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Objective: To document the experience of 14 academic child and adolescent psychiatry programs in transitioning to and managing telehealth services during the COVID-19 pandemic. The goal was to understand how programs adopted and sustained telehealth during the pandemic. Telehealth was defined as services delivered via videoconferencing and telephony.

Method: In this descriptive study, faculty from 14 programs completed online surveys about the use of both telehealth and in-person services from February 2020 to June 2021. Survey questions addressed telehealth practices (eg, policies, support resources), monthly service utilization, telehealth modality (videoconferencing vs telephony), and missed appointments.

Results: Programs varied in the proportion of appointments delivered by telehealth before the pandemic (February 2020; 0%-27%). By May 2020, all programs were providing a majority of visits via telehealth (64%-100%). In June 2021, all programs continued to provide services via telehealth (41%-100%) and reported that they would continue to do so moving forward. Programs addressed many challenges to telehealth provision during the study period, including adding interpreter services, technological support for providers and patients, and formalizing safety and training requirements.

Conclusion: Academic child and adolescent psychiatry programs provided outpatient services primarily via telehealth throughout the COVID-19 pandemic and reported that they planned to continue using telehealth in combination with in-person services moving forward. Academic programs should address logistical, technological, and financial barriers to the sustained use of telehealth.

Key words: ambulatory care; COVID-19; telemedicine; videoconferencing

At the start of the COVID-19 pandemic, the Centers for Medicare and Medicaid in the United States and provincial billing code modifications in Canada allowed for expansion of telehealth services, including videoconferencing and real-time audio-only (ie, telephony) appointments, to facilitate access to health care in the context of public health restrictions.[1-3] Child and adolescent mental health care providers were early and quick adopters of telehealth.[4,5] Folk *et al.*[4] documented the rapid transformation of child and adolescent mental health services in academic settings; programs transitioned to providing primarily home-based telehealth

services within 2 weeks of the onset of the pandemic restrictions. Despite the World Health Organization and the US Department of Health and Human Services issuing an end to the COVID-19 public health emergency in May 2023, mental health care delivery has continued largely via telehealth, even as other health care pediatric subspecialties have returned to in-person practice.[6]

To date, there has been little research on rates of telehealth vs in-person service provision and utilization in outpatient mental health care settings beyond the initial transition from in-person to telehealth services at the start of the pandemic. One study indicated that use of mental health

care improved over the course of the pandemic, with pediatric behavioral health cancellations being reduced from 30.3% before the pandemic to 18.5% in the first 10 months of the pandemic.[7] Another study indicated that substance use clinics that adopted telehealth during the COVID-19 pandemic intended to continue at least partial use of telehealth.[8] However, a study in a community mental health clinic suggested that telehealth as a service delivery method was less preferred by clients and providers for children than adults and that telehealth for children was more acceptable for psychiatry medical services than for psychotherapy.[9]

The current study is a follow-up to our prior report of the acute transition of 8 academic child and adolescent programs to telehealth[4] with the objective of describing the continuing use of telehealth in the provision of outpatient mental health services through the first half of 2021. Given that the use of telehealth in mental health services has persisted longer than in other pediatric specialties, it is critical to understand telehealth practices, provision, and challenges across a range of programs. The current study examined telehealth practices and both telehealth and in-person service utilization using a nonrandom sample of child and adolescent psychiatry programs in North American academic medical centers from February 2020 to June 2021. Having previously reported on 8 sites with 9 total child and adolescent psychiatry programs, the current study includes 13 sites with 14 total programs.

METHOD

Definitions
Consistent with Folk et al.,[4] telehealth is defined as interactive services delivered to patients in real time through telephone or videoconference. To specify either of these modalities individually, we use the terms telephony and videoconferencing, respectively.

Sample
This study included a nonrandom sample of 14 programs at 13 academic medical centers in the United States and Canada that provide outpatient child and adolescent psychiatry services. We excluded other psychiatric service providers due to wide variability in models of care, staffing, and reimbursement at community health centers or standalone programs. The following 8 academic programs included in this study had participated in our previous study: Children's Hospital Colorado (CHCO), Hospital for Sick Children (SickKids), Nationwide Children's Hospital (NCH), Seattle Children's Hospital (SCH), Zucker Hillside Hospital (ZHH), Zuckerberg San Francisco General Hospital (ZSFGH), and 2 programs from New York University Langone Health (NYU Health Child Study Center and

NYU Brooklyn.[4] Six new programs were added: Boston Medical Center (BMC), British Columbia Children's Hospital (BCCH), Texas Children's Hospital (TCH), University of Florida Health (UFH), University of Maryland Children's Hospital (UMCH), and University of New Mexico Health Sciences Center (UNM).

Measures and Procedure
Representatives from the programs collaboratively developed an online survey adapted from the survey used in Folk et al.[4] The objective of this survey was to understand in-person and home-based telehealth service utilization during the COVID-19 pandemic. The study period was February 2020 through June 2021, approximately 1 year after the collection of data for the original study. Two surveys were created, one for programs that participated in our previous study[4] and one for new programs. Surveys were completed in fall 2021. Programs that participated in the previous study reported on telehealth practices as of June 2021; information about telehealth practices before the pandemic was collected in May 2020 (see Folk et al.[4] for details) and is presented here for comparison. New programs reported on their telehealth practices before the pandemic (consistent with Folk et al.[4]) and as of June 2021.

Surveys were completed by mental health care providers (including faculty psychiatrists, nurse practitioners, and psychologists) at each site who receive regular feedback from clinic staff and leadership related to service delivery as part of their clinical and administrative roles. NYU Langone Health included 2 programs (private and public settings) and therefore completed 2 surveys. In total, there were 14 survey responses: 8 programs surveyed in the previous study and 6 new programs. As in our previous study, we confirmed with 2 institutional review boards that this data collection did not constitute human subjects research.[4]

Survey Content
Site Characteristics. Programs were asked to provide current descriptive characteristics at the program level, including whether the site was a public or private institution, urbanicity, safety-net status (safety-net hospitals provide services to all comers regardless of insurance status), and the number of staff and trainees). Programs also provided the sociodemographic characteristics of the patient population served.

Telehealth Practices. The survey included items assessing the platforms used for videoconferencing and electronic medical record (EMR) and specific policies and procedures for telehealth services (eg, whether providers were required to be on site, provider training requirements, and formalized

safety protocols). Respondents provided information about support services for patients and providers related to telehealth (eg, interpreter services, provision of devices or prepaid phone plans). They also reported whether they experienced a series of challenges related to telehealth service provision (eg, ordering laboratory tests, form completion, and vital signs and weight monitoring). Finally, respondents were asked about the anticipated future of telehealth service delivery in their programs; specifically, they were asked whether the programs intended to return to a model of care comparable to what was offered before the pandemic, a hybrid model including in-person and telehealth services, or an expansion of telehealth services as a primary form of service delivery.

Service Utilization. Each site was asked to report the number of completed and missed visits per month (February 2020 through June 2021). Aggregate visit numbers were reported by modality (in-person, telephony, or videoconferencing) and service type (new intakes, follow-up visits [medication management, individual therapy, family therapy], or group therapy). One program (UNM) did not provide service utilization data. Three programs did not distinguish between telephony and videoconferencing (BMC, CHCO, and UMCH). Two programs did not provide data for intake visits (NCH and UMCH). Five programs did not provide data for group therapy; 3 of these programs offered group therapy but did not share utilization data (NCH, TCH, and UFH), and 2 programs did not offer group therapy during the study period (BMC and UMCH). Three programs did not provide counts for missed appointments (BCCH, NYU Health Child Study Center, and ZSFGH).

RESULTS

Site Characteristics

Descriptive statistics about participating programs are presented in Table 1. Two programs were located in 2 Canadian provinces, and 12 programs were located in 11 US states. Of the 8 programs at public hospitals, 5 identified as safety-net hospitals. An additional 3 private hospitals identified as safety-net hospitals. The median proportion of patients served by Medicaid was 40% for programs in the United States that reported the proportion of patients served by Medicaid. Study programs served racially, ethnically, and linguistically diverse patient populations.

Telehealth Practices

As of June 2021, Epic (Verona, Wisconsin) was the most common EMR system (10 programs), and Zoom (San Jose, California) was the most used telehealth platform

(8 programs). Other EMR systems included myAvatar (Netsmart, Overland Park, KS) and PowerChart (Cerner, Kansas City, MO). Other telehealth platforms used included Vidyo (Hackensack, NJ), Doximity (San Francisco, CA), Webex (Cisco, San Jose, CA), and Microsoft Teams (Microsoft, Redmond, WA). Nine programs reported their telehealth and EMR were integrated, allowing providers to launch telehealth visits from within the EMR and add clinical data and notes to the patient's record during the visit. Seven programs had interpreter services integrated with their telehealth platform. Technological support was provided for health care providers by 12 sites, and 8 sites provided technological support for patients. In addition, 3 programs reported they were providing devices, internet access, or prepaid phone plans to patients for telehealth connectivity. Programs reported using both written (10 programs) and verbal (13 programs) methods of consent for telehealth services.

Table 2 summarizes descriptive statistics related to telehealth practices before and during the pandemic. Nine programs reported offering some telehealth services before the onset of the COVID-19 pandemic. By June 2021, there were more formalized telehealth practices as well as more flexibility for both providers and patients. Formalized safety protocols related to telehealth existed for 12 programs, and 9 programs had implemented provider training requirements. In addition, 12 programs allowed providers to conduct telehealth appointments from home, and all programs allowed patients to receive services at home.

Programs reported a range of challenges related to adapting workflows to telehealth technology. Approximately half of programs reported challenges delivering care via telehealth (8 programs) and ordering laboratory tests (6 programs). The most common challenges reported were difficulty monitoring patient vital signs (12 programs) and with form completion (11 programs). Looking forward, none of the programs anticipated returning to a service delivery model comparable to that used before the pandemic. Of 14 programs, 12 anticipated using a hybrid model with both in-person and telehealth services, and 1 program anticipated continued expansion of telehealth services (one site did not respond to this survey item).

Service Utilization

By April 2020, the first full month of the declared COVID-19 pandemic, all but one program (BCCH) had pivoted to a predominantly telehealth practice. Figure 1A shows the proportion of outpatient visits occurring each month via telehealth from February 2020 through June 2021. A box-and-whisker plot of these data is presented in Figure 1B. In

TABLE 1 Site Characteristics

General site information				Patient population				Clinical providers				
Name; affiliation	Location	Type	Medicaid (%)	Race/ethnicity	(%)	Primary language	(%)	FTE staff	Total FTE	FTE trainees	Total FTE	Total visits
BC Children's Hospital; University of British Columbia	Vancouver, British Columbia, Canada	Public hospital	N/A	Nothing reported		English	(79)	Clinical psychology	(7)	Nothing reported		11,885
						Spanish	(0.5)	Psychiatry	(11.5)			
						French	(0.4)	Psychiatric NP	(0.8)			
						Mandarin, Cantonese	(6.5)	Master's level	(11)			
								Other	(3.7)			
Boston Medical Center; Boston University School of Medicine	Boston, Massachusetts	Private hospital, safety-net	93	AI/AN	(0.1)	English	(79.7)	Clinical psychology	(3.5)	Clinical psychology	(1.5)	15,716
				Asian	(1.9)	Spanish	(15.8)	Psychiatry	(6.5)	Psychiatry	(22.5)	
				Black, AA	(39.9)			Psychiatric NP	(1.0)	Master's level	(3.5)	
				Hispanic, Latinx	(40)			Master's level	(7.0)			
				White	(18.1)							
				Other	(0.2)							
Children's Hospital Colorado; University of Colorado School of Medicine	Aurora, Colorado	Private hospital	30	AA	(3.4)	English	(96)	Clinical psychology	(4.9)	Clinical psychology	(5.4)	37,606
				AI/AN	(0.3)	Spanish	(3)	Psychiatry	(3.5)	Psychiatry	(0.6)	
				Asian	(1.6)	Other	(1)	Master's level	(10.6)			
				Hispanic, Latinx	(19)							
				NHPI	(0.1)							
				White	(71.1)							
				Other	(4.5)							
University of New Mexico Hospital; University of New Mexico	Albuquerque, New Mexico	Public hospital, safety-net	51	AI/AN	(11)	English	(68.5)	Clinical psychology	(4.5)	Clinical psychology	(6)	Nothing reported
				Asian	(1.8)	Spanish	(26.5)	Psychiatry	(5)	Psychiatry	(5)	
				Black, AA	(2.6)	Other	(5)	Psychiatric NP	(1)	Psychiatric NP	(2)	
				Hispanic, Latinx	(49.3)			Master's level	(14)	Master's level	(2)	
				NHPI	(0.2)							
				White	(81)							
Nationwide Children's Hospital; The Ohio State University	Columbus, Ohio	Public hospital, safety-net	39	AI/AN	(0.1)	English	(92)	Clinical psychology	(74)	Clinical psychology	(15)	315,843
				Asian	(2.3)	Spanish	(3.7)	Psychiatry	(25)	Psychiatry	(8)	
				Black, AA	(19.1)	French	(2)	Psychiatric NP	(25)	Psychiatric NP	(2)	
				Hispanic, Latinx	(5.2)	Mandarin, Cantonese	(2)	Master's level	(313)			
				NHPI	(0.2)	Other	(3.3)					
				White	(63.7)							
				Other	(9.4)							
NYU Langone Brooklyn Family Health Centers Pediatric Behavioral Health; NYU Langone Health	New York, New York	Public hospital	43	AI/AN	(2.9)	English	(74)	Clinical psychology	(10)	Nothing reported		37,613
				Asian	(4.5)	Spanish	(23)	Psychiatry	(10.5)			
				Black, AA	(14.5)	Mandarin, Cantonese	(2)	Psychiatric NP	(2)			
				NHPI	(2.15)	Other	(1)	Master's level	(34)			
				White	(39.9)							
				Other	(36.1)							

TABLE 1 Continued

General site information			Patient population					Clinical providers				Total visits
Name; affiliation	Location	Type	Medicaid (%)	Race/ethnicity	(%)	Primary language	(%)	FTE staff	Total FTE	FTE trainees	Total FTE	
NYU Langone Health Child Study Center, Department of Child and Adolescent Psychiatry; New York University Grossman School of Medicine	New York, New York	Private hospital	Nothing reported	Nothing reported		English	(99)	Clinical psychology	(48)	Clinical psychology	(25)	74,217
								Psychiatry	(19)	Psychiatry	(20)	
								Psychiatric NP	(1)	Master's level	(1)	
								Master's level	(3)			
								Other	(1)			
Seattle Children's Hospital; University of Washington School of Medicine	Seattle, Washington	Private hospital, safety-net	39	AI/AN	(0.6)	English	(92.7)	Clinical psychology	(21.6)	Clinical psychology	(0.2)	33,428
				Asian	(7)	Spanish	(4.3)	Psychiatry	(4)	Psychiatry	(1.1)	
				Black, AA	(6)	Mandarin, Cantonese	(0.3)	Psychiatric NP	(4.4)			
				Hispanic, Latinx	(15)	Other	(2.7)	Master's level	(4.3)			
				NHPI	(0.6)							
				White	(55.2)							
				Other	(0.5)							
SickKids Hospital; University of Toronto	Toronto, Ontario, Canada	Public hospital	N/A	Nothing reported		Nothing reported		Clinical psychology	(1)	Clinical psychology	(1)	14,437
								Psychiatry	(7.7)	Psychiatry	(1)	
								Psychiatric NP	(1)			
								Master's level	(5.4)			
								Other	(4.5)			
Texas Children's Hospital; Baylor College of Medicine	Houston, Texas	Private hospital	40	AI/AN	(0.7)	Nothing reported		Psychiatry	(10)	Psychiatry	(7.75)	11,703
				Asian	(4.2)			3.0 Master's level	(3)			
				Black, AA	(19.5)							
				Hispanic, Latinx	(37.8)							
				NHPI	(0.1)							
				White	(75.6)							
University of Florida Health	Gainesville, Florida	Public hospital, safety-net	12	AI/AN	(0.1)	English	(96.9)	Nothing reported		Nothing reported		82,865
				Asian	(1.7)	Spanish	(2)					
				Black, AA	(6)	Other/unknown	(1.1)					
				Hispanic, Latinx	(2)							
				NHPI	(0.01)							
				White	(82.7)							
				Other	(7.5)							
University of Maryland Children's Hospital	Baltimore, Maryland	Public hospital, safety-net	100	AI/AN	(0.3)	English	(98)	Psychiatry	(0.5)	Psychiatry	(13)	8,736
				Black, AA	(78.3)	Spanish	(2)	Master's level	(5)			
				Hispanic, Latinx	(5.1)							
				NHPI	(0.2)							
				White	(15.2)							
Zucker Hillside Hospital, Child and Adolescent	Queens, New York	Private hospital, safety-net	30	AI/AN	(1)	English	(96)	Clinical psychology	(1.7)	Clinical psychology	(2)	30,777

(continued)

TABLE 1 Continued

General site information | | | | **Patient population** | | | | | | **Clinical providers** | | | |

Name; affiliation	Location	Type	Medicaid (%)	Race/ethnicity	(%)	Primary language	(%)	FTE staff	Total FTE	FTE trainees	Total FTE	Total visits
Outpatient Psychiatry Department, Northwell Health; Zucker School of Medicine at Hofstra/Northwell				Asian Black, AA Hispanic, Latinx NHPI White Other	(1) (19) (8) (1) (55) (17)	Spanish French Mandarin, Cantonese Other	(1) (1) (1) (1)	Psychiatry Psychiatric NP Master's level Other	(2.65) (0.8) (4.4) (1)	Psychiatry	(6)	
Zuckerberg San Francisco General Hospital, Child and Adolescent Services; University of California, San Francisco	San Francisco, California	Public hospital, safety-net	100	Black, AA Hispanic, Latinx NHPI White Other	(10) (68) (4) (6) (12)	English Spanish Mandarin, Cantonese Other	(70)ᵃ (50) (2) (1)	Clinical psychology Psychiatry Master's level	(1.8) (0.2) (4.25)	Clinical psychology Psychiatry Master's level	(5.1) (0.1) (1.5)	4,158

Note: AA = African American; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian or other Pacific Islander; NP = nurse practitioner.
ᵃReflects the language in which services are received; children and families may receive services in multiple languages (eg, child receives individual therapy in English, while family therapy is provided in Spanish).
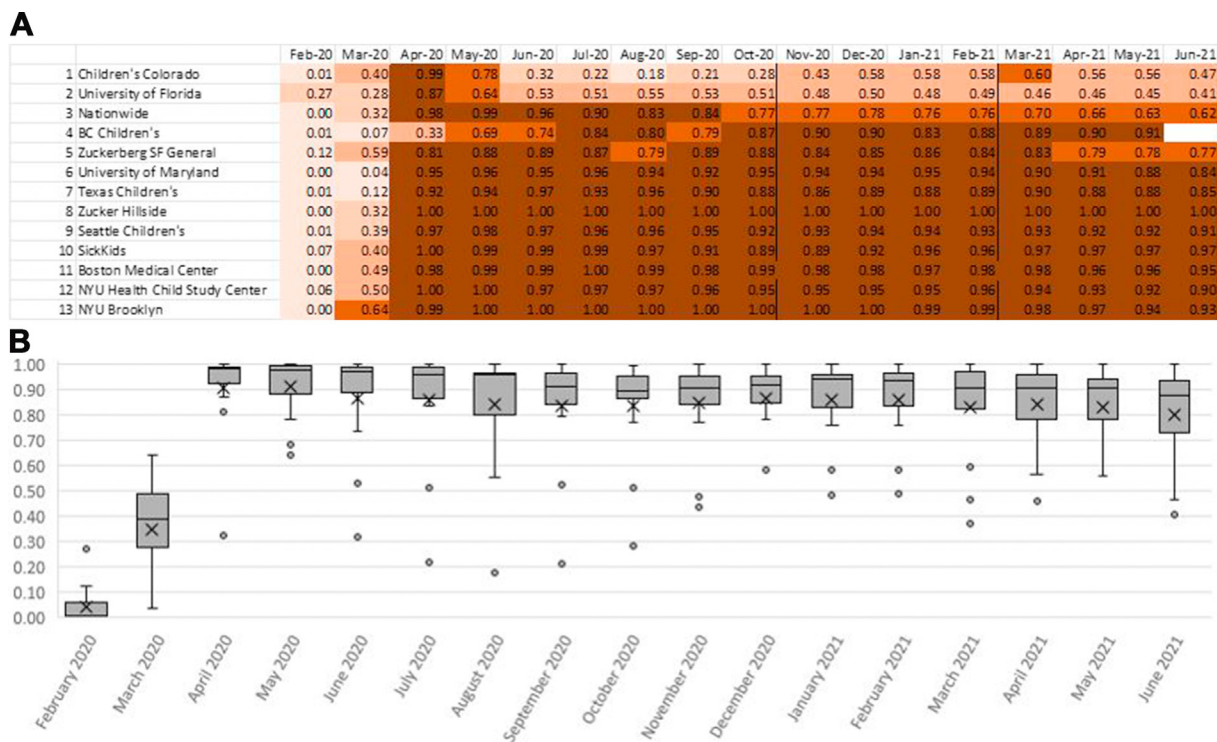

TABLE 2 Telehealth Practices

Practice	Before pandemicᵃ	June 2021ᵇ
Allow providers to provide telehealth services from home	3/9	12/14
Allow patients to receive telehealth services from home	3/9	14/14
Provider training requirements	4/9	9/14
Provider credentialing requirements	4/9	4/14
Formalized safety protocols	3/9	12/14
Allow billing	7/9	14/14
Documentation requirements	5/9	14/14
Train support staff to facilitate service delivery	3/9	11/14

Note: ᵃData available for 9 sites.
ᵇData available for 14 sites.

February 2020, the proportion of visits occurring via telehealth ranged from 0% to 27% (mean [SD] = 0.04 [0.08], median = 0.01). Of the 13 programs providing service utilization data, only 2 (UFH and ZSFGH) reported that more than 10% of visits occurred via telehealth in February 2020. In March 2020, when the initial lockdowns in the United States and Canada took place, the proportion of visits occurring via telehealth ranged from 7% (BCCH) to 64% (NYU) (mean [SD] = 0.35 [0.19], median = 0.39).

For the remainder of the study period (May 2020 through June 2021), most programs (10 of the 12 programs providing service utilization data) relied mainly on telehealth for the provision of services (means ranged from 0.80 to 0.91 and medians ranged from 0.88 to 0.98). However, there were a few notable outliers. At CHCO, 18% to 32% of visits occurred via telehealth from June 2020 through October 2020. From November 2020 through June 2021, 43% to 58% of visits were conducted via telehealth. The proportion of visits at CHCO occurring via telehealth then remained at approximately 50% through the end of the study period, a considerably lower level than the other programs. At the UFH, an initial increase in telehealth services after the onset of the pandemic was followed by a smaller decrease in the proportion of telehealth visits by June 2020, after which the proportion of visits occurring via telehealth remained around 50% from June 2020 through June 2021. Two other programs, NCH and ZSFGH, started earlier than other programs to transition back to in-person services by October 2020 and April 2021, respectively. In June 2021, the proportion of visits being conducted via telehealth at each site ranged from 41% to 100% (mean [SD] = 0.80 [0.20], median = 0.88).

**FIGURE 1** Proportion of Visits per Site Occurring via Telehealth

A

		Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
1	Children's Colorado	0.01	0.40	0.99	0.78	0.32	0.22	0.18	0.21	0.28	0.43	0.58	0.58	0.58	0.60	0.56	0.56	0.47
2	University of Florida	0.27	0.28	0.87	0.64	0.53	0.51	0.55	0.53	0.51	0.48	0.50	0.48	0.49	0.46	0.46	0.45	0.41
3	Nationwide	0.00	0.32	0.98	0.99	0.96	0.90	0.83	0.84	0.77	0.77	0.78	0.76	0.76	0.70	0.66	0.63	0.62
4	BC Children's	0.01	0.07	0.33	0.69	0.74	0.84	0.80	0.79	0.87	0.90	0.90	0.83	0.88	0.89	0.90	0.91	
5	Zuckerberg SF General	0.12	0.59	0.81	0.88	0.89	0.87	0.79	0.89	0.88	0.84	0.85	0.86	0.84	0.83	0.79	0.78	0.77
6	University of Maryland	0.00	0.04	0.95	0.96	0.95	0.96	0.94	0.92	0.95	0.94	0.94	0.95	0.94	0.90	0.91	0.88	0.84
7	Texas Children's	0.01	0.12	0.92	0.94	0.97	0.93	0.96	0.90	0.88	0.86	0.89	0.88	0.89	0.90	0.88	0.88	0.85
8	Zucker Hillside	0.00	0.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	Seattle Children's	0.01	0.39	0.97	0.98	0.97	0.96	0.96	0.95	0.92	0.93	0.94	0.94	0.93	0.93	0.92	0.92	0.91
10	SickKids	0.07	0.40	1.00	0.99	0.99	0.99	0.97	0.91	0.89	0.89	0.92	0.96	0.96	0.97	0.97	0.97	0.97
11	Boston Medical Center	0.00	0.49	0.98	0.99	0.99	1.00	0.99	0.98	0.99	0.98	0.98	0.97	0.98	0.98	0.96	0.96	0.95
12	NYU Health Child Study Center	0.06	0.50	1.00	1.00	0.97	0.97	0.97	0.96	0.95	0.95	0.95	0.95	0.96	0.94	0.93	0.92	0.90
13	NYU Brooklyn	0.00	0.64	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.98	0.97	0.94	0.93

B

Note: (A) Proportion of outpatient visits occurring each month via telehealth from February 2020 through June 2021. (B) In box-and-whisker plot of data, each gray rectangle (box) represents the interquartile range (values in the 25th-75th percentile) for the indicated month. The line within the box represents the median, and X represents the mean. The lines extending vertically from each box (whiskers) show the lowest and highest values falling within 1.5 times the interquartile range from the first and third quartile, respectively. Dots represents outliers (all values that fall outside of the whiskers).

For programs that reported service utilization by visit type, we graphed the average proportion of visits occurring via telehealth for follow-up visits, new intakes, and group therapy (Figure 2). The initial transition to telehealth seemed to vary based on visit type. Averaged across programs, 41.2% of follow-up visits in March 2020 occurred via telehealth compared with 15.6% of new intakes and 7.2% of group therapy visits. By April 2020, 90.2% of follow-up visits occurred via telehealth compared with 67.6% of new intakes and 85.7% of group therapy visits. When the proportion of visits occurring via telehealth peaked in May 2020, 92.7% of follow-up visits, 88.0% of new intakes, and 100% of group therapy visits were conducted via telehealth. From June 2020 through June 2021, the average proportion of follow-up visits and new intakes occurring via telehealth across programs did not drop below 80%, and the average proportion of group therapy visits occurring via telehealth across programs did not drop below 90%.

By April 2020, telehealth visits were provided predominantly by videoconferencing, ranging from 84% to 94% of visits per site from May 2020 to June 2021.

Figure 3 shows the average proportion of telehealth visits per site occurring via videoconferencing compared with telephony across programs. In March 2020, there was a wide range in the proportion of telehealth visits occurring via videoconferencing (1%-100%, mean [SD] = 0.59 [0.41], median = 0.67). During April 2020, a greater proportion of telehealth visits occurred via videoconferencing (25%-100%, mean [SD] = 0.77 [0.24], median = 0.84). From May 2020 through June 2021, the majority of telehealth visits across programs occurred via videoconferencing (means ranged from 0.85 to 0.93 and medians ranged from 0.91 to 0.98). Three programs relied more than the others on telephony, particularly in the period before November 2020 (ZHH, NYU Brooklyn, and ZSFGH). Telephony remained an important back-up and alternative for telehealth services for most programs. Although it took longer to initiate tele-group therapy compared with individual telehealth visits, the proportion of tele-group to in-person visits remained high throughout the study period, consistent with the proportions observed for individual intakes and follow-up visits.

**FIGURE 2** Proportion of Visits by Site Occurring via Telehealth (by Visit Type)
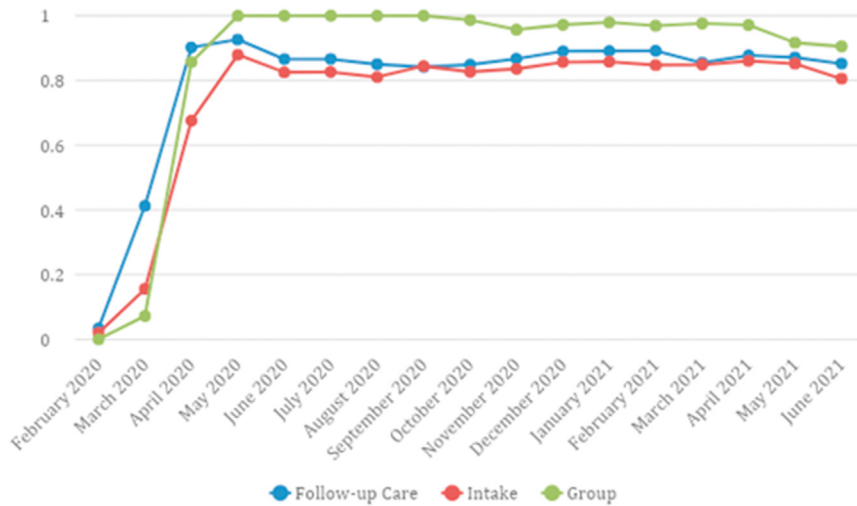
We also examined missed appointment rates at each site by visit modality. The rates of missed appointments for both in-person and telehealth visits by site are shown in Table S1, available online. Missed visit rates varied widely across sites for both in-person (3.3%-49.2%) and telehealth (6.3%-34.4%) visits. Missed visit rates for in-person appointments were significantly higher than for telehealth appointments at 2 sites (NYU Brooklyn and BMC) and significantly lower than for telehealth appointments at 6 sites (CHCO, SickKids, NCH, SCH, UFH, and ZHH). Missed visit rates did not differ between in-person and telehealth appointments at 1 site (TCH). In considering missed visit rates, it may be important to consider that a number of sites were providing more than 90% of services

via telehealth from April 2020 through the end of the study period (ZHH, SCH, BMC, and NYU Brooklyn).

DISCUSSION

The current study builds on our previous report of the successful transition of 9 programs at 8 academic child and adolescent psychiatry centers in the United States and Canada from in-person care to home-based telehealth at the start of the COVID-19 pandemic. Here, we report findings from a follow-up of telehealth use between February 2020 and June 2021. We added 6 more programs to provide greater geographical coverage and diversity of academic child and adolescent psychiatry programs.

FIGURE 3 Proportion of Telehealth Visits per Site Occurring via Videoconference (vs Telephony)
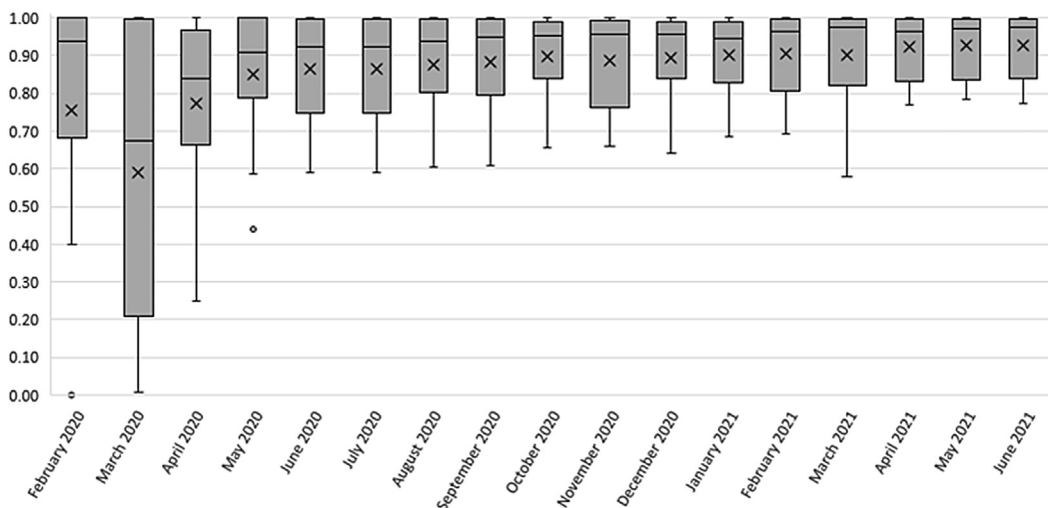
Most programs used Epic for EMR and Zoom for videoconferencing. Most programs used a platform that integrated their EMR and telehealth tasks, many of which also integrated interpreter services. These features likely facilitated providers' ease in using the technology both initially and over time. Most programs were able to quickly provide resources to support providers; resources to support patients were also available, although less frequently. An interesting finding that may herald the future of telehealth in academic settings was that a small number of program provided devices or prepaid phone plans to patients. As a telehealth visit can quickly deplete a patient's digital data, providing devices or prepaid plans may offer a new approach to delivering services to some of the most underserved and marginalized populations. Future research on the costs and benefits of this approach could help inform efforts, and financially sustainable strategies for technology access, to ensure that youth and families in need receive timely access to outpatient mental health care, particularly during times of crisis.

As programs pivoted to telehealth at the start of the pandemic, many practice barriers were quickly dropped by federal, state, and commercial payers and regulators in the United States (eg, credentialing of providers, approval of programs of service, and reimbursement using telehealth billing codes per *Current Procedural Terminology*.[10] By June 2021, additional changes had taken place. Most programs recognized the need to ensure best practices while continuing to allow both providers and patients to be at home during service delivery. Programs implemented safety protocols, required provider training, and trained support staff to facilitate telehealth service delivery; half of programs also provided technology training for patients. These efforts toward continuous improvement during the pandemic should be lauded. As the pandemic abates, published guidelines for child and adolescent telehealth should be honed and updated.[11]

Despite efforts to promote telehealth best practice more than a year into the pandemic, some challenges persisted. Providers had to modify traditional clinical practice, such as monitoring physiologic measures for children who were prescribed medication (ie, foregoing vital signs or laboratory tests because youth were not seen in person). Nonetheless, providers overwhelmingly noted that the pandemic forced awareness of alternatives to traditional in-clinic service delivery. They anticipate future clinical practice with a mix of in-person and telehealth appointments, ie, a hybrid model of service delivery. As hybrid models of care are likely here to stay, policymakers and institutions must define standards of practice. For example, health care organizations need to develop protocols that facilitate best practices for conducting timely laboratory tests, vital signs, and other medical and psychological assessments that require in-person visits, while still optimizing the use of quality telehealth services.

Programs differed in their provision and utilization of telehealth throughout the study period. Differences in regulations of states and provinces, variability of reimbursement, technology support, lack of program-specific guidelines for patient and provider behaviors during telehealth, program preferences, and variations in perceived patient and provider receptivity may have contributed to these variations. Nonetheless, some general patterns emerged regarding the use of telehealth to ensure broad access to psychiatric outpatient services. By April 2020, 13 of the 14 programs transitioned almost exclusively to telehealth. Subsequently, most visits across programs continued to occur through telehealth. A small number of sites returned to the use of in-person services on a larger scale, although even these sites were still using telehealth for at least 40% of visits in June 2021.

One important lesson gleaned from this follow-up study for future utilization was the adoption of technical supports to enable programs to rapidly implement and maintain videoconferencing, which was a new platform for most programs and providers. A second lesson was the persistence of telephony. While videoconferencing was the most frequently used platform, it can also require considerable technical support. Low-tech, low-cost telephony may have been crucial to reach families before they were able to begin using videoconferencing and to sustain care for families who did not have access to videoconferencing due to limited technology, low technological literacy, lack of reliable internet, and other barriers faced by marginalized communities. Several programs serving more marginalized populations relied more than others on telephony. Videoconferencing may remain the preferred telehealth modality, as it approximates in-person sessions with the ability to assess both the auditory and the visual components of the patient's mental status, but telephony may remain an important alternative for some patient populations, or at least for some patient encounters.

A third lesson was the difference in telehealth utilization by service type. Transitioning established individual outpatients to telehealth was a quicker process than enrolling new patients, which usually requires additional intake procedures and may have left some youth distressed while sheltering at home and awaiting care. The use of telehealth for group therapy sessions took longer to enact than for individual sessions, but programs were able to successfully transition even group therapy primarily to telehealth by May 2020. This finding is encouraging given the

contraindication for in-person group gatherings during pandemics. Despite these initial differences, once these service types were implemented, telehealth visits remained high across visit types through June 2021. These utilization findings support the feasibility and acceptability of ongoing telehealth for large populations of patients. A fourth lesson learned was the finding that missed appointment rates were generally lower for in-person visits than for telehealth visits, although this was not the case at all sites. This finding was surprising, as anecdotal reports during the pandemic suggested the missed appointment rate was lower for telehealth visits. In our previous study, 8 of 9 sites had similar or lower missed appointment rates for telehealth visits compared with in-person visits. It may be that the missed appointment rate for telehealth visits was lower than for in-person visits early on in the pandemic, but increased as the pandemic went on. Many factors may affect the ability of patients to keep scheduled appointments, and telehealth may therefore not help programs to improve attendance rates, even when families are "stuck at home." How telehealth and hybrid care affects missed appointment rates going forward is an important area of research and monitoring.

Our utilization data indicate the feasibility and acceptability of delivering psychiatric services virtually during prolonged crises, such as the COVID-19 pandemic. The success of telehealth programs during the pandemic underscores the role of government in health care. The US and Canadian governments were able to quickly reduce and clarify the regulatory burdens that prevented the widespread implementation of telehealth before the pandemic. Telehealth has the potential to allow youth to access patient-centered care by eliminating absences from school or extracurricular activities, caregivers' loss of income from missing work, and the need for transportation to health care facilities. Recognizing these benefits, the American Psychiatric Association has issued a policy statement advocating for the reduction of barriers to telepsychiatry and promoting its use going forward as a way to improve access to care.[12]

The success of academic child and adolescent psychiatry programs in pivoting to and sustaining telehealth services more than a year into the pandemic suggests future areas for development and examination. Academic programs should prepare now for potential future crises by integrating telehealth into routine mental health care services. Such preparation for a low likelihood event will also prepare our future generation of child and adolescent psychiatrists for practices that will likely include some component of telehealth delivered services—perhaps even across child-serving systems of care (eg, school-based consultations, rural mental health). In particular, programs will need to determine what combinations of in-person and telehealth care will be available for patients. Programs that plan to use hybrid models will need to define the circumstances in which they may provide individual patients 1 of 3 distinct service models: exclusive in-person care, exclusive telehealth care, and true hybrid care (where the same patient receives both in-person and telehealth care).

The American Board of Psychiatry and Neurology recently funded the development of a child and adolescent telepsychiatry training curriculum, suggesting growing academic interest in introducing telepsychiatry into training programs.[13,14] Curricula need to include approaches for establishing safety,[15] telehealth etiquette, interactional style (eg, verbal and nonverbal communication),[16] limit setting regarding the session environment (eg, not in public place), sites of service (eg, not in a moving vehicle), attire (eg, fully clothed, not exposed), and activities during sessions (eg, not multitasking). Approaches to these issues are not intuitive, and patients may regard telehealth sessions as more informal than in-person sessions. Curricula should also include approaches to establishing a therapeutic alliance during telehealth. Preliminary outcome data can be easily obtained through satisfaction ratings from providers and patients. Early research has indicated families' and referring physicians' satisfaction with clinic-based videoconferencing, and research early during the pandemic indicated providers' satisfaction with home-based telehealth.[17-19] Reassessment with home-based services is now indicated to help determine the best use of telehealth.

Future research should examine data related to costs, revenues, reimbursements, and missed appointments as part of developing an informed hybrid telehealth service delivery model and determining the sustainability of telehealth services. For example, programs may benefit financially by providing less office space for in-person sessions but will lose facility fees when patients are not treated on site. Behavioral health care systems must consider whether providers, particularly trainees, have the resources to practice from home and whether they would miss the professional development opportunities embedded into the collegiality of office practice (eg, quick in-person access to supervisors and peer consultation). Trainees may benefit from a clinic-based telehealth practice that offers opportunities for skill development in both telehealth and in-person care. Finally, while receiving services at home may be convenient for patients, insufficient privacy and safety may preclude virtual sessions for some youth and families. Moving forward, programs will need to examine which providers and patients are best suited for hybrid telehealth models and develop financial models to sustain telehealth service delivery.

This study has several limitations. First, data were from a nonrandom sample of 14 academic child and adolescent psychiatry programs in the United States and Canada that served urban and suburban communities, predominantly in coastal areas. Our programs' experiences may not fully represent the experiences of all academic programs, particularly programs serving rural or indigenous communities. Another limitation was the descriptive design, which relied on retrospective data collection from mental health care providers and clinic leadership at each participating site. Participants included faculty psychiatrists, psychologists, social workers, and nurse practitioners. Representatives from each site were encouraged to consult with multiple leaders and providers to complete the survey as accurately and thoroughly as possible. Service provision and utilization data were drawn from visit types and billing codes listed in the EMR. EMR data are subject to errors due to variability in recording visit types, particularly in differentiating videoconferencing and telephony sessions. Data were collected in aggregate form and not from individual patient charts, preventing disaggregation of the utilization data by patient demographic characteristics (eg, race, ethnicity). Our assessment of barriers did not include patients' input, which would help to elucidate how these system barriers affect the actual experience of families in accessing telehealth services. Finally, clinical outcome data or, at a minimum, satisfaction data from patients and providers would be crucial to understanding the value-added benefit of home-based telehealth to the mental health care landscape for children, adolescents, and families.

Our study highlights the ability of academic child and adolescent programs to transition to and sustain telehealth service delivery when supported by federal, state, and commercial regulators. The individual programs varied in their initial transition to telehealth and in their subsequent timing of return to in-person services. These variations depended on program-specific issues such as resources, administrative challenges, finances, staff acceptance, and patient perceptions of telehealth services. These findings underscore issues that clinicians, administrators, and policymakers in other academic programs in the United States and Canada are likely to encounter in implementing routine telehealth as part of their spectrum of mental health care services after the pandemic. The COVID-19 pandemic has demonstrated the value of telehealth for patients' access to mental health care and providers' practices. We call for academic child and adolescent psychiatry programs to document their experiences in implementing telehealth practice to help inform and promote equitable, quality, and sustainable telehealth service delivery going forward.

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