

ORIGINAL RESEARCH

The Use of ICT in Providing HIV Services during the COVID-19 Pandemic: A Qualitative Study among Filipino HIV Volunteers



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Abstract

Background: The COVID-19 public health crisis has caused disruptions in the continuum of Human Immunodeficiency Virus (HIV) services. Hence, HIV advocates and care providers must innovate to ensure the health and welfare of people living with HIV (PLHIVs) and other at-risk populations. There is a lack of empirical research that explores the experiences and perspectives of HIV volunteers in adapting to pandemic-related challenges.

Purpose: This qualitative study aimed to describe the use of information and communications technology (ICT) in the provision of HIV services of Filipino volunteers during the pandemic.

Methods: Qualitative descriptive study design was used, focusing on ICT use for HIV care. Sixteen (16) purposively selected volunteers from three community-based organizations (CBO) were interviewed using a semi-structured guide via videoconference. Inductive qualitative content analysis was used to draw insights from the data.

Results: Findings revealed that volunteers used various ICTs such as social media, videoconferencing, dating sites, and online-based courier services to ensure continuity of HIV services. However, volunteers noted challenges in using ICT for HIV services, such as limited access to digital resources, increased work demands, and lack of human connection.

Conclusion: Various tools and implementations of ICTs have been used by volunteers to ensure the continuity of services of PLHIVs. This study provides insights to nurses and informaticists in implementing digital technologies in caring for vulnerable clients during outbreaks like COVID-19.

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1. Introduction

The Philippines is one of the countries with the fastest growing Human Immunodeficiency Virus (HIV) epidemics worldwide, registering a 203% increase in new infections from 2010 to 2018 (Ganguangco, 2019). At the end of 2019, the Department of Health, the Philippines (2020) recorded 74,807 HIV cases and estimated that 35 Filipinos were tested positive for the virus daily. In 2020, the HIV registration rate was decreased by around 40% from 2019 due to the restrictions induced by the 2019 novel coronavirus (COVID-19) pandemic. However, in the 2021, the rate increased to 12,341, which is almost similar to the 2019 rate (Department of Health [DOH], the Philippines, Epidemiology Bureau, 2022).

HIV-focused community-based organizations (CBO) have been instrumental in augmenting national and local government efforts in providing health and social services for persons living with HIV (PLHIV). An essential human resource of CBOs is its group of volunteers (professional and non-professional HIV care and service providers), who aid in ensuring individuals have access to HIV-related services and advocate for the welfare of PLHIVs and other related at-risk groups. The landscape of HIV service delivery in the Philippines is shaped by the efforts and innovations of CBOs and their volunteers (Constantino et al., 2016; Cousins, 2018; Quilantang et al., 2020).

The COVID-19 pandemic presented unprecedented challenges in the delivery of HIV services. Evidence from a scoping review demonstrates pandemic-induced disruptions in services,

decreased access to pharmaceutical supplies, and disruptions in service coordination, face-to-face consultations, and other related services, which have caused poorer health wellbeing outcomes among PLHIVs (Winwood et al., 2021). In addition, the fear of exposure to coronavirus has constrained the care provided by HIV frontline workers (Operario et al., 2020) and impacted their overall wellbeing (Sagaon-Teyssier et al., 2020). Mathematical modeling (Jewell et al., 2020a; Silhol et al., 2021) and empirical evidence (Medina et al., 2021) suggest that prolonged COVID-19-induced interruptions in service provision can result in increased cases of opportunistic infections and HIV-related deaths (Jewell et al., 2020b). This is a concern for the Philippines, which placed 50th out of 53 countries in terms of COVID resilience in February 2022 (Chang et al., 2022). The country has yet to completely lift all quarantine and social distancing measures due to controversial public health strategies implemented by the government in addressing the pandemic (Hapal, 2021). In line with this, the DOH, the Philippines (2021) reported a 61% decrease in HIV testing in the Philippines during the first year of COVID-19.

During the early months of the pandemic, HIV scholars in the Philippines (Quilantang et al., 2020) and elsewhere (Beima-Sofie et al., 2020; Jewell et al., 2020a; Jewell et al., 2020b) have forwarded recommendations regarding innovations to ensure continuity of HIV service delivery. These include increasing the use of telemedicine for counseling and treatment, modifying distribution mechanisms for essential medicines, and advocacy activities for the continuity of social services. Case studies that feature these pandemic-responsive HIV programs demonstrate their promise for long-term use (Smith & Badowski, 2021; Qiao et al., 2020). However, there is limited evidence in the Philippines and ASEAN that investigates the actual experiences of the actors involved in these modifications and innovative strategies. On this topic, only one study in the Philippines has been published, demonstrating the effectiveness of an online-based HIV self-testing program among priority populations (Eustaquio et al., 2022).

Like other sectors in society, health and social services have relied on information and communication technologies (ICT) to ensure that the basic needs and services of the population are met during the pandemic (Mouratidis & Papagiannakis, 2021). COVID-19-related social restrictions necessitated the increased and innovative use of ICT in delivering HIV services (Beima-Sofie et al., 2020; Qiao et al., 2020; Quilantang et al., 2020). While substantial evidence demonstrates the effectiveness of ICT-based HIV services (Simoni et al., 2015; Smith & Badowski, 2021; Young & Chiu, 2014), most of these were conducted pre-pandemic.

Nursing informatics, which includes “...*use of information technologies by nurses in relation to the care of their patients, the administration of health care facilities...*” (Staggers & Thompson, 2002), is a practice in the Philippines that is being institutionalized at a rapid pace. The experience of CBO HIV volunteers, some of whom are nurses, can help further contextualize this field of nursing in the country and examine how frugal and advanced ICT innovations can address service disruptions during crises. There is limited research on COVID-focused, ICT-mediated HIV services in the Philippines (i.e., Eustaquio et al., 2022), which only focused on clients rather than the experiences of CBO-based volunteers. We argue that the volunteers’ perspectives can provide insights into the availability, design, and implementation of these ICT strategies for HIV care and inform technology-based practices and systems during the pandemic and beyond. Therefore, this descriptive qualitative study aims to describe the use of ICT in providing HIV services during the COVID-19 pandemic as experienced by CBO volunteers.

2. Methods

2.1 Research design

The present study used a qualitative descriptive research design to address the research goal of examining the use of ICT in addressing the challenges of delivering HIV-related services during the COVID-19 pandemic. Qualitative descriptive research is employed when an analogy of what, where, when, and why an event or experience is sought (Holly, 2014).

2.2 Setting and participants

The study was conducted in the National Capital Region of the Philippines wherein the highest rates of HIV in the country were noted in the past decade (DOH Epidemiology Bureau, 2022). Using snowball sampling, the researchers were able to recruit sixteen (16) participants with the following eligibility criteria: (1) age between 18 to 59 years old; (2) must be an active volunteer of any community-based organization in NCR providing HIV services during the period

of the COVID-19 pandemic; (3) must be using ICTs in providing HIV services; (4) must have access to Internet and gadget/s to participate in videoconferencing-facilitated interviews. HIV-focused CBOs endorsed the initial interviewees, who in turn, referred the subsequent informants. The participants were contacted via email and/or the cellphone numbers provided by the CBO heads and were introduced to the study. The study reached data saturation and ended the recruitment at the 16th participant. Table 1 shows the characteristics of the key informants.

Table 1. Profile of the participants (n=16)

Participant	Age	Gender	Nature of Organization	Educational Attainment	Nature of Work
P1	37	F	Non-Government Organization for HIV	High School Graduate	General Volunteer
P2	30	M	Non-Government Organization for HIV	College Graduate	Peer Navigator
P3	37	F	Non-Government Organization for HIV	Vocational	General Volunteer
P4	32	F	Non-Government Organization for HIV	College Undergraduate	General Volunteer
P5	30	F	Non-Government Organization for HIV	College Undergraduate	General Volunteer
P6	35	F	Hygiene Clinic	College Graduate	HIV/AIDS Coordinator
P7	33	F	Non-Government Organization for HIV	High School Graduate	General Volunteer
P8	30	M	Non-Government Organization for HIV	Vocational	HIV Counselor
P9	36	M	Non-Government Organization for HIV	College Graduate	HIV Case Manager
P10	34	M	University	Masters Graduate	HIV Care Provider
P11	44	M	Hygiene Clinic	College Graduate	HIV Case Manager
P12	42	M	Hygiene Clinic	Vocational	Peer Educator
P13	42	M	Hygiene Clinic	Vocational	Peer Educator and Fear Navigator
P14	45	M	Non-Government Organization for HIV	College Graduate	Organizational Manager
P15	24	F	Non-Government Organization for HIV	High School Graduate	General Volunteer
P16	28	F	Non-Government Organization for HIV	College Undergraduate	General Volunteer

2.3 Data collection

Once participants signified their voluntary intent to participate in the study, they were asked to sign the informed consent form via email. After recruitment, each participant was scheduled for an interview based on their free time. Semi-structured interviews were conducted and audio-recorded via a videoconferencing application. The interview was facilitated by an interview guide (see Table 2), validated by two health social scientists with experience in sexual health and volunteer work. During the first five minutes of each interview, the participants were reoriented about the objectives and procedures of the study, including their rights as research subjects. The videos for the participants were turned off, and their names were changed to protect their privacy. The interviews ranged from 30 minutes to 1 hour. Follow-up questions were asked as needed to probe for more insights regarding their responses. Each participant was interviewed once.

Table 2. Interview guide

Open-Ended Questions	
1.	What HIV or AIDS-related services do you personally perform at your organization?
2.	How long have you worked in HIV and AIDS care?
3.	Describe your daily routine on a typical volunteer day.
4.	How do you provide HIV-related Care Services during the pandemic? How is it different from the way you provided these services prior to the pandemic?
5.	How do HIV Care providers like you utilize the ICT in delivering HIV-related care services and medications needed by your patients? (For each ICT Technology used) How do you use this particular technology?
6.	How was your experience in using these technologies?
7.	Can you describe the effectiveness of using ICT in HIV-related services?

2.4 Data analysis

The analytic technique was inductive qualitative content analysis, which was used to develop frameworks emerging from themes from verbalized and printed materials (Elo & Kyngas, 2008). First, the authors transcribed all the audio-recorded interviews. All the transcripts were then read and reread to get a sense of the whole. We extracted significant interview statements that were pertinent to the phenomenon of interest. The responses were then collapsed into broad categories based on their similarities and differences. To link the extracted data with the purpose of the study, interpretations based on the common patterns found were deduced into common themes and sub-themes (and lower level categories, if applicable). Lastly, the organized answers were connected to form a general description of the participants' experiences in utilizing ICT for HIV-related services. In general, analyses were done using a consensual process, wherein members jointly coded the interview transcripts during weekly meetings and practiced voting and vigorous discussions when disagreements arose.

2.5 Trustworthiness

Adhering to the principles of trustworthiness for qualitative research (Stahl & King, 2020), this study ensured credibility by employing strict privacy measures to facilitate authenticity and honesty in the responses. For transferability, the study's specific context was clarified, as discussed in the introductory section of this paper. For dependability and confirmability, the research team met weekly to discuss our data collection and analysis process to ensure that they were consistent. The themes were presented to nurses and social scientists for expert validation. The research team also recorded and stored the memos for the meetings during our consensual analysis sessions.

2.6 Ethical considerations

Our study's protocol adhered to the principles of the Declaration of Helsinki and the Data Privacy Act of the Philippines and was approved by the De La Salle University Integrated School Ethics Review Committee (STEM12L-10-13-2021). Informed consent was secured prior to interviews. Verbal permission was sought to record interviews. Participants were assigned pseudonyms to protect their identity. All the personal information of the interviewees was secured and kept confidential. All recordings and transcripts were stored in an encrypted cloud accessible only to the research team.

3. Results

3.1 Characteristics of participants

The majority of the participants were in their 30s (n=10, 62.5%), working in non-government organizations (n=11, 67.9%), college graduates (n=5, 31.3%), and were general volunteers (n=7, 43.8%) as seen in Table 1. The insights that emerged from the interviews depicted the COVID-19 context that induced the need for ICT interventions, demonstrated the various ways ICT was used to sustain HIV care during the pandemic, and the difficulties experienced in using ICT for HIV.

3.2 The use of ICT in providing HIV services

The study found two themes and six sub-themes showing the use of ICT by the volunteers in providing HIV services. ICT-facilitated solutions and challenges in using ICT solution for HIV services during the COVID-19 pandemic were two themes generated from the data analysis.

Table 3. Overview of themes and subthemes

Theme 1. ICT-facilitated solutions for HIV services during the COVID-19 pandemic	Theme 2. Challenges in using ICT solutions for HIV services during the COVID-19 pandemic
Subtheme 1.1. ICT-facilitated HIV prevention initiatives <ul style="list-style-type: none"> - Category 1.1.1. Social media for educational campaigns - Category 1.1.2. Videoconferencing applications for HIV-related seminars - Category 1.1.3. Maximizing the use of private messaging applications 	Subtheme 2.1. Limited accessibility Subtheme 2.2. Increased work demands Subtheme 2.3. Lack of human connection
Subtheme 1.2. ICT-facilitated HIV testing promotion <ul style="list-style-type: none"> - Category 1.2.1. Facebook for HIV testing promotion - Category 1.2.2. Dating sites for HIV testing promotion 	
Subtheme 1.3. ICT-facilitated treatment support for PLHIVs <ul style="list-style-type: none"> - Category 1.3.1. Online-based courier services for drug delivery - Category 1.3.2. ICTs for treatment service coordination - Category 1.3.3. ICT tools for psychological support 	

3.2.1 ICT-facilitated solutions for HIV services during the COVID-19 pandemic

There were three sub-themes of this theme, including ICT-facilitated HIV prevention initiatives, ICT-facilitated HIV testing promotion, and ICT-facilitated treatment support for PLHIVs.

3.2.1.1 ICT-facilitated HIV prevention initiatives

Social media for educational campaigns was the first category. Due to the restriction of mass gatherings, all events are held on online platforms, providing less risk compared to meeting in person. P1 shared, "... We are not allowed to go from house to house... No crowds are allowed to congregate, so we do our HIV education online...". Also, announcements regarding HIV activities are made online, with the HIV clinics and CBOs utilizing their own social media pages. Also, the volunteers continued their awareness drives through follower networks on social media and internal announcement systems of partner private companies. Then these campaigns are circularly shared on various platforms. Participant 10 mentioned: "We have a social media component that includes different information about offline or on-the-ground tasks ... depending on whether the post was shared by the school or an organization, we also re-share it on our page." (P10)

Videoconferencing applications for HIV-related seminars was the second category. The pandemic-induced restrictions related to social distancing and in-person trainings prompted the volunteers to transition their lectures and seminars to online platforms; as said by P8, "...during the height of COVID and social distancing, we transitioned our face-to-face trainings to Zoom."

For HIV-related awareness events and training programs, videoconferencing applications such as Zoom had been used. One participant reported, “We [case managers and doctors] explain HIV, how someone could get it, what they should avoid, and what they need to do. It is an orientation conducted via Zoom” (P3). The participants have positive attitudes towards the affordances provided by these applications and the ability of the webinars to accommodate audiences who are distant from them. P16 mentioned, “I think these webinars are OK. They make remote teaching easy. The process is simple. They really helped during the pandemic.”

Maximizing the use of private messaging applications was the third category. The use of private messaging was already utilized even before the COVID-19 pandemic started. Online platforms are more utilized as all communications are done remotely. One participant (P10) verbalized, “On the line of prevention, we kind of intensified our campaign ... We have people working and answering queries on our social media pages and then scheduling them for consultation—that is our adaptation.” Some private messaging applications used, according to P8, were those that were embedded in “Facebook” and “Grindr.” Some participants noticed that certain queries would be brought up more often than others. To address this, some of the volunteers employed chatbots on private messaging on social media pages. P10 explained, “If a specific keyword appears in the chat, the chatbots automatically answer the client’s queries.”

3.2.1.2 ICT-facilitated HIV testing promotion

Facebook for HIV testing promotion was one category of this sub-themes. According to P14, “during COVID-19, HIV testing became constrained.” One solution for this issue was to use social media. P6 explained, “Our best solution was to utilize social media. Wherein Facebook is the medium... to invite people who want to test whether they have HIV or not.” Some participants used their social media presence to encourage people to take HIV tests, as reported: “...on my personal Facebook account, I joined different groups so I can invite and encourage people in LGBTQ+ groups.” (P11)

Dating sites for HIV testing promotion was another category. Dating sites, such as Grindr, were also used to find clients who would like to get tested for HIV. Some volunteers noted that they were active in HIV testing campaigns in Grindr because they had observed high sexual risk behaviors among users of the said application; “...we really reach out to the LGBT community online through dating apps because they may be exposed to more risk” (P2). Participants further claim that this gay dating site had been the source of many individuals who eventually became HIV seropositive after getting tested. P2 added, “most of our clients who turn out to be positive come from Grindr.” The volunteers created an account on Grindr and indicated the HIV services they could provide for potential clients who might reach them via the application. A participant illustrated “... for my Grindr profile... I also put there that I offer free HIV testing and counseling.” (P5)

3.2.1.3 ICT-facilitated treatment support for PLHIVs

Online-based courier services for drug delivery was the first category. Aside from the fact that mobility during the pandemic was constrained, the volunteers were concerned about making PLHIVs travel on their own to get their ARTs. At the same time, there was a threat of getting infected by the novel coronavirus, as said by a participant “Treatment and drug dispensing facilities had to hold their services, especially since these facilities also care for COVID patients” (P2). To address this, the volunteers used online courier and delivery applications (such as Lalamove and Grab in the Philippines) to send the medications to the clients to reduce the risk of infection. One participant (P9) explained, “One of the transitions that happened in treatment services is that the antiretroviral drugs are now being delivered ... so they get their ARV drugs by using ‘Lalamove’ or any other delivery services.” (P9)

ICTs for treatment service coordination was the second category. Along with the limited face-to-face interaction, service coordination done by volunteers for doctors and PLHIVs also became problematic. P7 disclosed, “...hospitals and doctors are very busy... sometimes the line is so long... it sometimes takes one to two days before I can contact hospital personnel...” This prompted the rise of telemedicine and remote consultations. A range of ICTs were used for this purpose; as P10 enumerated, “...for clients who need these services, they can reach out to us through text, through call, through direct messaging, through Twitter, through wherever... they’re all in these platforms.” For instance, two participants shared, “we used text messaging to link clients with

hospitals or treatment hubs.” (P7) and “...[analog] calls are still relevant in coordinating the care of PLHIVs... especially when in areas with poor exposure to cell sites.” (P14)

ICT tools for psychological support was the third category. Some volunteers say that during COVID-19, they maintained their communication and social media lines open so that their clients could contact them for any mental health and wellbeing needs. A participant shared, “...for our e-consultations, our patients send their problems to our official FB page... They inform us of their problems and send photographs to describe their concerns...” (P6). P11 added that online group chats could be an avenue for volunteers and other clients to look after the mental health of one another. One participant confirmed that these strategies helped, claiming, “...these communication lines help to lessen their negative feelings and worries.” (P9)

3.2.2 Challenges in using ICT solutions for HIV services during the COVID-19

There were three challenges in using the ICT solution for HIV services during the COVID 19 namely, limited accessibility, increased work demand, and lack of human connection.

3.2.2.1 Limited accessibility

Despite the perceived utility of ICT-facilitated solutions for HIV service delivery, the volunteers noted that for some of the clients and providers, accessibility to the tools and resources needed to use ICT may be constrained. For instance, participant 6 (P6) explained that some clients may be financially disadvantaged, “Our patients come from all walks of life. We have patients who are garbage collectors who don't have the means. They don't have cellphones; they don't have internet connection for e-consultation.”

Moreover, the volunteers lamented the limited coverage and reliability of internet services, especially in remote areas. P3 stated, “...sometimes the connection will just suddenly be interrupted while we are in the middle of an activity. If you are outside, away from Internet connection, you will not be able to attend to needs urgently.”

3.2.2.2 Increased work demands

The creation and implementation of these ICT-facilitated services were additional tasks that come on top of their usual workloads as volunteers. P1 explained, “...there are so many queries coming in... If you are going to create a page, you have to ensure that there is someone assigned to a certain time slot... to monitor this and that.” Some volunteers lamented that managing these ICT solutions and dealing with clients infringed on their personal and family time. P6 shared, “...sometimes they contact you during midnight and wee hours in the morning... unlike during face-to-face services, they know that our office hours are only from 8 to 5.”

3.2.2.3 Lack of human connection

Some volunteers expressed that they are not satisfied with their ICT-mediated interactions with clients, claiming that they lack the “human touch” to make these interventions more effective. P12 disclosed, “...I really prefer face-to-face, because I can explain more clearly and you can make them feel that you empathize with them, compared to just sending them the paraphernalia...”

P6 explained that it was harder to physically assess the patient in an online consultation. P10 says that in face-to-face interactions, he could “...see their reactions... their gestures.” P14 also added that “teaching new HIV counselors online is harder...” than in-person training.

4. Discussion

This study examined how volunteers use ICT to deliver HIV services during the COVID-19 pandemic using a qualitative research approach. In summary, our findings reveal ICT solutions in providing HIV services in the time of COVID-19, which included the use of social media, mobile technologies, and other common and emerging digital tools for prevention, testing and support for treatment. However, with the use of these technologies, there were some challenges and difficulties that volunteers experience in delivering care. To our knowledge, this is the first ASEAN-based study that explored pandemic-induced, ICT-facilitated HIV social services from volunteers' perspectives. In further discussing insights from our findings, this section was divided into two parts: one part per major theme.

4.1 ICT solutions for HIV services among volunteers

The present study demonstrates how the HIV volunteers were able to implement a diverse range of ICT-facilitated solutions to ensure that the various aspects of HIV services are available and the care needed by PLHIVs is maintained despite the difficulties posed by the pandemic. In this current study, the solutions were conceptualized based on the general types of HIV services provided by volunteers: prevention, testing, and treatment support. Thematic insights reveal many ICT-based strategies that had been already useful pre-pandemic but intensified during quarantine periods. For instance, the use of social media, messaging applications, and dating sites for HIV awareness campaigns, testing promotion, and treatment coordination had been proven efficient and effective by studies done before (Simoni et al., 2015; Sianturi, 2015; Young & Chiu, 2014) and during the time of COVID-19 (Quiao et al., 2020; Smith & Badowski, 2021) in the Philippines and elsewhere.

Furthermore, volunteers also shared new ICTs that gained prominence during the pandemic. This included the rise of videoconferencing applications for webinars instead of in-person seminars. Prior research has demonstrated the utility and ubiquity of videoconferencing for educational purposes and telemedicine has become in the time of COVID-19 (Sidpra et al., 2020; Wlodarczyk et al., 2020), and its usefulness extends to HIV education, as evidenced by our results.

Another emerging ICT solution for HIV is using online-based courier services for medicine distribution, which replaced the usual practice of the client traveling to the treatment hubs to receive the pharmaceutical supplies. Despite the added costs of delivery services, it ensures the continuity of ART for PLHIV experiencing transportation restrictions, while still being served by their official treatment hub. Many of these ICT solutions demonstrate some of the recommendations of the scholarly work of Quilantang et al. (2020), who proposed using online tools and courier services for HIV care amid the pandemic.

4.2 Challenges in using ICT tools for HIV services among volunteers

Finally, another novel finding in the context of pandemic-related ICT-based HIV services that we gleaned from the insights of the volunteers is the challenges they experienced during provision of services. These include reliability of Internet technologies, the tiring nature of online-mediated services and the decreased sense of human touch in these services.

As mentioned, the first of these issues was the accessibility of the Internet and gadgets for volunteers and clients. Evidence in the field of education and telemedicine also notes this as a major hurdle in providing optimal services (Cleofas, 2021; Cruz-Lim et al., 2021). This is unsurprising in the Philippines, which has the worst Internet quality in the ASEAN region (Barreiro, 2017). Second issue was the increased job demands among volunteers who must manage these ICT solutions and deal with the “always-on” nature of these technologies. There was a blurring boundary versus their personal time since the clients had easier contact with them. This confirms earlier evidence, which indicates the prevalence of technostress among health and caregivers from different professions during the time of COVID-19 (Camacho & Barrios, 2022). The last issue was the volunteers’ dissatisfaction with the lacking human aspect of ICT-mediated interventions. Participants felt that they were not providing optimal personal care in digitally mediated encounters with their clients. This thematic finding is corroborated by previous research that notes the importance of close contact during counseling as seen in a study in Indonesia (Hasanah et al., 2019). The lack of warmth and sense of social connection in various forms of telehealth care has also been noted by recent pandemic evidence (Smith & Badowski, 2021).

5. Implications and limitations

As the Philippines and the rest of the world enter a post-pandemic world, Community-based HIV nurses, CBOs, and other HIV organizations must take advantage of the lessons learned using ICT innovations during the pandemic. The use of online and digital resources to accommodate clients affected by travel restrictions can be sustained even after the pandemic to reach PLHIVs and other priority populations found in remote areas of the country. Community-based HIV nurses at CBOs are encouraged to document the practices that emerged during the pandemic and codify these processes through guidelines and manuals so that these innovations can become part of organizational culture. Monitoring and evaluation mechanisms on using these ICT-based solutions can help ensure that the strategies used remain relevant to the clientele's needs. On top

of HIV-related knowledge and skills, community-based nurses and HIV volunteers may also need to be capacitated on using ICTs. In line with the issues regarding increased task demands with the use of ICTs for HIV services, formal norms on official service hours of volunteers for non-emergency concerns must be communicated to the clients during the first contact. Managers of CBOs should also be mindful of the workload of nurses and volunteers, strategize the distribution of tasks and promote regular periods of rest. Government, private and civil society organizations can be tapped for support for subscription to reliable Internet services and gadgets to improve the ICT-facilitated health services of volunteers. When COVID-19-related restrictions become fully lifted, hybrid (online and offline) forms of tele-education, telemedicine, and tele-counseling services can be designed and implemented to take advantage of the greater reach afforded by digital technology while also ensuring the humanistic aspects of healthcare, social services, and HIV education are also addressed. Nursing informatics courses may include these findings in the syllabus so nursing students can appreciate how ICT facilitates the innovation of health care of nurses and other allied health professionals and advocates.

The findings of the study must be viewed considering its limitations. First, due to time constraints and the ethics review advice to limit exposure of participants who may be dealing with sensitive issues, prolonged engagement, and member checking were not done. Second, given the mobility restrictions of the pandemic, triangulation was not implemented.

6. Conclusion

Based on the findings, we concluded that HIV volunteers have used various tools and implementations of ICTs to ensure the continuity of care during the COVID-19 pandemic. Notwithstanding the challenges of integrating ICT in health services, the dynamic and multifunctional nature of currently available information and communication technologies can help fill multifaceted gaps in HIV service provision. The present study contributes to the broader literature on HIV volunteerism and nursing informatics during crisis situations and technology-facilitated HIV care by highlighting the importance of various ICT-based solutions that can augment the delivery of HIV services and ensure the continuity of care for clients during the critical period of the COVID-19 pandemic. Future researchers can conduct formal evaluations of these ICT strategies using quantitative methods. Future researchers can also replicate the study in other geographical locations in the Philippines (such as Visayas and Mindanao, Central and Southern island groups in the country, respectively) and employ multiple data collections such as participant observations in the use of ICT tools. Online ethnographies can also be used to analyze archival data generated by these ICT-mediated services.

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Author contribution

MCSC, FIUDC, LZSDC, AFQM: Initial protocol development, ethics processing, interviews and data processing, initial consensual qualitative analyses, initial manuscript writing. JVC: Finalization of protocol, finalization of consensual qualitative analyses, final manuscript writing.

Conflict of interest

There are no conflicts of interest to declare.

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