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Research

Client and provider experiences with, and approaches to sustain HIV care during the COVID-19 pandemic restrictions at two public hospitals in southwestern Uganda

Cecilia Akatukwasa[1] · Brian Beesiga[1] · Asiphas Owaraganise[1] · Joan Nangendo[2] · Elijah Kakande[1] · Florence Mwangwa[1] · Susan Nayiga[1] · Fred C. Semitala[1,2] · Moses R. Kamya[1,2] · Jane Kabami[1,2]

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Abstract

Introduction The COVID-19 pandemic had far-reaching consequences on global health systems, disrupting the delivery of routine healthcare services, and posing new challenges to ongoing disease control efforts. In Uganda, where HIV is endemic, the pandemic threatened to reverse the gains in the country's HIV response over the past decade. In this study, we explored the effects of the COVID-19 pandemic on the HIV cascade, focusing on the impact of pandemic-related disruptions on retention in HIV care among Persons with HIV (PWH). We further highlighted the key challenges and opportunities for mitigating the adverse effects.

Methods Qualitative data were collected from January 2022 to March 2022 using in-depth interviews with PWH (n = 20) and healthcare workers (n = 4) and key informant interviews (n = 6) with healthcare managers. The interviews explored current and previous experiences with HIV care services, including experiences of healthcare providers and managers delivering and PWH receiving HIV care amidst the COVID-19 restrictions and recovery period, strategies implemented to ensure continuity of services and barriers to implementing these strategies. We coded data in Dedoose software and analyzed using the thematic analysis.

Results The qualitative findings highlight the effects of the COVID-19 pandemic, including restricted access to HIV care points, sub-optimal clinical management of persons with HIV, loss of livelihoods, and interruptions in adherence. Adaptations to ensure continuity of care included leveraging community-based drug delivery strategies, phone call consultations, modification of clinic workspaces, and linkages to nearby health facilities. Barriers to these adaptations included the increased cost of services, psychological challenges, fear and anxiety surrounding COVID infection, access to treatment, survival, loss to follow-up with no information on patient referral, COVID infection among health workers, depletion of drug stocks due to multi-month scripting, shortage of Personal protective equipment (PPE) supplies and other drugs.

Conclusion The COVID-19 pandemic had a significant impact on HIV care in Uganda, including reduced access to HIV care and support services, interruptions to ART adherence, and changes in HIV care delivery. Our findings highlight the barriers and enablers to HIV care delivery during the COVID-19 pandemic and lockdown and provide valuable lessons on efforts to mitigate interruptions in the future during periods of pandemics/lockdowns.

Keywords COVID-19 · HIV care · Restrictions · Adaptations · Lockdown

✉ Cecilia Akatukwasa, cakatukwasa@idrc-uganda.org | [1]Infectious Diseases Research Collaboration, Kampala, Uganda. [2]Department of Medicine, College of Health Sciences, Makerere University, Kampala, Uganda.

1 Introduction

COVID-19 is a respiratory disease caused by novel coronavirus SARS-CoV-2, with symptoms ranging from mild flu-like symptoms to severe pneumonia [1]. The virus spreads through respiratory droplets expelled by an infected person through talking, sneezing, or coughing. The virus can also persist on surfaces, leading to indirect transmission [1]. The emergence of COVID-19 in the late 2019, marked the onset of a global health crisis. In response to the unprecedented threat caused by COVID-19, many countries implemented a range of preventive measures including widespread testing, contact tracing, quarantine, isolation protocols, social distancing and the promotion of hygiene practices such as hand washing, use of face masks and alcohol based sanitizers [1].

The COVID-19 pandemic has resulted in unprecedented health challenges leading to a knock-on effect on the diagnosis and treatment of different health conditions in Uganda [2]. The rapid spread of COVID-19 led to the widespread introduction of COVID-19 control and mitigation measures, including lockdown measures, social distancing and travel restrictions [3]. These measures registered far-reaching consequences on global health systems, disrupting the delivery of routine healthcare services and posing new challenges to disease control efforts, such as tuberculosis and HIV/AIDS [4].

Approximately 1.4 million Ugandans living with HIV (PWH) [5] need uninterrupted access to HIV care and treatment to achieve viral load suppression and reduce morbidity and mortality related to infection with HIV [6]. While Uganda has made remarkable strides in achieving the 95-95-95 targets set by UNAIDS to end the AIDS epidemic by 2030 [5], PWH are faced with persistent challenges, including stigma and discrimination as well as suboptimal access and retention into HIV care [7]. The COVID-19 pandemic amplified these challenges threatening to reverse the progress made in the country's HIV response over the past decade [8]. Literature shows that PWH disproportionately faced challenges accessing medications, routine care and support services, owing to interruptions in health services and travel restrictions, [9, 10].

HIV care is a critical aspect of public health response, and disruptions to care could impact HIV transmission, drug resistance and morbidity and mortality rates [11, 12]. Mathematical models showed that unless interventions were put in place to ensure HIV services continuity [10, 13], COVID-19-related disruptions would increase mother-to-child transmission (MTCT) of HIV as well as HIV-related morbidity and deaths [13].Overwhelming demand for clinical services, suboptimal clinical care [13], and stigma and discrimination posed by the movement restrictions were also foreseen [14]. Some strategies were implemented to counter the predicted challenges [15]. In healthcare settings, serving high client volumes and large catchment areas, there is a need to document the successes and failures of these strategies to inform future interventions that sustain healthcare during similar public health responses. In this study, we explored the effects of COVID-19, and overall restrictions on HIV care, experiences with strategies implemented to ensure continuity of care, as well as contextual barriers and enablers to successfully implement these strategies. Overall, this study aimed to contribute to the growing body of literature on the intersection of COVID-19 and HIV pandemics and foster awareness of the complex dynamic relationships between them and their implications for regional health.

2 Materials and methods

2.1 Study context

The findings of this study are presented in the context of the COVID-19 pandemic restrictions in Uganda. In March 2020, the World Health Organization (WHO) designated COVID-19 a worldwide pandemic. Different governments put public health restrictions in place to respond to the pandemic. Uganda particularly instituted stringent measures, such as a countrywide total lockdown to restrict the movement of people in March 2020 [3, 16]. Lockdown measures included banning public and private transport, banning mass gatherings, closure of educational and religious institutions and public entertainment facilities, instating a national dusk to dawn curfew, and engaging in hygienic practices like social distancing, hand washing or hand-based sanitizer use [16]. The lockdown was partially lifted at the beginning of June 2020 with the resumption of public transport and re-opening of businesses. However, the resurgence of COVID 19 in 2021, led to a second lockdown, which was instituted by the president of Uganda on the 7th of June 2021, and would last for 42 days.

2.2 Study setting

We conducted the research at the two large HIV clinics of Mbarara and Masaka regional referral hospitals in southwestern and southcentral Uganda respectively because of the wide catchment area they serve**.** The United States Agency of International Development (USAID) in collaboration with the Ministry of Health (MoH) supports the HIV clinic (Immune Suppression Syndrome (ISS) clinic) of Mbarara Regional Referral Hospital (MRRH). Currently, the clinic provides care to 21,600 clients from nearby districts. Uganda Cares supports the HIV clinic of Masaka regional referral hospital in collaboration with MoH. About 32,476 HIV clients are enrolled in care at the site overall. Annually, the HIV clinics each enroll more than 1000 PWH into care.

2.3 Selection of study participants

We purposively selected 4 healthcare providers working in the HIV clinic and 6 healthcare managers who oversaw HIV care services in the respective HIV clinics. Table 1 provides a summary of the research participants' characteristics. Four healthcare providers—two from each clinic—including the group of physicians, clinical officers, and nurses—took part in the in-depth interviews. District Health Officials (DHOs), HIV focal persons, and HIV clinic administrators participated in six key informant interviews (three per district). Additionally, we purposively selected twenty PWHs during their clinic visits and invited them to participate in the in-depth interviews. These were purposively selected with maximum variation based on age, sex, and current viral load status. We obtained data saturation with the sample, so we maintained it.

Table 1 Summary of characteristics of 30 study participants from Mbarara and Masaka regional referral hospitals, 2021

Participants	Categories	N (%)
Health workers (n = 4)	Sex	
	Male	2 (50%)
	Female	2 (50%)
	Cadre	
	Doctors	1 (25%)
	Clinical officers	2 (50%)
	Nurses	1 (25%)
	District	
	Mbarara	2 (50%)
	Masaka	2 (50%)
Healthcare managers (n = 6)	Age (median, IQR)	46 (36,54)
	Duration in position (median, IQR)	7 (1,11)
	Sex	
	Male	4 (66.7%)
	Female	2 (33.3%)
	Position	
	District Health Officer	2 (33.3%)
	HIV Focal person	2 (33.3%)
	HIV clinic Manager	2 (33.3%)
	District	
	Mbarara	3 (50%)
	Masaka	3 (50%)
PWH (n = 20)	Age (median, IQR)	34 (18, 51)
	Sex	
	Male	10 (50%)
	Female	10 (50%)
	Viral load status	
	Suppressed	13 (65%)
	Unsuppressed	7 (35%)

2.4 Data collection

Two trained research assistants conducted in-depth interviews with PWH and healthcare providers, and key informant interviews with healthcare managers using semi-structured interview guides, between January 2022 and March 2022. Interview guides for PWH explored participant's past and recent experiences with HIV care during the COVID-19 pandemic, including access to the HIV clinics, HIV clinic appointments, treatment and adherence support, viral load monitoring, and suggestions to improve HIV care. Interview guides for PWH were translated into the local languages, and interviews were conducted in the participants' language of preference. A digital audio recorder was used to capture the interviews, which covered 30–60 min. To maintain anonymity, we held interviews in private, inviting locations that the participants had chosen. Guides for PWH, providers and healthcare managers explored recent and past experiences with HIV care services, including those delivering care during the COVID-19 restrictions and the recovery phase, as well as their perspectives of clients' experiences with HIV care.

2.5 Data management and analysis

The research assistants transferred the audio recordings of the interviews to password-protected computers and transcribed verbatim directly translating the content to English and where necessary using meaning based translation throughout the implementation phases of the study to ensure the timely production of text files for analysis. Audio files were deleted from the recorder after transcription.

We used thematic analysis to analyze the qualitative data. We adopted a hybrid of deductive and inductive analysis to generate themes from the data [17]. Based on the six stages of thematic analysis suggested by Braun and Clarke, the transcripts were read and reread by the researchers to gain a deeper understanding of the meanings of the data to the point of saturation [18]. We developed the code list based on a priori codes from the lines of inquiry in the interview guides and emerging themes from the data. Initial coding was done by 3 members of the study team. This was followed by refinement of the final codebook by a7 -member team (CA, BB, AO, JN, EK, FM and JK). Codes were iteratively refined during the analytical process. Data were coded using Dedoose software and organized into three domains (1) effects of the COVID-19 lockdown on HIV care; (2) strategies to ensure continuity of HIV care during the lockdown; (3) barriers and challenges to implementation of strategies. Narratives are presented to describe the thematic areas under the three domains, and rich quotes included to support these.

3 Results

Figure 1 shows a summary of the results.

3.1 Description of study participants

Thirty participants were interviewed (Table 1). These comprised 4 healthcare providers, 6 key informants and 20 PWH. The median age for PWH was 34 years, IQR (18, 51) and 65% of these were virally suppressed at the time of interview.

3.2 Experiences with HIV care during the COVID-19 restrictions and effects

Participants reported several experiences of the COVID-19 restrictions, including limited access to HIV care points due to restrictions on movement, fewer staff at the HIV clinic, which reduced the quality of care, limited provider patient interactions due to social distancing leading to sub-optimal patient management and loss of livelihoods for PWH. Some providers acquired COVID-19 and could not continue offering services, while others reported psychological distress for fear of COVID-19 infection.

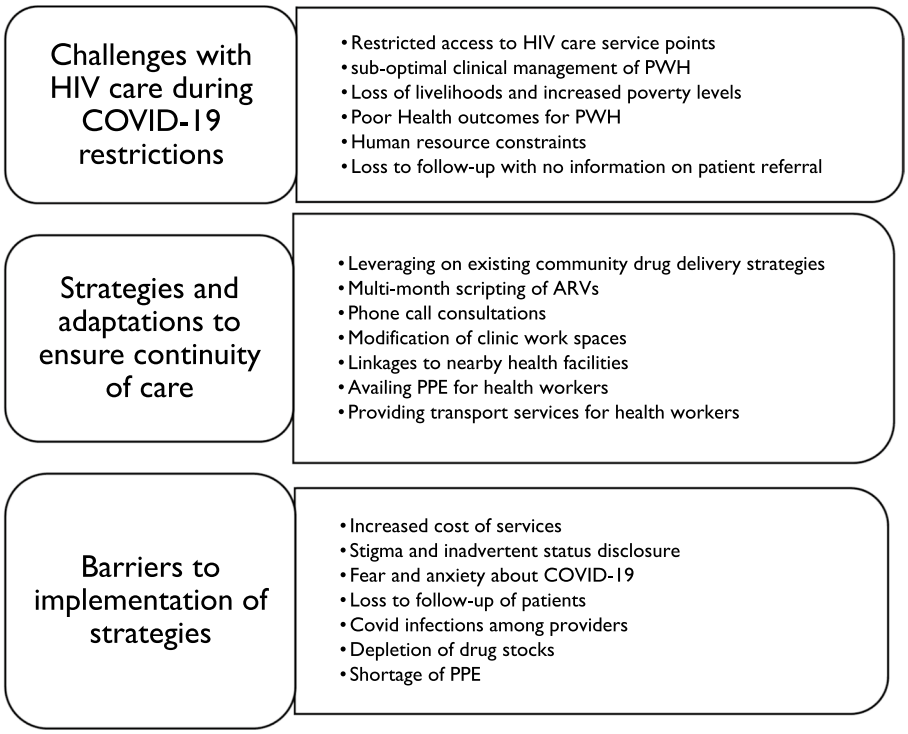

Fig. 1 Summary of results arising from the interviews of 30 participants at Mbarara and Masaka referrals hospitals, 2022

3.3 Restricted access to HIV care service points

Due to movement restrictions during the lockdown, persons with HIV (PWH) found it challenging to access their HIV care points. Participants' revelations show that most PWH were from remote areas and depended on public transportation to get to HIV care facilities. Restrictions on public transport, the requirement to obtain authorization to travel as well as security roadblocks created challenges. Even worse, many people lost their livelihoods and thus lacked the means to pay for transportation to the health facility. Some patients reported having to sell assets to afford transportation. Consequently, participants had to walk long distances to access health facilities or drop out of care altogether, resulting in non-adherence to HIV care and treatment. A male, 40-year-old provider narrates:

"There was a transport challenge. The majority of our clients come from a far distance, and a few of them come from a radius of a walkable distance, and those who are to board vehicles. You know public transport was stopped, and therefore they run short of their (drug) supplies, and they were stuck in their homes, and of course, that led to poor adherence. You would find somebody has missed taking drugs for some weeks because they did not have the private (personal vehicle) means, even time came when a person who had private means would not drive.

An HIV patient also narrated;

The countrywide COVID 19 lockdown which found me in the village with limited transportation means whereby Bodaboda (motorcycle taxi) operators were not allowed to carry passengers. This hindered us from getting medicines from the clinic (Male 20 year old, PWH).

3.4 Sub-optimal clinical management of persons with HIV due to infection prevention protocols

Limitations of patient-provider interactions Patient-provider interactions were limited in space and time. Clerking and physical examination of persons with HIV were challenging due to maintaining a social distance and avoiding or minimizing contact. Providers reported being fearful of contracting COVID-19, and as a result, they could not take a good history or thoroughly examine persons with HIV.

"...before we would normally touch them and even listen to their chest with a stethoscope, but now coming in contact with them to put Stethoscope in their chest was really a fearful situation (Male, medical officer)."

Supportive HIV services like Intensive adherence sessions (IAC) were suspended for participants with unsuppressed viral loads. The interruptions to the clinic visit scheduling in this subpopulation affected adherence to appointments leading to missed opportunities for switching drug regimens and, in some instances, reversed viral load suppression gains.

We actually failed to continue with IAC (Intensive Adherence Counselling), so this affected clients. You know, if you start a patient who is a non-suppressor in a period of 1 year… even though someone is switching into third line, they are supposed to have viral load tested…(Male, health facility manager).

Exclusion of routine investigations Quality of care was compromised, especially with the exclusion of certain services from routine care. For instance, when the routine viral load testing was suspended at one hospital, it was revealed that access to viral load tests had reduced by ten percentage points from 98 to 87%. Worse still, due to lack of capacity, these tests were not conducted at the lower-level health facilities, which were closer to where persons with HIV lived during lockdown. A PWH narrates;

I was much affected because I missed a lot the viral load tests that I was supposed to do because the other side (lower health facilities) they were not drawing blood, and they only used to give us drugs only (Male PWH aged 47 years).

Additionally, some crucial investigations such as sputum testing were not conducted, to avoid' exposure to COVID-19 infection during sample collection and handling.

"…some of these services that would have helped them (clients) were suspended. For example, collecting sputum for TB testing. A technique of Zn staining requires sputum to the microscope. We observed that the technique would have exposed clients to COVID-19 infection (Male medical officer)."

One person living with HIV also affirmed that viral load tests were not done at the lower health facilities where people with HIV had been referred to for HIV care during the lockdown.

I was affected because I missed many of the viral load tests that I was supposed to do. After all, the other side (lower health facilities) they were not bleeding us, and they only used to give us drugs (Male PWH, aged 47 years).

3.5 Poor HIV care and treatment outcomes

Poor HIV care and treatment outcomes were reported, including increase in the HIV viral load, an increase in opportunistic infections and a number of deaths among persons with HIV. Here a health worker explains how restrictions and enforcement could have contributed to a participant's inability to access specialist services and eventual death.

I lost my patient in the first lockdown who had meningitis. That patient asked permission from the RDC (Resident District Commissioner), yet the services she required were not available at nearby health centers. Therefore, 1 day the patient was unconscious because she had a severe headache, and the RDC denied her permission to come to the clinic. The following day we received news that the patient died, which was difficult to take in (Male, medical officer)."

Health facility managers reported that they noticed an increase in admissions among patients with HIV related to advanced HIV disease. Opportunistic infections such as tuberculosis, herpes zoster and meningitis and some instances death of some clients was described during the lockdown period.

"Yes, there are people who died, and now, because this is a Regional Referral, we are seeing a lot of advanced HIV diseases like TB, meningitis (Male, health facility manager)."

3.6 Human resource constraints at health facilities

There was a reduced human resource at the health facility and, thus an increase in the workload for the health workers who were retained, which increased waiting time for clients and eventually compromised the quality of care. Providers also revealed experiencing excessive fatigue. The causes of reduced staffing at the health facility are interweaved. Reduced staffing was mainly attributed to presidential directives to retain only half of the staff at any given health facility to minimize workplace congestion and allow social distancing. As a result, the number of clients at the health facility

overwhelmed providers. Providers who contracted COVID-19 and those who were regarded to be at a higher risk of severe COVID-19 infection due to underlying conditions were urged to stay at home. In some instances, providers experienced more than one episode of COVID-19 infection, and others had to care for sick family members.

"The challenges that I faced was that some of our fellow staff contracted COVID 19, and their absence created gaps in the working environment. Though the clients' attendances were low we had to work hard to fill the gaps and you found that 3 infected health workers were identified as COVID 19 positives per day so they created gaps in the clinic (Female nurse)."

3.7 Loss to follow up with no information on patient referral

Some clients were lost to follow up and could not be traced through phone calls. It was unclear whether these clients had self-referred to other health facilities without communication or had completely dropped out of care. Some of these clients resurfaced at the end of the second lockdown.

"What I can say is it was really not a good time because most of the clients were lost to follow up, others did self-transfer and they did not communicate with us. For others, we just lost touch. Generally, what I would say, the turn up was compromised. There were some visits where we would expect about 200 clients to turn up for a day's appointment, and you instead receive about 70 clients (Male health facility manager)".

3.8 Strategies and adaptations to ensure continuity of care for PWH

Strategies to ensure continuity of HIV care comprised leveraging existing community-based drug delivery strategies, providing personal and protective equipment for health workers, multi-month scripting of drugs, and modifying clinic workspaces to reduce contact between clients and providers.

3.9 Leveraging and expanding existing community-based drug delivery strategies

Drug deliveries. Health workers, patients' treatment supporters and the MOH encouraged clients who could not come for their refills to have their drugs delivered to nearby points within their communities. For some clients, drugs were delivered to the health facilities close to their residence or within the community or delivered to their residencies by motorcycle. Motorcycle riders were allowed to pick up drugs on behalf of clients. The strategy was mainly supported by implementing partners who financed drug deliveries to the communities. Existing community drug delivery points (CDDPs) were leveraged and expanded to bring drugs distribution closer where people resided. This was intended to ensure that clients did not incur any transport, reduce congestion at the respective health facilities. Health care workers felt that the clients compared to the situation before the COVID-19 pandemic appreciated the CDDPs much more.

"We have community approaches or treatment approaches that would have catered for some clients to get care and treatment from the nearby places of their residents. These includes CDDPs, but we introduced these approaches before COVID-19 and most clients were less interested in it, not until when the COVID 19 came. (Male, medical officer)."

Here a client explains how he was encouraged by his relative to join a community drug delivery group to ensure continuity of drug supplies. Community client-led ART delivery groups were also utilized to ensure that PWH continuously accessed their treatment.

"Okay, I have an uncle who is also HIV positive. After some weeks, he came and told me that they have formed groups, which will be sending one person to get their medical refills. If I am interested, I should also join and that they have secured an authorization letter to move. I did not ask anything else I joined immediately because I did not have any other option (Male PWH aged 41 years)."

The VHTs network enabled the clients' follow-up at the community level, while government and HIV implementing partners actively supported the adaptations.

"Yes, we have a network of VHTs who followed up with patients in the community. Therefore, if someone misses an appointment, we tell them to look out for them, and we have a tracking mechanism for our patients (Female, health manager)."

3.10 Multi-month scripting of ARVs

To reduce contact between providers and the clients, longer refills were given especially for stable clients. For newly enrolled or unstable clients' refills, dates were increased from 1 to 3 months.

"We also doubled our dispensation, whereby we were giving treatment that would last for 3 to 6 months (long refills) and for the new clients who we were giving 1 month we also adjusted to 3 months, and this one also still works even now (Male, health manager)."

The multi-month refills were thought to have worked well amidst uncertainties about when the lockdown would be lifted. They would also relieve PWH of the transport expenses to the health facility that was costly at the time. More so, it was challenging then for providers to deliver drugs to clients in the community or nearby health facilities in terms of transport and risk of exposure to COVID-19 while delivering drugs within the community. This approach was also deemed cost-effective for health workers regarding time and finances to deliver medications.

"… giving long refills, we were saving clients from transport expenses because, during that time, transport was challenging. Delivering medicine to other facilities was time-consuming and costly, and we needed to take part of the team away from the clinic. We would also expose them to COVID 19 disease in the field. Therefore, I think I would say the multi-month refills worked well for us (Male Health facility manager).

3.11 Linkages to nearby health facilities

Clients were referred to nearby health facilities close to their residences to allow continued access to HIV care services.

Yes, but I called the doctors from this clinic on that day and told them about the incident. They advised me to go to any nearby health Centre with my medical records and explain to them about my health condition such that they could give me medicines that can last for 1 month and that may be by that time the lockdown may be eased. I continue coming to my usual clinic (Male 20 year old PWH).
"What enabled me to continue working was that since I am working in the EID [Early Infant Diagnosis] section and our clients leave contacts or treatment supporter contacts. Therefore, we followed up with the mothers because I do not want positive children, and we linked those mothers that were coming from far places like village A and Village B to the linkage desks of other facilities for support until when the situation normalized (Female, nurse)."

3.12 Phone call consultations

Some services were delivered through phone calls for instance intensive adherence counselling as well as visit rescheduling to overcome movement restrictions. More so, phone call referrals to lower health facilities were offered to clients who could not make it to the clinic for their scheduled appointments. Peer educators were engaged to achieve this task.

"We got phones, and they were loaded with airtime [credit] to contact clients with active contacts, and we advised them to access services and during that time, the clinic employed many peers to help out. (Male Medical officer)."
"…they used to call us and update our files based on the refills we received from other facilities (Male PWH aged 47 years).

Clients were also availed with clinic contacts so that in case they encountered any challenges, they could get in touch with the health worker to have it addressed.

3.13 Modification of clinic workspaces and flow to minimize congestion at the clinic

There was an adjustment to the clinic flow to reduce the interface and contact between the health workers and clients. Clients who did not have any complaints or did not show any symptoms of illness were only allowed to get their

refills and then head back home. To reduce clients' waiting time, some services, such as monitoring tests for viral load and others, were postponed or done at the earliest opportunity; say 2 months ahead to the scheduled test date. Services were also shifted from indoors to outdoors to allow the circulation of air and maintenance of social distancing.

"I have told you that we were working from outside because we found that airflow in our rooms could betray us. So, we used to operate from outside, and there was a distance between the patient and the provider, and we ensured that the masks were on (Male Medical officer)."

3.14 Protective gear for healthcare worker's safety and protection

Healthcare managers reported purchasing protective gear such as face shields, gloves, aprons and sanitizers for health workers who frequently interfaced with clients. Protective gear was rationed to overcome the challenge of shortages, and thus, PPE was provided for only priority staff members.

"And also, as I had told you, because of the unavailability of protective gears and personal protective equipment, we could not really give them out, and we would not want to risk someone's life. So we just concentrated on the front line workers (active clinical team those who would interface with clients) those were the ones we tried to see how they can be facilitated to give care services and for other members who would give support most of them were stopped and we tried to limit their access to the facility (Male health facility manager)."

Government and implementing partners contributed PPEs to enable healthcare workers to perform their duties when protected. Implementing partners specifically boosted the supply of PPE in instances of limited supply from the government.

"As long as the pandemic was on, they needed supplies, the consumables, and the rate of consumption, could not be commensurate with the inflow. So that remained an issue, especially with masks, sanitizers, the gloves, protective gear, all that. But thankfully we had several implementing partners, any mess they would come in and do their best, they actually did very well in providing all those, but the demand was very high (Male, health manager).

3.15 Transport for providers to and from the health facility

Door-to-door transport provided at the health facility enabled providers to continue offering services amidst restrictions on public transport.

"The hospital also gave us a van that would drop us at our respective homes in the evening and then pick everybody up from their door in the morning to work. There was no public transport allowed on the road, not even bodaboda were allowed to carry passengers so the hospital van helped us to continue working (Male, provider)."

3.16 Barriers and challenges to the successful implementation of strategies

3.16.1 The increased cost of services

Providers reported that though the adopted strategies increased access to services, they exerted pressure on the facility in terms of time, work force and finances. It was costly to reach out to clients through phone calls. It was revealed that no extra funds were allocated to providers to conduct these phone calls. They utilized funds that were previously allocated to track clients. However, these were eventually depleted. The increased cost of travel affected both the health worker and the PWH.

3.17 Experiences of stigma and inadvertent HIV status disclosure

Due to the lockdown, providers attempted to review clients through phone calls. However, a couple of setbacks marred this strategy. First is the stigma, which was compounded by the non-disclosure of HIV status to family members. In some instances when the provider could reach the client on phone, the clients were uncomfortable talking about their HIV situation in the presence of family members to whom they may not have disclosed. In other instances, clients did not pick up the phone calls at all, had switched off their phones or even changed their phone contacts.

"… You would call someone and the person is unwilling to communicate at that time, or he/ she ignores your calls. Someone is indoors during the lockdown with other people whom he does not want to get to know what you are communicating. Some are not willing to give you time or are not comfortable talking to you…sometimes these phone numbers were off at the time you have called, and that would affect effective communication… some clients had changed contacts (Male health manager)."

Stigma and fear of status disclosure hindered clients from accessing community-based services, including the Community Drug Distribution Points (CDDPs), Community Client-Led ART Delivery (CCLAD), and enrolling into lower health facilities.

"But also had some disadvantages because some of us like to keep our HIV status a secret, but the group was so exposing, at first, I felt uncomfortable about it, (Male PWH aged 33 years)."

3.18 COVID-19 infection among health workers

It was indicated that some health workers experienced COVID-19 infection, requiring them to be away from the health facilities. This culminated in an increased workload for other providers who were retained at the health facility.

"The challenges I faced was that some of our fellow staff contracted COVID-19, and their absence created gaps in the working environment. Though the clients' attendances were low but we had to work hard to fill the gaps and you found that 3 infected health workers were identified as COVID-19 positives per day so they created gaps in the clinic (Female, nurse)."

3.19 Depletion of drug stocks due to multi-month scripting and disruption of the supply chain of drugs

Multi-month scripting resulted in drug shortages since some facilities were unprepared.

"Anyway, during the pandemic, there was a period when they gave us a 1-month refill because there were low drugs in stock, and they decided to give out 1 month so that everyone received (Female PWH aged 51 years)."

3.20 Shortage of PPE supplies and other drugs

Health workers reported lack of sufficient PPE to protect them from COVID-19 infection. These included mainly face shields and sanitizers.

"We had to put in our own money at some point. I remember they provided one face shield at the start, and that was it for the whole COVID-19 pandemic. As for the face masks, they would give you one mask once during the week, and that one would be enough and sometimes, we would have to buy with our own money and even sanitizers sometimes we would buy our sanitizers (Female provider)."

4 Discussion

This study presents findings from a qualitative assessment with PWH, healthcare providers, and healthcare managers. We highlighted the challenges faced when providing or seeking HIV care during the COVID-19 restrictions, strategies employed to ensure continuity of care, and the enablers and barriers to implementing these strategies. The results of this study reveal how restrictions on travel and mobility, as well as hygienic practices like social distancing attributable to the COVID-19 pandemic and subsequent restrictions, made it challenging for patients to attend in-person clinic visits and obtain their medications. Similar studies in Uganda and other similar settings underscored the significant role of COVID-19 restrictions on access to optimal HIV care during the COVID-19 pandemic [14, 19, 20]. Although the study sites did not suspend HIV services, these restrictions specifically led to; limited access to HIV care service points and sub-optimal clinical management of PWH, including limitations on patient-provider interactions and exclusion of routine investigations such as viral load monitoring.

This study reports PWH missing their medication or experiencing interruptions in their treatment leading to concerns about treatment failure, drug resistance and increased morbidity and mortality [11, 12]. Additionally, there was a

reduction in the number of healthcare workers available to provide care due to illness from COVID-19 or redeployment. These challenges led to concerns about the continuity of care for individuals living with HIV and their overall health outcomes. Limited access to HIV service points had many ramifications, including inability to obtain drug refills on time, culminating into non-adherence to ART. Our findings do not specifically indicate when access to ART refills was interrupted. However, studies conducting time series analyses have shown that this only happened for a short while before strategies to ensure continuity were in place, including multi-month scripting of ART [21]. Other services like HIV testing and ART initiation were significantly low throughout the restrictions [21]. Disruptions in laboratory services led to challenges in monitoring viral loads, which are crucial for assessing treatment success, ensuring timely adherence and informing decisions about treatment regimens [22]. A study in Malawi reported that although there was no significant reduction in viral suppression rates, there was a substantial reduction in viral load monitoring [23]. Interruptions in viral load monitoring could eventually register negative consequences in the long term, especially when monitoring treatment success [22].

Studies predicting the overall impact of the COVID-19 pandemic reported potential interruptions due to movement restrictions on ART adherence, HIV-related deaths and increased MTCT if no strategies were implemented to ensure continuity of care [13, 24]. Although some of these predictions came to fruition, our findings indicate that healthcare systems adopted several innovative strategies to ensure PWH had uninterrupted care during the pandemic. Healthcare systems implemented measures to reduce the number of in-person visits to healthcare facilities, including multi-month prescription refills to reduce the number of clinic visits, home delivery of medication, linkage to nearby health facilities, phone call consultations and community-based care [25]. These measures helped to reduce the risk of exposure to COVID-19 while ensuring the PWH continue to receive the necessary care.

Phone call consultations emerged as a critical tool in the HIV care delivery of care, with providers using phone calls to conduct consultations, adherence counselling, psychosocial care and guidance to accessible healthcare points. This finding is consistent with results of other similar studies [25]. Our findings reinforce prior evidence on the need to concretize the use of telemedicine to augment in-person patient-provider interactions [26]. It could also serve as the best option to sustain healthcare during a public health crisis such as the COVID-19 outbreak [26]. However, the cost of maintaining phone services, patient anxiety, and anticipated stigma from phone calls that could arise from inadvertent status disclosure may deter optimal utilization of this strategy. Nonetheless, there is a need for resource prioritization to sustain this strategy.

Uganda's health system is marred by poor infrastructure and inadequate funding, which could disrupt the supply chain of essential HIV medications, leading to frequent stock outs and shortages of drugs [27]. The severe consequences of these shortages would be treatment interruptions and increased risk of drug resistance among PWH. However, our findings report minimal challenges in maintaining drug stocks especially in the second lockdown which came as a result of multi-month scripting. Recent studies reveal no effect of the COVID restrictions on drug supplies [10]. Nevertheless, there is a need for different innovative approaches that were adopted elsewhere, such as digital technologies, to ensure a continuous drug supply.

The adaptations implemented during the COVID-19 pandemic have important implications for the future of HIV care. The findings indicate that strategies were employed depending on individual patient needs [25]. Scaling up of patient-centered ART delivery models may significantly influence retention in care in such circumstances. DSD models, including telemedicine and other digital approaches, could offer new opportunities for delivering care, particularly for populations that face barriers to accessing HIV care, such as those living in rural areas or with limited mobility [28]. Our findings also show that community engagement and partnerships were essential in ensuring the continuity of HIV care for PWH during the pandemic. Leveraging the role of lay health workers could play a significant role in sustaining HIV care for PWH in crises like these.

5 Limitations

Our study had some limitations. Noteworthy, the findings of this study are reported from high volume and urban HIV care sites serving PWH from large catchment areas. A survey conducted in 65 primary health-care clinics in Southern Africa reported a difference in the effects of COVID-19 between urban and rural health facilities, with rural-based clinics experiencing fewer effects than urban clinics [21]. The findings of this study are not necessarily representative of lower health facilities in rural Uganda. Secondly, the study was conducted after Uganda's second wave of the COVID-19 pandemic. Two lockdowns were registered. According to evidence, the adaptations to ensure continuity of HIV care were

more scaled-up and efficient after the first lockdown. Our findings do not clearly tease out the timing between the first and second lockdown and during which period the findings were more salient.

6 Conclusion

In conclusion, the COVID-19 pandemic and response posed significant challenges to the continuity of HIV care in Uganda, marked by disruptions in the supply chain of essential medications, travel restrictions, mobility restrictions, laboratory services disruptions and a reduction in the number of healthcare workers available to provide quality care. These challenges influenced HIV treatment and overall health outcomes. However, the healthcare system demonstrated remarkable resilience and innovation in adapting to these challenges. The adaptations implemented during the pandemic helped to ensure that PWH received uninterrupted care while reducing exposure to COVID-19 and minimized the overall effect of the COVID-19 pandemic and restrictions. These adaptations offer important lessons for the future of HIV care and could inform the development of more resilient and responsive healthcare systems. There is need to implement some of the successful strategies beyond the pandemic period in order to build resilient healthcare systems.

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Data availability All the data needed for this manuscript have been included. In case there is a need for clarification, the corresponding author can be contacted. Codebooks used to analyze the data are available on request.

Declarations

Ethics approval and consent to participate Ethical clearance was obtained from the Makerere University School of Medicine Research and Ethics Committee (SOMREC)-Mak-SOMREC-2021–201 and the Uganda National Council of Science and Technology (UNCST)—HS1855ES. All participants provided Informed consent. Permission was also obtained to allow the interview to be recorded. Privacy and confidentiality were maintained during the data collection process. Each participant was assigned a unique identification number, and no identifiers were associated with the participants' data.

Competing interests The authors declare no competing interests.

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