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# Impact of the COVID-19 Pandemic on the Care Continuum of Youth Living with HIV: Qualitative Study of the Scale It Up Program Clinical Sites

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## Abstract

The study objective was to explore the impact of COVID-19 pandemic restrictions on the clinics' ability to provide continuous healthcare services to youth (15–24 years) living with HIV (YLWH). One focused semi-structured interview was conducted with each HIV clinic site—resulting in ten interviews. Data were analyzed using thematic analysis techniques assisted by NVIVO coding software and themes indicating barriers and facilitators to providing uninterrupted healthcare were elicited. Six themes were identified that affected the care continuum of YLWH: Timeframe of clinic preparation to address COVID-19 restrictions; impact on treatment cascade monitoring data; impact on patient care; impact on staff and services offered; software use and virtual visits; community impact. With careful planning and preparation, clinics were able to successfully implement a process of care that adapted to COVID-19 restrictions. Guidance is provided on how healthcare facilities can effectively incorporate strategies to provide continued services during pandemics and natural disasters.

**Keywords** COVID-19 · HIV · Youth · Continuity of care · Treatment cascade

## Introduction

As of March 24, 2022, the COVID-19 pandemic has affected over 476 million people worldwide and led to over 6.1 million deaths [1]. Consequently, an urgent change in the delivery of care is necessitated as healthcare facilities have been pushed to capacity and a significant strain has been

placed on the global healthcare system. With the onset of the COVID-19 pandemic, healthcare facilities restricted care to emergency situations and cancelled routine and elective services [2]. Healthcare professionals also sought to develop creative solutions to mitigate the impact of the pandemic on their ability to provide uninterrupted and continuous care to populations living with chronic diseases. As we learned more about the COVID-19 disease, the process of delivering care had to remain fluid—as the situation was evolving quickly and presenting new and dangerous challenges. The evolving landscape of the healthcare system led to amplified use of telehealth services to manage increased patient load. Intensified use of telehealth services resulted from increased need of substance abuse treatment [3], challenges in management of treatment options for chronic conditions [4], increased prenatal care and pregnancy outcome concerns [5] and to provide continuous care and ensure healthcare professional and patient safety [6, 7].

Adolescents and young adults aged 15–24 years living with HIV (YLWH) have been distinctively impacted by the pandemic as they face many challenges to successful HIV treatment—however, the data are limited. YLWH have poorer outcomes on each step of the HIV care continuum (i.e., HIV diagnosis, linkage to HIV care, receipt of care,

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retention in care, achievement of viral suppression, maintenance of viral suppression) compared to adults 25 years of age and older [8]. The COVID-19 pandemic likely hinders YLWH's ability to secure and maintain scheduled appointments and treatment regimens and further negatively impacts outcomes on various steps of the HIV care continuum. Additionally, the large percentage of YLWH with mental health concerns likely undermine engagement in care and medication adherence and the COVID-19 pandemic likely adds to this burden [9].

Scale It Up (SIU), a collaborative program (U19) within the Adolescent Trials Network for HIV/AIDS Intervention (ATN), aims to bring to practice evidence-based self-management interventions to positively impact the youth HIV prevention and care cascades. The SIU U19 cores evaluate and prepare for implementation self-management interventions to increase the likelihood that youth will be adherent with each step of the HIV prevention and care cascades [10]. The Cascade Monitoring protocol [11]—a sub study of the SIU program [10]—was designed to monitor the HIV treatment cascade within the ATN to provide longitudinal, pragmatic effectiveness outcomes. The purpose of this current study was to conduct a qualitative exploration of the impact of the COVID-19 pandemic, and its imposed restrictions on the ability of SIU clinics to provide continuous health care services to YLWH. Primarily, we focused on the following two research objectives: (1) to understand the challenges from the COVID-19 pandemic for clinics within the Scale It Up program and (2) to investigate the strategic and operational responses to the COVID-19 pandemic by healthcare professionals.

## Methods

In compliance with ethical standards, this SIU: Cascade Monitoring study (ATN 154) was approved by an expedited review process by the single institutional review board of Florida State University (approval no. IRB00000446). All procedures performed in this study were in accordance with the ethical standards of the institutional review board.

### Study Participants

Study participants were the principal investigators of the ten Study Recruitment Venues (SRVs) participating in SIU. SRVs are located in different regions of the United States: (1) Baltimore—Johns Hopkins University, Maryland; (2) Birmingham—University of Alabama at Birmingham, Alabama; (3) Brooklyn—SUNY Downstate Medical Center, New York; (4) Los Angeles—Children's Hospital Los Angeles, California; (5) Memphis—St. Jude Children's Research Hospital, Tennessee; (6) Miami—University of

Miami, Florida; (7) Philadelphia—Children's Hospital of Philadelphia, Pennsylvania; (8) San Diego—University of California San Diego, California; (9) Tampa—University of South Florida, Florida; (10) Washington, DC—Children's National Health System, District of Columbia.

### Data Collection

One focused semi-structured interview was conducted with each of the ten HIV clinic site—resulting in a total of ten interviews. All interviews were conducted between August and November 2020 through teleconference and were recorded with permission granted from each site. Study participants were asked a standard set of questions developed by SIU investigators to determine the impact of the COVID-19 pandemic on their ability to provide continuous care to YLWH. Information was obtained regarding each clinic's preparation for possible shutdown of services. What were the initial procedures put in place in preparation for needed safety measures? How did the clinic site adapt to the constantly changing/fluid situation characteristic of an emerging pandemic? Investigators were also interested in how well the patients adapted to clinic site changes, clinic visit restrictions and modes of interactions with practitioners. Participant responses were audio recorded and transcribed verbatim.

### Data Analysis

Three trained coders utilized NVIVO (QSR International) for the analysis of the semi-structured interviews. Using NVIVO coding assistance software and manual coding, key concepts were isolated, themes developed, and quotes were identified within the interview transcripts that facilitated illustration of data analysis. Individual themes that indicated barriers and facilitators to providing uninterrupted health care during the COVID-19 pandemic were categorized in thematic grids. The coders resolved divergences in their understanding of participant perspectives via discussion among the three coders.

Our methodological approach was based on the thematic analysis outlined by Braun and Clarke [12]. The steps include the following: (1) transcription and checking transcripts with recordings for accuracy; (2) open coding from interview responses to be performed by two researchers independently; (3) agreement of initial codes to be discussed among the researchers and an initial codebook developed; (4) the code structure to be used for analyzing the remaining responses with openness to including new codes and refining existing ones; and (5) themes and subthemes to be identified from the final code structure and their relationships presented.

## Results

Ten transcripts for study clinic sites were available. Main study outcome measures captured individual themes indicating barriers and facilitators to providing uninterrupted health care to YLWH. Although the prevalence of COVID-19 cases within the general population varied across geographic regions, the clinic sites did not differ in their overall response to the COVID pandemic. Investigators saw clear indications and themes emerge through the coding of the transcripts. Six focused themes were identified that affected the care continuum of YLWH: Timeframe of clinic preparation to address COVID-19 restrictions; impact on treatment cascade monitoring data; impact on patient care; impact on staff and services offered; software use and virtual visits; community impact (see Table 1). Study sites also shared insight on the process of returning to the clinic after the height of the COVID-19 pandemic.

### Theme 1: Timeframe of Clinic Preparation to Address COVID-19 Restrictions

A clear timeline for the clinic response to the COVID-19 outbreak was observed among the SRVs. SRVs collectively reported a timeline spanning approximately 2 weeks in which they experienced the initial impact on the clinic of the spread of COVID-19 and began to modify clinic procedures during this time period of mid-March and the beginning

of April 2020. The “greatest impact began in the middle of March” and it was around this time “when the city and state came up with a kind of stay at home” with one site reporting “We shut down all clinic operations on March the 17th”. Some sites had ongoing outreach and HIV testing services during the start of the COVID-19 outbreak; however, those services were shut down by mid-March. In response to local and state imposed COVID-19 restrictions by the end of March, clinics prepared to modify the number and types of services offered. At this time, sites began to see more cases through modified in-clinic availability and alternative modalities of clinic services. Efforts were made to reduce the number of staff in the clinic to essential personnel to minimize potential spread of COVID-19.

Interviewees described a very fluid situation with changes to process occurring daily. One clinic site reported that:

within seven days’ time we had in place a robust telehealth program that was very quickly put together. And was pretty comprehensive in terms of its ability to ... provide counseling services and ... as much care as we could provide over a telehealth link.

In preparation for restricted access to the clinic, personnel sometimes called patients to let them know what this shutdown meant for them and to provide “information on resources about COVID and ... assess what the need of our population was”. Clinic patients with medication delivered to the clinic were given the opportunity to pick up the medication at the clinic. In many instances, patients received a

**Table 1** Illustrative quotes for study themes

Theme	Illustrative quote
Timeframe of clinic preparation to address COVID-19 restrictions	“our clinic started to modify at the end of March” “they(patients) all received a phone call from...either our case manager or patient navigator to discuss with them...the option for telehealth, how it would work”
Impact on treatment cascade monitoring data	“we were more permissive in letting longer lapses of time between blood draws” “I anticipate that we are going to have a significant lag in terms of our usual testing.”
Impact on patient care	“If anything could be potentially COVID related we sent them to the ER or urgent care or someplace else and they couldn’t be seen.” “That allowed us to keep up with patients medications, it allowed us to keep up with their symptoms and in many ways it actually improved our show rate.”
Impact on staff and services offered	“it’s clear that you do not necessarily get the same interactions with your patients when you’re doing it via telephone...as you would, if you were doing it in person” “I don’t think we’ve had...many changes to our numbers of...staff” “no one got furloughed or reassigned people have been working from home mostly”
Software use and virtual visits	“within seven days time we had in place a robust telehealth program that was very quickly put together” “the system was very open about these other modalities... and worst case scenario we would convert it to a call”
Community impact	“we’ve had some patients lose their jobs” “they (patients) were reaching out around support for housing or emergency financial assistance, food assistance, mental health care”

phone call from case managers or patient navigators to discuss the option of virtual clinic appointments. During these conversations, patients were informed about tele-health, how it would work, and also received basic COVID-19 education about precautions and what the shutdown order meant in terms of in-clinic visits and the practice of obtaining routine labs. Clinic personnel were committed to providing continuous service to patients by assessing the needs of the patient population and providing information on resource availability.

### **Theme 2: Impact on Treatment Cascade Monitoring Data**

One of the guiding objectives of this study was to explore the impact of the COVID-19 pandemic on the treatment cascade and the resulting impact on successful retention in care for YLWH. The first step in the care continuum is HIV testing and diagnosis. Some clinics brought in new patients during early stages of the pandemic restrictions while attempting to keep the “new patient process as intact as possible”. Some sites reported an increase in the number of referrals for new patients during this time and were able to quickly provide the newly diagnosed patients with care. Completing routine lab tests during timely clinic visits was problematic. CDC guidelines for YLWH call for two or more CD4 or viral load tests, performed at least 3 months apart. Given restrictions on face-to-face visits, clinic site providers expect to see time lags in the completed labs; however, most believe they were “pretty good about keeping between three and 6 months”. Care providers were generally more permissive in allowing longer lapses of time between blood draws for those patients who were consistently taking their antiretrovirals and on other measures of successfully managing their disease. Patients who had shown some difficulties with treatment adherence were asked to get their labs at the recommended time either at the clinic site or at a designated outside lab. Through consistent monitoring, site personnel also made every effort to ensure all medication therapies were picked up by or delivered to the patient. Additionally, several study site providers found that YLWH who had been lost to care or marginally engaged in care appeared more motivated to re-engage in care.

### **Theme 3: Impact on Patient Care**

The COVID-19 pandemic impacted patients in various ways including access to care, patient attitudes and patient behavior. In terms of clinic access, only COVID-19 asymptomatic patients could be seen in-clinic. Patients with certain symptoms that signified a possible STI, for example, could be seen; however, patients displaying symptoms that could be COVID related, such as an unproductive cough, were sent

to the emergency department or urgent care. In addition to obtaining clinical services, patients also visited the clinic for more tangible services such as food bank services and other essential items.

Clinic personnel expressed increased “distress” among the patient population. Along with the stigma attached to HIV, patients often expressed that COVID-19 had its own stigma. Patients were often more open about their HIV and often refrained from speaking about possible COVID-19 diagnosis due to the potential implications related to their employment and access to in-clinic care. Many patients who continued to work lost a lot of hours and experienced more financial issues. Additionally, social unrest heavily impacted patients and was often addressed with patients in clinical spaces. Many participated in demonstrations; however, even those who did not participate were certainly attuned and impacted by what was happening in terms of social justice. Consequently, there was a higher demand for counseling as patients who would not normally make time to see the therapist in person would do so virtually.

### **Theme 4: Impact on Staff and Services Offered**

The pandemic impacted staff and services offered across all the sites. All sites stated they did not lose staff to COVID-19 teams or to furlough, however, staff were often working remotely, conducting virtual visits, and maintaining communications with patients. Staff in the office were frequently rotated to limit the number of people and maintain social distance; many older staff were not allowed to see patients in-person. Access to clinics were negatively affected for patients needing transportation assistance. Options for transportation were greatly diminished as many of these services were not operational during the pandemic. Services that changed was the ability to physically examine individuals—which was described as “very frustrating”. Designated laboratories routinely utilized by patients were closed and labs were being collected in the clinic by staff. Clinics sometimes absorbed the costs for lab work not covered by insurance companies in order for patients to continue scheduling laboratory visits for routine viral load and CD4 testing. The intensity of the virtual visits was limited in the amount of information covered due to technical, scheduling and privacy issues. Practitioners often reported not discussing “risk stuff” with the younger patients because other family members were present, and patients were not comfortable disclosing practices and/or behaviors.

The COVID-19 pandemic impacted how patients received services and the availability of services at the clinics. The mode of delivery for clinic visits transitioned to a virtual platform for most visits when the clinics shut down. Some clinics were only able to see select patients in-person to keep the number of people in the building to the minimum—often

reserving these in-person visits for new patients or patients that did not have their HIV under control. This was a necessary “modification of patient’s actual clinic availability” but was also in efforts to minimize the number of individuals in the building and the spread of COVID-19.

### Theme 5: Software Use and Virtual Visit

Telephone and/or virtual services were utilized by practitioners when face-to-face patient visits were not possible. In general, sites expressed virtual visits to be a positive option for YLWH as this option removed the possible transportation barriers to receiving care. Initially, there were concerns regarding insurance coverage of telephone and/or virtual visits; however, clinics reported that they were quickly able to resolve this issue in order to provide continued care. Virtual visits were sometimes limited due to issues with site technology capabilities. Clinic sites mostly reported utilizing Zoom software for their virtual visits with patients; however, other interfaces such as FaceTime and Polycom telephones were also used. Cloud based electronic health record (EHR) systems, such as Epic, were also utilized as it was described as having an “interface that we can use .... we did work very hard to use Epic whenever possible”. Practitioners reported being more likely to use telephone contact with patients who either did not have access to Zoom or who experienced challenges with the technology. In regard to patients’ potential lack of confidentiality in the virtual settings, practitioners reported this as an issue addressed during the consent process.

### Theme 6: Community Impact

Community impact was a common theme between clinic sites, however, sites expressed it differently. One “community impact” viewpoint frames how the patient’s community was impacted by the COVID-19 pandemic. Increased unemployment and perceived risky work environments were top concerns. Many clinic patients are essential workers and therefore had to continue working during the height of the pandemic. On a case-by-case basis, practitioners had to determine whether a letter excusing the patient from work was necessary due to increased vulnerability of this patient population to the corona virus. Another perspective involved the clinic helping the community to mediate the impact of COVID-19 restrictions on their clients’ ability to communicate with clinic personnel. In some instances, clinics allotted some funds for smartphones which allowed clinic personnel to offer services to patients. Clinics provided taxi services and shuttle buses to facilitate appointment compliance and to lessen interruptions in care. Clients requested support for housing or emergency financial assistance, food assistance, and mental health care in addition to requesting

time with their health care team. Clinics worked to put into place resources targeted at combating these social needs—by either directly providing the resources or by facilitating client knowledge of available resources within their communities. This was especially important as some community efforts were not effectively geared toward those that needed it most—for example, food drives were not accessible to clients who did not have an automobile.

### Returning to the Clinic

Readjustment of the clinic, the waiting room and clinic policies was a challenge for study sites in response to the COVID-19 pandemic. Most clinic sites brought employees back in-office with a staggering of presence on campus to try to keep capacity to a site designated minimum percentage. Examples include allowing only one staff person per room and not allowing all staff onsite every day. Some staff work split shifts being in office on various days and times to try to limit the number of people who are in the office and to ensure physical distancing. In-clinic patient capacity has also slowly increased along with continued telehealth services offered. Over a period of approximately a month, some clinics worked to increase the number of in-clinic visit to previous levels of the total number of visits. “As things have opened up more and more, we’re bringing... more and more patients back in a much higher percentage of our visits” to get patients “caught up on their routine” of labs and other surveillance services.

Due to safety concerns, many clinics faced the challenge of convincing patients to return to the clinic. To combat these concerns, patients were offered “limited visits” for bloodwork and routine surveillance on a limited basis. Clinics have reported varying levels of success in getting more people to come back and have a face-to-face visit while additional services such as elective surgeries and other subspecialties are once again operational. Dashboards of visits are beginning to show recovery from the dramatic drop witnessed in March 2020.

### Discussion

The COVID-19 pandemic has imposed many barriers across the global healthcare system. This study attempted to further understand the type of impact COVID-19 had on delivery of care to YLWH. Entering the COVID-19 pandemic, much of the needed infrastructure was poorly developed—Informatics infrastructure was inadequate for virtual care, clinician communication, and home hospital care [13]. The pandemic has affected the delivery of care to those with chronic diseases and for which continual care is required. Consistent with other study findings [14], most clinic sites

confirmed that the COVID-19 pandemic has placed strain on the ability to provide continued care to the pediatric and young adult population. Clinics prepared to modify the number and types of services offered. The first line of defense was to see patients virtually, so as not to spread the disease, and to keep as many patients as prudent out of the hospital [15]. At this time, sites began to see more cases through modified in-clinic availability and alternative modalities of clinic services. Practices increased virtual visits and telephone-based care and delayed nonurgent appointments [13]. Practices promoted physical distancing by separating healthy patients from those with symptoms, minimizing the number of patients in common areas like waiting rooms, and spreading chairs six feet apart to enforce distancing [15]. Efforts were made to reduce the number of staff in the clinic to essential personnel and transition to telemedicine as alternative mode of healthcare. Challenges to this transformation in modality of care included the paucity of sufficient equipment, software services, and user capabilities. Clinics reported that many patients who had been lost to care have now returned as telemedicine became an option. Privacy concerns arose with the increased use of telemedicine via software use concerns as well as patients being able to find a safe physical space to complete the visit. There were also initial concerns about insurance coverage of telemedicine visits; however, an increased number of insurance companies began to reimburse the costs associated with patient care delivered via telehealth [16]. On a positive note, all sites stated they did not lose staff to COVID teams or to furlough. This finding contrasts with what has been reported across primary care practices where office visits were reduced by more than one-half [17].

The findings from this qualitative study offer unique insight on the impact of the COVID-19 pandemic on the delivery of care to YLWH. The COVID-19 pandemic has caused major disruptions in routine clinical visits across the country. It is important to understand how these disruptions are affecting all aspects of the HIV treatment cascade. Upon conducting a formative evaluation of the changes in the process of care after the COVID-19 pandemic, we were able to obtain a narrative record of each clinic's level of disruption and the coping mechanisms that they used to retain patients in care. Although there is increasing recognition of the critical role telemedicine can play in improving access to care and delivering real time care from home [18, 19], there are several challenges associated with moving in-person visits to virtual, distance-based medical care. First, many clinics were not well equipped with the technologic platforms to offer affordable and accessible care for patients outside the office or hospital. Integrating advanced technologies onto a single, unified platform can enable patients to have comprehensive virtual access to their HIV care providers. With improved telemedicine funding to increase access to real-time care and

coordination of distance learning, clinical decision support, and health care delivery models, health care organizations and clinics will be well prepared to provide access to quality of care and achieve health equity.

The COVID-19 pandemic has imposed a significant bearing on the ability of health care providers to offer continued care to YLWH as well as other pediatric and mental health conditions [14]. Synthesizing the process and direct measures taken to mitigate the impact of COVID-19 pandemic restrictions provides insight regarding how we may more successfully move forward with providing continued optimum quality health care during the current pandemic as well as future challenges to the healthcare system. Given the challenges incurred by this vulnerable population, it is imperative that focused attention is given to the process of providing care during the COVID-19 pandemic to maximize and maintain achievements in HIV disease management among youth. Conducting standard of care visits, including case management and psychological evaluation for newly diagnosed HIV patients were found to be challenging in the clinics located in cities strongly affected by COVID-19. On the other hand, the ATN clinics located within major academic research institutions continued to provide standard of care visits 5 days a week. While some clinics were able to provide telehealth services seamlessly, other clinics seemingly had limited resources. This suggests that the clinics affiliated with hospitals and research institutions may have more funding and informatics support as well as greater ability to adopt convenient care at home than those without university support. The different types of clinics and whether they are operated publicly, privately, or by the government need to be considered when exploring the impact of the pandemic on standard of care visits.

Current study findings offer guidance on how healthcare facilities can effectively incorporate strategies to provide continued services during pandemics and natural disasters. Specific actions that should be undertaken include the developing of standardized clinical protocols for underserved and vulnerable patient populations who are transferring to home-based care during a pandemic. Additionally, establishing an automatic email and/or telephone notification to alert patients of impending changes to services offered is suggested. This alert should include information regarding, an emergency contact number, hours of operation, methods to obtain prescription medication and directions regarding the "how to" for virtual or telehealth visits, along with other pertinent information. It is paramount that facilities ensure that software equipment is both sufficient and available to all patients and staff—along with optimal user capabilities—as an ever-present option to providing care. Policies should be put into place to maintain patient privacy during the virtual and telehealth visits. Healthcare facilitates are encouraged to delay nonurgent appointments to decrease

the overall presence of staff and patients within the facility. Perhaps facilities may decide to permanently arrange the waiting areas to ensure proper social distancing at all times to lessen disruption to services when emergent events arise. All suggestions have the potential to attenuate the delay in our response to emergency situations that interrupt providing health care services.

It is important to note the limitations of this qualitative study. While the interviews were collected from 10 ATN clinic sites to diversify the data, the impact of the COVID-19 pandemic on their ability to provide care to YLWH may not be generalizable to the cities and communities across the country. Additionally, limitations may emerge when interpreting the data as a result of having only one interview from each site. However, a growing body of evidence supports the conjecture that robust identification of themes and codes can be achieved by utilizing 6–9 interviews [20] with additional cases adding slight nuance to identified themes [21]. Given the quality of the information received and the intended use of this information to inform disruptions in continued care, smaller sample sizes of 6–9 interviews can prove to be adequate [21]. Second, due to the descriptive nature of this study, none of its conclusions should be interpreted as statements of causality. In addition, this qualitative study was not able to investigate on how statewide COVID-19 reopening and reclosing plans contributed to the changes in clinics opening hours and number of physical appointments in each clinic. As such, a causal association between statewide COVID-19 restrictions and the disruptions in HIV care clinics cannot be hypothesized based on our study findings.

In conclusion, the COVID-19 pandemic has had an impact on the overall delivery of care to YLWH. Health care professionals and administrators were forced to adapt to a fluid situation and develop policies and guidelines out of necessity and in response to an ever-evolving situation. Consequently, healthcare system personnel were able to satisfactorily modify their approach to delivery of care to YLWH and provide continuous care during this precarious time. Telehealth allowed for the delivery of care where resources were available to do so in an ethical, safe, and effective manner. Potential healthcare system pandemic response strategies exist in addition to telehealth services. The World Health Organization (WHO) has provided guidance on pandemic influenza preparedness and response that, if utilized, may prove useful in informing potential implementation intervention strategies beyond telehealth [22]. Specifically, the WHO advised the following actions/strategies during a pandemic: provide health-care services while attending to the influx of patients with influenza illness; plan for surge capacity in health-care facilities; and maintain adequate triage and infection control measures to protect health-care workers, patients, and visitors. Future studies assessing the global healthcare system's response to

the COVID-19 pandemic are yet to determine if these WHO plans were implemented and the level of success achieved.

**Author Contributions** All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by TD, SG, MD and KNS. The first draft of the manuscript was written by TD and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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**Data Availability** Participants were assured anonymity and the sharing of data would put that anonymity at risk.

**Code Availability** Not applicable.

## Declarations

**Conflict of interest** Authors report no conflict of interest.

**Ethical Approval** In compliance with ethical standards, this Scale It Up: Cascade Monitoring study (ATN 154) was approved by an expedited review process by the single institutional review board of Florida State University (Approval No. IRB00000446). All procedures performed in this study were in accordance with the ethical standards of the institutional review board.

**Consent to Participate** Informed consent was not required as there was no patient study enrollment and this study only utilized secondary data.

**Consent for Publication** Not applicable.

## References

1. COVID C. Global cases by Johns Hopkins CSSE. 2021.
2. Chu DK, Akl EA, Duda S, Solo K, Yaacoub S, Schunemann HJ, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *Lancet*. 2020;395(10242):1973–87.
3. Dubey MJ, Ghosh R, Chatterjee S, Biswas P, Chatterjee S, Dubey S. COVID-19 and addiction. *Diabetes Metab Syndr*. 2020;14(5):817–23.
4. Al-Quteimat OM, Amer AM. The impact of the COVID-19 pandemic on cancer patients. *Am J Clin Oncol*. 2020;43(6):452–5.
5. Justman N, Shahak G, Gutzeit O, Ben Zvi D, Ginsberg Y, Solt I, et al. Lockdown with a price: the impact of the COVID-19 pandemic on prenatal care and perinatal outcomes in a tertiary care center. *Isr Med Assoc J*. 2020;22(9):533–7.
6. Patel SY, Mehrotra A, Huskamp HA, Uscher-Pines L, Ganguli I, Barnett ML. Trends in outpatient care delivery and telemedicine during the COVID-19 pandemic in the US. *JAMA Intern Med*. 2021;181(3):388–91.
7. Mehrotra A, Chernew M, Linetsky D, Hatch H, Cutler D. The impact of the COVID-19 pandemic on outpatient visits: practices are adapting to the new normal. *Commonw Fund*. 2020;25:2020.

8. Wood SM, Dowshen N, Lowenthal E. Time to improve the global human immunodeficiency virus/AIDS care continuum for adolescents: a generation at stake. *JAMA Pediatr.* 2015;169(7):619–20.
9. Mellins CA, Malee KM. Understanding the mental health of youth living with perinatal HIV infection: lessons learned and current challenges. *J Int AIDS Soc.* 2013;16:18593.
10. Naar S, Parsons JT, Stanton BF. Adolescent trials network for HIV-AIDS Scale It Up program: protocol for a rational and overview. *JMIR Res Protoc.* 2019;8(2): e11204.
11. Pennar AL, Dark T, Simpson KN, Gurung S, Cain D, Fan C, et al. Cascade monitoring in multidisciplinary adolescent HIV care settings: protocol for utilizing electronic health records. *JMIR Res Protoc.* 2019;8(5): e11185.
12. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77–101.
13. Krist AH, DeVoe JE, Cheng A, Ehrlich T, Jones SM. Redesigning primary care to address the COVID-19 pandemic in the midst of the pandemic. *Ann Fam Med.* 2020;18(4):349–54.
14. Galloway DP, Mathis MS, Wilkinson LT, Venick RS, Wendel D, Cole CR, et al. Effect of the COVID-19 pandemic on pediatric intestinal failure healthcare delivery. *JPEN J Parenter Enteral Nutr.* 2021;45(1):50–6.
15. Bacon J. NOVA healthcare adapts to the epidemic. Bacon's Rebellion blog March. 2020;20.
16. Golberstein E, Wen H, Miller BF. Coronavirus disease 2019 (COVID-19) and mental health for children and adolescents. *JAMA Pediatr.* 2020;174(9):819–20.
17. Etz R. Quick COVID-19 primary care weekly survey, week 7.2020. Available from: <https://static1.squarespace.com/static/5d7ff8184cf0e01e4566cb02/t/5eaffa894f6a412098294b7a/1588591241666/PC+C19+Series+7+Nat+Exec+Summary+with+comments.pdf>.
18. Anderson K, Francis T, Ibanez-Carrasco F, Globberman J. Physician's perceptions of telemedicine in HIV care provision: a cross-sectional web-based survey. *JMIR Public Health Surveill.* 2017;3(2): e31.
19. Budak JZ, Scott JD, Dhanireddy S, Wood BR. The impact of COVID-19 on HIV care provided via telemedicine-past, present, and future. *Curr HIV/AIDS Rep.* 2021;18(2):98–104.
20. Hennink MM, Kaiser BN, Marconi VC. Code saturation versus meaning saturation: how many interviews are enough? *Qual Health Res.* 2017;27(4):591–608.
21. Young DS, Casey EA. An examination of the sufficiency of small qualitative samples. *Soc Work Res.* 2018;43(1):53–8.
22. World Health Organization. Pandemic influenza preparedness and response: a WHO guidance document. Geneva: World Health Organization; 2009.

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