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Increasing Access to Care for Transgender/Gender Diverse Youth Using Telehealth: A Quality Improvement Project

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Abstract

Purpose: *We sought to expand telehealth at an academic multidisciplinary pediatric gender center to increase access to gender-affirming care without compromising communication, privacy, or patient satisfaction.*

Materials and Methods: *Patient needs assessments were performed from January 2019 to March 2020. The severe acute respiratory syndrome coronavirus 2 pandemic accelerated implementation of the quality improvement project, and clinically appropriate patients were scheduled for video visits starting March 16, 2020. From September 8, 2020 to October 2, 2020, caregivers of transgender and gender diverse (TGD) minors or TGD young adults pursuing gender-affirming medications completed 9-item surveys evaluating communication quality and privacy, access to care, and quality of services for video and clinic visits. Answers were rated via Likert scales (1 = strongly agree, 5 = strongly disagree; 1 = less travel time, 4 = more travel time).*

Results: *Needs assessment (*n = *69) showed that 63.8% felt that video visits would improve follow-up. Survey participants (*n = *91) reported statistically significant differences (*$p < 0.05$*) in several areas. Compared with clinic visits, video visits were more convenient, 1.21 ± 0.435 versus 2.36 ± 1.207, took less time from other activities, 4.55 ± 0.522 versus 2.93 ± 1.281, required less travel time, 1.03 ± 0.180 versus 2.63 ± 0.901, and were more acceptable, 1.35 ± 0.545 versus 1.65 ± 0.736. Participants were more likely to choose video visits in the future, 1.32 ± 0.555 versus 1.57 ± 0.732. There were no statistically significant differences in communication quality, privacy, or overall satisfaction.*

Conclusion: *An integrated clinic-video visit model increases access to gender-affirming care for TGD youth while maintaining excellent communication, privacy, and patient satisfaction.*

Keywords: *transgender, pediatrics, telehealth, telemedicine, quality improvement, access to care*

Introduction

Approximately 0.6% of adults and 0.7–1.8% of adolescents in the United States identify as transgender and gender diverse (TGD),[1,2] with gender identity and/or gender expression different from sex designated at birth.[3] Compared with cisgender peers, TGD youth experience health disparities with higher rates of affective disorders, suicidal ideation, substance abuse, risky sexual behaviors, sexually transmitted infections, and violence victimization.[1,2,4–8] These disparities are theorized to result from minority stress and body dysphoria, which can be ameliorated by quality social, mental health, and medical services.[9–11] Access to gender-affirming medications such as puberty blockers (gonadotropin-releasing hormone agonists) and sex hormones (estradiol or testosterone) is, thus, critically important for TGD youth who seek medical transition since delaying treatment is associated with poorer mental health outcomes, whereas facilitating access improves mental health, well-being, and function.[12–14] However, TGD youth face significant barriers due to fear of discrimination and lack of trained providers to deliver gender-affirming health care within a feasible geographic location.[15,16]

Telehealth is an innovative solution for addressing geographic barriers to care. This modality of delivering health care services via information and communication technologies while patient and provider are at different locations includes synchronous videoconferencing, asynchronous store-

it-forward, and remote patient monitoring.[17,18] A study of 204 TGD youth found that 80% were interested in video visits for hormone refills and 71% for follow-up lab monitoring.[19] Although there is growing evidence of its use for TGD youth,[20–22] telehealth has been established as effective, convenient, and satisfactory health care for adult and pediatric patients with a wide range of medical and psychiatric disorders.[23–34] However, before the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, telehealth use was limited, with only 2.4% of enrollees in large employer health plans with an outpatient service having used telehealth in 2018 and beneficiaries enrolled in Medicare and Medicaid managed care plans was similarly low.[17] Due to concerns about viral contagion coupled with growing efficacy evidence, interest, and acceptance, the utilization of telehealth increased.

Before the SARS-CoV-2 pandemic, the University of California, San Francisco (UCSF) was a leader in health information technology and implemented evidence-based telehealth in 2015. However, the UCSF Benioff Children's Hospital (BCH) Child and Adolescent Gender Center (CAGC) clinics had not fully integrated videoconferencing (video visits) to deliver care. The CAGC clinic model provides access to an interdisciplinary team dedicated to delivering quality gender-affirming health care to TGD youth primarily utilizing clinic visits. However, the majority of patients reside outside of San Francisco (SF), resulting in challenges with regular follow-up. Bridging the gap between the best practices of expanded telehealth and a clinic-visit model is critical to increasing access to quality care.

The purpose of the telehealth quality improvement (QI) project is to offer video visits as an option for follow-up visits to TGD youth aged 8–25 years who reside in California and pursue gender-affirming medications, with the overall goal to increase convenience and reduce hours missed from other activities compared with clinic visits while maintaining high patient satisfaction.

Materials and Methods

THEORY OF CHANGE

To increase chances of success, the Iowa Model of Evidence-Based Practice guided the telehealth QI project.[35,36] The clinical question, "Will expanding telehealth increase access to care while maintaining excellent communication, privacy, and high patient satisfaction?" is an organizational priority given the value of increasing access to care for a diverse population, while reducing viral contagion and maintaining financial health during the SARS-CoV-2 pandemic. Analysis of the pilot process change enables UCSF to improve strategies before long-term adoption.

LOCAL CONTEXT

The UCSF Health system, with affiliates in Northern California, is part of UCSF, a health sciences research and graduate university. Part of UCSF Health, BCH operates at two main sites in SF and Oakland, as well as satellite clinics, to serve a diverse patient population in California, including patients with public insurance. The telehealth project was implemented at the UCSF-BCH SF CAGC clinic, which has twice-weekly clinics that were in-person before SARS-CoV-2. The clinic is comprised of four medical providers, two mental health gender specialists, a social worker, and a nurse care coordinator.

NEEDS ASSESSMENT

An informal needs assessment was first conducted through patient interviews from January 2019 to November 2019 to investigate barriers to regular clinic follow-up before development of the project (*Fig. 1*). Based on this informal assessment, a formal anonymous needs assessment survey was developed by the QI team (*Fig. 2*) and distributed via electronic or paper format to CAGC patients or caregivers ($n = 69$) seen in the clinic from November 2019 to March 2020. Project data were collected and managed by using Research Electronic Data Capture (REDCap) electronic data capture tools hosted by UCSF. REDCap is a secure, Web-based software platform designed to support data capture for research studies.[37,38]

TELEHEALTH INTERVENTION

Following institutional guidance in response to the SARS-CoV-2 pandemic, the CAGC rapidly converted to telehealth

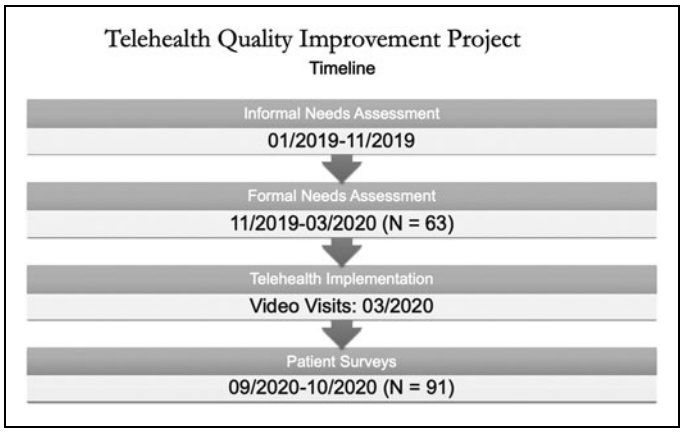

Fig. 1. Telehealth QI project timeline. Timeline of telehealth QI project, with informal needs assessment beginning in January 2019, formal needs assessment beginning in November 2019, implementation of telehealth in March 2020, and patient surveys distributed in September 2020. QI, quality improvement.

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CAGC QI Needs Assessment

This is a survey to help us improve our services. It is anonymous, meaning we will not be able to identify who filled out the survey. Please answer each question to the best of your ability.

1	PATIENT: What is your gender identity?	○ Female ○ Male ○ Non-binary/Gender Queer ○ Something else
2	PATIENT: What is your sex assigned at birth (on birth certificate after birth)?	○ Female ○ Male ○ Not recorded on birth certificate
3	What are the most significant barriers that prevent you from attending clinic visits at least every 3-6 months? Check all that apply.	☐ Travel distance or time needed to get to clinic ☐ Inability to take time off work or school ☐ Mistreatment related to being transgender by staff or providers ☐ Forgot about the appointment
4	What would be the most helpful to enable you to attend clinic visits at least every 3-6 months? Check all that apply.	☐ Video visits (video calls with your provider that you can do remotely) ☐ More appointment availability ☐ Staff training on gender diversity ☐ Financial assistance with the cost of travel or parking
	Have you seen a gender specialist in the past 6 months (therapist qualified to care for transgender or non-binary youth)?	○ Yes ○ No
	If you do not see a gender specialist (therapist), what is the reason why? Check all that apply.	☐ Can't afford it. ☐ There are no gender specialists with availability near home. ☐ Don't need it (moods are good, no gender-related dysphoria/distress). ☐ Difficulty discussing personal experience like gender identity. ☐ Not helpful in the past. ☐ Previous bad experience with a therapist. ☐ No time (too busy with school/work/activities)
5	What improvements to our clinic would be helpful? Check all that apply.	☐ Help with changing identity documents (passport, legal name/gender change, driver's license, birth certificate). ☐ Clinic or video visits with a UCSF gender specialist (therapist). ☐ Help establishing care with a mental health provider. ☐ Information on fertility preservation options (egg or sperm freezing) ☐ Information on voice therapy ☐ Help finding a support group ☐ Information on medications (puberty blockers, estrogen/testosterone) ☐ Information on surgeries (chest reconstruction/bottom surgeries). ☐ Help stopping mistreatment related to being transgender at school or work.
6	How satisfied are you with the care you receive from the gender clinic?	○ Very satisfied ○ Satisfied ○ Neutral ○ Unsatisfied ○ Very unsatisfied

projectredcap.org REDCap

Fig. 2. Formal needs assessment survey. Anonymous formal needs assessment survey questions and answer choices.

visits starting March 16, 2020, and offered limited in-person clinic visits starting April 22, 2020. SARS-CoV-2 thus accelerated the implementation of the telehealth QI project and fast-tracked the survey distribution plan. No additional financial resources were required, because UCSF Health: (1) was already telehealth-enabled, with the infrastructure, policies, and procedures required to conduct video visits effectively, compliantly, and with appropriate reimbursement; (2) had a business associate agreement with Zoom Video Communications, Inc. (San Jose, CA, USA); and (3) provided training and education through the UCSF Telehealth Resource Center.

Providers received telehealth training through the Telehealth Resource Center or Pediatric Endocrinology Nurse Practitioner tutorial. They conducted video visits from a private room at UCSF-BCH, or from a remote location with a telecommuting agreement, encrypted computer, and adequate bandwidth. Patients and legal guardians conducted video visits by using a computer or phone with a camera, adequate bandwidth, and from multiple private locations such as home, work, school, primary care clinic, or community center. Schedulers sent adult patients or legal guardians of pediatric patients an email or electronic medical record message with instructions on how to prepare and conduct the video visit.

Participants recruited from the UCSF-BCH SF CAGC included legal guardians of patients aged 8–17 years and patients 18–25 years who reside in California, identify as TGD, pursued gender-affirming medications, and spoke English or Spanish. Participants were included in the telehealth intervention if they did not need an in-person evaluation as determined by the provider and were included in the survey distribution if they had completed at least one clinic visit and one video visit. The QI project was approved by the UCSF Human Research Protection Program Institutional Review Board (IRB) as an exempt study.

SURVEY DESIGN AND DISTRIBUTION

A QI team including medical, nursing, and administrators developed the anonymous 9-item electronic REDCap survey (*Fig. 3*) in English and Spanish, with three-question blocks in three categories: (1) communication quality and privacy, (2) access to care, and (3) quality of services. Participants completed the survey for clinic and video visit types. Due to a lack of validated telehealth surveys for TGD youth, the survey was adapted from published telehealth surveys in other populations.[27,39–41] Survey responses utilized a Likert-scale, with eight questions using a 5-point scale of agreement, where 1 was "strongly agree" and 5 was "strongly disagree," and one question using a 4-point ordinal scale regarding travel time, where 1 corresponded to less time and 4 corresponded to more time.

A sample size of 63 was calculated to detect an effect size of 0.5 using an anticipated of standard deviation (SD) of 1. Since we had no *a priori* estimate of the SD, we planned to survey more participants than the calculated sample size to increase power. From September 8, 2020 to October 2, 2020, all eligible participants ($n = 107$) were contacted in a convenience sample of patients seen by follow-up visit to explain the QI project and were emailed surveys regarding experience with the last clinic and video visits.

DATA ANALYSES

Statistical analyses were conducted by using IBM SPSS Statistics Grad Pack 27.0 BASE statistical package. The Wilcoxon Signed Rank Test was performed to assess the differences between the clinic and video visits survey responses. Categorical variables were expressed as mean, median, range, and interquartile range by using descriptive statistics. All *p*-values were two-sided, with a statistical significance level of 0.05.

Results

NEEDS ASSESSMENT

Informal needs assessment revealed that patients who missed follow-up clinic visits and experienced long-gaps in care struggled to access gender-affirming medications and experienced frustration. The main barriers to regular follow-up included (1) length of distance between home and clinic and (2) time required to attend visits. In the formal needs assessment (*Table 1*), participants ($n = 69$) reported that the most significant barriers to regular clinic follow-up were travel distance or travel time to clinic (78.3%) and inability to take time off work or school (42%). The majority chose video visits (63.8%) and more appointment availability (65.2%) as the most helpful changes to enable regular follow-up. These results demonstrated a geographical barrier to care and patient desire for telehealth, forming the basis of the telehealth QI project.

QI PROJECT

Of the 107 eligible participants, 91 (85%) completed both clinic and video visit surveys. Overall survey results are summarized in *Figure 4*.

Communication quality and privacy. There were no statistically significant differences in ease of communication, protection of privacy, or patient understanding between clinic and video visits (*Table 2*). Most patients agreed that they could easily talk to the provider during clinic (98.9%) and video (100%) visits; that their privacy was protected during clinic

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CAGC CLINIC VISIT SURVEY

Please complete the survey below.

Thank you!

1)	Languages	◯ English ◯ Español
2)	Was your visit in clinic or video?	◯ clinic ◯ video
	This is a survey to help us improve our services. It is anonymous, which means we will not be able to identify who completed the survey. Thank you for your help!	
3)	Please type the last 5 digits of your phone number.	_____
	Communication Quality & Privacy	
4)	I could easily talk to the health care provider during the [clinic_video] visit.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree
5)	My privacy was protected during the [clinic_video] visit.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree
6)	I was able to understand the provider's recommendation.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree
	Access to Care	
7)	The [clinic_video] visit was a convenient form of health care delivery for me.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree
8)	The [clinic_video] visit took too much time away from other activities such as school or work.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree
9)	Please estimate the time spent to attend the [clinic_video] visit (including system setup or travel time to and from the clinic location).	◯ 0-1 hours ◯ 2-3 hours ◯ 4-5 hours ◯ more than 5 hours
	Quality of Services	
10)	The [clinic_video] visit was an acceptable way to receive healthcare services.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree
11)	Overall, I am satisfied with the quality of the service being provided by a [clinic_video] visit.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree
12)	I will use [clinic_video] visit services again.	◯ Strongly agree ◯ Agree ◯ Undecided ◯ Disagree ◯ Strongly disagree

projectredcap.org REDCap

Fig. 3. Telehealth QI survey for clinic and video visits. Anonymous telehealth QI survey questions and answer choices. Survey participants answered this survey for clinic visits and for video visits.

Table 1. Needs Assessment Survey Results ($n=69$)	
Participant demographics	
Sex designated at birth	
Female	68.1% ($n=47$)
Male	30.4% ($n=21$)
Not recorded	0% ($n=0$)
No answer	1.4% ($n=1$)
Gender identity	
Female	29.0% ($n=20$)
Male	60.9% ($n=42$)
Non-binary/gender queer	8.7% ($n=6$)
Something else	1.4% ($n=1$)
"What are the most significant barriers that prevent you from attending clinic visits at least every 3–6 months? Check all that apply."	
Travel distance or time needed to get to clinic	78.3% ($n=54$)
Inability to take time off work or school	42.0% ($n=29$)
Mistreatment related to being transgender by staff or providers	1.4% ($n=1$)
Forgot about the appointment	5.8% ($n=4$)
"What would be the most helpful to enable you to attend clinic visits at least every 3–6 months? Check all that apply."	
Video visits (video calls with your provider that you can do remotely)	63.8% ($n=44$)
More appointment availability	65.2% ($n=45$)
Staff training on gender diversity	4.3% ($n=3$)
Financial assistance with the cost of travel or parking	11.6% ($n=8$)
"How satisfied are you with the care you received from the gender clinic?"	
Very satisfied	59.4% ($n=41$)
Satisfied	33.3% ($n=23$)
Neutral	7.2% ($n=5$)
Unsatisfied	0% ($n=0$)
Very unsatisfied	0% ($n=0$)

(97.8%) and video (97.8%) visits; and that they understood the provider's recommendation during clinic (98.9%) and video (97.8%) visits (*Table 3*).

Access to care. There were statistically significant differences between clinic and video visits for all three measures of access to care (*Table 2*). Participants agreed more strongly that video visits were convenient, 1.21 ± 0.435, compared with clinic visits, 2.36 ± 1.207 ($z=-6.279$, p-value <0.001). Participants disagreed more strongly that video visits required them to spend too much time, 4.55 ± 0.522, compared with clinic visits, 2.93 ± 1.281 ($z=-6.957$, p-value <0.001). Travel time spent was lower for video visits, 1.03 ± 0.180, compared with clinic visits, 2.63 ± 0.902 ($z=6.194$, p-value <0.001).

Quality of services. There were statistically significant differences between clinic and video visits in two measures of quality of services (*Table 2*). Participants agreed more strongly that video visits were acceptable for the delivery of health care services, 1.35 ± 0.545, compared with clinic visits, 1.65 ± 0.736 ($z=-2.932$, p-value $=0.003$). Participants also agreed more strongly that they would use video visits in the future, 1.32 ± 0.555, compared with clinic visits, 1.57 ± 0.732 ($z=-2.566$, p-value $=0.010$). There was no statistically significant difference in patient satisfaction between the visit types. Patient satisfaction was >95% for both visit types (*Table 3*).

Discussion

The results of this telehealth QI project demonstrate that patients who participated in telehealth reported that clinic and video visits provide equally excellent communication quality, privacy, and overall satisfaction with health care services. However, video visits were more convenient, took less time away from other activities such as school or work, and required less travel time when compared with clinic visits. In addition, video visits were an acceptable way to receive health care, and patients were more likely to choose video visits in the future. As such, the project goals were met of increasing access to gender-affirming health care for TGD youth by utilizing video visits while providing communication quality, privacy, and satisfaction commensurate to clinic visits.

These findings add to the growing body of evidence that telehealth is an effective and satisfactory method to increase access to health care services. A 2015 Cochrane review of 93 eligible trials examined the effectiveness of telehealth as an addition, alternative, or partial substitution to usual care in adult and pediatric patients with a wide range of medical and psychiatric conditions, and it found that telehealth resulted in similar outcomes for patients with heart failure, improved glycemic control for patients with diabetes, and improved quality of life for patients with mental health or substance abuse disorders.[25] Similarly, several studies have shown that telehealth is an effective and/or satisfactory method of health care delivery for pediatric patients with gender dysphoria, diabetes, obesity, asthma, and psychiatric disorders.[21,23,24,26,27,33,42] Future studies should focus

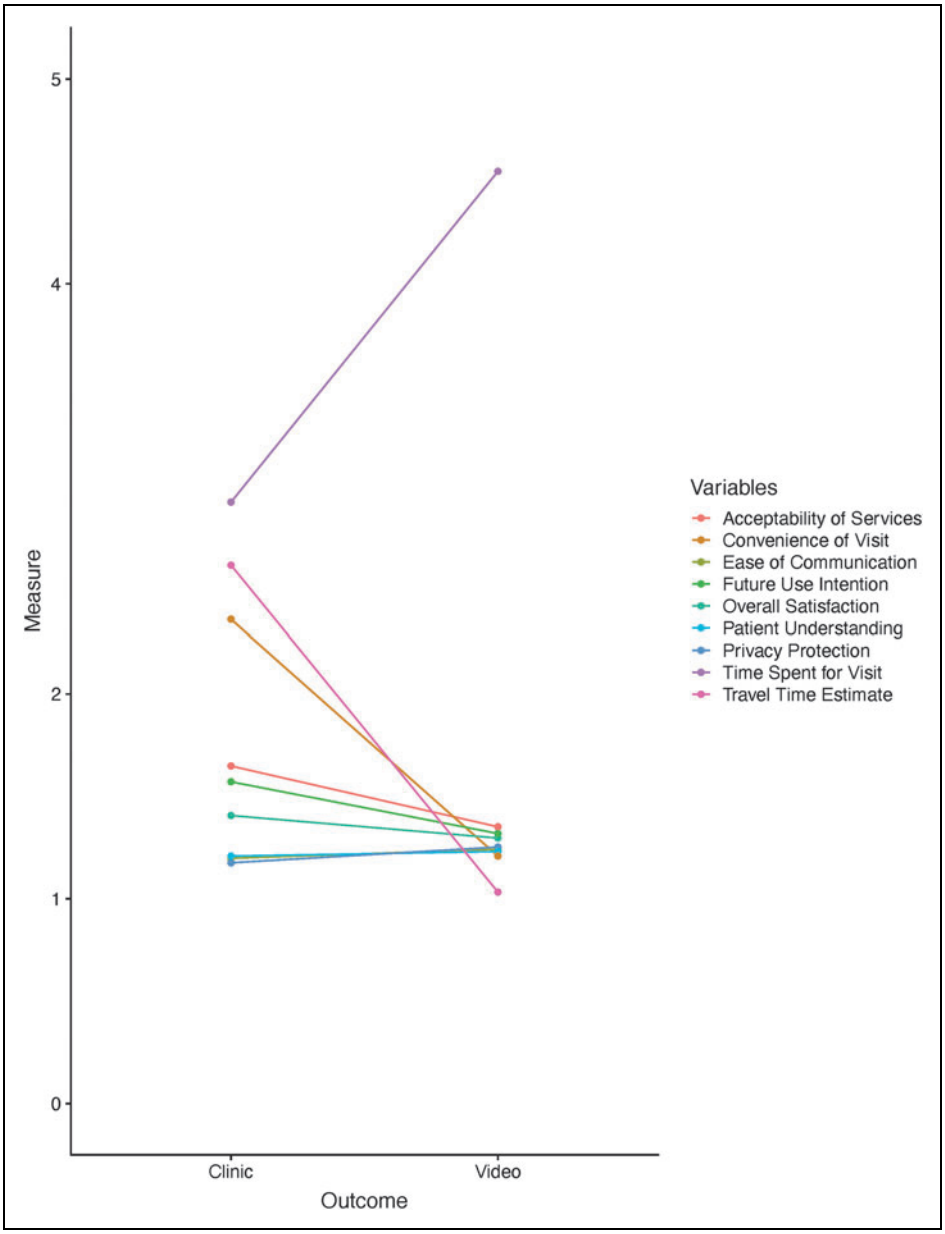

Fig. 4. Telehealth QI project mean survey responses by visit type. Mean survey responses to the telehealth QI survey for clinic visits (left) and video visits (right). For Travel Time Estimate, 1 = less time and 4 = more time. For all other variables, 1 = strongly agree and 5 = strongly disagree.

on the use of telehealth to deliver gender-affirming health care to the TGD youth population and evaluate measures of efficacy and cost.

Given the successful results of the pilot telehealth QI project and the supporting evidence that telehealth is an effective and acceptable method of delivering health care services, the UCSF-BCH CAGC will develop a post-SARS-CoV-2 sustainability plan. The National Health System Institute for Innovation and Improvement "Sustainability Model" will be used as a framework to address the core sustainability elements of process, staff, and organization.[43] A hybrid clinic-video visit model will be implemented long-term at the SF, Oakland, and satellite clinics to increase access to health care while maintaining quality. We envision a service model in which new patients or those who would benefit from an in-person evaluation would be seen in clinic while those appropriate for video visits based on medical, psychosocial, and technology access would be offered a follow-up video visit. This is anticipated to address both geographical barriers to care and patient avoidance of health care due to fear of experiencing stigma while at a medical center.[15,16,44] Therefore, telehealth can reduce disparities in health care access for TGD youth.

A major strength of the project is that the needs assessment captured the geographic barrier to care and patient interest in telehealth before the SARS-CoV-2 pandemic, increasing provider acceptance and facilitating rapid expansion of video visits. Further, the project evaluation survey had an excellent response rate of 85%, compared with average response rates of health service satisfaction surveys of 34.2%.[45] This suggests that results reflect the opinions of the CAGC patient population.

However, as a pilot project, the small sample size comprised a convenience sample, and it limits the generalizability of findings to the TGD population. Also, there is self-selection bias since patients who are socioeconomically disadvantaged or reside in rural areas that lack adequate broadband may not access telehealth. However, there is high adolescent comfort with technology,[26] and TGD youth use it to find support and information, thereby building resilience.[11] A 2019 Pew Research Center report showed that 90% of American adults use the internet and 75% have broadband internet service at home, whereas older adults,

Table 2. Telehealth Quality Improvement Survey Results: Comparison of Clinic and Video Visits

	PRE (CLINIC: BASELINE) (N = 91)	POST (VIDEO: FOLLOW-UP) (N = 91)	*Z*-STATISTICS/*P*-VALUE	TOTAL (*N* = 182)
Easy communication				
Mean	1.20	1.24	−0.62/0.537	1.22
Median [min, max]	1.00 [1.00, 3.00]	1.00 [1.00, 4.00]		1.00 [1.00, 4.00]
IQR [Q1, Q3]	0.00 [1.00, 1.00]	0.00 [1.00, 1.00]		0.00 [1.00, 1.00]
Privacy				
Mean	1.18	1.25	−1.61/0.108	1.21
Median [min, max]	1.00 [1.00, 3.00]	1.00 [1.00, 3.00]		1.00 [1.00, 3.00]
IQR [Q1, Q3]	0.00 [1.00, 1.00]	0.00 [1.00, 1.00]		0.00 [1.00, 1.00]
Understand communication				
Mean	1.21	1.23	−0.63/0.527	1.22
Median [min, max]	1.00 [1.00, 3.00]	1.00 [1.00, 3.00]		1.00 [1.00, 3.00]
IQR [Q1, Q3]	0.00 [1.00, 1.00]	0.00 [1.00, 1.00]		0.00 [1.00, 1.00]
Convenience				
Mean	2.36	1.21	−6.28/<0.001	1.79
Median [min, max]	2.00 [1.00, 5.00]	1.00 [1.00, 3.00]		1.00 [1.00, 5.00]
IQR [Q1, Q3]	2.00 [1.00, 3.00]	0.00 [1.00, 1.00]		1.00 [1.00, 2.00]
Time spent				
Mean	2.93	4.55	−6.96/<0.001	3.74
Median (min, max)	3.00 [1.00, 5.00]	5.00 [3.00, 5.00]		4.00 [1.00, 5.00]
IQR [Q1, Q3]	2.00 [2.00, 4.00]	1.00 [4.00, 5.00]		2.00 [3.00, 5.00]
Travel time				
Mean	2.63	1.03	−8.19/<0.001	1.83
Median [min, max]	2.00 [1.00, 4.00]	1.00 [1.00, 2.00]		1.00 [1.00, 4.00]
IQR [Q1, Q3]	1.00 [2.00, 3.00]	0.00 [1.00, 1.00]		1.00 [1.00, 2.00]
Acceptability				
Mean	1.65	1.35	−2.93/0.003	1.50
Median [min, max]	2.00 [1.00, 4.00]	1.00 [1.00, 3.00]		1.00 [1.00, 4.00]
IQR [Q1, Q3]	1.00 [1.00, 2.00]	1.00 [1.00, 2.00]		1.00 [1.00, 2.00]
Satisfaction				
Mean	1.41	1.30	−1.39/0.165	1.35
Median [min, max]	1.00 [1.00, 4.00]	1.00 [1.00, 3.00]		1.00 [1.00, 4.00]
IQR [Q1, Q3]	1.00 [1.00, 2.00]	1.00 [1.00, 2.00]		1.00 [1.00, 2.00]
Future use				
Mean	1.57	1.32	−2.57/0.01	1.45
Median [min, max]	1.00 [1.00, 4.00]	1.00 [1.00, 3.00]		1.00 [1.00, 4.00]
IQR [Q1, Q3]	1.00 [1.00, 2.00]	1.00 [1.00, 2.00]		1.00 [1.00, 2.00]

Wilcoxon Signed Ranks Test; IQR, interquartile range; Q1, quartile 1; Q3, quartile 3.

Table 3. Communication and Satisfaction: Respondents Who "Strongly Agree" or "Agree"

SURVEY STATEMENT	CLINIC VISIT ($N=91$), %	VIDEO VISIT ($N=91$), %
I could easily talk to the health care provider during the visit.	98.9	100
My privacy was protected during the visit.	98.7	97.8
I was able to understand the provider's recommendation.	98.9	98.9
Overall, I am satisfied with the quality of the service being provided by the visit.	95.6	96.7

racial minorities, rural residents, and those with lower education or income levels are less likely to have home broadband.[46] Therefore, telehealth may exclude TGD youth most in need of improved access to gender-affirming care.

To facilitate response rate, the survey was limited to nine questions, and demographics were not collected. Therefore, results could be biased due to qualities of the respondents. Although the survey questions were adapted from questionnaires used in telehealth research, they were not validated for TGD youth, and psychometric parameters such as sensitivity, specificity, and reliability are not available. The survey also lacked qualitative data, which would have enabled participants to explain, expand, or add to their opinions. Due to rapid implementation of telehealth during the SARS-CoV-2 pandemic, the surveys were administered in sequence after a completed visit during the survey distribution phase. As a result, recall bias was introduced as patients answered questions based on both the recent visit and one that occurred months earlier.

As we develop a sustainability plan to implement a hybrid clinic–video visit gender care program, we plan to readminister the survey after clinic and video visits to collect quantitative, qualitative, and demographic data to capture the patient experience with telehealth and determine whether there are demographic differences for responses. This will enable us, if needed, to design interventions to increase access to telehealth for patients of specific demographics.

As a cross-sectional design, the QI project could not follow longitudinal changes in participant experience comparing clinic and video visits. As patients gain experience with videoconferencing and access to technology and broadband increases, patient attitudes regarding telehealth communication, access, and satisfaction may improve. Future research with TGD youth using longitudinal, randomized controlled studies comparing these attitude changes from clinic visits to video visits is needed to guide gender program telehealth services.

Finally, the telehealth QI project was completed during SARS-CoV-2, which bypassed the complex regulatory framework for telehealth that requires providers to comply with multiple federal and state policies regarding reimbursement for services, health professional licensing, credentialing and privileging, online prescribing, medical malpractice and professional liability insurance, privacy and security, and fraud and abuse.[16,17,47] Due to SARS-CoV-2, the Centers for Medicare and Medicaid Services (CMS) broadened access to telehealth on a temporary basis under the 1,135 waiver authority and Coronavirus Preparedness and Response Supplemental Appropriations Act.[17] This bypassed state policies that limited telehealth to patients located in the state of provider licensure, and it mandated equal reimbursement for telehealth and clinic services. Due to patient and provider demand for telehealth,[22,48,49] many of the regulations are likely to evolve long-term, and the CAGC telehealth sustainability plan must include compliance with changing regulatory requirements.

Conclusions

Despite clinical practice guidelines from the Endocrine Society,[3] American Academy of Pediatrics,[50] and the World Professional Association for Transgender Health,[51] few TGD youth who desire gender-affirming medical treatments actually receive them.[9,15] Interdisciplinary gender clinics offer quality, team-based, coordinated care, but patients may need to travel long distances to access such services. Healthy People 2020 recommends increasing the use of telehealth to improve access to health care,[52] and the Patient Protection and Affordable Care Act (2010) proposed the meaningful use of telehealth to improve health care and population health.[26] The SARS-CoV-2 pandemic has elevated the role of telehealth, which has been shown to be an effective and satisfactory method of delivering health care services. The UCSF CAGC telehealth QI project demonstrated that video visits increased access to gender-affirming services, acceptability, and intention for future use while maintaining excellent communication, quality, and overall patient satisfaction. Although considerations such as regulatory compliance and improving access for rural and low socioeconomic TGD youth must be addressed, the success of the QI project justifies a long-term hybrid clinic–video visit model to increase access to gender-affirming care.

Authors' Contributions

M.R.R. led the project design, implemented the project, distributed surveys, and wrote the article. R.L.R. assisted with

the project design. S.M.R. assisted with the project design, formal needs assessment survey distribution, and article review. J.Y.L. assisted with the project design, formal needs assessment survey distribution, data interpretation, and article editing.

Disclaimer

The content is solely the responsibility of the authors and does not necessarily represent the official views of Samuel Merritt University or the National Institutes of Health.

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