = 0.1297$; Fig. 5). Most applicants had to use vacation for in-person interviews (12/18, 66.7%) while most applicants were not required to use vacation time for virtual interviews (3/18, 16.7%; Fig. 6).

DISCUSSION

The COVID-19 pandemic disrupted residency and fellowship interviews across many fields. Our study demonstrated that the virtual interview process was an efficient process for applicants from both a financial and time perspective. However, the virtual interview process left applicants less satisfied with their interview experience. The applicants felt they did not become as acquainted with the program as their in-person counterparts. Most applicants preferred in-person interviews over virtual interviews, and many applicants felt that in-person interviews had a match advantage over virtual interviews.

Residency and fellowship interviews are among the most important factors in resident and fellow selection.[8-14] The residency and fellowship interview processes pose different challenges to applicants and programs. Medical students interviewing for residency slots do have classroom and clinical rotation obligations but likely have more time for travel and interviews, whereas residency applicants will have more clinical obligations and less time for travel and interviews. Inversely, medical students likely have fewer financial resources without incomes other than student loans. Residents applying for fellowship positions have financial income, though likely in the setting of student loan debt. Despite these differences at baseline, both medical students and fellows would likely appreciate the time-efficiency and cost-efficiency of virtual interviews.

The cost-saving advantage for virtual interviews is clear. Application and match programs including Electronic Resident Application Service, National Resident Matching Program, and San Francisco Match do charge large amounts for applications,[15] but the vast majority of cost for residency and fellowship applications is from the interview process with ranges of $1000 to $11,580 quoted in the literature.[5,15] For the independent plastic surgery residency match, applicants traditionally attend an average of 10 to 11 interviews.[16,17] In our cohort, the applicants attended an average of 15 interviews. However, this number may have been inflated by the availability of virtual interviews. Across all residency and fellowship training programs, applicants, especially those applying to competitive fields, are being encouraged to attend many interviews to maximize their match chances. This is undoubtedly a costly process. With average costs of public medical schools at $243,902 and private schools at $322,767 and with the median medical student debt at $200,000 in 2018,[18] finding areas for cost savings of medical students and residents is imperative to decrease debt for students. Implementation of virtual interviews is one way to decrease expenses.

For fellowship applicants in general surgery, time off work for interviews can be a challenge. The Accreditation Council for Graduate Medical Education and American Board of Surgery mandate that residents work 48 clinical weeks per year in order to graduate.[19,20] Residents taking time off work to attend fellowship interviews can be burdensome to those around them as well with other residents having to shoulder the load when they are away. While some programs may be well-equipped for this with large resident cohorts or advanced practice providers, many smaller programs may struggle to maintain optimal patient care. This can be especially a challenge in competitive matches in which residents are attending large amounts of interviews to optimize their match chances. Balancing clinical duties and fellowship prospects is a challenge every year for surgery residents applying to fellowship, and virtual interviews may help mitigate that challenge.

Despite the positives of the virtual interview process, there were some negative consequences to the virtual interview process in our cohort. The applicants who interviewed virtually felt they had a worse interview experience and felt less familiar with faculty and residents. The majority of residents favored in-person interviews over virtual interviews, and a majority of residents felt that an in-person interview had a match advantage over virtual interviews. These findings are not surprising given that we are used to in-person interactions, especially in the fields of medicine and surgery. Human beings are social beings. Connections can be made over telephone and video, but live interactions will always be stronger. Furthermore, medical students and residents

are always counseled to look for the residency or fellowship that has the "best feel" or is the "best fit," and this will likely be more difficult to judge virtually.

The virtual interview process has previously been trialed in the residency and fellowship interview process. Shah et al found similar results in a study of urology resident applicants who found that a virtual interview process was more cost-effective and time-efficient but found that their applicants felt less comfortable ranking their program if interviewed virtually.[21] Daram et al found a high satisfaction rate in virtual interviews in the gastroenterology fellowship match.[22] The Association of American Medical Colleges is amidst developing a standardized video interview for resident applications as an adjunct to the Electronic Resident Application Service file in order to provide program directors a holistic view of applicants rather than purely examination scores and grades.[23] Husain et al found that these standardized video interviews were more likely to increase scores of applications, leading to an in-person interview.[24]

A majority of our respondents thought that an in-person interview would allow a better chance to match at that program. However, those who undergo virtual interviews may not be at a match disadvantage. Vadi et al found similar match rates in anesthesiology-resident applicants undergoing in-person and web-based video interviews.[25] The disadvantage our respondents felt may be biased by the fact that they had other in-person interviews at other programs. If there were universal virtual interviews, that feeling of being at a disadvantage may disappear.

There are several limitations to our study. Our response rate was only 60%, which may influence the ratings of our program. Applicants who had more negative feelings toward our program or their interview may have been less likely to respond. We did administer our survey after rank lists were due for both the programs and applicants, and therefore, our hope was that we received genuine responses from the applicants. However, there is always a possibility that respondents were concealing their true opinions if they had concern that a negative answer could hinder their match results. Our study was small since it was only performed for one interview cycle of independent applicants. However, despite these limitations, we achieved statistical significance in many of our questions, showing that virtual interviews who have significant positive and negative effects.

Looking toward the future, residency and fellowship programs must do more investigation into virtual interviews. For plastic surgery applicants, there have been previous discussions about regionalization of interviews or interviews during national meetings, and virtual interviews may play an important role in streamlining the application process. Given our findings, it is difficult to support replacing in-person with virtual interviews in its current state completely given the advantages to in-person encounters and clear preferences of applicants as seen in this study. Improvement of the virtual interview process to make it as similar to an in-person encounter as possible will help close the gap between in-person and virtual interviews. We recommend surveys of applicants and collaboration of program directors to investigate preferences on virtual interviews and how to best incorporate them into the application process. At the very least, programs should have virtual interviews as a back-up. Many residency and fellowship application processes are during times of the year when air travel is susceptible to weather cancellations. That combined with applicant personal or family emergencies as well as possible future national emergencies or pandemics make virtual interview protocols important to be familiar with.

The residency and fellowship applications are important processes to both applicants and programs. The match processes were created in order to optimize the fit between applicants and programs. The resulting effect is that applicants often attend more interviews than actually necessary in order to broaden exposure to programs and to increase their match probability. Programs will often interview more applicants than necessary in order to increase their own match probability. Therefore, the optimization and streamlining of the process would be beneficial to both programs and applicants.

Advanced technology like virtual meeting platforms may not be able to replace traditional interviews at the current time, but it has the potential to make the resident and fellowship application process both more time- and cost-efficient.

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