

Comparing Virtual vs In-Person Immersive Leadership Training for Physicians

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Purpose: The COVID-19 pandemic caused a disruption of in-person workforce development programs. Our immersive physician-oriented leadership institute suspended in 2020, resumed in 2021 with a virtual program, and in 2022 reconvened in-person training. We used this opportunity to compare the participant experience, including reported knowledge acquisition and ability gains, between these nearly identical curricula delivered in vastly different circumstances and formats.

Participants and Methods: We describe the differences in immersive leadership training implementation and adaptations made for virtual vs in-person engagement of two cohorts of OB-GYN physicians. Data were collected from virtual (n=32) and in-person (n=39) participants via post-session surveys. Quantitative data reported includes participant ratings for knowledge gain and ability gain. Qualitative data were obtained via open-ended feedback questions per session and the overall experience.

Results: Knowledge and ability scores indicated strong, statistically significant gains in both formats, with some reported learning gains higher in the virtual training. Qualitative data of participant feedback identified a number of positive themes similar across the in-person and virtual settings, with virtual participants noting how construction of the virtual program produced highly effective experiences and engagement. Constructive or negative feedback of the virtual setting included time constraint issues (eg, a desire for more sessions overall or more time per session) and technical difficulties. Positive comments focused on the effectiveness of the experience in both formats and the surprising ability to connect meaningfully with others, even in a virtual environment. However, there were also many comments clearly supporting the preference for in-person over virtual experiences.

Conclusion: Immersive physician leadership training can be effectively delivered via virtual or in-person methods, resulting in significant reported gains of knowledge and skills. These programs provide valuable interpersonal connections and skills to support physician leadership. While both formats are effective, participants clearly prefer in-person leadership development experiences and interpersonal learning.

Keywords: workforce development, leadership, physicians, virtual training, onsite training

Plain Language Summary

Physician leadership training is most commonly provided in face-to-face settings where participants are brought together for a few days of immersive and intensive training. However, the pandemic of 2020 disrupted the ability to convene groups for this kind of development experience. The American College of Obstetricians and Gynecologists (ACOG)-Robert C. Cefalo Leadership Institute trains obstetricians and gynecologists who are active in their professional organization (ACOG) in a 4-day program each year. In 2020, this program was suspended, in 2021 it was offered virtually, and in 2022, it was offered in a face-to-face setting. With the curricula being nearly identical between the virtually deployed program and the in-person, onsite program, we compared participants' reported knowledge and skills gains, as well as their open-ended comments about the two experiences. We found that participants' learning grew by a statistically significant amount in both types of training situations, and in some cases, the numbers were even higher in the virtual setting. Participants' comments indicated that the leadership training and development was engaging and helped them build

meaningful connections and practical skills in both the virtual and in-person environments; however, there was a clear preference for in-person training.

Introduction

Physicians are recognized leaders in healthcare who have important influence over the internal policies and culture of their teams and organizations. Further, physician leaders can successfully impact systems of care through employing a sophisticated set of value-guided skills that go beyond basic and specialty medical training. Physician leadership extends to more than just the bottom line of the enterprise¹ as these leaders and their organizations increasingly focus on reducing health disparities in their communities and addressing health equity.²⁻⁴

Given that medical and specialty training is an intensive experience, leadership strengthening and development opportunities typically occur at mid-career to senior-career phases, when physicians are more likely to impact organizations and systems to a greater extent. At these career points, they begin to fill roles in the leadership chain of command in their institutions^{1,5-7} and engage with impacting health equity in their communities.^{8,9} In noting the importance of effective physician leadership,¹⁰ both Frich et al¹¹ and Hopkins et al⁵ describe how leadership programs targeted to physicians aim to strengthen common leadership competencies. They note that while programs generally show increased self-assessed knowledge and expertise, relating those outcomes to increased self-awareness and organizational or system-level impacts remains a persistent challenge.

Given the demands and impact of the pandemic, physician leadership training takes on even greater importance in terms of leader skills for creating psychological safety^{12,13} on healthcare teams, for addressing physician resilience,¹⁴ for improving communication skills during rapidly evolving and complex challenges,^{15,16} and for understanding equity concerns subsequent to the crisis.^{13,17} Yet, the pandemic interrupted capacity-building and leadership development opportunities.⁹ One such program was the American College of Obstetricians and Gynecologists (ACOG) Robert C. Cefalo National Leadership Institute (www.ACOGLeadershipInstitute.org) (hereafter referred to as ACOG-Cefalo), which was suspended in March 2020 due to COVID-19, held virtually in 2021, and then resumed in-person in 2022.

Since the inception of the program in 2006, the ACOG-Cefalo program has trained over 600 physician leaders in women's healthcare. The ACOG-Cefalo leadership program serves OB-GYNs who are active in their professional organization and participate by nomination from their District leadership. The program provides an intensive, fast-paced experience in which participants learn how to employ "equity-centered leadership skills" to nurture thought diversity, promote psychological safety, and address the needs of diverse communities. These skills are developed through training in tools for building effective partnerships, for strengthening participants' abilities to lead innovative teams, and to promote innovative and creative thinking. Participants gain skills to advocate effectively for their patients and profession as they advocate for change within their organizations and communities. Topics also include successful negotiation skills to create win/win outcomes for all stakeholders in order to foster results that strengthen, rather than diminish, their partnerships. Through a concrete tools-based communications core of the program, participants gain skills to translate complex scientific findings into understandable, accessible language for patients, other medical professionals, policy makers, and the media. Participants learn how to manage communications in times of high tension and crisis, helping them lead their teams through the turbulent waters that healthcare organizations world-wide so commonly face. The ACOG-Cefalo program also offers a focus on physician resiliency, providing both experiential learning and coaching on strategies to prevent personal and professional burnout.

In previous studies, the ACOG-Cefalo program has demonstrated effectiveness in moving the needle of competency and efficacy as well as of preparedness for new leadership opportunities.¹⁰ These findings were highlighted in the Geerts et al¹⁸ systematic review of physician leadership programs, which indicated that the outcomes of the ACOG-Cefalo program were notable when compared to the body of available literature. It is important to note that providing training in such sophisticated and nuanced skills became far more complex during fully remote operations and travel restrictions imposed starting in 2020. In this analysis, we seek to understand the impacts on physician leadership development given the pandemic-related disruption in learning deployment strategies coupled with the increased stress and demands on healthcare providers. We explore differences in program outcomes regarding skill development and leadership self-

efficacy by comparing evaluation data from virtual and in-person leadership training programs with two cohorts of physician leaders participating in the ACOG-Cefalo program in 2021 (virtual) and 2022 (in-person).

Methods

Setting

The 2021 ACOG-Cefalo program was hosted virtually using the Zoom¹⁹ platform coupled with the Whova Meeting App²⁰ to foster connection, networking, and organization from pre-program to 3 months post program. The Whova App stored recordings of virtual sessions and provided electronic forums/functionality for spontaneous participant-directed connection and “meet ups” either during breaks or after the program. The 2021 program was held over 4 days, convening between 11:00 AM eastern time through 6:00 PM eastern time to accommodate participants more reasonably across 4 time zones. The degree of the use of the App was not a focus of this study and these data were not collected.

The 2022 ACOG-Cefalo program was hosted in-person over 3.5 days from 8:00 AM through 5:00–6:00 PM eastern time. The Zoom platform was not used, although the Whova Meeting App was offered as a general meeting facilitation tool which allowed both cohorts to have access to identical opportunities for participants to meet and connect in self-directed ways, both during and post-program. The degree of the use of the Whova App was not a focus of this study, and these data were not collected. [Table 1](#) provides a comparison of the convening formats, numbers of sessions offered, number of training hours, and number of attendees in both the virtual and the onsite programs. All programs were interactive, grounded in adult learning theory,²¹ and to the greatest extent possible, provided by the same instructors.

Data Collection

Participant demographics were collected through self-report on exit surveys. Participants in the 2021 and 2022 cohorts were asked to electronically provide feedback through QualtricsXM²² on their experience at the end of each session. Participants rated sessions using a 7-point Likert scale, where 1 = Very Poor, 2 = Poor, 3 = Fair, 4 = Average, 5 = Good, 6 = Excellent, and 7 = Outstanding.²³ For in-person training attendees not wishing to use the e-format, paper forms were made available. Ratings of shifts in knowledge and ability were gathered using a retrospective pre- and post-test, with participants asked at the end of each session to rate their knowledge of the session content and their ability to use the session content before and after attending the session on a 7-point Likert scale, with 1 being the lowest and 7 being the highest.^{23–27}

Open-ended qualitative feedback via QualtricsXM²² was sought from participants at the end of each session and in an exit survey at the end of the institute. At the end of each session, the two open-ended prompts were 1) “Please provide any comments or feedback about this presentation. Is there anything we need to consider to make it better for the next cohort?” and 2) “Do you have any general feedback about the retreat thus far?” In the exit survey, the three open-ended prompts were 1) “Reflecting on your overall experience participating in this retreat, please provide any comments or

Table 1 Comparison of 2021 and 2022 ACOG Robert C. Cefalo National Leadership Institutes

	2021	2022
Location	Virtual via Zoom and Whova Event App	In-Person in Durham, North Carolina, Whova Event App
Institute Dates	Monday, June 28 – Thursday, July 1, 2021 11 AM–6 PM EST	Thursday, March 17 – Sunday, March 20, 2022 Days 1–3 = 8 AM–6 PM; Day 4 = 8 AM–2:30 PM EST
Total Training Hours	24.5	31
Number of Sessions Offered	18	16
Number of Attendees	32	39

feedback (i.e., What worked well? What did not work well? What should we keep for next time? Any suggestions for improvement?), 2) Were there any skills or lessons you learned this week that were particularly “sticky”? [“sticky” in that they stuck with you, strongly resonated with you, or moved you?] If so, please describe”, and 3) “Reflecting on your response to the previous question, do you feel like the lessons you listed resonated even more in the context of the COVID-19 pandemic? If so, why do you think that?” In the 2021 exit survey, an additional qualitative prompt was “What made virtual training an attractive option for you to commit to, given that society has not fully exited the COVID-19 crisis yet?” All IRB protocols and ethical procedures were followed (IRB protocol #18-2037).

Data Analysis

Data collected using Qualtrics XM survey software were exported into a secure MS Excel database for preliminary descriptive analyses. StataSE 16 64-bit software was used for statistical analysis and reporting. The final sample excluded individuals with missing data on a test-by-test basis. Individual session evaluation data were analyzed in MS Excel for descriptive analyses, including mean and standard deviation. The differences in means were calculated between the mean pre- and post-ratings for each knowledge and ability question in each individual session, and nonparametric testing in StataSE was used to assess the significance of the differences in means. A nonparametric testing approach was used due to low sample sizes in individual sessions. The Wilcoxon matched-pairs signed-rank test was used to explore for significant differences in the pre- and post-test ratings of participants’ reported knowledge and ability because of attending a specific session.

Qualitative feedback from each year was analyzed by two graduate-level research assistants to identify emergent themes. Each feedback statement was coded independently to determine the frequency of each theme in each year. Participants often covered multiple topics in a single feedback submission, so multiple codes may apply to each response. Data were analyzed anonymously, so there is the possibility that one participant may have submitted the same or similar feedback in response to multiple prompts.

Results

Descriptive results

Participants in the two program years were highly similar with respect to age, gender, race, years since residency and in their types of specialty practice (Table 2). Fewer attendees participated in the virtual session as compared to the in-person session (32 vs 39).

Quantitative Results

Regardless of virtual or in-person delivery format, the participants rated the sessions highly and retrospective pre- and post-test scores for knowledge and ability showed statistically significant differences for each of the sessions (Table 3). The mean difference in scores between knowledge and ability ratings from pre- to post- were larger for the virtual program than the in-person program for each session that had a direct counterpart, with the exception of Peer Coaching (an interactive exercise).

Qualitative Results

Analysis of qualitative themes from open-ended response data collected after each session (Table 4) indicates highly similar responses from both the virtual and the in-person formats regarding success in connecting and networking with other attendees, reactions to breakout group experiences, learning new concepts, or general positive comments about the experiences. In general, there were more comments from virtual participants than in-person participants. Some differences that emerged were the desire for virtual participants to have more program content, comments on the challenges of the virtual setting itself, and desire for more small group time, which were not themes that emerged in the in-person setting.

Table 2 Demographics* of ACOG Robert C. Cefalo National Leadership Institute Participants in 2021 and 2022

	Year (n)	
	2021 (31)	2022 (34)
Gender^a		
Female	84% (26)	71% (24)
Male	16% (5)	29% (10)
Race^b		
Asian	16% (5)	18% (6)
Black or African American	16% (5)	18% (6)
Native Hawaiian or Other Pacific Islander	3% (1)	0% (0)
Other	13% (4)	3% (1)
White	52% (16)	62% (21)
Ethnicity^c		
Hispanic or Latino	13% (4)	15% (5)
Not Hispanic or Latino	84% (26)	85% (29)
No answer	3% (1)	0% (0)
Age (years)	Mean: 41.4 ± 8.4 years	Mean: 42.9 ± 9.5 years
30–39	52% (16)	38% (13)
40–49	35% (11)	26% (9)
50–59	6% (2)	24% (8)
60 and older	6% (2)	6% (2)
No answer	0% (0)	6% (2)
Years Since Completed Residency	Mean: 10.6 ± 8.9 years	Mean: 12.3 ± 10.5 years
1 or less	0% (0)	21% (7)
2–5	29% (9)	15% (5)
6–10	39% (12)	18% (6)
11–20	19% (6)	12% (4)
More than 20	10% (3)	29% (10)
No answer	3% (1)	6% (2)
Main Practice Setting		
University/academic	42% (13)	44% (15)
Ob-gyn partnership/group	6% (2)	15% (5)
Multispecialty partnership/group	3% (1)	3% (1)
Solo/private practice	13% (4)	6% (2)
Military/government	13% (4)	12% (4)

(Continued)

Table 2 (Continued).

	Year (n)	
	2021 (31)	2022 (34)
Public health or community clinic	3% (1)	3% (1)
Public hospital	3% (1)	3% (1)
Private hospital	3% (1)	6% (2)
Other	13% (4)	9% (3)
Main Practice Specialty		
General obstetrics and gynecology	61% (19)	59% (20)
Maternal/fetal medicine	19% (6)	24% (8)
Reproductive endocrinology/infertility	6% (2)	3% (1)
Gynecology only	6% (2)	6% (2)
Urogynecology	0% (0)	3% (1)
Other	6% (2)	6% (2)

Notes: *Of participants completing demographic survey questions. ^aSelf-reported by participants from survey options of female, male, transgender female, transgender male, gender variant/non-conforming, and not listed. ^bSelf-reported by participants from survey options of American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, and Other. ^cSelf-reported by participants from survey options of Hispanic or Latino and Not Hispanic or Latino.

Discussion

This study compares differently delivered but nearly identical programs in equity-centered leadership training for physicians and indicates that the experience can be equally impactful whether the format is virtual or in-person. Our findings were similar to those of Nilaad et al²⁸, when studying live virtual vs in-person pharmacy curriculum learning outcomes in medical and pharmacy students or to the team of Reddy et al²⁹, when examining the acceptability of virtual vs in-person grand rounds. The data here show that participants responded positively in both situations and reported similarly large learning gains. Program curricula followed industry-standard models³⁰ employing both practically focused skill-building sessions,³¹ grounded in adult learning theory,²¹ as well as valid and reliable psychological assessment instruments including a multi-rater 360 survey. Content topics were taught by expert faculty who remained largely identical between the two years and two deployment models (Table 3). In leadership development programs, psychological assessment tools are used to help increase both self-awareness as well as awareness of others, a crucial skill of emotional intelligence, as detailed by Fernandez, Steffen, and Upshaw³⁰ and Fernandez and Fernandez.³¹

We have previously shown in the Clinical Scholars program that pivoting an in-person-based equity-centered leadership training to a virtual one did not sacrifice learning gains when training interprofessional teams of healthcare providers.⁹ Similar to this work, that research investigated the short-term outcomes of training. However, the Clinical Scholars program is a funded, 3-year development program serving interprofessional teams working to ameliorate health disparities in their local communities. The ACOG Cefalo program serves physician leaders participating as individuals and is a short-term intervention (4 days virtually, 3.5 days in-person). The finding of positive responses to our equity-centered leadership training regardless of the format (virtual or in-person) seem to be supported by the significant improvements seen in knowledge and abilities across sessions, whether the program was delivered virtually or in-person to the physicians in the cohorts here reported.

There were changes made to accommodate the virtual environment, such as shortening the convening time to prevent “zoom burnout”³² and to accommodate business hours for the four time zones in which participants resided. Based on prior work⁹ describing the efforts required to pivot an in-person program to a virtual one, we paid particular attention to

Table 3 Session Satisfaction and Changes in Knowledge and Ability Scores Across Virtual (2021) and in-Person (2022) ACOG Robert C. Cefalo National Leadership Institutes

Session Title	Year (n)	Overall Session Mean (SD) ^a	Mean Pre- Rating (SD) ^a	Mean Post- Rating (SD) ^a	Mean Differenc
Adaptive Leadership ^b	Virtual (34)	6.38 (0.60)	K: 2.79±1.82 A: 2.68±1.66	K: 6.03 (0.80) A: 5.50 (1.21)	K: 3.24** A: 2.82**
	In-person (21)	6.43 (0.75)	K: 3.00±1.38 A: 2.90±1.26	K: 6.05 (0.72) A: 5.67 (0.86)	K: 3.05** A: 2.77**
Thought Diversity/MBTI ^b	Virtual (34)	6.65 (0.49)	K: 3.71±1.27 A: 3.15±1.50	K: 6.38 (0.60) A: 6.09 (0.93)	K: 2.67** A: 2.94**
	In-person (19)	6.63 (0.77)	K: 4.11±1.59 A: 3.84±1.46	K: 6.37 (0.68) A: 6.11 (0.88)	K: 2.26** A: 2.27**
Media Training ^b	Virtual (35)	6.51 (0.61)	K: 3.40±1.40 A: 4.23±1.31	K: 6.26 (0.82) A: 6.14 (0.81)	K: 2.86** A: 1.91**
	In-person (19)	6.00 (0.88)	K: 3.84±1.21 A: 4.05±1.27	K: 5.79 (0.85) A: 5.89 (0.66)	K: 1.95** A: 1.84**
CSI	Virtual (33)	6.34 (0.60)	K: 2.69±1.32 A: 2.85±1.33	K: 6.26 (0.70) A: 6.24 (1.01)	K: 3.57** A: 3.39**
	In-person (16)	6.81 (0.40)	K: 3.43±1.36 A: 3.38±1.41	K: 6.44 (0.63) A: 6.31 (0.70)	K: 3.01** A: 2.93**
360 Debrief ^b	Virtual (14)	6.42 (0.65)	K: 3.36±1.01 A: 3.00±1.24	K: 6.14 (0.77) A: 6.21 (0.80)	K: 2.78* A: 3.21**
	In-person (21)	6.48 (0.51)	K: 3.95±1.65 A: 3.55±1.82	K: 6.18 (0.91) A: 6.36 (0.66)	K: 2.23** A: 2.81**
FIRO-B ^b	Virtual (32)	6.44 (0.76)	K: 2.76±1.39 A: 2.73±1.44	K: 6.03 (0.92) A: 5.76 (1.17)	K: 3.27** A: 3.03**
	In-person (20)	6.60 (0.68)	K: 2.85±1.87 A: 3.15±1.76	K: 6.05 (1.00) A: 6.00 (0.92)	K: 3.20** A: 2.85**
Mentoring ^b	Virtual (25)	6.12 (0.93)	K: 3.84±1.18 A: 3.76±0.97	K: 5.84 (0.99) A: 5.80 (1.04)	K: 2.00** A: 2.04**
	In-person (20)	6.25 (0.85)	K: 4.50±1.32 A: 4.35±1.42	K: 6.00 (0.92) A: 5.95 (0.94)	K: 1.50** A: 1.60**
Peer Coaching ^b	Virtual (26)	6.46 (0.58)	K: 3.28±1.31 A: 3.44±1.39	K: 6.28 (0.79) A: 6.24 (1.01)	K: 3.00** A: 2.80**
	In-person (21)	6.57 (0.60)	K: 3.19 (1.29) A: 3.55 (1.19)	K: 6.19 (0.81) A: 6.40 (0.60)	K: 3.00** A: 2.85**
Executive Coaching	Virtual (25)	6.76 (0.52)	K: 3.44 (1.33) A: 3.32 (1.28)	K: 6.36 (0.57) A: 6.40 (0.71)	K: 2.92** A: 3.08**
	In-person (24)	6.46 (0.93)	K: 3.63 (1.41) A: 3.38 (1.47)	K: 6.04 (0.75) A: 6.13 (0.74)	K: 2.41** A: 2.75**

(Continued)

Table 3 (Continued).

Session Title	Year (n)	Overall Session Mean (SD) ^a	Mean Pre- Rating (SD) ^a	Mean Post- Rating (SD) ^a	Mean Differenc
Resilience Tank ^b	Virtual (24)	6.08 (0.72)	K: 3.71 (1.23) A: 3.33 (1.27)	K: 5.96 (0.91) A: 5.96 (1.08)	K: 2.25** A: 2.63**
	In-person (13)	6.38 (0.77)	K: 4.14 (1.75) A: 3.64 (1.95)	K: 6.07 (1.07) A: 6.07 (1.00)	K: 1.93** A: 2.43**
Negotiation	Virtual (30)	6.87 (0.35)	K: 3.13 (1.28) A: 3.03 (1.40)	K: 6.50 (0.57) A: 6.17 (0.99)	K: 3.37** A: 3.14**
	In-person (21)	6.67 (0.58)	K: 4.29 (1.68) A: 4.09 (1.67)	K: 6.24 (0.83) A: 6.10 (0.89)	K: 1.95** A: 2.01**
Bystander to Upstander ^b	Virtual (34)	6.88 (0.33)	K: 3.85 (1.31) A: 3.74 (1.40)	K: 6.59 (0.61) A: 6.62 (0.55)	K: 2.74** A: 2.88**
	In-person (28)	6.79 (0.63)	K: 4.38 (1.45) A: 3.83 (1.61)	K: 6.55 (0.63) A: 6.48 (0.63)	K: 2.17** A: 2.65**
Crisis Communication ^b	Virtual (34)	6.44 (0.66)	K: 2.88 (1.49) A: 2.97 (1.55)	K: 6.09 (0.87) A: 6.06 (1.07)	K: 3.21** A: 3.09**
	In-person (18)	6.39 (1.04)	K: 3.74 (1.37) A: 3.53 (1.35)	K: 6.11 (0.81) A: 6.21 (0.92)	K: 2.37** A: 2.68**
Personal Board of Directors	Virtual (25)	6.28 (0.61)	K: 3.40 (1.41) A: 3.24 (1.67)	K: 6.32 (0.63) A: 5.92 (1.08)	K: 2.92** A: 2.68**
	In-person ^c	—	—	—	—
Team Building: Ropes Course ^b	Virtual ^c	—	—	—	—
	In-person (22)	6.64 (0.66)	K: 4.32 (1.36) A: 3.82 (1.84)	K: 6.19 (0.75) A: 6.00 (0.87)	K: 1.87** A: 2.18**
Success & Derailment ^b	Virtual ^c	—	—	—	—
	In-person (17)	6.59 (0.51)	K: 3.83 (1.15) A: 3.83 (1.20)	K: 6.28 (0.75) A: 6.11 (0.83)	K: 2.45** A: 2.28**
President Update	Virtual ^c	—	—	—	—
	In-person (17)	6.12 (0.70)	K: 4.88 (1.22) A: 4.94 (1.60)	K: 6.06 (0.77) A: 6.41 (0.51)	K: 1.18* A: 1.47*

Notes: ^aRatings were provided on a scale of 1 – lowest to 7 – highest. ^bSame faculty presented the topic in both years. ^cSession not held and/or evaluated in given year. *p < 0.01. **p < 0.001.

Abbreviations: n, number of respondents; SD, standard deviation; K, knowledge; A, ability.

crafting breakout sessions to be strategic in relationship to content, timing, and group make-up. Our research group was surprised and gratified (internal communications) that the virtual participants wanted more content, more examples, and more interaction given the tiring nature of day-long virtual meetings.³²

There was an interesting trend for a higher proportion of the virtual participants in 2021 to respond to the session evaluation requests, although the virtual participants were fewer in number than the in-person cohort of 2022. In the virtual environment, we dedicated time at the end of each session and provided a visual reminder to evaluate the program along with a link that was loaded into the chat function. During that time screens were blanked-out and a “fluid balancing” break was offered. During the in-person program, at the end of each presentation a verbal reminder to tap into the electronic evaluation form was given, a break was offered, and participants would often immediately start forming

Table 4 Comparison of Qualitative Results Between Virtual (2021)^a and in-Person (2022)^b Program Delivery

2021 Virtual ACOG Robert C. Cefalo National Leadership Institutes (n=451)		
Code/Frequency	Definition	Example Quotes
2021 Virtual: Successes of virtual setting Frequency^c 36	Participants reported successes in the virtual setting, including navigating technology, flexibility and comfort, and connecting/ networking	"I had my doubts about how well this would work virtually but it was fantastic. I really felt like I connected with the team and the other attendees. Such a worthwhile experience."
2022 In-Person Successes net-working/ connecting Frequency^c 23	Participants reported successes connecting and networking with other participants	"The session allowed strangers to connect, learn from each other and apply our collaboration skills and techniques to be an active teacher, leaders and collaborators."
2021 Virtual: Challenges of virtual setting Frequency^c 37	Participants reported challenges in the virtual setting, including technology difficulties, distractions/interruptions, and connecting/ networking	"I think for the current times we are living in, I understand the remote delivery. However, I think that has drastically compromised our ability to connect and network. We have made attempts, but a few chatroom comments and breakout sessions is nothing like dinner/drinks after a long day. I would strongly encourage keeping this program in person."
2022 In-Person —	—	—
2021 Virtual: Appreciation for breakout rooms Frequency^c 17	Participants reported appreciation for breakout groups and small group sessions	"Excellent execution of a virtual program! I appreciated the break out sessions and the opportunities to share experiences. The engagement was great over the past 4 days!"
2020 In-Person: Appreciation for interactive sessions Frequency^c 22	Participants reported appreciation for interactive format and small group sessions	"The program is well organized with good balance between didactic and interactive sessions, seated and kinetic activities. The breakout sessions work very well moving the attendees from education to practical application."
2021 Virtual: Wanting more small group time Frequency^c 35	Participants reported wanting more time for small groups, discussion, and practice	"I would have liked more small group time. Because I find that people share a lot about this topic in smaller groups."
2022 In-Person —	—	—
2021 Virtual: Learning new concepts Frequency^c 24	Participants reported learning new information and skills that will impact their leadership	"I am so relieved to have these tools. I will be using and practicing these skills frequently in the future."
2022 In-Person Learning new concepts Frequency^c 29	Participants reported learning new information and skills that will impact their leadership	"I love this experience. It was completely immersive and I learned so much about myself, my leadership style and more importantly, other leadership approaches"
2021 Virtual: Wanting more content Frequency^c 39	Participants reported wanting more examples, content, and/or time for various topics	"I liked it but having more examples during the lecture I think would have been helpful."

(Continued)

Table 4 (Continued).

2021 Virtual ACOG Robert C. Cefalo National Leadership Institutes (n=451)		
Code/Frequency	Definition	Example Quotes
2022 In-Person—	—	—
2021 Virtual: Overall positive comments Frequency^c 157	Participants reported enjoying and/or appreciating the sessions, content, speakers, and overall experience	“This workshop was amazing. I wish everyone in my division could take this training so we could be more effective.” “This was amazing, time appropriate, needed, important, tangible, and crucial foundation of understanding for leaders. Thank you!”
2022 In-Person Overall positive comments Frequency^c 93	Participants reported enjoying and/or appreciating the sessions, content, speakers, and overall experience	“Great retreat!! I learned so much. And feel like I only scratched the surface. The program worked well as put together, great job.”

Notes: ^an= 451 total number of feedback submissions over all retreat sessions from six open-ended feedback questions (session-specific and overall) in the 2021 Virtual Program. ^bn= 237 total number of feedback submissions over all retreat sessions from five open-ended feedback questions (session-specific and overall) in the 2022 In-person Program. ^cFrequency may include coding of individual statements within a feedback submission due to participants discussing multiple topics within each feedback submission.

small groups and chatting. The lower response rates of the in-person participants might be a function of the more social nature of the in-person setting and the greater challenges in getting a link to the evaluation conveniently before them. Links were sent via email each morning; however, as the program provides physical notebooks, not all participants had a computer active during the sessions. Indeed, we discouraged the use of computers during in-session time to focus the participants' attention on the session content and interaction; quite a contrast to the virtual setting where everyone participated via computer. Links were functional via mobile devices as well as laptops.

An observation our team made post-program was that after the program, the 2021 virtual cohort only minimally used the program-based email connection system, or the Whova meeting app-based networking system provided. However, the 2022 in-person group, which had access to the same systems to foster further networking, connected dozens of times per week for a few months post-program, choosing to use the group email. The observed content of the 2022 group's connection centered around strategizing policy issues and collaborating across states and districts. While we did not collect data around this difference, we hypothesize that the interaction could be attributable to several factors. First, there could be individual cohort differences. Secondly, significant contextual differences in issues in US healthcare policy around women's health emerged in 2022,³³ which would reasonably present a shared area of concern for these physicians. Thirdly, it is possible that a higher level of comfort developed in the cohort by being in the same shared space together. Any or all of these possibilities could have fostered the supportive connections observed in the weeks and months after the in-person program.

Participants in both programs noted success in connecting with other participants during the program. For the virtual program, connections were carefully planned and implemented to ensure that participants interacted with every cohort member during the 4 days of training. For the in-person program, some strategic planning around participant groupings occurred but most opportunities happened organically. While both delivery formats of the program were successful in terms of a variety of participant scores, the qualitative feedback was clear that a preference remains for such programs to be offered in-person whenever possible (Table 4).

One very interesting finding was the trend for knowledge acquisition scores and ability gains to be rated as higher for the virtual participants. In most cases, the content of the sessions, the speakers, even the slides were identical. To prevent “zoom fatigue”³² there was a great deal of attention to frequent breakouts into small groups for content processing and application for the 2021 virtual program, which could have played a role in this difference, in addition to the program days being shorter. The difference could have been related to the participants themselves, who agreed to take part in the first-ever virtually deployed ACOG-Cefalo program and thus might indicate a special degree of motivation and interest in

leadership development and strengthening, particularly leadership with an equity-centered lens. There were several individuals nominated for the 2021 program who deferred their enrollment until the program would be held in person again, partially accounting for the lower cohort number in the virtual course. In both the virtual and in-person formats, participants rated the equity-centered leadership content as impacting their knowledge and skills, resulting in statistically significant shifts in scores regardless of the format of the learning and engagement.

The preference of mid-career and senior-level healthcare professionals for in-person training experiences incorporating multiple delivery methods that focus on practice-based learning and feedback is well known.^{9,11,18,34–37} Our work and that of others supported the usefulness of in-person, intensive “Leadership Boost” trainings for developing leadership skills.^{2,10,38–40} While across their careers, physicians can be exposed to a variety of experiences that ultimately contribute to their skills in building teams and leading their organizations through challenging times, this intensive “skills boosting approach” to training can be an important leadership strengthening component that offers a faster-track for self-insight and leadership skills acquisition.^{2,4,9–11,18,38–40} While such approaches are more supportive of work–life integration concerns, we also believe the immersive experience strongly supports learning, whether that learning is conducted virtually or in-person. We use the retrospective pre- and post-test with questions on ability as a proxy for measuring self-efficacy.^{10,24–27,40–48} “Training” is an experience (such as attending the program), while “development” refers to the ability to implement what one has learned in real-world settings. Implementation and use of skills in a workplace setting is fostered by first supporting participants’ development through a focus on specific competencies in a learning environment.^{2,40–49} In our evaluation approach, we use the “ability” measure as an indicator of self-efficacy.^{44,45} Monitoring such self-efficacy (ability) indicators across time and cohorts over time allows the program faculty to adapt and transition the curriculum to meet contextual changes in societal concerns, such as an increasing focus on physician resilience over the years and a greater emphasis on tools for managing interpersonal and organizational conflict over diversity-related tensions.

The work of Throgmorton et al⁶ found that building relationships and confidence in physicians through leadership training can contribute to ongoing physician resilience. The suspension of such development opportunities during the early phases of the pandemic had the unfortunate side-effect of robbing the physician workforce of yet another arm of support for their resilience. Our curriculum addressed the topic, with large gains noted in both knowledge (a delta of 2.25 for Virtual and 1.93 for In-person venues) and ability (a delta of 2.63 for Virtual and 2.43 for In-person). From this experience, we believe that it is markedly helpful to physician participants for programs to directly address the topic of resilience and to present skills and tools, regardless of the format of the interaction.

Leadership development programs^{10,11,18} focus on building leadership skills with the goal of strengthening the leadership potential and effectiveness of participants; thus, leadership development leads to both a greater number of *leaders* and a greater degree of *leadership* across the profession.⁵⁰ Measures presented here show significant gains, even in the short-term, in participants’ reported ability, our indicator of self-efficacy, immediately after completing a retreat, regardless of whether that experience was virtual or in-person. Fassiotto¹ and Throgmorton⁶ both showed that leadership training participants take on expanded leadership roles, are more likely to hold regional or national leadership positions, implement new projects and ideas, and engage in team development⁶ after completing leadership training. Our prior work has also found similar outcomes.¹⁰ Further, since the ACOG-Cefalo program launched in 2006, 19 presidents of national professional organizations for physicians in three countries have emerged from alumni of this program (unpublished data).

Limitations

As with all studies utilizing self-reported measures, this study is not without limitations. Social desirability bias may influence reports of satisfaction, knowledge, and ability ratings.⁵¹ Participants may desire to be seen as more knowledgeable or more skilled. A positive regard for program faculty may also influence question scoring. While this study offers comparison groups experiencing a nearly identical curriculum offered either virtually or in-person, it does not offer a traditional control group which was convened but not engaged in leadership content as that would be highly impractical.⁵² Indeed, the relatively few studies offering a control group in leadership and management training tend to be quite small^{53,54} or focus on delivering similar leadership materials via differing methods.⁵⁵ Retrospective

pre- and post-tests allow for the cohort to act as its own control by comparing ratings of knowledge and ability before and after the training and are highly useful when having a true control group for comparison is not practical or possible.

It was unfortunate that the meeting App (Whova) was not significantly used or accessed by the participants in either cohort. It may be that such a sophisticated application lends itself better to a more complex meeting with several competing sessions and that less complex events where the participants are generally all together simply do not need the organizational benefits such technology provides. The lack of participant's significant use of the Whova platform denies us the ability to aid the better understanding of how alternative technologies can facilitate networking.

Conclusion

This comparison of nearly identical leadership training programs supports the efficacy of either virtual or in-person modalities as highly effective strategies for physician leadership development. While some participants may have a stronger motivation for a virtual environment, overall, the qualitative feedback data support a strong preference for an in-person experience, which seemed to facilitate stronger development of professional networks post-program. Significant improvements in knowledge and ability across a wide variety of sophisticated skills should be expected in physician leadership development whether the program employs a virtual or in-person platform. Our experience here indicates that tools for creating psychological safety and inclusive cultures, understanding motivation, how to engage in crisis communications and media communications, negotiation skills, leading change, physician resilience, etc, can be effectively imparted in virtual or in-person formats when instituting physician leadership programs. Further studies should assess the degree to which these improvements in physician learning endure over time, relate to career or leadership opportunity advancement, and serve to improve system-level problems.

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Disclosure

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