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Conducting an ongoing HIV clinical trial during the COVID-19 pandemic in Uganda: A qualitative study of research team and participants' experiences and lessons learned

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Conducting an ongoing HIV clinical trial during the COVID-19 pandemic in Uganda: A qualitative study of research team and participants' experiences and lessons learned

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Keywords: COVID-19; HIV & AIDS; Qualitative research

Abstract

Objective: To explore the experiences and lessons learned by the study team and participants of the WISE-Men (Workplace-based HIV self-testing among Men) trial during the COVID-19 pandemic in Uganda.

Design: An explorative qualitative study comprising two virtual focus group discussions with 12 participants and 32 in-depth interviews (N=44). Data were collected via telephone calls for in-depth interviews or Zoom® for focus group discussions and manually analyzed by inductive content analysis.

Setting: Fourteen private security companies in two Uganda districts.

Participants: Members of the clinical trial study team, and men working in private security companies who undertook workplace-based HIV testing.

Results: The key themes for participants experiences were: 'challenges in accessing HIV treatment and care', 'misinformation' and 'difficulty participating in research activities'. The effects on HIV treatment and care resulted from; repercussions of the COVID-19 restrictions, participants fear of co-infection and negative experiences at health facilities. The difficulty in participating in research activities arose from: fear of infection with COVID-19 for the participants who tested HIV negative, transport difficulties, limited post-test psychosocial support and lack of support to initiate Pre-exposure prophylaxis.

The key study team reflections focused on the management of the clinical trial, effects of the local regulations and government policies and the need to adhere to ethical principles of research.

Conclusions: Findings highlight the need to organize different forms of HIV support for persons living with HIV during a pandemic. Additionally, the national research regulators and ethics committees or review boards are strongly encouraged to develop policies and guidelines for the continuity of research and clinical trials in the event of future shocks. Furthermore, this study calls on the appropriate government agencies to ensure public and researchers' preparedness through continuing education and support.

Strengths and limitations of this study

- This is the first study of the experiences and lessons learned while conducting an ongoing HIV clinical trial during the COVID-19 pandemic in Uganda.
- This study shares the perspectives of both the clinical trial team and trial participants.

- We utilized telephone calls for the in-depth interviews and the Zoom® platform for the focus group discussions.
- Telephone interviews made it impossible to observe non-verbal cues during the in-depth interviews.

Introduction

Coronavirus Disease 2019 (COVID-19) is a viral respiratory disease caused by the 2019 novel coronavirus (SARS-CoV-2) ^{1 2}. By 07, January 2021, there were 85,509,194 confirmed cases of COVID-19 worldwide, reported to the World Health Organization (WHO) with 36,050 cases and 274 deaths in Uganda ³. Several countries introduced variations of social distancing restrictions ranging from the extreme of lockdown, to banning of social gatherings and quarantine of exposed individuals. While these measures may have helped to disrupt the spread of the virus, they also interrupted the delivery of other health services and the conduct of research activities. Global reports on the impact of COVID-19 on health systems are beginning to emerge. For example, because of the closure of borders and lock downs, antiretroviral (ARV) manufacturers in India reported concerns with international shipping of raw materials, thus causing delays and raising costs ⁴. Globally, there is an expected shortage of ARVs not only because of the lockdowns, but also due to a shift of financial resources ⁵. Consequently, HIV morbidity and mortality are expected to increase during the pandemic and post-pandemic. A model by Jewell et al. ⁶, predicts that a six-month supply disruption of ARVs because of COVID-19 pandemic could result in over 500,000 HIV related deaths in sub-Saharan Africa and 2-fold increase of mother to child transmission of HIV.

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3 One of the challenges faced by the global community is how to maintain
4 continuity of HIV care, treatment, and research programs during the COVID-
5 19 pandemic. Emerging evidence suggests that COVID-19 has disrupted HIV
6 services with negative implications on the attainment of the 90-90-90 targets
7 and clinical services for people living with HIV/AIDS (PLWHA) ⁷. In a survey
8 conducted in February 2020 in China, 32.6% of PLWHA were at risk of
9 antiretroviral therapy (ART) discontinuation and another 48.6% did not know
10 where to get ARVs in the near future ⁸. In yet another study, Sun et al. (2020)
11 found that 22.8 % of the participants, reported medication uptake was
12 disrupted and 67.5% worried about disruption in their medication and future
13 care ⁹. In the same study, some participants discontinued medication to keep
14 their HIV status concealed ⁹. Field notes from Kenya document how the
15 disease has impacted HIV testing and assisted partner-notification programs
16 ¹⁰. Due to fear of acquiring the COVID-19 infection, patients hesitated to
17 attend the clinic, and many others could not afford transport to the health
18 facilities ¹¹.

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42 In this study, we sought to document experiences of clinical trial study
43 participants and reflections of the study team in the Wise-Men trial during the
44 COVID-19 pandemic. The 'WISe-Men' trial (**W**orkplace-based HIV **S**elf-testing
45 among **M**en) is a cluster-randomized trial assessing the effectiveness of
46 workplace-based HIV self-testing in Uganda (Clinicaltrials.gov, ID:
47 NCT04164433). The trial started participant enrolment on February 4, 2020.
48 However, new participant enrolments were halted on March 28, 2020. This
49 followed directives such as the country-wide mandatory lockdown and curfew
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3 implemented by the Ugandan government and the national research
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5 regulator, the Uganda National Council of Science and Technology (UNCST)
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10 11 12 **Methods**

13 14 15 **Study design and participants**

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18 This was an explorative qualitative sub-study nested in a clinical trial. The data
19
20 in this study was collected during follow-up calls with trial participants. In this
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22 paper, '*study participants*' will refer to the enrolled clinical trial participants
23
24 who consented to share the challenges reported in this paper. The trial
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26 participants who took part in this study were men employed by private security
27
28 companies in two Ugandan districts: Hoima and Kampala. Participants were
29
30 eligible to share their perspectives if they were already enrolled in the WISE-
31
32 Men trial. The eligibility criteria were 1) Men 18-60 years old 2) Employed >6
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34 months within the security industry 3) Not tested for HIV before 4) Negative test
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36 results for HIV more than one year prior to enrolment.
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44 45 **Ethical considerations**

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47 This sub-study ethical approval was granted by the School of Health Sciences
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49 Research and Ethics Committee at Makerere University (Ref. Number: 2018-
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51 054). Additional approval was obtained from the UNCST (Ref Number: HS 2672).
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53 The initial study design did not include telephone or Zoom interviews; therefore,
54
55 additional approval for these changes was obtained in August 2020. All
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57 interactions with the participants were audio-recorded with permission.
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3 Patients or the public were not involved in the design, or conduct, or reporting,
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5 or dissemination plans of our research.
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9 **Data Collection**

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11 Data were collected from a combination of in-depth interviews and virtual
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13 Focus group discussions by PAM and two research assistants who are trained
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15 and have experience in qualitative methodologies.
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19 ***In-depth participant interviews***

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21 Two research team members experienced in qualitative research conducted
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23 the in-depth interviews (IDIs). Participants were purposefully sampled to
24
25 include men from different employee ranks and age categories (18-25, 36-35,
26
27 36-45 and 46-64). The interview guide was tested and developed iteratively at
28
29 three pilot interviews to refine the questions. The participants in the pilot
30
31 interviews gave consent prior to participation in the study. The interview guide
32
33 collected data about participants' experiences, challenges and lessons
34
35 learned while participating in all the trial activities during the COVID-19
36
37 pandemic. Phone interviews were conducted in August and September 2020
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39 and each lasted 45 minutes to an hour.
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46 ***Research team reflections***

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48 Reflections from the research team were collected during the daily de-brief
49
50 meetings. The reflections were collected in two ways; face-to-face in-depth
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52 interviews (IDIs) between March 15, to March 30, 2020, and virtual focus group
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54 discussions (FGDs) between June 1, to June 11, 2020 using the Zoom platform.
55
56 The FGDs had 6 team members per group. All the team members were
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3 informed that these reflections were part of the study, and informed consent
4 was sought. The meetings lasted 45 minutes to one hour, led by a moderator
5 and note-taker. Both the FGD and IDI utilised an open guide with the question
6
7
8 “*What were today’s experiences, successes, challenges and lessons learned*
9
10
11 *from conducting the WISe-Men trial during the COVID-19 pandemic?*” This
12
13 question was incorporated into the clinical trial following ethics approval to
14
15 modify the design during the unanticipated COVID-19 pandemic.
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21 **Data Analysis**

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24 The phone interview recordings were transcribed verbatim. The minutes from
25
26 each de-brief meeting were typed up after each meeting and archived. Both
27
28 the participant and study team data were analyzed manually using inductive
29
30 content analysis. This process entailed open coding, developing emergent
31
32 categories and conceptualization¹⁴. Two team members (PAM and RN)
33
34 reviewed the transcripts independently. The pair identified codes separately
35
36 and then discussed them to achieve consensus. Any disagreements on the
37
38 codes were settled by discussion with another member of the trial team (TDN).
39
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41 The coders iteratively named and re-named the codes as more insights and
42
43 latent meanings emerged from the data. The codes were then grouped into
44
45 categories and subcategories.
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51 The research team members who took part in the de-brief meetings did not
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53 analyze the data.
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3 To ensure trustworthiness and the quality of the data, a sample of the study
4 participants reviewed the categories and subcategories. Interview notes were
5 recorded in the principal researcher's reflective journal for confirmability.
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10 11 12 **Results**

13 14 15 **Participant's characteristics**

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18 In total we interviewed 44 participants, the majority were 18-25 years old, and
19 mostly security guards. See table 1.
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23 24 25 **Participants' challenges**

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28 Three themes emerged from the participants' experiences. The themes,
29 categories, and sub-categories are presented in Figure 1.
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33 34 35 **Challenges in accessing HIV treatment and care**

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37
38 Participants reported challenges in seeking and accessing HIV treatment and
39 care. The narrative quotes are presented in table 2.
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42 43 44 **Difficulty accessing treatment facilities**

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47 Several participants who had recently started on ART were unable to continue
48 with their treatment due to difficulty in accessing the health facility following
49 the stay-at-home directives among other reasons. During the COVID-19
50 lockdown and curfew period in Uganda, only essential personnel who had
51 special car stickers or travel in vehicles with special government permission
52 were permitted to drive personal cars. Additionally, during this time, many
53 worksites were closed. The study participants had previously selected health
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3 facilities that were close to their workplaces for their HIV care. They expressed
4
5 difficulty in walking to and from their homes to the health facility to access their
6
7 treatment.
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10 11 ***Interruptions in HIV treatment schedule*** 12

13 A few participants experienced interruptions in their treatment schedule due
14
15 to issues of non-disclosure of their HIV status and inability to explain the daily
16
17 medication to their partner. They reported that they typically keep their
18
19 medications at the workplace where they can easily take them without
20
21 intrusive questioning from family members.
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26 27 ***Fear of co-infection with COVID-19*** 28

29 Study participants who tested positive for HIV expressed concern about being
30
31 more at risk of COVID-19 infection because it was widely circulated that men,
32
33 older people, and those with pre-existing comorbidities were more susceptible
34
35 to infection.
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39 40 ***Difficulty in transferring HIV care to new facilities*** 41

42 During the lockdown period, some participants travelled to their home villages
43
44 to stay with their families. While they were there, they visited nearby hospitals
45
46 for drug refills, however, some were denied the opportunity to transfer their
47
48 care to new ART treatment facilities.
49
50

51 52 ***Limited HIV treatment support at health facilities*** 53

54 Some of the participants experienced some side effects following ART
55
56 initiation. One suffered from severe stomach upsets and skin changes which
57
58 he attributed to the ART treatment. Unfortunately, he was not able to access
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3 the hospital where he was receiving HIV care. He felt unsupported and still
4 reports difficulty coping with the new treatment.
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8 9 **Misinformation**

10
11
12 At the start of the pandemic, there was a lot of information shared via several
13 social media platforms. Participants reported that this information influenced
14 their decisions regarding HIV treatment. The narrative quotes are presented in
15 table 2.
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23 ***Incorrect information about COVID-19***

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25 Some participants reported that they received wrong information from their
26 peers. For example, some participants were informed that PLWHA who were
27 on ART were more likely to get infected with COVID-19. Therefore, some
28 participants stopped taking their medication.
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35 ***Unforeseen effects of peer information on ART adherence***

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38 A few participants heard about Remdesivir as a potential drug for use in
39 treatment of COVID-19. Their colleagues suggested that it was like the HIV
40 antiretroviral medication. This erroneously encouraged adherence to their ART
41 regimen as they thought it would lower their risk of COVID-19 infection.
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49 **Difficulty participating in research activities**

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52 The other main experience involved the participants' difficulty in taking part in
53 follow-up research activities as part of the clinical trial. The narrative quotes are
54 presented in table 2.
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Transport difficulties

Following enrolment into the trial, each participant was meant to return for follow-up visits after 1 week, one month and then at three months. Unfortunately, the stay-at-home orders made this impossible. The research team then changed to follow-up phone calls; however, some participants had poor telephone network connectivity and therefore missed these calls.

Fear of exposure to COVID-19

Participants were concerned about the likelihood of exposure to the coronavirus at the research site. They requested for a significant risk allowance for in-person visits during the pandemic.

Limited post-test psychosocial support

Some participants tested HIV positive for the first time and were still in denial. They reported the unmet need of support with adherence, coping with taking ART, dealing with side effects, and assisted partner notification.

Need for PrEP initiation support

One of the participants who was undergoing counselling to commence PrEP, reported that he lacked the confidence to start without face-to-face support.

Study team reflections of managing a clinical trial during the COVID-19 pandemic

The study team reflected on their experiences of conducting an ongoing clinical trial during the COVID-19 pandemic. The coding tree is in figure 2 and the categories and narrative quotes are presented in table 3.

Effects of local regulations and government policies

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3 On March 25, 2020, the government of Uganda suspended public transport
4 and placed restrictions on private vehicle movements, while on March 30, the
5
6 President declared a nationwide lockdown and curfew ¹². On March 27, the
7
8 UNCSST banned the recruitment of new study participants. Researchers were
9
10 also directed to halt face-to-face follow-up visits of the already recruited
11
12 participants indefinitely ¹³. This had ripple effects on both the management
13
14 and continuity of the clinical trial.
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21 **Clinical trial management**

22 ***Trial design modifications***

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25 This was a cluster randomized design where two districts were randomly
26
27 assigned to receive the intervention which was HIV self-testing and the
28
29 standard HIV testing services to the control arm. During this time, several trial
30
31 participants travelled back to their home villages or ancestral homes. The study
32
33 team expressed concern that this may have unintentionally caused
34
35 'contamination' among the individuals, since participants in both the control
36
37 and intervention clusters could have interacted in the villages. Evidence is still
38
39 being sought regarding whether there was study contamination.
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48 ***Budget and procurement alterations***

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50 The trial started enrolment on 4, February 2020, and the first COVID-19 case in
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52 Uganda was reported on 21, March 2020 ¹². The study team therefore incurred
53
54 unanticipated purchases and budget modifications to ensure continuity of
55
56 study activities, and safety of the team and participants.
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Supply chain interruptions

A prominent implication of the COVID-19 pandemic was the degree to which services were entirely shut down. This meant that there were interruptions in procuring and obtaining equipment and materials needed for crucial elements of the clinical trial, which led to a delay in research activities.

Human resource considerations

The study team members reported low levels of COVID-19 health literacy. The trial directors hired more staff who had received training in infection prevention and control (IPC) measures for COVID-19. The new personnel conducted screening, 4 hourly surface disinfection and provided training and education for study participants. Other precautionary measures are highlighted in table 3. Additionally, the trial suffered some personnel losses since some team members were unable to continue participating in the research activities.

Loss to follow-up (LTFU) of enrolled participants

Some security companies downsized, and participants lost their jobs, therefore, they had to be removed from the trial as they no longer met the inclusion criteria. Others could not be reached due to their poor phone network connectivity, while others simply refused to take calls from the study team.

Adherence to ethical principles of research

Ethical approvals for protocol deviations

The trial protocol and consent forms were modified to reflect the changes mentioned in table 3 and submitted to the review board for approval before the trial could proceed. The research team felt that the modifications were

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3 minor and did not necessitate a complete discontinuation of the trial.
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5 However, because of the COVID-19 restrictions, there was a substantial delay
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7 before this was approved.
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10 11 **Balancing risks and benefits** 12

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14 The study team conducted daily assessments of predictable risks to both the
15
16 staff and the trial participants in comparison with potential benefits. The trial
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18 was eventually halted, and several contingency plans were initiated to ensure
19
20 safe continuity of some research activities.
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23 24 25 **Discussion** 26

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28 This sub-study explored the trial team and participants' experiences of
29
30 participating in an ongoing clinical trial during a pandemic. Three themes
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32 emerged for the participants' experiences: effects on accessing HIV treatment
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34 and care, misinformation and difficulty participating in research activities. The
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36 study team reflections focused on the management of the clinical trial, effects
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38 of the local regulations and government policies and the need to adhere to
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40 ethical principles of research.
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43
44 One of the greatest implications for this clinical trial were the knock-on effects
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46 of the local regulations and government policies. In March 2020, the
47
48 government of Uganda enforced several COVID-19 restrictions including travel
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50 bans, border closures, nationwide lockdowns and curfews, and suspension of
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52 mass gatherings ¹². While this strategy maybe efficacious in preventing the
53
54 transmission of COVID-19, it could aggravate non-COVID-19 related health
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3 outcomes¹⁵. Additionally, as in this study, these effects may include difficulties
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5 in accessing lifesaving treatment, or participating in research activities.
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7 Furthermore, results from mathematical modelling suggest that interruption to
8
9 condom supply and health education could make populations more
10
11 vulnerable to increases in HIV incidence.¹⁶ In agreement with¹⁷, this suggests
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13 the need for appropriate government agencies and research regulatory
14
15 bodies to develop systems that can ensure continuity of essential services and
16
17 research even when lockdowns and travel bans are in effect. Research and
18
19 ethics committees might consider asking researchers conducting trials in HIV,
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21 to submit a contingency plan if participants are unable to access their
22
23 treatment and care.
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31 An important consideration is the need to plan for different forms of support for
32
33 research participants and PLWHA during a pandemic. The difficulty in
34
35 continuing ART treatment was a recurring issue among many of the
36
37 participants who missed clinic visits. This agrees with Opio and colleagues in
38
39 Uganda who reported some of the major reasons for loss to follow up (LTFU) as
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41 the long distance from home to the health facility for drug replenishment and
42
43 limited capacity at lower level ART clinics¹⁸. In hindsight, HIV research teams
44
45 could have provided participants with transfer letters to new facilities or home
46
47 delivery of ART¹⁹. For example, the research team from a Tuberculosis clinical
48
49 trial made arrangements for delivery of medicines to the homes of participants
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51 who gave prior consent²⁰. Another form of support could be psychosocial
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53 support where participants are availed a phone number that they can
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3 contact for any further pertinent discussions or a routine follow-up phone call
4
5 in the absence of in-person visits. At the policy level, Rewari and colleagues
6
7 recommend instituting measures and guidelines to minimize ART supply shocks
8
9 and to prepare for future emergencies ⁴.
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14 Another challenge that the research participants faced was the
15
16 misinformation regarding COVID-19. Some participants halted their treatment
17
18 because of misinformation from their peers about the relationship between
19
20 ART and infection with COVID-19. Coincidentally, the information from peers
21
22 encouraged adherence to ART. This followed reports that patients with both
23
24 HIV and SARS-CoV-2 co-infected patients may have a less severe clinical
25
26 picture of COVID-19 if they are already receiving ART ²¹. Unfortunately, they
27
28 altered the information that people on ART were less likely to get the COVID-
29
30 19 infection. To prevent this, researchers should make every effort to get well
31
32 informed about a new health threat (within the limits of available information),
33
34 so that they can advise participants appropriately but also make robust plans
35
36 on how to manage the research. Researchers are therefore encouraged to
37
38 design information and initiatives to advance research literacy and serve as a
39
40 source for correct information. This will maintain trust and encourage
41
42 continued participation and engagement ²²⁻²⁴ and prevent unnecessary fear
43
44 and distress ²⁵. Participants should receive regular practical tips on handling
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46 the disruption in their work life and giving them hope that normal research
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48 activities will resume once the pandemic abates ²⁶⁻²⁸.
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3 The principle of beneficence requires those in positions of responsibility to act
4 with the best intentions for all those under their jurisdiction ²⁹, therefore trial
5 managers must be cognizant of maintaining the integrity of the trial whilst
6 ensuring the safety of the participants ³⁰. The COVID-19 pandemic poses
7 potential serious risks for clinical trial participants and staff engaged in health
8 research. Researchers should ensure that participant safety is always supreme
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29. For instance researchers may close a clinical trial where the risk of exposure to coronavirus is high ²⁰. Anker and colleagues discourage the hasty permanent termination of ongoing clinical trials unless they are nearing planned completion or have not yet started ³⁰. In this case, we initially stopped all procedures that prevented the social distancing requirements such as venepuncture. Eventually, we halted participant recruitment and face-to-face follow up visits.

Before the pandemic, many researchers only used in-person methods for follow up-visits. This period has seen clinical researchers consider several other options including the use of mobile apps, and other remote platforms to conduct research visits ²⁶. In this study, we used both Zoom and phone interviews to collect the follow-up data for the clinical trial. The telephone interviews drastically improved the time efficiency for following up participants, reduced the expenditure for participants' transport compensation, and provided access to participants who were geographically distant or located in high COVID-19 transmission areas. This agrees with ³¹ that telephones give researchers access to diverse resources and experiences without the

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3 inconvenience, the expense and the time expended in travel. However, the
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5 phone follow-up was a challenge for some participants who developed
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7 reactions to the HIV medication and those who needed support with initiating
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9 PrEP. Additionally, several ethical issues and unscrupulous behaviors may also
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11 arise from the use of these new methods like Zoom such as potential abuse
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13 and exploitation ³²³³. Potential difficulties such as lack of technology expertise,
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15 confidentiality challenges, reimbursement matters ³⁴, poor phone network,
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17 and low internet connectivity need to be addressed first.
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24 **Conclusions and policy implications**

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26 The major implications for participants were the challenges in accessing HIV
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28 treatment and care, misinformation, and difficulty in participating in research
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30 activities. The major effects on the trial from the research team perspectives,
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32 were the cumulative effects of local regulations, the unforeseen protocol
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34 modifications, and the ethics committee reporting requirements. Responsible
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36 government agencies and research regulators are strongly encouraged to
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38 develop policies and guidelines in preparedness for the continuity of research
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40 and clinical trials in the event of future pandemics or epidemics.
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50 **Competing interests**

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52 The authors declare that they have no competing interests.
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55 **Data availability statement**

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57 Data will be made available upon reasonable request.
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Authors' contributions

PAM, RN, TDN made substantial contributions to the conception of the manuscript, analyzed the data and drafted the paper. **PAM, RN, NK, NKS** are investigators on the WISe-Men trial. **PK, EMN, JN, RM, FEK, CPO, LK, MN, NK, NKS** critically revised the manuscript for important intellectual content. All the authors gave final approval of the work to be published. All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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List of abbreviations

ART	Antiretroviral Therapy
ARV	Antiretroviral
CRT	Cluster Randomised Trial
COVID-19	Corona virus disease
FGD	Focus group discussion

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2		
3	HIVST	HIV Self-testing
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5	HTS	HIV Testing Services
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7		
8	IDI	In-depth interview
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10	IPC	Infection prevention and control
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12		
13	LTFU	Loss to follow-up
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15	MoH	Ministry of Health
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17		
18	PI	Principal Investigator
19		
20	PLWHA	people living with HIV/AIDS
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23	PPE	Personal protective equipment
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25	PrEP	Pre-exposure prophylaxis
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27		
28	SOPs	Standard operating procedures
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30	UNAIDS	Joint United Nations Programme on HIV/AIDS
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33	UNCST	Uganda National Council for Science and Technology
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35	WHO	World Health Organisation
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Table 1. Demographics of Participants

Participant Characteristics (N = 44)	Frequency (n)	Percentage (%)
Age range, years		
18-25	19	43.2
26-35	10	22.7
36-45	11	25.0
46-64	4	9.1
Employment position/ Job title		
Security guard	20	45.5
Field supervisor/administrator	7	15.9
Employers/ company executives	5	11.4
Clinical trial team member	12	27.3

Table 2: Narrative quotes of participants' experiences in being part of an ongoing HIV trial during a pandemic

Sub-Category	Narrative quotes
Difficulty accessing treatment facilities	<i>"I got my results on March 2, 2020 and started taking HIV medication and was told to return for follow-up on April 6, 2020. I selected that hospital because it is close to my workplace but since we are not working now, I am at home and it is too far from the hospital. I have therefore decided to wait until we are released from this lockdown, to go for the medication."</i> (Participant 29, district 2)
Interruptions in HIV treatment schedule	<i>"I haven't yet told my wife my HIV status because I wasn't expecting to be tested positive. I have been keeping the ARVs at the office and taking them each morning as soon as I report to work. When companies were closed after the president's speech, I was one of those who was sent on temporary and indefinite unpaid leave. I am now at home and have no way of explaining why I am taking this daily medication. I just threw the tablets away and when I resume my work, I will start afresh."</i> (Participant 01, district 1)
Fear of co-infection with COVID-19	<i>"People have been saying that men and people who have other illnesses are more likely to get infected with COVID-19. Now that I am HIV positive, am I not more likely to get infected? Is HIV considered a pre-existing condition? Are people taking anti-retroviral treatment (ART) more at risk or is it better to continue the treatment?"</i> (Participant 05, district 2)
Incorrect information about COVID-19 and HIV	<i>"Some of our colleagues told us that people who were on ART would get COVID-19 much faster than those who were HIV positive but not on ART. That all one needs to do is eat plenty of fruits and vegetables during this time. When this happened, I stopped taking the medicine for one week. With this lockdown, we are mostly getting information from our friends, it is very unfortunate that many of us stopped taking medicine based on fake information."</i> (Participant 07, district 1)
Unforeseen effects of peer information on ART adherence	<i>"About a month ago, I was talking to some friends and they told me that there was a new drug for COVID-19. Apparently, this anti-viral drug is like the drugs we take for HIV. Although I did not tell them that I have HIV, I decided to take my drugs faithfully. I hope that this will lower my chance of getting the disease."</i> (Participant 7, district 1)
Difficulty in transferring HIV	<i>"The lockdown from the government came so suddenly and we rushed to the village. I visited the health centre near my home for condoms and to refill my medicine [ART] for the next month, I was surprised to learn</i>

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3 **care to new**
4 **facilities**

that I cannot just get medication from any hospital. They told me to go back to the place where I usually get my medication. I am now trying to get in touch with the former hospital to see if they can inform this health centre to allow me to pick some drugs." (Participant 16, district 2)

7 **Limited HIV**
8 **treatment support**
9 **at health facilities**

"I keep forgetting to take the tablets because I am not used to taking medicine every day. I have also been struggling with some pain in my stomach since I started taking the medications. There are also some changes in my skin, I developed some swellings on my arms, and I needed to show them to my counsellor, but I cannot access the hospital. She asked me to take some pictures and send them to her on the phone, but I do not have a smartphone. I can't cope with this anymore, I need support." (Participant 20, district 1)

14 **Transport**
15 **difficulties**

"I was told to return for my follow-up visit on March 28, unfortunately by then we were in a lockdown so I couldn't go to the facility because of the stay-at-home order. About a week later, I was not feeling well and decided to go to the facility to see the counsellor. I started walking from my house at 7:00am and finally got to the hospital at about 11am. After seeing the doctor, it was 2pm and I could not get transport back home. Unfortunately, if I decided to walk, I would have reached home past curfew hours. I therefore decided to stay at the hospital for the night with no beddings since I had not prepared for an overnight visit. The next morning, I walked home again and by the time I got home, I was feeling unwell again and sore all over. After that experience, there was no way I could go to the hospital again." (Participant 1, District 2)

24 **Fear of infection**
25 **with COVID-19**

"I am sorry that I did not come for the follow up visit, but I am worried about the danger of leaving my house. My family and I have been at home the entire month and my wife said that if I come back home then I need to self-isolate for 14 days. If I take that risk and come, then you must provide a substantial allowance for putting myself and my family at risk. I also figured that since I am HIV negative, there is really no need for me to come for any further check-up." (Participant 20, district 1)

31 **Limited post-test**
32 **psychosocial**
33 **support**

"Just a few weeks ago, I took a test, and I was told that I am HIV positive. I still cannot believe it. The counsellor told me that I need to start on treatment [ART] immediately but I still do not believe it. I had started talking with the counsellor who asked us to come back after one month and I have started accepting my fate. However, now that I cannot see her, I feel like I have gone back to a bad state, like how I was when I had just received my results. She calls me regularly, but the network is so poor and it is impossible to talk about so many things because we stay in a small place with many people now that we are all in the lock-down. I am waiting for this

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3 to end then I go back to the hospital for further confirmation. I hope the person who did the first test made a
4 mistake." (Participant 15, district 2)
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6 **Need for PrEP**
7 **initiation support**

8 "My results were negative, but we discussed with the counsellor about starting treatment because of some
9 reasons [PrEP]. I went to the hospital and I received the HIV drugs, but I have not yet started taking them.
10 People told me that there are many side effects, and I do not want to have problems when I am on my own at
11 home. I think I will wait to start treatment until I can easily see the counsellor or the doctor when they open
12 public transport again." (Participant 5, District 1)
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For peer review only

Table 3: Narrative quotes of the study team reflections on conducting a clinical trial during a pandemic

Category	Narrative quotes
Trial design modifications	<i>"During this time, several participants travelled back to their villages and homes, which may have reduced the ability to control for 'contamination' among the individuals and this could affect our study outcomes. Additionally, the original plan was for in-person follow up visits, but the travel restrictions made this almost impossible. According to the protocol, participants were supposed to receive group pre-test HIV counselling, however, was modified to individual counselling to accommodate the social distancing directives." (Study team member, 01)</i>
Budget and procurement alterations	<i>"For example, we had to procure personal protective equipment (PPE) like masks, aprons and gloves, and educational materials for the prevention of COVID-19. We also procured hand-held infrared temperature monitors, hand sanitizers, and installed handwashing stations for use at each entry point." (Study team member, 07)</i> <i>...public transport, we increased the budgeted transport refund from 10,000 Uganda Shillings (USD 2.65) to 76,000 (USD 20) per participant to cater for private transportation." (Study team member, 11)</i>
Supply chain disruptions	<i>"Predictably, some of the companies supplying materials for the trial closed and the few that were open were overwhelmed with numbers and resorted to rationing of supplies like PPE. We experienced disruptions in obtaining vital materials like HIVST test kits and were thus were unable to continue with crucial elements of our research." (Study team member, 01)</i>
Human resource considerations	<i>"...they hired two (2) new COVID-19 personnel responsible for sanitation, screening and for ensuring adherence to recommended infection prevention and control (IPC) guidelines. The new staff hired also trained the rest of us and helped to respond to any queries from the participants regarding COVID-19 as it continually evolved." (Study team member, 08)</i>
	<i>"The principal investigator made it clear that continuation of field-work was voluntary, and many people opted to work from home. This staffing reduction drastically slowed the trial processes because those of us who stayed had to handle more than one role." (Study team member, 06)</i>

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Effects of local regulations

*"..the Principal investigator (PI) in consultation with the oversight committee and research team, halted the recruitment of new participants into the study. We also revised and prioritized trial outcome measures to collect at each follow-up visit and the participants who were already enrolled were followed up via phone."
(Study team member, 02)*

Loss to follow-up of enrolled participants

"Some of the men lost their jobs during this time and according to the trial eligibility criteria, had to be removed from the study. Others travelled upcountry to rural areas and their phones were unreachable due to the telecom network challenges. Others simply refused to take my calls or just kept 'rejecting' the call. This made participant follow-up difficult." (Study team member, 03)

Ethical approvals for protocol deviations

"The trial involved the collection of biological specimens (blood), therefore, each participant was required to don a face mask and wash their hands prior to involvement in any research activities. This was eventually halted as venepuncture invalidated the social distancing guidelines." (Study team member, 11)

Balancing risks and benefits

"Initially, the men were supposed to return for follow-up after 1 and 3 months. However, for those who were already recruited, their follow up visits were right in the middle of the lockdown. We therefore submitted a request for an amendment to the ethics committee to allow us to conduct the follow up visits by phone. Some of the participants were not happy about this because they wanted to discuss some things when they were assured of privacy" (Study team member, 09)

"We considered the aims of the study vs. the potential for exposure to COVID-19 for everyone involved, the potential for community transmission in the study districts and the staffing strain. We eventually temporarily halted the trial. However, before the temporary closure of the trial, we informed all the study participants and sought informed consent to conduct follow-up via phone calls. We also assigned study counsellors to individual study participants, to offer psychological support and for immediate contact in the event of any adverse events." (Study team member, 02)

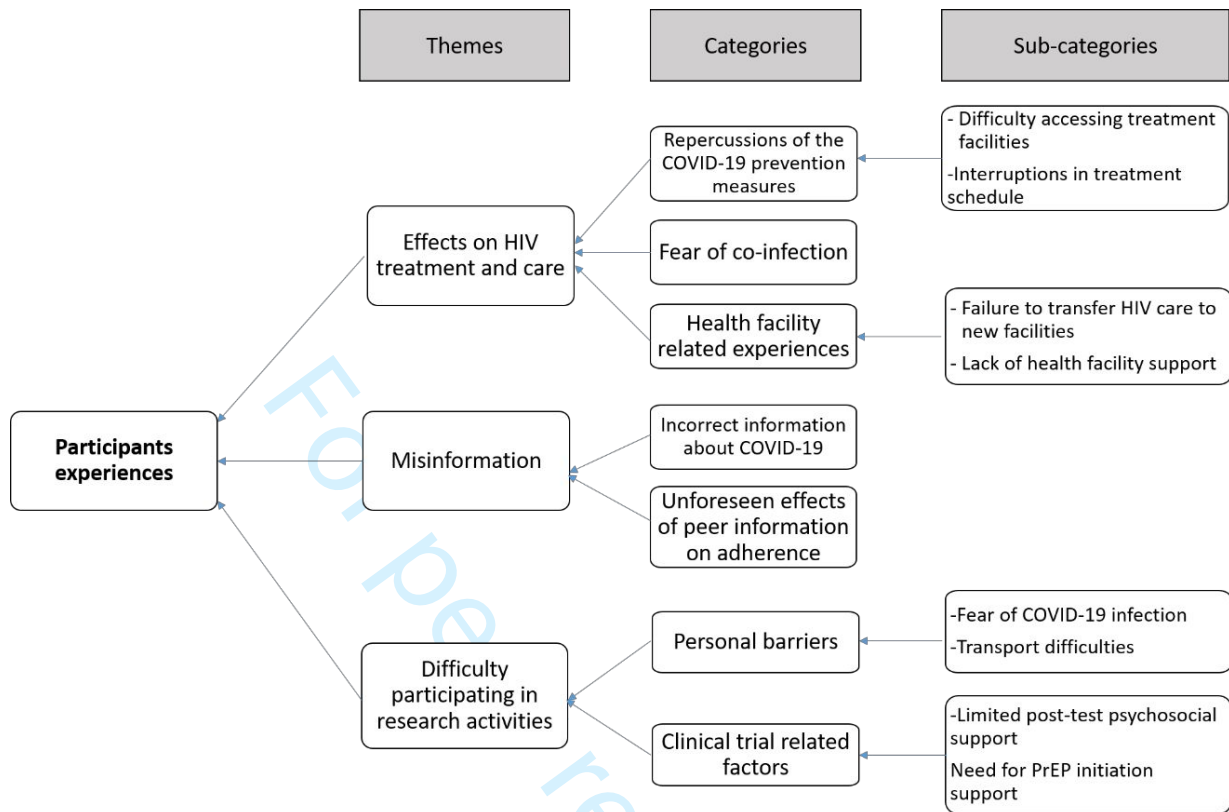


Figure 1: Coding tree for the participants experiences of participating in an ongoing HIV clinical trail during a pandemic

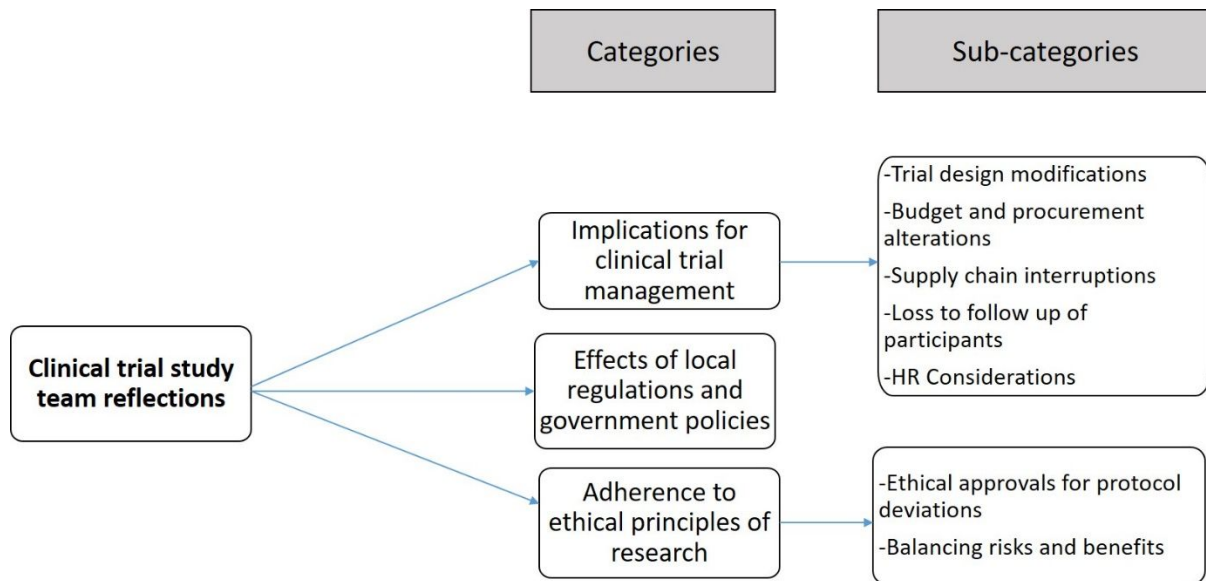


Figure 2: Coding tree for the clinical trial study team of managing an ongoing HIV clinical trail during a pandemic

Standards for Reporting Qualitative Research (SRQR)

O'Brien B.C., Harris, I.B., Beckman, T.J., Reed, D.A., & Cook, D.A. (2014). Standards for reporting qualitative research: a synthesis of recommendations. *Academic Medicine*, 89(9), 1245-1251.

No.	Topic	Item	Page
	Title and abstract		
S1	Title	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
S2	Abstract	Summary of key elements of the study using the abstract format of the intended publication; typically includes objective, methods, results, and conclusions	2
	Introduction		
S3	Problem formulation	Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	3-4
S4	Purpose or research question	Purpose of the study and specific objectives or questions	4
	Methods		
S5	Qualitative approach and research paradigm	Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., positivist, constructivist/interpretivist) is also recommended	5
S6	Researcher characteristics and reflexivity	Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, or transferability	6
S7	Context	Setting/site and salient contextual factors; rationale ^a	5
S8	Sampling strategy	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale ^a	6
S9	Ethical issues pertaining to human subjects	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	5
S10	Data collection methods	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale ^a	6

S11	Data collection instruments and technologies	Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	6
S12	Units of study	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	7
S13	Data processing	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/deidentification of excerpts	7
S14	Data analysis	Process by which inferences, themes, etc., were identified and developed, including researchers involved in data analysis; usually references a specific paradigm or approach; rationale ^a	7
S15	Techniques to enhance trustworthiness	Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale ^a	7
Results/Findings			
S16	Synthesis and interpretation	Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-14
S17	Links to empirical data	Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Table 2 Table 3
Discussion			
S18	Integration with prior work, implications, transferability, and contribution(s) to the field	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	14
S19	Limitations	Trustworthiness and limitations of findings	2, 7
Other			
S20	Conflicts of interest	Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	18
S21	Funding	Sources of funding and other support; role of funders in data collection, interpretation, and reporting	19

^aThe rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

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Conducting an ongoing HIV clinical trial during the COVID-19 pandemic in Uganda: A qualitative study of research team and participants' experiences and lessons learned

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Conducting an ongoing HIV clinical trial during the COVID-19 pandemic in Uganda: A qualitative study of research team and participants' experiences and lessons learned

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Keywords: COVID-19; HIV & AIDS; Qualitative research

Abstract

Objective: To explore the experiences and lessons learned by the study team and participants of the WISE-Men (Workplace-based HIV self-testing among Men) trial during the COVID-19 pandemic in Uganda.

Design: An explorative qualitative study comprising two virtual focus group discussions with 12 trial team members and 32 in-depth participant interviews (N=44). Data were collected via telephone calls for in-depth interviews or Zoom® for focus group discussions and manually analyzed by inductive content analysis.

Setting: Fourteen private security companies in two Uganda districts.

Participants: Members of the clinical trial study team, and men working in private security companies who undertook workplace-based HIV testing.

Results: The key themes for participants experiences were: 'challenges in accessing HIV treatment and care, and prevention services', 'misinformation' and 'difficulty participating in research activities'. The effects on HIV treatment and prevention resulted from; repercussions of the COVID-19 restrictions, participants fear of co-infection and negative experiences at health facilities. The difficulty in participating in research activities arose from: fear of infection with COVID-19 for the participants who tested HIV negative, transport difficulties, limited post-test psychosocial support and lack of support to initiate Pre-exposure prophylaxis.

The key study team reflections focused on the management of the clinical trial, effects of the local regulations and government policies and the need to adhere to ethical principles of research.

Conclusions: Findings highlight the need to organize different forms of HIV support for persons living with HIV during a pandemic. Additionally, the national research regulators and ethics committees or review boards are strongly urged to develop policies and guidelines for the continuity of research and clinical trials in the event of future shocks. Furthermore, this study calls on the appropriate government agencies to ensure public and researchers' preparedness through continuing education and support.

Strengths and limitations of this study

- This is the first study of the experiences and lessons learned while conducting an ongoing HIV clinical trial during the COVID-19 pandemic in Uganda.

- The participants included both the clinical trial team and trial participants.
- Data were collected through in-depth interviews and focus group discussions.
- We utilized telephone calls and the Zoom® platform.
- Telephone interviews made it impossible to observe non-verbal cues during the in-depth interviews.

Introduction

Coronavirus Disease 2019 (COVID-19) is a viral respiratory disease caused by the 2019 novel coronavirus (SARS-CoV-2)^{1 2}. By 12, March 2021, there were 118,268,575 confirmed cases of COVID-19 worldwide, reported to the World Health Organization (WHO) with 40,544 cases and 334 deaths in Uganda³. Several countries introduced variations of social distancing restrictions ranging from the extreme of lockdown, to banning of social gatherings and quarantine of exposed individuals. While these measures may have helped to disrupt the spread of the virus, they also interrupted the delivery of other health services and the conduct of research activities. Global reports on the impact of COVID-19 on health systems are beginning to emerge. For example, because of the closure of borders and lock downs, antiretroviral (ARV) manufacturers in India reported concerns with international shipping of raw materials, thus causing delays and raising costs⁴. Globally, there is an expected shortage of ARVs not only because of the lockdowns, but also due to a shift of financial resources⁵. Consequently, HIV morbidity and mortality are expected to increase during

1
2
3 the pandemic and post-pandemic. A model by Jewell et al. ⁶, predicts that a
4 six-month supply disruption of ARVs because of COVID-19 pandemic could
5 result in over 500,000 HIV related deaths in sub-Saharan Africa and 2-fold
6 increase of mother to child transmission of HIV.
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13 One of the challenges faced by the global community is how to maintain
14 continuity of HIV care, treatment, and research programs during the COVID-
15 19 pandemic. Emerging evidence suggests that COVID-19 has disrupted HIV
16 services with negative implications on the attainment of the 90-90-90 targets
17 and clinical services for people living with HIV/AIDS (PLWHA) ⁷. In a survey
18 conducted in February 2020 in China, 32.6% of PLWHA were at risk of
19 antiretroviral therapy (ART) discontinuation and another 48.6% did not know
20 where to get ARVs ⁸. In yet another study, Sun et al. (2020) found that 22.8 % of
21 the participants, reported medication uptake was disrupted and 67.5% worried
22 about disruption in their medication and future care ⁹. In the same study, some
23 participants discontinued medication to keep their HIV status concealed ⁹.
24 Field notes from Kenya document how the disease has impacted HIV testing
25 and assisted partner-notification programs ¹⁰. Due to fear of acquiring the
26 COVID-19 infection, patients hesitated to attend the clinic, and many others
27 could not afford transport to the health facilities ¹¹.
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50 In this study, we sought to document experiences of clinical trial study
51 participants and reflections of the study team in the Wise-Men trial during the
52 COVID-19 pandemic. The 'WISe-Men' trial (**W**orkplace-based HIV **S**elf-testing
53 among **M**en) is a cluster-randomized trial assessing the effectiveness of
54 workplace-based HIV self-testing in Uganda (Clinicaltrials.gov, ID:
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3 NCT04164433). The trial started participant enrolment on February 4, 2020.
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6 However, new participant enrolments were halted on March 28, 2020. This
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8 followed directives such as the country-wide mandatory lockdown and curfew
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10 implemented by the Ugandan government and the national research
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12 regulator, the Uganda National Council of Science and Technology (UNCST)¹²
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17 18 19 **Methods**

20 21 22 **WISe-Men clinical Trial**

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27 This was a two-arm cluster randomized trial (CRT) involving men employed in
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29 private security companies. The clusters were private security companies each
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31 employing more than 50 men. The trial was conducted in two Ugandan
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33 districts; Kampala and Hoima. Through randomization, Kampala district was
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35 allocated to the intervention arm and Hoima to the control arm. The clusters in
36
37 the intervention arm received HIV Self-testing while those in the control arm
38
39 received standard HIV testing services. Men who worked at private security
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41 companies were eligible to participate in the trial if they were 1) 18-60 years
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43 old, 2) Employed >6 months within the security industry 3) Not tested for HIV
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45 before or attained Negative test results for HIV \geq one year prior to enrolment.
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49 The participants in each arm received either an HIV test or an HIV test kit with
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51 planned follow-up at 1 month, 3 months and 12 months to assess linkage to care
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53 or prevention services.
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Study design and participants

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3 This was an explorative qualitative sub-study nested in the WISe-Men clinical
4 trial. The data in this study were collected during follow-up calls with trial
5 participants. In this paper, '*study participants*' will refer to the enrolled clinical
6 trial participants who consented to share their challenges reported in this
7 paper.
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16 **Ethical considerations**

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20 This sub-study ethical approval was granted by the School of Health Sciences
21 Research and Ethics Committee at Makerere University (Ref. Number: 2018-
22 054). Additional approval was obtained from the UNCST (Ref Number: HS 2672).
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25 The initial study design did not include telephone or Zoom interviews; therefore,
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36 **Patient and Public Involvement**

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40 No patient involved. Patients or the public were not involved in the design, or
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46 **Data Collection**

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49 Data were collected from a combination of in-depth interviews and virtual
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In-depth participant interviews

Two research team members experienced in qualitative research conducted the in-depth interviews (IDIs). Participants were purposefully sampled to include men from different employee ranks, age categories (18-25, 36-35, 36-45 and 46-64) and HIV status (positive and negative). The interview guide was tested and developed iteratively at three pilot interviews to refine the questions (See supplementary file 1). The participants in the pilot interviews gave consent prior to participation in the study. The interview guide collected data about participants' experiences, challenges and lessons learned while participating in all the trial activities during the COVID-19 pandemic. Phone interviews were conducted in August and September 2020 and each lasted 45 minutes to an hour.

Research team reflections

Reflections from the research team were collected during the daily de-brief meetings. The reflections were collected in two ways; face-to-face in-depth interviews (IDIs) between March 15, to March 30, 2020, and virtual focus group discussions (FGDs) between June 1, to June 11, 2020 using the Zoom platform. The FGDs had 6 team members per group. All the team members were informed that these reflections were part of the study, and informed consent was sought. The meetings lasted 45 minutes to one hour, led by a moderator and note-taker. Both the FGD and IDI utilised an open guide with the question "*What were today's experiences, successes, challenges and lessons learned from conducting the WISE-Men trial during the COVID-19 pandemic?*" This

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2
3 question was incorporated into the clinical trial following ethics approval to
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5 modify the design during the unanticipated COVID-19 pandemic.
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8 9 **Data Analysis**

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12 The phone interview recordings were transcribed verbatim. The minutes from
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14 each de-brief meeting were typed up after each meeting and archived. Both
15
16 the participant and study team data were analyzed manually using inductive
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18 content analysis. This process entailed open coding, developing emergent
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20 categories and conceptualization¹⁴. Two groups (PAM/RN and FEK/JN)
21
22 reviewed the transcripts independently. The pairs identified codes separately
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24 and then discussed them to achieve consensus. Any disagreements on the
25
26 codes were settled by discussion with other members of the study team
27
28 (TDN/EMN/CPO). The coders iteratively named and re-named the codes as
29
30 more insights and latent meanings emerged from the data. The codes were
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32 then grouped into categories and subcategories.
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40 The research team members who took part in the de-brief meetings did not
41
42 analyze the data.
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45 To ensure trustworthiness and credibility of the data, a sample of the study
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47 participants reviewed the categories and subcategories. The sample (n=7)
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49 included one participant from each of the different employee ranks, different
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51 age groups, different HIV status and 2 members from the research team. The
52
53 reviewers read through the identified categories and sub-categories to
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55 validate them as a true representation of their perspectives of participating in
56
57 an ongoing clinical trial during a pandemic. The participants corroborated
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3 most of the identified categories and sub-categories, except one category
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5 'Wrong information' which was changed to 'misinformation'. Interview notes
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7 were recorded in the principal researcher's reflective journal for confirmability.
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10 11 12 **Results**

13 14 15 16 **Participant's characteristics**

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19 In total we interviewed 44 participants, the majority of the clinical trial
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21 participants were 18-25 years old, and mostly security guards. The trial
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23 participants in this study (n=32) had all received HIV testing services as part of
24
25 the clinical trial and 10 (31.2%) were newly diagnosed as HIV positive. See table
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33 34 35 36 **Participants' challenges**

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Three themes emerged from the participants' experiences. The themes,
categories, and sub-categories are presented in Figure 1.

Figure 1: Coding tree for the participants experiences of participating in an ongoing HIV clinical trail during a pandemic

47 48 49 50 51 52 53 54 55 56 57 58 59 60 **Challenges in accessing HIV treatment and care, or prevention services**

Participants reported challenges in seeking and accessing HIV treatment and care or prevention services. The narrative quotes are presented in table 2.

Difficulty accessing treatment facilities

Several participants who had recently started on ART were unable to continue with their treatment due to difficulty in accessing the health facility following the stay-at-home directives among other reasons. During the COVID-19 lockdown and curfew period in Uganda, only essential personnel who had special car stickers or travel in vehicles with special government permission were permitted to drive personal cars. Additionally, during this time, many worksites were closed. The study participants had previously selected health facilities that were close to their workplaces for their HIV care. They expressed difficulty in walking to and from their homes to the health facility to access their treatment.

Interruptions in HIV treatment schedule

A few participants experienced interruptions in their treatment schedule due to issues of non-disclosure of their HIV status and inability to explain the daily medication to their partner. They reported that they typically keep their medications at the workplace where they can easily take them without intrusive questioning from family members.

Fear of co-infection with COVID-19

Study participants who tested positive for HIV expressed concern about being more at risk of COVID-19 infection because it was widely circulated that men, older people, and those with pre-existing comorbidities were more susceptible to infection.

Difficulty in transferring HIV care to new facilities

During the lockdown period, some participants travelled to their home villages to stay with their families. While they were there, they visited nearby hospitals for drug refills, however, some were denied the opportunity to transfer their care to new ART treatment facilities.

Limited HIV treatment support at health facilities

Some of the participants experienced some side effects following ART initiation. One suffered from severe stomach upsets and skin changes which he attributed to the ART treatment. Unfortunately, he was not able to access the hospital where he was receiving HIV care. He felt unsupported and still reports difficulty coping with the new treatment.

Need for PrEP initiation support

One of the participants who was undergoing counselling to commence PrEP, reported that he lacked the confidence to start without face-to-face support.

Mitigation measures for trial participants challenges in accessing HIV treatment, care or prevention services

As a result of the challenges experienced by study participants, the trial team implemented some mitigation measures to ensure that the participants received their treatment or had access to prevention services.

- i. Home delivery of ART by study counsellors for participants who needed refills, these visits were also useful for follow-up assessments, and counselling for study participants and their partners.

- ii. Delivery of ART to community pick-up points for participants who were not willing to receive the study team members in their homes.
- iii. Follow-up phone calls from the study counsellors and nurses for participants who returned reactive HIV self-test kits and needed further counselling for ART initiation. During these counselling sessions, further information was provided regarding COVID-19.
- iv. Home and community delivery of condoms for all study participants.
- v. Active linkage of participants to clinics for further counselling and initiation of PrEP.
- vi. Provision of letters and health information to health facilities that enabled the participants to link to HIV care and treatment at new facilities.

Misinformation

At the start of the pandemic, there was a lot of information shared via several social media platforms. Participants reported that this information influenced their decisions regarding HIV treatment. The narrative quotes are presented in table 2.

Incorrect information about COVID-19

Some participants reported that they received wrong information from their peers. For example, some participants were informed that PLWHA who were on ART were more likely to get infected with COVID-19. Therefore, some participants stopped taking their medication. Other participants who tested HIV negative were initially unwilling to follow the COVID-19 guidelines. They

1
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3 reported that their peers informed them that only people with underlying
4 disease conditions were at risk for infection with the Corona virus. The WISE-
5 Men trial had also involved blood pressure, blood glucose and syphilis tests.
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7 Therefore, some of the participants who tested negative for all the tests, were
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Unforeseen effects of peer information on ART adherence

A few participants heard about Remdesivir as a potential drug for use in treatment of COVID-19. Their colleagues suggested that it was like the HIV antiretroviral medication. This erroneously encouraged adherence to their ART regimen as they thought it would lower their risk of COVID-19 infection.

Difficulty participating in research activities

The other main experience involved the participants' difficulty in taking part in follow-up research activities as part of the clinical trial. The narrative quotes are presented in table 2.

Transport difficulties

Following enrolment into the trial, all participants were meant to return for follow-up visits after 1 week, one month and then at three months. This was for participants who tested HIV positive and HIV negative. Unfortunately, the stay-at-home orders made this impossible and those who tested HIV negative were unwilling to spend their money and face the inconvenience to travel to the research sites. The research team then changed to follow-up phone calls;

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3 however, some participants had poor telephone network connectivity and
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5 therefore missed these calls.
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8 9 ***Fear of exposure to COVID-19***

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11 Participants were concerned about the likelihood of exposure to the
12 coronavirus at the research site. They requested for a significant risk allowance
13 for in-person visits during the pandemic. This was expressed more among
14 participants who returned negative test results. They felt that there was no
15 need to put themselves in danger of exposure to COVID-19 since they had
16 already tested HIV negative.
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26 27 ***Limited post-test psychosocial support***

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29 Some participants tested HIV positive for the first time and were still in denial.
30 They reported the unmet need of support with adherence, coping with taking
31 ART, dealing with side effects, and assisted partner notification.
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38 39 **Study team reflections of managing a clinical trial during the COVID-19** 40 **pandemic**

41
42 The study team reflected on their experiences of conducting an ongoing
43 clinical trial during the COVID-19 pandemic. The coding tree is in figure 2 and
44 the categories and narrative quotes are presented in table 3.
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52 **Figure 2:** Coding tree for the clinical trial study team of managing an ongoing HIV
53 clinical trail during a pandemic
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56 57 **Effects of local regulations and government policies**

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3 On March 25, 2020, the government of Uganda suspended public transport
4 and placed restrictions on private vehicle movements, while on March 30, the
5
6 President declared a nationwide lockdown and curfew ¹². On March 27, the
7
8 UNCSST banned the recruitment of new study participants. Researchers were
9
10 also directed to halt face-to-face follow-up visits of the already recruited
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12 participants indefinitely ¹³. This had ripple effects on both the management
13
14 and continuity of the clinical trial.
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21 **Clinical trial management**

22 ***Trial design modifications***

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25 This was a cluster randomized design where two districts were randomly
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27 assigned to receive the intervention which was HIV self-testing and the
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29 standard HIV testing services to the control arm. During this time, several trial
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31 participants travelled back to their home villages or ancestral homes. The study
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33 team expressed concern that this may have unintentionally caused
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35 'contamination' among the individuals, since participants in both the control
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37 and intervention clusters could have interacted in the villages. Evidence is still
38
39 being sought regarding whether there was study contamination.
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49 ***Budget and procurement alterations***

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51 The trial started enrolment on 4, February 2020, and the first COVID-19 case in
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53 Uganda was reported on 21, March 2020 ¹². The study team therefore incurred
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55 unanticipated purchases and budget modifications to ensure continuity of
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57 study activities, and safety of the team and participants.
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Supply chain interruptions

A prominent implication of the COVID-19 pandemic was the degree to which services were entirely shut down. This meant that there were interruptions in procuring and obtaining equipment and materials needed for crucial elements of the clinical trial, which led to a delay in research activities.

Human resource considerations

The study team members reported low levels of COVID-19 health literacy. The trial directors hired more staff who had received training in infection prevention and control (IPC) measures for COVID-19. The new personnel conducted screening, 4 hourly surface disinfection and provided training and education for study participants. Other precautionary measures are highlighted in table 3. Additionally, the trial suffered some personnel losses since some team members were unable to continue participating in the research activities.

Loss to follow-up (LTFU) of enrolled participants

Some security companies downsized, and participants lost their jobs, therefore, they had to be removed from the trial as they no longer met the inclusion criteria. Others could not be reached due to their poor phone network connectivity, while others simply refused to take calls from the study team.

Adherence to ethical principles of research

Ethical approvals for protocol deviations

The trial protocol and consent forms were modified to reflect the changes mentioned in table 3 and submitted to the review board for approval before

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2
3 the trial could proceed. The research team felt that the modifications were
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5 minor and did not necessitate a complete discontinuation of the trial.
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7 However, because of the COVID-19 restrictions, there was a substantial delay
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9 before this was approved.
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13 ***Balancing risks and benefits***

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17 The study team conducted daily assessments of predictable risks to both the
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19 staff and the trial participants in comparison with potential benefits. The trial
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21 was eventually halted, and several contingency plans were initiated to ensure
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23 safe continuity of some research activities.
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28 **Discussion**

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31 This sub-study explored the trial team and participants' experiences of
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33 participating in an ongoing clinical trial during a pandemic. Three themes
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35 emerged for the participants' experiences: effects on accessing HIV treatment
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37 and care, misinformation and difficulty participating in research activities. The
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39 study team reflections focused on the management of the clinical trial, effects
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41 of the local regulations and government policies and the need to adhere to
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43 ethical principles of research.
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49 One of the greatest implications for this clinical trial were the knock-on effects
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51 of the local regulations and government policies. In March 2020, the
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53 government of Uganda enforced several COVID-19 restrictions including travel
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55 bans, border closures, nationwide lockdowns and curfews, and suspension of
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57 mass gatherings ¹². While this strategy maybe efficacious in preventing the
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3 transmission of COVID-19, it could aggravate non-COVID-19 related health
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5 outcomes ¹⁵. Additionally, as in this study, these effects may include difficulties
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7 in accessing lifesaving treatment, or participating in research activities.
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10 Furthermore, results from mathematical modelling suggest that interruption to
11
12 condom supply and health education could make populations more
13
14 vulnerable to increases in HIV incidence. ¹⁶. In agreement with ¹⁷, this suggests
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16 the need for appropriate government agencies and research regulatory
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18 bodies to develop systems that can ensure continuity of essential services and
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20 research even when lockdowns and travel bans are in effect. Research and
21
22 ethics committees might consider asking researchers conducting trials in HIV,
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24 to submit a contingency plan if participants are unable to access their
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26 treatment and care.
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33 An important consideration is the need to plan for different forms of support for
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35 research participants and PLWHA during a pandemic. The difficulty in
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37 continuing ART treatment was a recurring issue among many of the
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39 participants who missed clinic visits. This agrees with Opio and colleagues in
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41 Uganda who reported some of the major reasons for loss to follow up (LTFU) as
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43 the long distance from home to the health facility for drug replenishment and
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45 limited capacity at lower level ART clinics ¹⁸. In hindsight, HIV research teams
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47 could have provided participants with transfer letters to new facilities or home
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49 delivery of ART ¹⁹. For example, the research team from a Tuberculosis clinical
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51 trial made arrangements for delivery of medicines to the homes of participants
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53 who gave prior consent ²⁰. Another form of support could be psychosocial
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3 support where participants are availed a phone number that they can
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5 contact for any further pertinent discussions or a routine follow-up phone call
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7 in the absence of in-person visits. At the policy level, Rewari and colleagues
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9 recommend instituting measures and guidelines to minimize ART supply shocks
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11 and to prepare for future emergencies ⁴.
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16 Another challenge that the research participants faced was the
17
18 misinformation regarding COVID-19. Some participants halted their treatment
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20 because of misinformation from their peers about the relationship between
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22 ART and infection with COVID-19. Coincidentally, the information from peers
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24 encouraged adherence to ART. This followed reports that patients with both
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26 HIV and SARS-CoV-2 co-infected patients may have a less severe clinical
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28 picture of COVID-19 if they are already receiving ART ²¹. Unfortunately, they
29
30 altered the information that people on ART were less likely to get the COVID-
31
32 19 infection. To prevent this, researchers should make every effort to get well
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34 informed about a new health threat (within the limits of available information),
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36 so that they can advise participants appropriately but also make robust plans
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38 on how to manage the research. Researchers are therefore encouraged to
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40 design information and initiatives to advance research literacy and serve as a
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42 source for correct information. This will maintain trust and encourage
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44 continued participation and engagement ²²⁻²⁴ and prevent unnecessary fear
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46 and distress ²⁵. Participants should receive regular practical tips on handling
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48 the disruption in their work life and giving them hope that normal research
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50 activities will resume once the pandemic abates ²⁶⁻²⁸.
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3 The principle of beneficence requires those in positions of responsibility to act
4 with the best intentions for all those under their jurisdiction ²⁹, therefore trial
5 managers must be cognizant of maintaining the integrity of the trial whilst
6 ensuring the safety of the participants ³⁰. The COVID-19 pandemic poses
7 potential serious risks for clinical trial participants and staff engaged in health
8 research. Researchers should ensure that participant safety is always supreme
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29. For instance researchers may close a clinical trial where the risk of exposure to coronavirus is high ²⁰. Anker and colleagues discourage the hasty permanent termination of ongoing clinical trials unless they are nearing planned completion or have not yet started ³⁰. In this case, we initially stopped all procedures that prevented the social distancing requirements such as venepuncture. Eventually, we halted participant recruitment and face-to-face follow up visits.

Before the pandemic, many researchers only used in-person methods for follow up-visits. This period has seen clinical researchers consider several other options including the use of mobile apps, and other remote platforms to conduct research visits ²⁶. In this study, we used both Zoom and phone interviews to collect the follow-up data for the clinical trial. The telephone interviews drastically improved the time efficiency for following up participants, reduced the expenditure for participants' transport compensation, and provided access to participants who were geographically distant or located in high COVID-19 transmission areas. This agrees with Block and Erskine, ³¹ that telephones give researchers access to diverse resources and experiences

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3 without the inconvenience, the expense and the time expended in travel.
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5 However, the phone follow-up was a challenge for some participants who
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7 developed reactions to the HIV medication and those who needed support
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9 with initiating PrEP. Additionally, several ethical issues and unscrupulous
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11 behaviors may also arise from the use of these new methods like Zoom such as
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13 potential abuse and exploitation ^{32 33}. Potential difficulties such as lack of
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15 technology expertise, confidentiality challenges, reimbursement matters ³⁴,
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17 poor phone network, and low internet connectivity need to be addressed first.
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19 The strength of the study lies in the opportunity to get both research team and
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21 participants' perceptions about conducting or participating in a clinical trial
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23 during a pandemic. One limitation of the study may have been the methods
24
25 of data collection. With phone interviews, it was neither possible to observe
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27 non-verbal cues during the IDIs, nor the non-verbal interaction of participants
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29 during the FGDs. Additionally, study team members may have participated
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31 out of an obligation to the trial team leaders. This was mitigated by requesting
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33 written consent prior to participation in the study, and the constant reminder
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35 that it was not mandatory to participate, and non-participation would not
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37 affect their employment in the study trial.
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49 **Conclusions and policy implications**

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52 The major implications for participants were the challenges in accessing HIV
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54 treatment and care, misinformation, and difficulty in participating in research
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56 activities. The major effects on the trial from the research team perspectives,
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58 were the cumulative effects of local regulations, the unforeseen protocol
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3 modifications, and the ethics committee reporting requirements. Responsible
4 government agencies and research regulators are strongly encouraged to
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6 develop policies and guidelines in preparedness for the continuity of research
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8 and clinical trials in the event of future pandemics or epidemics.
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15 **Competing interests**

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17 The authors declare that they have no competing interests.
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22 **Data availability statement**

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24 Data will be made available upon reasonable request.
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30 **Authors' contributions**

31
32 **PAM** is the Principal Investigator of the WISE-Men clinical trial and was involved
33 in data collection, analysis and drafting the manuscript. **RN** is the WISE-Men
34 trial manager and was involved in data collection, analysis and drafting the
35 manuscript. **NK** and **NKS** are both co-investigators and supervisors on the WISE-
36 Men trial, were involved in designing the study and critically revised the
37 manuscript for important intellectual content. **TDN** is a co-investigator on the
38 WISE-Men trial and was involved in conceptualizing the study and drafting the
39 work. **PK** and **RM** made substantial contribution to the conception of the study,
40 and critically revised the manuscript for important intellectual content
41 especially around IRB and ethical issues. **EMN** made substantial contribution to
42 the design of the study and was involved in data analysis and drafting the
43 work. **JN** and **FEK** were critical in inductive content analysis of the findings from
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3 IDI and FGD's and critically revised the manuscript for important intellectual
4 content related to access to HIV treatment and care. **CPO** was involved in the
5 early conception of the study, generation of study themes and drafting the
6 work, **LK** and **MN** were involved in data collection from both trial team
7 members and study participants and critically revised the manuscript for
8 important intellectual content, specifically the methods section.
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18 All the authors gave final approval of the work to be published. All authors
19 agree to be accountable for all aspects of the work in ensuring that questions
20 related to the accuracy or integrity of any part of the work are appropriately
21 investigated and resolved.
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52 ensuing lockdown and travel restrictions in Uganda. Your courage made this
53 study possible.
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List of abbreviations

ART	Antiretroviral Therapy
ARV	Antiretroviral
CRT	Cluster Randomised Trial
COVID-19	Corona virus disease
FGD	Focus Group Discussion
HIVST	HIV Self-testing
HTS	HIV Testing Services
IDI	In-depth interview
IPC	Infection prevention and control
IRB	Institutional Review Board
LTFU	Loss to follow-up
MoH	Ministry of Health
PI	Principal Investigator
PLWHA	people living with HIV/AIDS
PPE	Personal protective equipment
PrEP	Pre-exposure prophylaxis
SOPs	Standard operating procedures
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNCST	Uganda National Council for Science and Technology
WHO	World Health Organisation

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Table 1. Demographics of Participants

Participant Characteristics (N = 44)	Frequency (n)	Percentage (%)
Age range, years		
18-25	19	43.2
26-35	10	22.7
36-45	11	25.0
46-64	4	9.1
Employment position/ Job title		
Security guard	20	45.5
Field supervisor/administrator	7	15.9
Employers/ company executives	5	11.4
Clinical trial team member	12	27.3
Trial participants HIV status (n=32)		
HIV positive	10	31.2
HIV negative	22	68.8

Table 2: Narrative quotes of participants' experiences in being part of an ongoing HIV trial during a pandemic

Sub-Category	Narrative quotes
Difficulty accessing treatment facilities	<i>"I got my results on March 2, 2020 and started taking HIV medication and was told to return for follow-up on April 6, 2020. I selected that hospital because it is close to my workplace but since we are not working now, I am at home and it is too far from the hospital. I have therefore decided to wait until we are released from this lockdown, to go for the medication."</i> (Participant 29, district 2)
Interruptions in HIV treatment schedule	<i>"I haven't yet told my wife my HIV status because I wasn't expecting to be tested positive. I have been keeping the ARVs at the office and taking them each morning as soon as I report to work. When companies were closed after the president's speech, I was one of those who was sent on temporary and indefinite unpaid leave. I am now at home and have no way of explaining why I am taking this daily medication. I just threw the tablets away and when I resume my work, I will start afresh."</i> (Participant 01, district 1)
Fear of co-infection with COVID-19	<i>"People have been saying that men and people who have other illnesses are more likely to get infected with COVID-19. Now that I am HIV positive, am I not more likely to get infected? Is HIV considered a pre-existing condition? Are people taking anti-retroviral treatment (ART) more at risk or is it better to continue the treatment?"</i> (Participant 05, district 2)
Incorrect information about COVID-19 and HIV	<i>"Some of our colleagues told us that people who were on ART would get COVID-19 much faster than those who were HIV positive but not on ART. That all one needs to do is eat plenty of fruits and vegetables during this time. When this happened, I stopped taking the medicine for one week. With this lockdown, we are mostly getting information from our friends, it is very unfortunate that many of us stopped taking medicine based on fake information."</i> (Participant 07, district 1)
Unforeseen effects of peer	<i>"About a month ago, I was talking to some friends and they told me that there was a new drug for COVID-19. Apparently, this anti-viral drug is like the drugs we take for HIV. Although I did not tell them that I have HIV, I</i>

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3 **information on**
4 **ART adherence**
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decided to take my drugs faithfully. I hope that this will lower my chance of getting the disease.” (Participant 7, district 1)

6 **Difficulty in**
7 **transferring HIV**
8 **care to new**
9 **facilities**
10

“The lockdown from the government came so suddenly and we rushed to the village. I visited the health centre near my home for condoms and to refill my medicine [ART] for the next month, I was surprised to learn that I cannot just get medication from any hospital. They told me to go back to the place where I usually get my medication. I am now trying to get in touch with the former hospital to see if they can inform this health centre to allow me to pick some drugs.” (Participant 16, district 2)

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13 **Limited HIV**
14 **treatment support**
15 **at health facilities**
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“I keep forgetting to take the tablets because I am not used to taking medicine every day. I have also been struggling with some pain in my stomach since I started taking the medications. There are also some changes in my skin, I developed some swellings on my arms, and I needed to show them to my counsellor, but I cannot access the hospital. She asked me to take some pictures and send them to her on the phone, but I do not have a smartphone. I can’t cope with this anymore, I need support.” (Participant 20, district 1)

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20 **Need for PrEP**
21 **initiation support**
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“My results were negative, but we discussed with the counsellor about starting treatment because of some reasons [PrEP]. I went to the hospital and I received the HIV drugs, but I have not yet started taking them. People told me that there are many side effects, and I do not want to have problems when I am on my own at home. I think I will wait to start treatment until I can easily see the counsellor or the doctor when they open public transport again.” (Participant 5, District 1)

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30 **Transport**
31 **difficulties**
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“I was told to return for my follow-up visit on March 28, unfortunately by then we were in a lockdown so I couldn’t go to the facility because of the stay-at-home order. About a week later, I was not feeling well and decided to go to the facility to see the counsellor. I started walking from my house at 7:00am and finally got to the hospital at about 11am. After seeing the doctor, it was 2pm and I could not get transport back home. Unfortunately, if I decided to walk, I would have reached home past curfew hours. I therefore decided to stay at the hospital for the night with no beddings since I had not prepared for an overnight visit. The next morning, I walked home again and by the time I got home, I was feeling unwell again and sore all over. After that experience, there was no way I could go to the hospital again.” (Participant 1, District 2)

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"Honestly, it is such a hustle to come all the way to the hospital, I think I can give you all the information over the phone. I told you that my self-test was negative, therefore there is no need to come in person. The line at the Resident District Commissioner's office for a travel permit is so long. It is not worth it. (Participant 20, district 1)

**Fear of infection
with COVID-19**

"I am sorry that I did not come for the follow up visit, but I am worried about the danger of leaving my house. My family and I have been at home the entire month and my wife said that if I come back home then I need to self-isolate for 14 days. If I take that risk and come, then you must provide a substantial allowance for putting myself and my family at risk. I also figured that since I am HIV negative, there is really no need for me to come for any further check-up." (Participant 20, district 1)

**Limited post-test
psychosocial
support**

"Just a few weeks ago, I took a test, and I was told that I am HIV positive. I still cannot believe it. The counsellor told me that I need to start on treatment [ART] immediately but I still do not believe it. I had started talking with the counsellor who asked us to come back after one month and I have started accepting my fate. However, now that I cannot see her, I feel like I have gone back to a bad state, like how I was when I had just received my results. She calls me regularly, but the network is so poor, and it is impossible to talk about so many things because we stay in a small place with many people now that we are all in the lock-down. I am waiting for this to end then I go back to the hospital for further confirmation. I hope the person who did the first test made a mistake." (Participant 15, district 2)

Table 3: Narrative quotes of the study team reflections on conducting a clinical trial during a pandemic

Category	Narrative quotes
Trial design modifications	<i>“During this time, several participants travelled back to their villages and homes, which may have reduced the ability to control for ‘contamination’ among the individuals and this could affect our study outcomes. Additionally, the original plan was for in-person follow up visits, but the travel restrictions made this almost impossible. According to the protocol, participants were supposed to receive group pre-test HIV counselling, however, was modified to individual counselling to accommodate the social distancing directives.” (Study team member, 01)</i>
Budget and procurement alterations	<i>“For example, we had to procure personal protective equipment (PPE) like masks, aprons and gloves, and educational materials for the prevention of COVID-19. We also procured hand-held infrared temperature monitors, hand sanitizers, and installed handwashing stations for use at each entry point.” (Study team member, 07)</i>
Supply chain disruptions	<i>...public transport, we increased the budgeted transport refund from 10,000 Uganda Shillings (USD 2.65) to 76,000 (USD 20) per participant to cater for private transportation.” (Study team member, 11)</i>
Human resource considerations	<i>“Predictably, some of the companies supplying materials for the trial closed and the few that were open were overwhelmed with numbers and resorted to rationing of supplies like PPE. We experienced disruptions in obtaining vital materials like HIVST test kits and were thus unable to continue with crucial elements of our research.” (Study team member, 01)</i>
Human resource considerations	<i>“...they hired two (2) new COVID-19 personnel responsible for sanitation, screening and for ensuring adherence to recommended infection prevention and control (IPC) guidelines. The new staff hired also trained the rest of us and helped to respond to any queries from the participants regarding COVID-19 as it continually evolved.” (Study team member, 08)</i>
	<i>“The principal investigator made it clear that continuation of field-work was voluntary, and many people opted to work from home. This staffing reduction drastically slowed the trial processes because those of us who stayed had to handle more than one role.” (Study team member, 06)</i>

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3 **Effects of local** *"..the Principal investigator (PI) in consultation with the oversight committee and research team,*
4 *halted the recruitment of new participants into the study. We also revised and prioritized trial*
5 **regulations** *outcome measures to collect at each follow-up visit and the participants who were already*
6 *enrolled were followed up via phone."*
7 *(Study team member, 02)*
8
9 **Loss to follow-up** *"Some of the men lost their jobs during this time and according to the trial eligibility criteria, had to*
10 *be removed from the study. Others travelled upcountry to rural areas and their phones were*
11 **of enrolled** *unreachable due to the telecom network challenges. Others simply refused to take my calls or just*
12 *kept 'rejecting' the call. This made participant follow-up difficult."* (Study team member, 03)
13 **participants**
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15 **Ethical approvals** *"The trial involved the collection of biological specimens (blood), therefore, each participant was*
16 *required to don a face mask and wash their hands prior to involvement in any research activities.*
17 **for protocol** *This was eventually halted as venepuncture invalidated the social distancing guidelines."* (Study
18 *team member, 11)*
19 **deviations**
20
21 *"Initially, the men were supposed to return for follow-up after 1 and 3 months. However, for those*
22 *who were already recruited, their follow up visits were right in the middle of the lockdown. We*
23 *therefore submitted a request for an amendment to the ethics committee to allow us to conduct*
24 *the follow up visits by phone. Some of the participants were not happy about this because they*
25 *wanted to discuss some things when they were assured of privacy"* (Study team member, 09)
26 **Balancing risks** *"We considered the aims of the study vs. the potential for exposure to COVID-19 for everyone*
27 *involved, the potential for community transmission in the study districts and the staffing strain. We*
28 **and benefits** *eventually temporarily halted the trial. However, before the temporary closure of the trial, we*
29 *informed all the study participants and sought informed consent to conduct follow-up via phone*
30 *calls. We also assigned study counsellors to individual study participants, to offer psychological*
31 *support and for immediate contact in the event of any adverse events."* (Study team member, 02)
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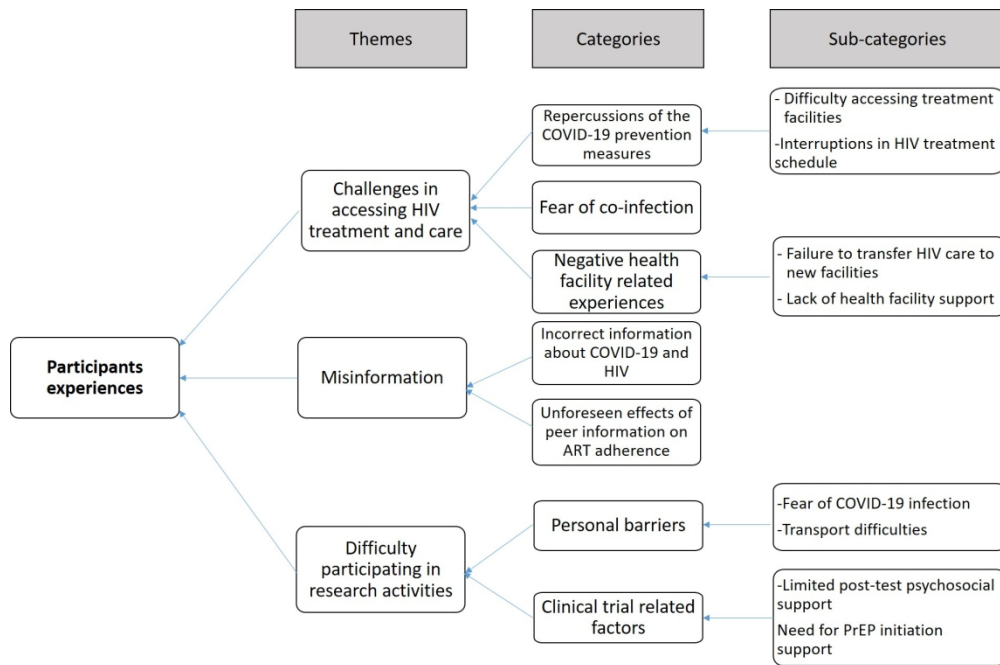


Figure 1: Coding tree for the participants experiences of participating in an ongoing HIV clinical trail during a pandemic

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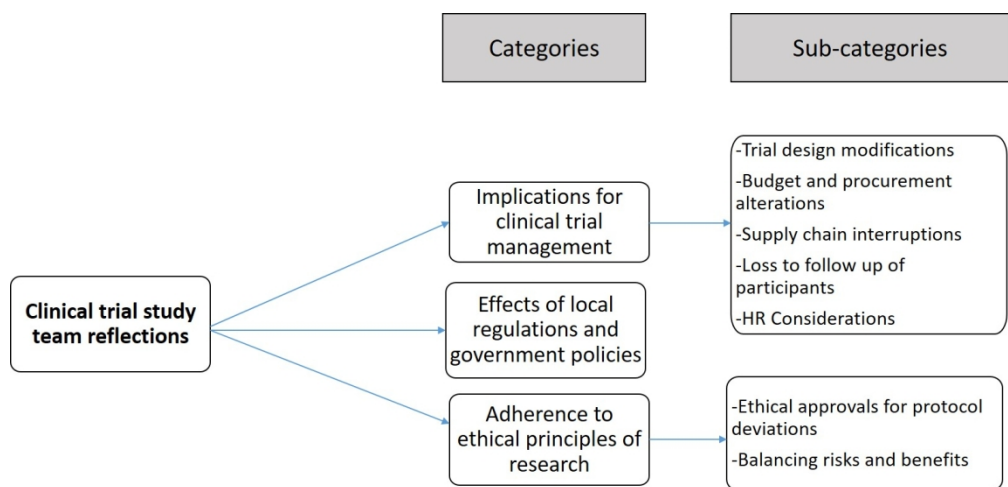


Figure 2: Coding tree for the clinical trial study team of managing an ongoing HIV clinical trail during a pandemic

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Supplementary file 1: In-depth interview guide

Before commencing the focus group discussion or In-depth interview, please ensure informed consent is received.

“Hello, my name is _____. I work for _____. You recently consented to participate in a study about HIV testing at your work premises and this interview is part of the follow-up activities for that study. Your name will not be included in any documents or presentations but we may include the name of this location. If you are uncomfortable with any of this, you are free to opt out of participating now or at any time during the discussion. You can also choose not to answer any of the questions. Please stop me at any time during the interview if you have questions or concerns.

Interview guide for clinical trial participants who received an HIV positive diagnosis

1. What is your experience of participating in this study during the COVID-19 pandemic?
2. What challenges have you faced, if any? How can the study team help you to overcome these challenges?
3. What lessons have you learned while participating in this study during the pandemic?
4. What should we do in future to prevent such challenges and experiences from happening?
5. Have you heard anything about being HIV positive and COVID-19?
6. What actions have you taken since you received your HIV test results? (Probe: personal actions, family actions, disclosure, social actions, behavioural actions, ART)
7. Have you experienced any side-effects from the HIV treatment? How did you manage them? Were there any challenges faced in the management of the side effects?
8. Are there any actions that you did not take related to your HIV care due to the COVID-19 pandemic? What solutions have you found to overcome these challenges?
9. How many doses of the HIV treatment have you missed since the start of the COVID-19 pandemic? Why? How do you suggest that we reach you to provide your treatment during this time?
10. Are you willing to have a nurse counsellor to conduct home visits? What exactly would you like the counsellor to do?

Interview guide for clinical trial participants who received an HIV negative diagnosis

1. What is your experience of participating in this study during the COVID-19 pandemic?
2. What challenges have you faced, if any? How can the study team help you to overcome these challenges?
3. What lessons have you learned while participating in this study during the pandemic?
4. What should we do in future to prevent such challenges and experiences from happening?
5. Have you heard anything about HIV and COVID-19?
6. What actions have you taken since you received your HIV test results? (Probe: behavioural actions, condom use, VMMC, PrEP)
7. Are there any actions that you did not take related to HIV prevention due to the COVID-19 pandemic? What solutions have you found to overcome these challenges?
8. How do you suggest that we reach you to provide prevention services during this time?

Thank you for your time and participation, we have learnt a lot from our discussion here today and we hope the time has also been useful to you.

Standards for Reporting Qualitative Research (SRQR)

O'Brien B.C., Harris, I.B., Beckman, T.J., Reed, D.A., & Cook, D.A. (2014). Standards for reporting qualitative research: a synthesis of recommendations. *Academic Medicine*, 89(9), 1245-1251.

No.	Topic	Item	Page
	Title and abstract		
S1	Title	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
S2	Abstract	Summary of key elements of the study using the abstract format of the intended publication; typically includes objective, methods, results, and conclusions	2
	Introduction		
S3	Problem formulation	Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	3-5
S4	Purpose or research question	Purpose of the study and specific objectives or questions	4
	Methods		
S5	Qualitative approach and research paradigm	Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., positivist, constructivist/interpretivist) is also recommended	6
S6	Researcher characteristics and reflexivity	Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, or transferability	6
S7	Context	Setting/site and salient contextual factors; rationale ^a	5
S8	Sampling strategy	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale ^a	5
S9	Ethical issues pertaining to human subjects	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	6
S10	Data collection methods	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale ^a	6-8

S11	Data collection instruments and technologies	Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	6-7
S12	Units of study	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	7
S13	Data processing	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/deidentification of excerpts	8
S14	Data analysis	Process by which inferences, themes, etc., were identified and developed, including researchers involved in data analysis; usually references a specific paradigm or approach; rationale ^a	8
S15	Techniques to enhance trustworthiness	Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale ^a	8
Results/Findings			
S16	Synthesis and interpretation	Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	9-17
S17	Links to empirical data	Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Table 2 Table 3
Discussion			
S18	Integration with prior work, implications, transferability, and contribution(s) to the field	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	17-21
S19	Limitations	Trustworthiness and limitations of findings	2, 21
Other			
S20	Conflicts of interest	Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	22
S21	Funding	Sources of funding and other support; role of funders in data collection, interpretation, and reporting	23

^aThe rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.