

Anxiety and Worry About COVID-19 Infection are Associated with Less Confidence in Ability to Engage in Treatment: Results from a South India Cohort of People Living with HIV (PLWH)

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Introduction

Following its initial outbreak in Wuhan in December 2019, SARS-CoV-2 spread rapidly around the world and was characterized by WHO as a global pandemic on March 12, 2020.¹ Given its global impact, it led to a great deal of concern among the approximately 38 million people living with HIV (PWH).² Although many governments worked hard to sustain HIV services, often in collaboration with community partners, it soon became clear that PWH faced multiple barriers and challenges to remain engaged in the HIV care continuum.³ Containment of the global COVID-19 pandemic required that governments implemented multiple strategies, including requirements to shelter-in-place, distancing, and placing restrictions on travel, which may serve as barriers to accessing non-COVID-related healthcare.

On March 25, 2020, the government of India announced an initial “lockdown,” due to the global COVID-19 pandemic,⁴ which restricted movement, social gatherings and economic activity until May 31st. This resulted in many citizens returning to their native homes to shelter with their extended families. It is unknown what impact the lockdowns may have had on the ability of PWH to visit ART clinics, obtain prescription refills or adhere to their regimens. Since successful management of HIV requires excellent adherence and timely prescription refills to avoid treatment interruptions, real or perceived challenges, including HIV stigma⁵ and worries about coronavirus infection may have interfered with this effort.

Methods

Overview

The data described in this paper were collected from participants enrolled in the “Tel-Me-Box” cohort,⁶ which is a

longitudinal study of 526 PWH in the state of Karnataka who are followed for 24 months. The study was designed to validate novel measures of antiretroviral medication adherence and is currently in its fifth year. To be eligible, participants had to be on ART, willing to keep all their ART medication in a pillbox that monitors adherence wirelessly in real time, live within 100 km of the study site and be willing to be followed quarterly for 24 months.

Procedures

During April, 2020, we were able to reach 467 out of 526 cohort participants, who agreed to participate in a COVID-related telephone survey. Twenty-seven of the remaining 59 had already been lost to follow-up pre-pandemic, an additional ten refused to participate in a phone interview, either due to lack of time or privacy concerns, one participant was hospitalized and twenty-one were unreachable, likely due to having moved out of the area during the lockdown. A 1-month follow-up survey was conducted in May and June. All procedures were approved

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by the IRBs of both St John's Medical College and UCSF. All patients provided written informed consent prior to enrollment.

Interviewers were trained to administer the COVID-related questions over the phone, by conducting and recording mock interviews with another team member and share it with assessment coordinators and study manager for certification before they conducted the interviews with study participants. Once certified, interviewers contacted the participants over phone to set up a mutually convenient time for the interview. Participant responses were recorded on a secure online form accessible via project smartphones. The data collected were subsequently downloaded from the online form to a database by the study data manager and uploaded on a secure server hosted by SJRI and shared with the UCSF statistician.

Measures Used in the Present Analyses

Demographics: Changes in living situation and income were assessed during the phone interview. Other demographic information, such as age, sex, education, and religion, was obtained from data collected as part of the parent study.

Sources of COVID-19-related information. Participants were asked from where they had received information about the COVID-19 pandemic. Twelve sources of information were listed, including five types of government offices, three health care providers and clinics, media, friends and family. For each, the participants indicated whether they had received information from this source and whether they trusted the source 1 'not at all' to 4 'completely'. Responses were dichotomized as not at all/somewhat versus very much/completely.

Knowledge about COVID-19. Participants were asked if they had heard (yes or no) of ten potential transmission routes, both true (eg droplets, fomites) and false (eg mosquitoes, mail parcels), six common symptoms (eg fever, cough), and 13 potential preventive measures against COVID-19 infection, again both true (eg masks, handwashing) and false (eg gargling, eating garlic).

Confidence. Three questions assessed confidence in their ability to manage their health by taking their medication as prescribed, visiting the ART clinic (where they receive their prescription refills), and visiting other medical clinics. Response options ranged from very confident to not at all confident on a 4-point scale.

Worry: We assessed worry of becoming infected with the coronavirus, both in general and if visiting the ART clinic, on a 4-point scale, ranging from very worried to not at all worried.

ART supply in days: Participants were asked how many days their present supply of ART was expected to last. Responses were dichotomized into more than 2 weeks versus 2 weeks or less.

Anxiety: The Generalized Anxiety Disorder Scale (GAD-7)⁷ Brief 7-item scale assessing self-reported anxiety symptoms and their severity. Found to have good reliability, as well as criterion, construct, factorial, and procedural validity. Used in India.⁸

Depression. The Patient Health Questionnaire Depression Scale (PHQ-9)⁹ was used to assess depressive symptoms. This scale has been validated in India^{10,11} and used in our

previous studies¹² with similar populations as well as in the parent cohort study.

Social Support: We used the MOS Social support survey,¹³ which is a brief, self-administered instrument with four social support subscales and an overall functional social support index. It was originally developed for patients in the RAND Medical Outcomes Study, but has been adapted and validated in India.¹⁴

Open-ended questions about adherence barriers. Following presentation of the list of potential barriers, interviewers asked participants "Have you experienced any other barriers?". The responses were written down verbatim on a notepad and then entered on the online form.

Data Management and Analyses

Due to the government lockdown, data were collected via phone and entered via a Google form on the interviewers' android-based smart phones. They were imported into SPSS which was used for data analysis. Descriptive statistics consisted of frequencies and percentages for categorical variables and means with SD for continuous variables. Bivariate associations with the dichotomous outcomes of lack of confidence in ability to keep ART appointment and lack of confidence in ability to adhere to ART regimen were assessed via unadjusted logistic regression analyses. In subsequent multivariate logistic regressions, we included those variables with significant ($p < 0.05$) unadjusted odds ratios (OR) – remaining ART pill supply, worry about becoming infected at ART center, receiving Covid-19 related information via the ART center, and any anxiety and any depression.

Ethical Approval and Informed Consent

All procedures were approved by the Institutional Ethics Committees at UCSF (approval no. 15-18109) and St John's Medical College (approval no. 361 / 2015). All participants provided written informed consent prior to enrollment.

Results

As shown in Table 1, at 97%, the most common source of news were "media" (internet, TV, radio), which was trusted by 88.3%. Fewer people reported receiving their news from health departments (37%), their ART clinic (15.2%) or doctor (9.9%), but those who did, reported greater levels of trust in these sources (94.2%, 93% and 97.8%, respectively). Only 13.9% reported having downloaded the government App "Aarogya Setu" that includes both a locator and COVID-19-related information, perhaps partly due to the fact that only 55.9% of the sample possessed smart-phones. Virtually all participants knew that the coronavirus can be transmitted via droplets (98.1%) and human contact (94.9%) and most knew that surfaces (66.8%) and asymptomatic people (62.5%) presented transmission risks too. The most common transmission misconceptions concerned packages received

Table 1. Covid-19 Related Knowledge and Misconceptions.

| | N (n = 467) | % |
|--|----------------|------|
| Information sources re. COVID-19: | | |
| News on TV/radio/internet | 453 | 97.0 |
| If yes, trust source ^a | 399 | 88.3 |
| Health department | 173 | 37.0 |
| If yes, trust source ^a | 163 | 94.2 |
| ART clinic | 71 | 15.2 |
| If yes, trust source ^a | 66 | 93.0 |
| My doctor | 46 | 9.9 |
| If yes, trust source ^a | 45 | 97.8 |
| Coronavirus transmission: | | |
| Via droplets | 458 | 98.1 |
| By humans | 443 | 94.9 |
| From surfaces | 312 | 66.8 |
| By people even if they look healthy | 292 | 62.5 |
| From a mail parcel | 258 | 55.2 |
| Only old/young get it, others cannot easily get it | 209 | 44.8 |
| COVID-19 symptoms: | | |
| Cough | 457 | 97.9 |
| Fever | 443 | 94.9 |
| Shortness of breath | 445 | 95.3 |
| Protective measures against COVID-19: | | |
| Wear mask outside | 466 | 99.8 |
| Wash hands | 463 | 99.1 |
| Physical distancing | 449 | 96.1 |
| Drink lots of water | 306 | 65.5 |
| Eat garlic | 278 | 59.5 |
| Hot baths | 255 | 54.6 |
| Gargle with water/other liquid | 238 | 51.0 |

^aDenominator = n who got info from this source.

from China (55.2%) and that only young or old people could become infected (44.8%). Almost all (95-98%) knew that symptoms of COVID-19 infection included symptoms of cough, fever and shortness of breath and that infection could be prevented by mask wearing (99.8%), hand washing (99.1%) and by distancing (96.1%). The most common prevention misconceptions included “drinking lots of water” (65.5%), eating garlic (59.5%), taking hot baths (54.6%) and gargling with water or other liquid (51%).

Virtually all participants (94.4%) reported feeling confident in their ability to take their ART medication as prescribed during the pandemic (Table 2). Slightly fewer (79.9%) were confident in their ability to keep their ART clinic appointments or other clinic appointments (60.4%). The majority (57%) of participants were worried about their risk of becoming infected with SARS-CoV-2 during ART clinic visits and 49.5% expressed similar concerns regarding their general infection risk. At the time of the interview, 22.5% of participants reported having less than a two-week supply of their antiretroviral medication and almost three times as many participants reported anxiety (16.5%) than depression (6.4%). The mean score on the social support index (3.7) was similar to scores reported during pre-pandemic data collection waves.

Table 2. Psychosocial Characteristics (n = 467).

| | n | % |
|---|-----|-------|
| Very confident can adhere to ART regimen during pandemic | 441 | 94.4 |
| Very confident can keep ART clinic appointments during pandemic | 373 | 79.9 |
| Very confident can keep other clinic appointments during pandemic | 282 | 60.4 |
| Worried about COVID-19 infection in ART clinic | 266 | 57.0 |
| Worried about COVID-19 infection (general) | 231 | 49.5 |
| Reporting ≤ 14 day pill supply | 105 | 22.5 |
| Downloaded “Aarogya Setu” app | 65 | 13.9 |
| Mild-severe anxiety (GAD-7 ≥ 5) | 77 | 16.5 |
| Mild-severe depression (PHQ-9 ≥ 5) | 30 | 6.4 |
| Social Support (MOS scale range: 1-5): Mean (SD) | 3.7 | (1.1) |

Bivariate analyses (Table 3) showed that the more transmission routes participants knew, the greater their worry of getting infected during ART clinic visits, regardless of whether it was a true route ($r = 0.20$, $p < 0.001$) or a misconception ($r = 0.20$, $p < 0.001$) While there were structural barriers in place, such as government limits placed on the hours and distance that people in certain zones were allowed to travel, all participants were able to identify some mechanism by which they could get to an ART clinic.

Participants who reported having a 2-week supply or less of ART were more than twice as likely to be “not very confident” in their ability to be able to keep their ART clinic appointment than those with a larger ART supply (AOR = 2.19; 95% CI: 1.29-3.72). Similarly, those who worried about getting infected with SARS-CoV2 in the ART clinic (AOR = 2.10; 95% CI: 1.25-3.51), and those reporting symptoms of at least mild anxiety (AOR = 3.19; 95% CI: 1.79-5.69) had around two to three times the odds of being not very confident, compared to their respective less worried and anxious counterparts. Symptoms of at least mild depression and not receiving Covid-19 related information from the ART center were bivariately related to lack of confidence in being able to keep one’s ART clinic appointment, but were no longer significant when the other variables were added to the model. Of these same variables, only having an ART supply of 2 weeks or less was significantly associated with lack of confidence in one’s ability to adhere to ART regimen (Table 3). An open-ended question at the end revealed that in addition to concerns about infection during clinic visits, participants also worried about HIV stigma and discrimination if stopped by police while traveling to the clinic, as this would likely force them to disclose their status.

Discussion

Anxiety, depression and worry about SARS-CoV-2 infection during ART clinic visits are associated with less confidence in one’s ability to keep clinic appointments during the COVID-19 pandemic in this cohort of PWH in South India.

Table 3. Correlates of Lack of Confidence in ART Appointment Keeping and Regimen Adherence.

| | Not very confident can keep appointment | | Not very confident can adhere | |
|-------------------------------------|---|----------------------|-------------------------------|----------------------|
| | Unadjusted OR (95% CI) | Adjusted OR (95% CI) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) |
| ART supply \leq 2 wks | 2.12 (1.29-3.49) | 2.19 (1.29-3.72) | 5.32 (2.36-11.98) | 4.67 (2.04-10.65) |
| Worried re. infection in ART clinic | 2.31 (1.41-3.79) | 2.10 (1.25-3.51) | 1.75 (0.74-4.11) | 1.73 (0.71-4.19) |
| No Covid info from ART clinic | 2.18 (1.01-4.73) | 1.89 (0.84-4.23) | 4.72 (0.63-35.38) | 3.34 (0.43-25.94) |
| Anxiety (GAD-7 \geq 5) | 3.50 (2.06-5.94) | 3.19 (1.79-5.69) | 0.92 (0.31-2.74) | 0.67 (0.20-2.31) |
| Depression (PHQ-9 \geq 5) | 2.89 (1.34-6.23) | 1.38 (0.59-3.26) | 2.90 (0.93-9.04) | 2.56 (0.69-9.47) |

These concerns can serve as barriers to medication adherence, clinic visits and timely medication refills. Structural interventions are needed to assist PWH with safe clinic transport, reduction of clinic wait times, and delivery of medication refills when patients cannot get to the clinic. Increasing the time between clinic visits and providing medications for multiple months for anxious and worried patients may also help decrease treatment interruptions.

Given the association between increased confidence and having received information from clinic staff, these results also suggest that responding to patient concerns using teletherapy, either via phone or video chats, may help reduce worry and anxiety among PWH during the pandemic. Based on the data presented here, such calls could benefit from including information about coronavirus transmission, problem-solving individual barriers to clinic visits and prescription refills and teaching simple techniques such as deep breathing etc, may help reduce anxiety which was an independent predictor of confidence in keeping clinic appointments in the adjusted model. If the clinic staff do not have sufficient time for to provide this counseling, perhaps they could consider collaborating with local AIDS Service Organizations, affiliated psychologists, or train para-professionals, such as community health outreach workers (ASHAs) to assist them. Future research is needed to evaluate whether such efforts will improve appointment keeping and timely prescription refills as well as reduce ART treatment interruptions.

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