Scientific Research Publishing

World Journal of AIDS, 2021, 11, 50-59
https://www.scirp.org/journal/wja
ISSN Online: 2160-8822
ISSN Print: 2160-8814

Telehealth Combined with Differentiated ART Delivery Improves ART Pick Up during COVID 19 at a Large HIV Treatment Facility in Trinidad and Tobago

N. Lyons*, W. Samaroo Francis, J. Edwards, O. Lavia

Medical Research Foundation, Trinidad and Tobago
Email: *lyonsweb1@gmail.com

How to cite this paper: Lyons, N., Francis, W.S., Edwards, J. and Lavia, O. (2021) Telehealth Combined with Differentiated ART Delivery Improves ART Pick Up during COVID 19 at a Large HIV Treatment Facility in Trinidad and Tobago. *World Journal of AIDS*, **11**, 50-59.
https://doi.org/10.4236/wja.2021.112005

Received: March 18, 2021
Accepted: June 1, 2021
Published: June 4, 2021

Abstract

Objective: To describe the implementation and outcomes of using telehealth in combination with a differentiated ART delivery model to improve HIV antiretroviral therapy pick up at a large treatment facility in Trinidad and Tobago during COVID-19. **Design and Methods:** Beginning in April 2020, a list of patients was generated daily prior to their scheduled ART appointments. Nurses, doctors and social workers conducted telephone consultations to first screen patients for COVID-19 symptoms, conducted brief medical and behavioural health screenings, and helped patients to identify barriers to ART retention. Patients were recommended for 1) fast track ART refill collection at facility, 2) community ART refills, and 3) ART pick-up through patient peers. The uptake and outcomes of telehealth and ART pick up were compared with the corresponding period in 2019. Data was analyzed using SPSS 21.0. **Results:** During the period April-June 2020, 1361 patients were identified for telephone consultations, 1084 (80%) were successfully contacted and 984 patients (88%) participated in phone session. The independent t test showed a significant increase in ART pick-up when compared to the corresponding period in 2019. 59% of patients collected via fast-track ART refill, 30% had community refills, and 11% pick-up medications through patient peers. **Conclusion:** Telehealth is an integral component of DSD as part of the COVID-19 response at the MRF. Understanding the medium and longer-term outcomes of Telehealth can provide additional insights on the scale up of telehealth as a component of DSD to improve ART outcomes for patients in the context of the developing countries of the Caribbean.

Keywords

HIV, COVID 19, Telehealth, Depression

1. Introduction

The World Health Organization (WHO) defines Telehealth as "the delivery of health care services, where patients and providers are separated by distance. Telehealth uses ICT for the exchange of information for the diagnosis and treatment of diseases and injuries, research, and evaluation, and for the continuing education of health professionals" [1]. As communities around the world continue to adjust to the reality of the COVID-19 pandemic, health care providers are adopting telehealth services minimizing the need for in-person visits and any negative consequences of delayed care. Recent studies have documented the use of telephone, live video conferencing, e-mails and other telecommunication tools during the COVID-19 outbreak to diminish potential disruptions in services and facilitate access to continuous care [2] [3] [4]. Prior to the COVID-19 pandemic, the use of Telehealth services has been well documented in the medical field in the developing and developed world [5] [6], and increasingly used in HIV care over the last decade [7].

Schwamm and colleagues made a compelling case for telemedicine, noting that "there is no better way to provide healthcare at scale, in a climate of social distancing for both patients and providers, than through virtual care". Telehealth protects patients, maintains the capacity of the healthcare workforce to care for patients without contributing to disease spread, limits community spread to vulnerable patients, and prevents overcrowding within health facilities [8].

With steady access and adherence to antiretroviral therapy (ART), persons with HIV infection can expect to live a near normal life expectancy [9] [10]. However, achieving optimal health can be complicated by higher rates of mental health disorders among PLHIV to include youth, men who have sex with men (MSM), injection drug users and older adults when compared to the general population [11] [12] [13]. Mental health disorders have been shown to contribute to barriers across the HIV care continuum from engagement in initial HIV care, to ART medication adherence and retention. A study by Krumme and colleagues shows depression as one of the strongest predictors of poor ART adherence and attrition from care among HIV-infected adults receiving antiretroviral therapy [14].

Published studies on the behavioural health consequences of COVID-19 on persons living with HIV are still unfolding. In an early study in China among 703 persons with HIV infection (data collected in February–March 2020), 60.8% reported depression, 49.8% anxiety symptoms, and 38.5% reported insomnia [15]. Behavioural health issues may further exacerbate adverse health outcomes among persons with HIV including suboptimal medication adherence, failure to achieve viral suppression, resulting in increased HIV transmission risk.

2. Methodology

2.1. Study Design

The study is a retrospective analysis of program data collected during the period

of April through June 2020 to monitor the implementation of a telehealth intervention in combination with differentiated ART delivery at the Medical Research Foundation (MRF).

2.2. Setting

The MRF is a large non-governmental organization providing comprehensive HIV prevention, care and treatment in Trinidad and Tobago. At the end of 2019, the MRF reported a total of 6700 patients enrolled in care—contributing to 75% of all PLHIV known to be enrolled in care in Trinidad and Tobago.

With the announcement of the first confirmed cases of SARS-CoV-2 infections, the MRF expanded implementation of differentiated ART services (DSD) to improve patient retention on ART. The scope of DSD services during the time of the pandemic included 1) implementation of fast-track ART refill visits; 2) implementation of a telehealth intervention; 3) expanding community ART pick-up; and 4) expanding ART delivery facilitated through patient peers. Telehealth as part of the differentiated ART strategy was implemented to reach and screen patients, address their social and psychological needs and offer follow up services. In the context of this paper, Telehealth services refer to the use of phone consultations to engage and screen patients, answer questions, provide counselling and promote retention in care. Tele counselling by a Psychologist refers to the provision of structured counselling through phone, consultations.

1) Identifying patients for tele counselling

Beginning in March 2020, a list of patients was generated in advance of their scheduled appointments from the Electronic Patient Records (EPR) at the MRF. Patient files were reviewed, and patients prioritized for telephone consultations with a nurse, doctor and/or social worker. Stable patients identified as having a viral load of less than 1000 copies/ml, adherent to antiretroviral therapy, stable immune function and with no acute medical conditions. Clients were contacted using their last recorded telephone number on their records.

2) Implementing telephone consultations to screen patients and teleconsulting

Patient confidentiality was reinforced for patients successfully reached by phone. Consenting patients were first interviewed and screened for COVID-19 risk factors and symptoms by a nurse or a doctor. The interviews were guided by a brief screening tool based on Ministry of Health/national guidelines and criteria for consideration of COVID-19 Infection. The brief questionnaire asked patients whether about their experienced with the following:

- Fever and at least one sign or symptom of respiratory disease (shortness of breath, cough or sore throat), in the last 14 days.
- Whether they had a history of international or regional travel in the 14 days before the onset of cough or cold.
- The names of persons in close or casual contact in the 14 days before onset probable case of symptoms above (if cases were suspected.

Patients were referred/linked for appropriate testing /services based on outcome of screening as directed by Ministry of Health guidelines.

Nurses provided tele counselling to address medication adherence, and addressed patient fears and health concerns during stay-at-home period. Doctors reviewed patients' blood investigations results and conducted brief medical screenings for any acute conditions. Social workers provided extended psychosocial support to alleviate the clients concerns about contracting COVID-19 and issues related to their compromised immune system; Social workers provided consultations to elicit patient barriers to ART adherence and offered food hampers, bus tickets to patients, Social workers also provided booster ART adherence counselling for patients who initiated ART in the last 3 to 5 months.

At the end of each telephone consultation an appropriate action was undertaken, to include, 1) generation of a six-month prescription 2) patients needing a physical examination or blood investigation were scheduled for a visit and 3) ART pick up services were also offered based on their individual needs. These interventions included, 1) *Fast track ART refill visits* at the primary treatment facility, 2) *Community ART distributions through the ART satellite clinic and* 3) *ART Delivery through PLHIV networks/patient peers*.

For patients who were not reached by phone, on the first attempt were followed on subsequent days if they did not show up for their appointments. Patients expressing psychosocial challenges related to their HIV disease and/or COVID-19 received counselling and were further referred to a Psychologist for tele counselling.

3) Tele counselling with Psychologist

In May, the use of a standardized psychological assessment tool was introduced to screen patients at risk for, and those with mental health conditions. Patients were screened by nurses, doctors and social workers during telephone consultations. Patients with psychological distress were subsequently referred for Tele counselling. Tele counselling sessions were conducted over the phone and through virtual sessions with a Psychologist for further assessments and appropriate psychological interventions. Patient were evaluated for symptoms of depression, trauma, alcohol and substance use problems; and general anxiety disorders.

2.3. Data Collection and Measurement

Ethical approval for conducting the study was obtained from the Institutional Review Board of the University of the West Indies, St Augustine. All data were collated from call logs and the scheduling module contained in the Health Information System at the MRF. Patient call logs captured a patient's unique identification number so that their identities remained private and secure; the result of the contact was a binominal variable recorded as successful or unsuccessful; the individual service scheduled for, review by a doctor, a nurse visit, medication pick up or counselling session; the date of the schedule session; and any addi-

tional comments on the patient outcomes as a result of the telehealth session. The scheduling module was used to determine the number of patients who having been successfully contacted attended the clinic during the period. This module captured the patent's unique identification number, their appointment type, whether it was to drawing blood, have a doctor review, visit a nurse, pick up their medication or have a counselling session with the social worker or psychologist. For telehealth consultations the module identified the location of the visit as a telehealth visit differentiating these consultations from the standard clinic visits.

Clinic attendance is defined as a scheduled visit by a patient to see a doctor, nurse or social worker visit to review patient clinical status, conduct and review blood investigations, and prescribe medications collect antiretroviral medications booked in the scheduling module of Electronic Medical Record System at the MRF, ART pick up in the context of this study is defined as 1) fast track art refill collection at the MRF main facility, 2) community refills at satellite ART clinic, or ART pick-up and delivery through patient peers.

2.4. Data Analysis

Variables were created from the data captured from call logs and the EPR. Descriptive statistics were used to report on attendance and participation in telephone consultations. The number of patients identified for telephone consultations, the number reached and those successfully engaged. This data was compared to the corresponding period of the previous year (April -June 2019. An independent t-test was used to determine if there was a statistically significant difference between the in 2019 and the attendance in 2020, as well as medication pick-ups in 2019 compared to 2020. Data analysis was conducted using SPSS Version 21.

3. Results

As shown in Figure 1, a total of 1360 patients were identified for telehealth interventions during the period of April to June 2020. These consisted of stable patients defined as having a viral load of less than 1.000 copies/ml (within the last 6

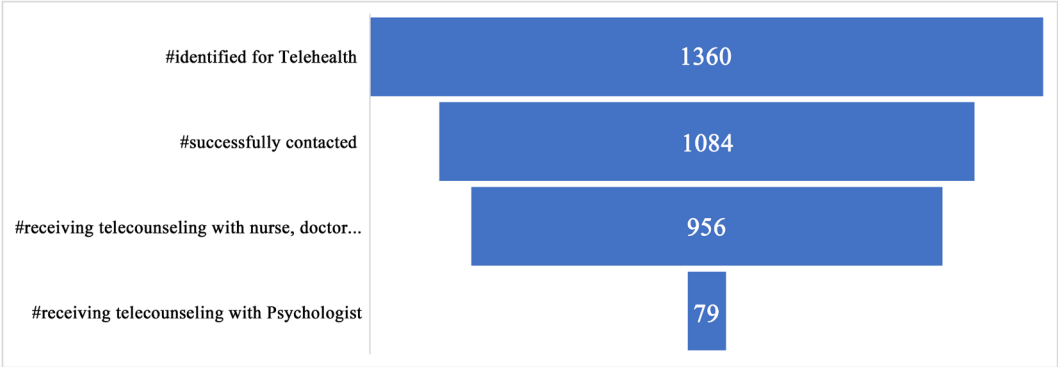

Figure 1. Patients reached via Telehealth.

months) adherent to antiretroviral therapy, and with stable immune function with no acute medical conditions. Also, patients with a previously scheduled clinic appointment were called in advance of their visit.

Of the 1360 patients identified, 1084 (80%) were successfully reached (*i.e.*, patients with working telephone numbers and responded to the telephone call). Of those reached 956 (88%) received screening for COVID-19 symptoms followed by an interview with a doctor, nurse or social worker. Three-month prescriptions were generated in advance and patients were offered fast track medication pick-up options

Patients who were successfully reached as they were called one day prior to their scheduled clinic appointment. Those who were not reached were subse-quently followed up two and three days subsequent to their missed clinic ap-pointment.

Table 1, presents the results of the independent Sample t Test comparing the period of the intervention (April -June 2020) with the corresponding period in 2019 showed a decrease from 1629 to 1461 in the average number of patients attending clinic to see a doctor, a social worker, collect meds and/or to get blood investigations done. This decrease in clinic attendance may be on account of calls made to patients prior to their scheduled appointments and using Telehealth to conduct brief screenings to determine their eligibility for aa clinic visit and or follow up care. Overall, the result of Telehealth intervention omitted the need for in-person visit by patients.

Table 2, presents the results of the independent t test, which shows a statistically significant increase in ART pick up during the period of the intervention (April-June 2020) when compared to corresponding period in 2019.

The increase in ART pick-up could be attributed to reaching patients prior to their scheduled ART visit using Telehealth to conduct consultations with patients

Table 1. Group statistics for t-test calculation.

	Year	Mean	Std. Deviation	Std. Error Mean
Clinic Attendance	2019	1629.67	366.901	211.830
	2020	1461.33	142.507	82.277
Medication Pick-up	2019	1727.00	240.589	138.904
	2020	2372.67	154.782	89.363

Table 2. Independent sample test for the equality of means.

		Levene & apos; s Test for Equality of Variances						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Attendance	Equal variances assumed	4.025	0.115	0.741	4	0.500	168.333	227.248
	Equal variances not assumed			0.741	2.590	0.520	168.333	227.248
Medication pickup	Equal variances assumed	0.656	0.463	−3.909	4	0.017	−645.667	165.167
	Equal variances not assumed			−3.909	3.413	0.023	−645.667	165.167

to elicit barriers to care and concerns about health and to reinforce medication adherence. During telephone consultations, advanced prescriptions were generated for stable patient (*i.e.*, those with viral load of less than 1.000 copies/ml) for a period of six-month to be dispensed in three-month intervals. Three-month ART dispensing was necessary to manage the potential ART stock out during the time of the pandemic.

4. Study Limitations

This analysis documents the implementation and initial findings of expanding differentiated ART delivery using Telehealth. A major challenge to implementing Telehealth is patient's access to technology and internet services. On account of these differences, implementation was limited to patients with access to mobile devices (such as a smart phone) and further, only patients with internet were able to access virtual tele counselling sessions with a Psychologist.

Secondly, the results of the initial 3-months are presented reflecting the implementation period during the peak of the government's lock-down orders during COVID-19. Medium- and longer-term outcomes can provide additional insights on the scale up of telehealth as a component of DSD to improve ART outcomes for patients during times of emergencies and beyond.

5. Discussion

These preliminary results underscore the contribution telehealth as part of a differentiated ART strategy during the COVID 19 pandemic providing opportunities to counsel, initiate screening and provide follow-up psychological support for patient during COVID 19. As part of the differentiated ART strategy, clinicians used telephone consultations to elicit the needs of patients and provide patient centred services to include, fast track ART refill collection at the MRF ART treatment facility, community refills at the ART satellite clinic, and (3) ART pick-up and delivery services through patient peers. Using telephone interviews patients were screened for COVID-19 risk factors and symptoms and referred for appropriate follow up as per Ministry of Health guidelines.

Fast track ART refill visits

During the telephone consultations, three-month ART prescriptions were dispensed for stable patients to pick up via fast-track ART refill collections at the MRF treatment facility.

Community ART distributions through the MRF ART satellite clinic

The MRF satellite clinic which previously operated two days per week was extended to five days to facilitate community ART refill during the COVID-19 pandemic.

ART Delivery through PLHIV networks/patient peers

The support of trained patient peers was expanded during the period to support ART-pick up. Patient peers working through a community network of PLHIV were instrumental in reaching patients at agreed upon locations to fa-

cilitate medication pick-up and delivery. Patients who expressed having transportation challenges or could not travel to the clinic were offered to have their medications delivered via courier services.

While there are many benefits to Telehealth, there are several barriers that limit its uptake and

Use by patients. Telehealth can communication and reduced barriers to access by reducing the need to travel, expanding screening, and counselling, and determining which patients need follow-up care. However, telehealth also raises concerns about the quality of services and maintaining trust and confidentiality between patient and providers. Telehealth has been shown to exacerbate challenges with reaching underserved populations and therefore the feasibility of the intervention among low socioeconomic groups are yet to be explored [20]. For patients with uneven access to the internet, a smart phone device and lower technology literacy the use of telehealth becomes a challenge.

6. Conclusion

PLHIV experience mental illness at significantly higher rates than the general population including those with past or current history of alcohol or substance use disorders [21]. During the government stay at home measures, disruptions in HIV services may elevate fears for PLHIV, and its relationship to behavioural health outcomes is not yet fully explored. As communities in around the world continue to adjust to the reality of the novel coronavirus virus, health practitioners continue to explore options like telehealth [22]. The expansion of differentiated ART strategies to include the use of telehealth to reach PLHIV for whom stigma remains a prominent barrier presents an opportunity to reduce this disparity. Attention is needed to document the long-term outcomes of telehealth use as a component of a differentiated ART strategy to increase ART uptake for PLHIV and among MSM and other vulnerable populations in the Caribbean [23] and those experiencing mental health challenges.

Acknowledgements

As the lead author, I would like to express my gratitude to the team at the Medical Research Foundation, doctors, nurses and other clinical staff who contributed to the delivery of essential health services during the period of the COVID-19 pandemic.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] World Health Organization (2016) https://www.who.int/gho/goe/telehealth/en/

[2] Rogers, B.G., Coats, C.S., Adams, E., Murphy, M., Stewart, C., Arnold, T., *et al.*

(2020) Development of Telemedicine Infrastructure at an LGBTQ+ Clinic to Support HIV Prevention and Care in Response to COVID, Providence RI. *AIDS and Behavior*, **24**, 2743-2747. https://doi.org/10.1007/s10461-020-02895-1

[3] Calton, B., Abedini, N. and Fratkin, M. (2020) Telemedicine in the Time of Coronavirus. *Journal of Pain and Symptom Management*, **60**, E12-E14. https://doi.org/10.1016/j.jpainsymman.2020.03.019

[4] Dandachi, D., Lee, C., Morgan, R.O., Tavakoli-Tabasi, S., Giordano, T.P. and Rodriguez-Barradas, M.C. (2019) Integration of Telehealth Services in the Healthcare System: With Emphasis on the Experience of Patients Living with HIV. *Journal of Investigative Medicine*, **67**, 815-820. https://doi.org/10.1136/jim-2018-000872

[5] Scott, R. and Mars, M. (2015) Telehealth in the Developing World: Current Status and Future Prospects. *Smart Homecare Technology and TeleHealth*, **25**, 25-37. https://doi.org/10.2147/SHTT.S75184

[6] Betancourt, J.A., Rosenberg, M.A., Zevallos, A., Brown, J.R. and Mileski, M. (2020) The Impact of COVID19 on Telemedicine Utilization across Multiple Service Lines in the United States. *Healthcare*, **8**, Article No. 380. https://doi.org/10.3390/healthcare8040380

[7] Brantley, A.D., Page, K.M., Zack, B., Radtke Friedrich, K., Wendell, D., Robinson, W.T., *et al.* (2019) Making the Connection: Using Videoconferencing to Increase Linkage to Care for Incarcerated Persons Living with HIV Post-Release. *AIDS and Behavior*, **23**, 32-40. https://doi.org/10.1007/s10461-018-2115-4

[8] Schwamm, L.H., Erskine, A. and Licurse, A. (2020) A Digital Embrace to Blunt the Curve of COVID19 Pandemic. *npj Digital Medicine*, **3**, Article No. 64. https://doi.org/10.1038/s41746-020-0279-6

[9] Grimsrud, A., Bygrave, H., Doherty, M., Ehrenkranz, P., Ellman, T., Ferris, R., *et al.* (2016) Reimagining HIV Service Delivery: The Role of Differentiated Care from Prevention to Suppression. *Journal of the International AIDS Society*, **19**, Article ID: 21484. https://doi.org/10.7448/IAS.19.1.21484

[10] Duncombe, C., Rosenblum, S., Hellmann, N., Holmes, C., Wilkinson, L., Biot, M., *et al.* (2015) Reframing HIV Care: Putting People at the Centre of Antiretroviral Delivery. *Tropical Medicine & International Health*, **20**, 430-447. https://doi.org/10.1111/tmi.12460

[11] Joint United Nations Programme on HIV/AIDS (2006) Fact Sheet. https://data.unaids.org/pub/globalreport/2006/200605-fs_caribbean_en.pdf

[12] Cohen, M.S., Chen, Y.Q., McCauley, M., Gamble, T., Hosseinipour, M.C., Kumarasamy, N., *et al.* (2016) Antiretroviral Therapy for the Prevention of HIV-1 Transmission. *New England Journal of Medicine*, **375**, 830-839. https://doi.org/10.1056/NEJMoa1600693

[13] Sabin, C.A. (2013) Do People with HIV Infection Have a Normal Life Expectancy in the Era of Combination Antiretroviral Therapy? *BMC Med*, **11**, Article No. 251. https://doi.org/10.1186/1741-7015-11-251 https://bmcmedicine.biomedcentral.com/articles/10.1186/1741-7015-11-251

[14] Guimaraes, M.D., McKinnon, K., Cournos, F., Machado, C.J., Melo, A.P., Campos, L.N., *et al.* (2014) Correlates of HIV Infection among Patients with Mental Illness in Brazil. *AIDS Care*, **26**, 505-513. https://doi.org/10.1080/09540121.2013.832722

[15] Mehrotra, M.L., Glidden, D.V., McMahan, V., Amico, K.R., Hosek, S., Defechereux, P., *et al.* (2016) The Effect of Depressive Symptoms on Adherence to Daily Oral PrEP in Men Who Have Sex with Men and Transgender Women: A Marginal Structural Model Analysis of the iPrEx OLE Study. *AIDS and Behavior*, **20**, 1527-1534.

https://doi.org/10.1007/s10461-016-1415-9

[16] Krumme, A.A., Kaigamba, F., Binagwaho, A., Murray, M.B., Rich, M.L. and Franke, M.F. (2015) Depression, Adherence and Attrition from Care in HIV-Infected Adults Receiving Antiretroviral Therapy. *Journal of Epidemiology and Community Health*, **69**, 284-289. https://doi.org/10.1136/jech-2014-204494

[17] Sun, S., Hou, J., Chen, Y., Lu, Y., Brown, L. and Operario, D. (2020) Challenges to HIV Care and Psychological Health during the COVID-19 Pandemic among People Living with HIV in China. *AIDS and Behavior*, **24**, 2764-2765. https://doi.org/10.1007/s10461-020-02903-4

[18] Joint UN Programme on HIV/AIDS (2020) Impact of COVID-19 on Mental Health and Quality of Life of Young Key Populations and Young People Living with HIV in Asia and the Pacific. https://www.unaids.org/en/20200612_mental_health_ykp_ap

[19] Gonzalez, J.S., Batchelder, A.W., Psaros, C. and Safren, S.A. (2011) Depression and HIV/AIDS Treatment Nonadherence: A Review and Meta-Analysis. *Journal of Acquired Immune Deficiency Syndromes*, **58**, 181-187. https://doi.org/10.1097/QAI.0B013E31822D490A

[20] Joseph, V., West, R.M., Shickle, D., Keen, J. and Clamp, S. (2011) Key Challenges in the Development and Implementation of Telehealth Projects. *Journal of Telemedicine and Telecare*, **17**, 71-77. https://doi.org/10.1258%2Fjtt.2010.100315

[21] Smith, A.C., Thomas, E., Snoswell, C.L., Haydon, H., Mehrotra, A., Clemensen, J. and Caffery, L.J. (2020) Telehealth for Global Emergencies: Implications for Coronavirus Disease 2019 (COVID-19). *Journal of Telemedicine and Telecare*, **26**, 309-313. https://doi.org/10.1177%2F1357633X20916567

[22] Figueroa, J.P. (2014) Review of HIV in the Caribbean: Significant Progress and Outstanding Challenges. *Current HIV/AIDS Reports*, **11**, 158-167. https://doi.org/10.1007/s11904-014-0199-7