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Using an HIV self-test kit to test a partner: Attitudes and preferences among high-risk populations

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Abstract

For those most at risk of contracting HIV, new strategies for preventing transmission and increasing testing are needed. As part of a multi-site, randomized, controlled trial (RCT), we explored attitudes and preferences among 272 HIV-negative men who have sex with men and HIV-negative transgender women using an HIV self-testing (HIVST) kit to test partners. Less than one quarter had previously self-tested with HIVST kits (21.7%) and few had partner-tested (4.8%). Most preferred gum swab (96%) over fingerprick tests (69%), but would prefer a blood test if it gave results for other sexually transmitted infections (STIs) (86%). Five percent reported difficulties performing the test, four percent with storage, and 26% with portability. Ninety-three percent reported likelihood of using HIVST to test partners in future, but only 3% were willing to pay the current price. Efforts to improve HIVST uptake should focus on incorporating testing for other STIs, reducing test kit size, and reducing cost.

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ACD, IB, IF, CD, RG designed the study and developed the protocols. JL, CC, RC recruited, conducted IDIs. RG, JL, SI, CL, CD Coded and analyzed data. All authors contributed to the manuscript development.

Resumen

Se necesitan nuevas estrategias para prevenir la transmisión del VIH e incrementar el testeo para aquellos con mayor riesgo al contagio. Como parte de un ensayo controlado aleatorio (ECA) multicéntrico, exploramos las actitudes y preferencias entre 272 hombres VIH-negativos que tienen sexo con hombres y mujeres transgénero VIH-negativos que utilizaron kits del auto-test para el VIH (HIVST) para testear a sus parejas. Menos de una cuarta parte de los participantes había utilizado HIVST para auto-testearse (21.7%), y solo pocos para testear a sus parejas (4.8%) antes del comienzo del estudio. El hisopo bucal fue preferido (96%) sobre una prueba con un pinchazo de sangre (69%) por la mayoría de los participantes pero estos preferirían la prueba de sangre si pudieran obtener resultados para otras enfermedades de transmisión sexual (ETS) (86%). Cinco por ciento reportó problemas con el uso de la prueba, 4% con el almacenamiento, y el 26% con la portabilidad. Noventa y tres por ciento reportó que utilizarían HIVST para testear a sus parejas en el futuro, pero solo 3% estaba dispuesto a pagar el precio actual. Los futuros esfuerzos para mejorar la adopción del HIVST deberían enfocarse en incorporar otras pruebas de ETS, en reducir el tamaño del kit y en reducir los costos.

Keywords

HIV prevention; HIV self-testing; transgender; men who have sex with men

INTRODUCTION

Globally, a significant number of people do not know their HIV status despite decades of efforts to increase access to available testing and counselling.(1) Of the estimated 1.1 million people living with HIV (PLWH) in the US, approximately 14% are unaware of their HIV status.(2) This figure is even higher among men who have sex with men (MSM) and transgender women (TGW).(3, 4) In a 2017 testing event, the percentage of transgender people who received a new HIV diagnosis was 3 times the national average, similarly in a survey conducted between 2014 and 2015, two thirds had never tested for HIV.(3, 5) An estimated 67% of new HIV diagnoses occur among MSM, and a quarter of these infections remain undiagnosed.(4, 6) Additionally, MSM and TGW often face barriers, such as stigma and discrimination, to engaging in HIV testing.(7, 8) To meet the UNAIDS 90–90–90 targets,(9) new strategies are needed to prevent transmission, reduce risk, increase testing, and promote behavior change, particularly for those who are most at risk of contracting HIV.

The World Health Organization (WHO) has recommended HIV rapid diagnostic self-testing (HIVST) since 2016 as a gateway into both prevention and treatment services.(1) However, despite HIV surveillance and prevention strategies, researchers have identified that MSM and TGW are not testing for HIV at high rates, for example, in the US and the Caribbean. The use of HIVST may facilitate access to HIV testing, support shared approaches to risk prevention between partners, and help increase HIV testing uptake, particularly among key populations.(10) In prior studies, including a global review, HIVST was reported as highly acceptable due to its convenience, privacy, prompt test results, and confidentiality across different settings.(11, 12) However, few studies have focused on preferences and considerations for HIVST use as a tool for HIV prevention among MSM and TGW.(12) To

be utilized as an HIV prevention and linkage-to-care strategy, HIVST must be responsive to end users' preferences. Understanding preferences and perceptions of HIVST can optimize use, inform policy, and guide funding allocation.

Intervention studies provide key information on end users' preferences, needs, and likelihood of using a test, and can inform such guidelines and implementation strategies. A 5-year randomized controlled trial exploring the effectiveness of HIVST as a risk-reduction tool provided data on HIVST preferences among MSM and TGW at high risk of HIV infection. The discussion below outlines this sample's HIVST preferences, experiences using the kit, perception/opinion changes regarding test type and kit use on self and others after using the test kits at home, cost considerations, recommendations for test improvement, and potential future use of HIVST among this cohort. We examined how participants 1) responded to survey questions at the beginning of the study, 2) reported experiences during the study, and 3) indicated future plans for HIVST use after completing the study. These data can inform recommendations for future use of HIVST as a prevention strategy.

METHODS

Quantitative surveys and in-depth interviews (IDIs) with non-monogamous, high-risk, HIV-negative MSM and TGW were analyzed to explore their HIVST considerations as part of a larger RCT. The study's field name was ISUM (I'll show you mine"), a pun on the idea of potential sexual partners showing each other their HIV self-test results. The study took place in New York City (NYC) and San Juan, Puerto Rico (SJU), and participants could choose English or Spanish when responding to surveys and interviews.

Sample

To focus on high-risk individuals, participants had to be: HIV-negative, 18 years of age or older, non-monogamous, identify as a man or transgender woman who has sex with men, report three or more occasions of condomless anal intercourse with at least two sero-discordant or unknown status partners in the past three months, and not be on oral PrEP at the time of recruitment.

Recruitment

Participants were sampled through venue-, online-, and referral-based recruitment between 2014 and 2017 (detailed elsewhere).(13) Recruitment included word-of-mouth through other participants, who were given a \$30 incentive per referral who enrolled in the study for a maximum of \$90.

Procedures

Participants responded to a brief pre-screening survey by phone or in person. Those who qualified were invited to an in-person screening (Visit 1; V1) in which they provided informed consent, completed a baseline behavioral questionnaire via computer administered self-interview (CASI), performed a rapid HIV self-test (OraQuick® In-home HIV Test) correctly without direction from staff (within 2 attempts or were considered ineligible to continue), and a staff-administered confirmatory test (Alere Determine™ HIV-1/2 Ag/Ab

Combo Test). Eligible individuals were invited to return for enrollment (Visit 2; V2) within one week and were randomized to either an intervention or control group. To ensure that transgender participants were randomized into both groups in roughly equal numbers, randomization was stratified by gender identity. Intervention group participants received ten rapid oral HIVST kits to take home and use to test themselves and partners. They also viewed a video that included key points to consider when using the tests to screen sexual partners (<https://www.youtube.com/watch?v=uq6Qb4BJLdM>). Those in the control group were not given self-test kits or shown the video at V2. All participants received HIV counseling and were offered condoms. All participants were also trained to use the study text message (SMS) system. They received daily SMS messages asking them to report on condomless sexual behavior, knowledge of partners' HIV status during condomless sex occasions, and number of remaining self-test kits (intervention group only).⁽¹⁴⁾ Participants in the intervention group could request up to 20 additional kits before the end of the trial period.

After three months, participants returned for a follow-up visit (Visit 3; V3), in which they were re-tested for HIV and completed a follow-up CASI. In addition, a subsample of participants in the intervention group — selected based on number of tests used, having partners who tested HIV positive, or transgender identity — underwent an IDI to further explore their experiences using the test kits with partners. These IDIs were conducted face-to-face in NYC and by phone with participants from PR. At V3, those in the control group were given 6 HIV test kits to take home, were shown the video about test use with partners, and finished study participation. The intervention group participants continued follow-up for three additional months with no further provision of kits and reported on their sexual behavior through SMS. They returned for a final visit (Visit 4; V4), 6 months after the start of the study, in which they completed a final CASI assessment, an HIV test, and an IDI (if previously interviewed at V3). The main outcomes of the study will be reported elsewhere.

Participants were compensated in cash for the clinic visits and received a modest incentive for responding to the SMS. In total, the compensation for study participation could amount to \$445. All procedures were reviewed and approved by the Institutional Review Boards at the New York State Psychiatric Institute and the University of Puerto Rico Medical Sciences Campus.

Measures

Quantitative and qualitative data were used to assess HIVST preferences, issues using the kit, and plans to use HIVST in the future. The qualitative data were utilized to add nuance and determine reasonings behind expressed preferences. Due to how the data were collected in the study, survey and qualitative data findings are organized into experiences prior to study (V1), during the study (V3), plans for future use (V3 [control group] and V4 [intervention group]), and comparison of intentions at start and end of the study (V1 compared to V3) after having access to HIVSTs (intervention group).

The specific survey items from the V1 and V3 CASIs that were used for the present analysis focused on participants': use of HIVST kits; preferences (oral fluid versus blood sample); cost differences; speed of results; option for information on other sexually transmitted

infections (STIs); window of detection; likelihood of testing partners; and confidence in test results. V3 questions included: perceived effectiveness and difficulty of storing and using the HIV test, ease of getting more kits when supplies ran out, storing kits, transporting kits with (or without) packaging, and future use. Survey items used 4-point Likert scales (e.g., extremely unlikely, unlikely, likely, extremely likely). For example, one question was: “If cost were not an issue, now that the test is available over-the-counter, how likely is it that you would use it to test yourself?”

Regarding the IDIs, the coding reports (described below) for “testing logistics”, “willingness to pay for kits”, “tips and recommendations”, and “future use” were explored.

Analysis

Analyses were conducted using SPSS version 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY). Percentages, means, and medians (where applicable) are reported. Paired sample *t*-tests were conducted on survey items asked at both V1 and V3 to assess potential changes before and after having access to HIVST kits (intervention group) or as a function of participating in the study. Descriptive thematic analysis was used to identify main themes and subcodes within the qualitative data.(15, 16) All audio files of the IDIs were transcribed and checked for accuracy. A codebook, which included code names and definitions, was developed based on the IDI guide. The codebook was modified as needed after coding a set of five initial transcripts. Transcripts were imported into QSR International’s NVivo 11 qualitative data analysis software, and each was reviewed by two independent coders, who subsequently met to discuss discrepancies until reaching consensus. Two additional coders further analyzed the salient codes to assess for subthemes. Quotes included from participants at the PR site were translated from Spanish to English by the first author and verified by other bilingual authors. Survey data are reported as change in perception/opinion regarding likelihood to use HIVST after having access to the kits (intervention group) or as a function of participating in the study.

RESULTS

Participant characteristics

This study had a total of 272 participants. Among them, 245 (90%) were men and 27 (10%) were transgender women. The median age for all participants was 33.97 (SD = 11.12). Other baseline characteristics are shown in Table 1.

The following presents findings organized as experiences using HIVST kits prior to the study (V1), during the study (V3), plans for future use (V3 and V4), and comparison of intentions at the start and end of the study (V1 compared to V3) after having access to HIVST kits. Qualitative data findings are integrated with the survey data with illustrative examples from participants’ comments during their exit interviews.

Prior use of HIVST kits

HIVST kit use.: HIVST kit use prior to the start of the study is summarized in Table 2. A majority (182, 66.9%) of the participants had previously heard of the OraQuick® in-home

HIV test kit; less than a quarter (59, 21.7%) had used it on themselves and few (13, 4.8%) had used it to test a partner. The main reasons cited in an open-ended question on why they had not previously used HIVST kits included: issues of access (e.g., not knowing they were available, where to get them, or how to use them) (85, 51%); cost (28, 17%); hadn't thought about it (20, 12%); preferred free testing at a clinic (20, 12%); and 'other' reasons (e.g., preferred blood-based tests, feared testing would kill the mood, feared receiving positive results, were unsure how partner would react, and their partner was already HIV positive) (5, 3%). Roughly half (135, 49.6%) of participants reported trusting blood-based test results more, while slightly less than half (122, 44.9%) trusted oral and blood test results equally.

Likelihood to test self and sexual partner using gum swab versus finger stick test.: If two rapid HIVSTs were available over-the-counter and the costs were about the same, the likelihood (likely and extremely likely) to test self using the gum swab was reported as higher than the likelihood of using a fingerprick blood test (253, 93% vs 187, 68.8%). However, as shown in Figure 1, participants' likelihood of using the fingerprick to self-test increased if it were half the cost, faster, gave results about other STIs, and had a shorter window period. Preferences for each test were gauged using separate questions; therefore percentages do not sum to 100.

Similarly, if the two rapid HIVSTs were available over-the-counter and the costs were about the same, the likelihood (likely and extremely likely) to test a sexual partner using the oral swab was higher than their likelihood of using the fingerprick blood test (251, 92.3% vs 161, 59%). As shown in Figure 2, participants' likelihood of using the fingerprick test to test a sexual partner increased if it were half the cost, faster, gave results about other STIs, and had a shorter window period. Compared to self-testing, participants were slightly less likely (i.e., gave more extremely unlikely or unlikely responses) to test sexual partners (about 30% were unlikely to test partners while 20% were unlikely to self-test).

HIVST Experiences and Issues During Study—Participants reported on their experiences during the study, particularly regarding the benefits of using the HIVST kits and testing logistics.

Benefits of HIVST.: Participants reported a number of benefits to using the HIVST. These included feeling more secure about their partners' status, creating a sense of confidence between partners, and that the test was easy to do, convenient, and offered privacy.

“Because it [test] makes me feel more secure about who I'm dating, with what person I'm going to be intimate. Or, in the same way, those who tell me no [that they don't want to take the test] may be lying and infected. And this gives me more security.” (translation) [21 years, Hispanic/Latino, V3]

“Well, I tested him and he continues to call me and all that, and he was very satisfied with me because having done the test alongside him gave him confidence in me. I also did the test, both results were negative and fine, we were both happy.” [21 years old, Hispanic/Latino, V3]

“I’d rather go to the STI clinics and test in there. But, again, you don’t want to go -- the ease of the tests, that you can do them on the spot wherever you’re going to meet. It could be a quick thing, 20 minutes, instead of you having to travel to somewhere, waiting in line, and then having a social worker tell you regarding sexual safe practices. Because sometimes people will tell me, “I don’t go to the STD clinic because they chastise me. I’m not into condoms. I hate them.” [38 years, Hispanic/Latino, V4]

Testing Logistics.: Testing logistics encompassed issues of storage, portability, test accuracy, and partner-testing.

As noted in Carballo-Diequez’s primary outcome paper,(17) seven participants (5%) reported having any difficulties performing the test; one (1%) reported difficulties interpreting the results, four (3%) reported calling the hotline number shown in the test kit, and one (1%) reported contacting study personnel due to problems using the test. The most commonly reported difficulties were the test kits getting damaged or not working properly.

Storage.: Most participants reported that they did not have difficulty storing the HIVST kits at home (Table 3).

In the qualitative data on storage, some participants emphasized having the tests in plain sight so potential partners could see them; others reported keeping the test kits out of direct sunlight.

“...not when you walk in, but after you’re in my house and you, once you -- if you sit here you’re going to see tests, so. And he saw the test, you know, and I think that was purposely done by me, especially when that was coming because, you know, so they would see it.” [50 years, African-American, V3]

“...I don’t take them [tests] outside because they told me not to – the test shouldn’t be exposed to much sun or anything like that.” (translated) [35 years, Hispanic/Latino, V3]

Portability.: Although most participants reported that it was easy to carry the kits with them at all times, approximately 26% reported difficulty carrying the HIVST kits in their original packaging when taking them with them outside of their home (Table 3). The OraQuick® In-Home HIV Test, which we used in our study, comes packaged in a plastic box that measures 6 in x 7 in x 2 in (16 cm x 18 cm x 5 cm) (Figure 3).

Having a test on hand at all times was commonly described.

“...I left them in the car, I carried them in a bag and I carried them with me. That’s what I did.” (translated) [58 years, Hispanic/Latino, V3]

A number of participants described having to actively plan for the kit’s size when preparing to meet a partner. Some took the test out of the box to mitigate the size concern.

“...I had to actively make sure that I had space for it. It’s not something that’s small enough and convenient enough that I can just pick it up and throw it in my bag the way that I can with my phone or my wallet.” [24 years, White, V3]

“Yeah, no. I didn’t carry the whole box. The boxes were kind of bulky so I would just carry the package — yeah, the package. I’d just carry that and I wouldn’t carry the whole box.” [49 years, African-American, V3]

Concerns about test kit accuracy.: Although participants commonly described the HIVST as easy to use, there were participants who had trouble performing the test and raised concerns that user error (e.g., people not swabbing themselves correctly) could lead to inaccurate results or incorrect test interpretation.

“...I feel like, sometimes, people don’t know how to do the oral swabbing themselves. They become extremely -- I don’t want to use the term, but, yes. Stupid. They might swab their teeth or their gums. (laughs) They might swab their tongue.”

[38 Years, Hispanic/Latino, V3]

“He didn’t know, he ruined the test, so I had go back to look for another test to give to him. The thing was that he picked it up and opened it upside down and touched the pad of the test and contaminated it. I told him “I am going to look for another one to use.” I explained it step by step, I laid out the instructions for him to read, but he didn’t want to read them, so I had to read them for him and make sure he was following me. I was telling him how to do every single thing until we got to the part where the results needed to be read.” (translated) [21 years, Hispanic/Latino, V3]

A few participants also noted that their partners were concerned that the tests may have been tampered with.

“Yes. I would say that a lot of people -- you know, when I was doing the testing, people were like, “Are they really sealed? Is that --?” It’s like, wow. Only one or two people kind of hinted at -- if it were -- if they were tampered. If -- that if I re-glued them.”

[38 Years, Hispanic/Latino, V3]

Test use with partners.: Participants reported initiating test use in a number of ways: asking their partner to read the instructions aloud; reading the test instructions aloud to their partner; or, more frequently, directly administering the test to their partner. Some participants also reported a need to assure partners that the test was a swab rather than a fingerprick.

“No, I did it [conducted test on partner]. I played -- I played nurse, Nurse Ratched to everybody. (laughs)” [24 years, African-American, V4]

“I told him how to use it, step by step, and I told him to read the instructions so that he learns how to do it by himself, in case he ever wants to get it done he can just go

buy a home test and he'll already know how to do it. So we went step by step, and I showed him, and he did it by himself.” (translated) [21 years, Hispanic/Latino, V3]

“...he always told me: “I’m afraid of needles. I can’t – I get dizzy”. And I told him “Well, look, you’re afraid of needles, but this test does not need a finger stick. You only have to pass this through your mouth, and that’s its.” (translated) [58 years, Hispanic/Latino v3]

Future HIVST Kit Use—Future HIVST kit use is presented in terms of: 1) comparison of intentions at the start and end of the study after having access to HIVST kits (V1 vs. V3); 2) description of future use; 3) recommendations for improving the HIVST kits and their uptake; and 4) cost considerations.

Likelihood of self-testing and partner-testing if cost were not an issue. There was no significant difference between V1 and V3 regarding participants’ likelihood of testing themselves and their sexual partners using the HIVST kits if cost were not an issue (Table 4). At both V1 and V3, participants reported that they would be likely to test themselves and sexual partners; slightly higher rates of participants were less likely to test lovers, one-night stands, and other partners at V3. Results from only the intervention group participants were also nonsignificant.

Why participants would use HIVST kits in the future. Although there was no significant difference in likelihood of use over time in the study, over 90% of participants reported that in the future (e.g., after the study) they would be likely to use the tests with sexual partners. Further, participants’ likelihood of testing themselves and testing partners increased overall at V3 (Table 4). In the qualitative results, some nuances emerged regarding future use such as being willing to use the test when it’s within easy physical reach or using it solely with particular partners.

“Well, as long as they are within my reach, I will use them because I do not think anyone wants to live with a sexually transmitted infection. But, based on my reality and my circumstances, I know I am at risk. But, well, it’s gonna be one thing or the other. It’s about survival.” (translated) [39 years, Hispanic/Latino, V3]

“if I just had access to them, the way that I know I would use them is that I would just have them sitting at my place, and when I -- if I brought a new partner back home with me, then I would offer it to them. I’m not the type of person who would take one with me and always have it to use at a moment’s notice unless I, as I did when I did, unless I had discussed previously with that person that I was going to use it, in which case then I would make a point to take it with me.” [24 years, Hispanic/Latino, V3]

“...I think the place where I would use it [HIVST kit] the most, by choice, would be when I have a new partner who I intend to be a long-term partner...In cases where I don’t intend for that person to be a long-term partner, then I probably would not use it. Then I’d probably just resort to using other forms of protection instead. That’s kind of what the conclusion was for me, based on the amount of time it takes and the ease of bringing it up and how invested I am in bringing it up

and how willing I am to take the time to explain it and how much I intend to get out of that relationship down the road, etcetera.” [24 years, Hispanic/Latino, V3]

Why participants would NOT use HIVST kits in the future.: When asked about future plans for using HIVST kits, some participants indicated that they would be unlikely to use the test in the future, regardless of cost, because they would prefer to wear a condom or simply ask partners about their status instead.

“I wouldn’t buy it. I’m not going to spend money on it. Before, and during, knowing whether you were positive or negative wasn’t an issue. Because first of all, either I wear a condom, or I don’t. And knowing the current status of how things are, that’s an issue, that’s a factor of how I’m feeling. Actually, lately, I’ve been wearing condoms.”

[38 years, Hispanic/Latino, V4]

“I would I think just simply ask, like, “Hey, are you clean?” [Age 27, Hispanic/Latina, Transgender woman, V4]

Additionally, participants commonly reported that bringing up the test was too awkward, resulting in a loss of passion. In this vein, one participant indicated they would prefer for a partner to test on his own so they could avoid dealing with a potential positive result.

“...it’s just -- it’s an awkward thing to bring up. And I -- you know, so I’m not really sure. I’m not really sure how I would use them because I imagine the situations I’ve been experiencing will just repeat themselves.” [58 years, White, v3]

“It’s extremely difficult. It’s like bridging people regarding -- bring a partner to test himself is kind of a rodeo -- very, very, very awkward rodeo where you get on the bull and you, for dear God, hope to hold on long enough until the person actually gets the idea of the test. But sometimes, it’s so abrupt that you’re flung before.” [38 Years, Hispanic/Latino]

Recommendations to improve the HIVST kit and its uptake.: A prominent theme was a desire for the test kit to be in a smaller and more convenient packaging. Other recommendations to improve the test were to have it test for other STIs and to include a privacy window over the results.

“Well, like I said, you know, a lot of people said that they loved the idea of the test, and they like how simple the test is, but they just wish that it was in a smaller package. Because they said it’s too much. And then I had some environmental friendly people going like, “This is too much plastic. This is too much paper. You could definitely reduce this and save a carbon footprint.” [38 Years, Hispanic/Latino]

“OK. That’s the tricky part. So in the home test kit, when you have the result waiting, you can cover it. So I covered everyone’s.” [29, Hispanic/Latino, V3]

To better facilitate HIVST kit use, participants recommended improving its marketing, cultivating community knowledge, and increasing access to the test kits at local centers, clinics, or common places within the community.

“...I believe that it should be marketed in a way to, I don’t know, reeducate the community regarding what its true purpose is. Because, every time you bring OraQuick, very few people have heard it, and very few people know what it is. I believe that a national rollout campaign of commercials educating people about it would benefit others -- newspaper ads in *AM New York* or stuff like that. Because right now, most people are talking to me about PrEP. PrEP, PrEP, PrEP. But, PrEP’s being advertised in old newspapers now. So, it has this huge financial rollout. I believe that OraQuick would benefit from that.” [38 Years, Hispanic/Latino, V3]

“Look, there, they go and give out condoms at the disco. And there are discos here that set up shop in front of the discos, and they give away condoms, and they test you before you go in. I understand that these same programs could have one of these tests that they can give you right there. That is, give away the test too. After they do it to you, give one or two for someone you know. A sexual partner even if you are not a couple. I think that at least they won’t give away ten, right? Because this is an investigation, but - at least they give you one or two, it wouldn’t be bad.”

(translation)[46 years, Hispanic/Latino, V4]

Cost considerations

Amount willing to spend on one HIVST kit.—Nearly three-quarters of participants reported being willing to spend up to \$20 USD for one HIVST kit. However, only 2.7% were willing to pay the current cost of the test. There was little change between willingness to pay between V1 and V3 (Table 5).

To improve their likelihood of future use and make the tests more accessible, the vast majority reported that the HIVST kits needed to cost less. Similar to the survey data, most indicated a willingness to pay up to \$20 USD.

“If I had the money I would buy and have them but, as I said, I will not stop buying a packet of rice to buy an HIV test.” [39 years, Hispanic/Latino, V4]

“I feel like anywhere between \$5 or \$10 is, like, perfect, because people can buy more than one, they can buy them in bulk. Like, and it’ll be something that people will use, because it’s like, so inexpensive. But with it being -- if it’s, like, over \$40, then it’s kind of like, I could go do something else with that money. Like, I can get my nails done and -- or anything. Like, people have lives, people have priorities. So having something cost so much, it’ll, like -- same with, like, pregnancy tests. Like, they’ve lowered the cost of pregnancy tests, so it’s, like, so easy to get one. Why can’t an HIV test be the same?” [24 years, African-American, V4]

However, a few participants reported that the cost, whatever it might be, would be worth feeling protected.

“...I feel more protected with these tests, because, or rather, more relaxed... literally, I would buy them whatever the cost.”(translation)[23 years, Hispanic/Latino, V4]

“...I mean, it is not going to cost as much as having HIV. The cost of the test is not going to be as expensive as having HIV.” (translation) [35 years, Hispanic/Latino, V3]

Strategies to mitigate the costs that were used during the study included rationing the tests (e.g., by taking a video of themselves testing so that they would not have to use another test to verify their status to partners, only conducting tests on partners, etc.), saving money elsewhere, getting tests through insurance or, among sex workers, passing on the cost to clients.

“...I actually recorded a video in my iPhone of it. And, you know, it’s -- when you take with the iPhones when you record videos or take pictures, it’s dated. So it was only, like, a week and a half or so, like, not even that, before that I did it on myself. So he’s like, “Are you going to do it?” And I’m like, “I just did one.” So I showed him the video, he got to watch it, and it was, like, from start -- I literally, for, like, 20 minutes, sat there and held it, so you can see, like, it wasn’t any editing.” [24 years, African-American, V3]

“I could improve my business in the sense that I could charge a bit more for simply testing.” (translation) [23 years, Other, V3]

“Yes, because it’s a cost, I mean, it would cost just as much as going to a hotel or a motel. I mean, better to buy the test and I take the person home. And that way I can avoid the cost of the motel.”(translation)[35 years, Hispanic/Latino V4]

I mean, this test usually is like \$40, I think. I don’t know. I guess I pay, I pay, and this was with the insurance. I paid out of pocket I think it was \$7, something. For two. So, \$7, that wasn’t that bad. [52 years, Hispanic/Latino, V4]

Another prominent theme was the preference for utilizing free community resources instead of purchasing HIVST kits.

“Most people will do -- most people like me will go to a clinic and get it [HIV test] for free, or if they have health insurance, go to their doctor. And they’re not g-- I don’t think -- most people -- I want to say, yeah -- I would say a lot of people are not going to buy it because it’s too much.” [38 years, Hispanic/Latino, V3]

“Sure. Of course, [price] is an obstacle. Because, apart from being expensive, it is not the same. And then, from my way of thinking, it is not the same to buy a test over the counter than go to a place where, obviously, they are dedicated to prevention, and can guide me better.”(translation) [39 years, Hispanic/Latino, V3]

Some participants even mentioned having to revert to condom use since the kits were too expensive to resupply.

“I was hoping to get more. But I think what the study did for me was change my behavior -- my sexual behavior. So, yeah, I was looking for more. But then, I also

said, OK, I'm not going to get them. And they -- they expensive, so it made me realize that I have to actually use condoms." [49 years, African-American, V4]

DISCUSSION

This paper explored preferences, use issues, cost considerations, and future plans for HIVST kit use among a high-risk population of 272 MSM and TGW. In-depth exploration of preferences and issues is an essential approach to help design better tools and more broadly scalable strategies to prevent transmission, support decision-making regarding kit use, and promote behavior change for at-risk individuals. Findings from this study can inform strategies to improve the usability of the HIVST test kit and increase its uptake for self- and partner-testing as an HIV prevention modality. The present findings indicate that cost, convenience, and access to broader sexual health knowledge are all salient factors that will determine if HIVST kit can be broadly adopted as a strategy for HIV prevention. Overall, participants found HIVST kits to be acceptable for testing sexual partners; however, the bulky, inconvenient packaging appeared to limit their ability to carry the tests wherever needed. Similarly, the current pricing was considered too expensive for HIVST kits to serve as an ongoing prevention strategy.

Comparable to other studies, participants found the oral HIVST to be highly acceptable and expressed a preference for an oral swab version of the self-test over a finger stick version.(1, 11) It was common for participants to administer tests for their partners, which appeared to stem from the fact that it was more convenient for the tester than verbally instructing their partners and also helped to foster a sense of test performance accuracy. The preference for an oral test appeared to stem from its convenience, privacy, and the fact that it did not entail a finger prick. However, of the various scenarios regarding preference of a fingerstick over an oral swab test, participants expressed higher interest to use the fingerstick version for self- and partner-testing if the test also included results for other STIs. Reduced cost, speed, and a shorter window period were all equally preferred. These findings are consistent with an earlier study in which participants indicated greater likelihood of using an oral swab over a blood-based test, notwithstanding lower prices or quicker results from the latter.(12) These findings suggest that these populations may be more concerned with receiving a broader understanding of potential sexual partner's status, specifically in testing partners for a variety of STIs. Future research should focus on incorporating the testing of other STIs into convenient in-home tests and, although an oral swab test is preferable, could include fingerstick testing.

Storing the test kits at home was not identified as a barrier. However, the results of the current study suggested that the bulky packaging of the test kit limited its use as a prevention strategy to screen sexual partners. The size of the package and the amount of paper instructions contained within were reported as inconvenient to carry and have accessible for encounters outside of participants' homes. Participants reported that one workaround for this issue was to remove the test from its packaging. However, while some were comfortable with this approach, others raised concerns regarding partners' mistrust of the test's accuracy if the box was compromised; therefore, these participants did not consider removing the test from its original packaging. Thus, for this HIVST kit to emerge as a viable risk reduction

tool, the packaging needs to be redesigned so it is more portable. To this end, packing two tests into one kit to facilitate partner-testing has been previously recommended.(18)

Willingness to pay the current price of approximately \$40 USD for the HIVST was low in the survey and reiterated in the qualitative data. This finding is not surprising given similar findings in the literature. In a global review of HIV self-testing, 10 studies reported on cost preferences for the oral HIVST kit.(11) Similar to our findings, the majority of studies found that participants were not willing to pay more than \$20 USD for the test. Making the kits affordable for at-risk individuals needs to be a priority to help achieve target HIV prevention goals. Given that there are a substantial number of people living with undiagnosed HIV, early diagnosis and treatment is essential in facilitating meaningful reductions in transmission and ensuring that other prevention interventions are utilized by those who test negative.(19)

Participants also highlighted the importance of increasing access to the test kits. Marketing campaigns, cultivating community knowledge, and increasing access to the test kits at local centers, clinics, or common places within the community were suggested strategies to get the word out and increase uptake of HIVST kits as a prevention tool. Similarly, in a systematic review of HIV testing barriers and strategies in the Caribbean, findings supported targeting places where at-risk populations congregate, training laypeople to conduct rapid tests, and promoting the use of oral fluid HIV self-testing, which allows individuals to test at home.(20)

Limitations

The above conclusions were drawn from a combined sample of MSM and TGW. Although researchers often combine these heterogeneous groups into a single sample, research suggests that they possess unique HIV-risk profiles.(5, 21) Therefore, future studies should be designed to further assess these groups' separate needs. Participants were not given blood-based tests to take home and use during the study. Thus, while the survey responses may have indicated participants had a preference for oral swabs, a direct comparison is hard to achieve given that they only had access and became accustomed to using one type of test at home.

CONCLUSIONS

Making HIVST kits available, affordable, and convenient to use for at-risk individuals can be a key component for all HIV prevention campaigns. Having test kits on hand at all times was a priority. Future efforts could focus on reducing test kit size to improve convenience of portability, incorporating testing of other STIs into convenient in-home tests, and reducing cost. Current costs will be a major barrier to widespread adoption of sexual partner-testing. Better marketing, cultivating community awareness, and increasing access to the test kits at local centers, clinics, or common places within the community could also improve future use of HIVST kits among at-risk individuals.

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Figure 1.
Likelihood of using the finger prick test to test self if they cost the same as oral test

Figure 2.
Likelihood of using the fingerprick test to test sexual partners if they cost the same as oral test

Figure 3.
Images of the OraQuick® In-Home HIV Test

Table I.

Sample Characteristics

Demographics	Intervention (n=136)	Control (n=136)	Full Sample (n=272)	
	Mean (SD)	Mean (SD)	t (df) p	Mean (SD)
Age	33.85 (11.12)	34.09 (11.16)	.180 (269) .857	33.97 (11.12)
Level of education ^a	4.36 (1.26)	4.46 (1.22)	.686 (270) .493	4.41 (1.24)
Annual income	\$24,668 (29,876)	\$22,566 (26,087)	-.797 (242) .426	\$23,617 (28,007)
	N (%)	N (%)	χ^2 (df) p	N (%)
Hispanic/Latino	76 (56%)	78 (57%)	0.06 (1) .807	154 (57%)
White	39 (29%)	43 (32%)	0.24 (1) .625 ^b	82 (30%)
Black/African-American	64 (47%)	44 (32%)		108 (40%)
Asian	3 (2%)	3 (2%)		6 (2%)
Native American	1 (1%)	2 (2%)		3 (1%)
Other/More than one	28 (21%)	44 (32%)		72 (27%)
Man	123 (90%)	122 (90%)	0.04 (1) .839	245 (90%)
Woman/Transgender	13 (10%)	14 (10%)		27 (10%)
Gay/Homosexual	102 (75%)	110 (81%)	1.37 (1) .242 ^c	212 (78%)
Bisexual	26 (19%)	16 (12%)		42 (15%)
Straight/Heterosexual	4 (3%)	3 (2%)		7 (3%)
Other	4 (3%)	7 (5%)		11 (4%)
Employed	94 (70%)	86 (63%)	1.24 (1) .265	180 (66%)
Student	22 (16%)	27 (20%)	0.62 (1) .430	49 (18%)

^a Education was measured on a scale where 1=eighth grade or lower, 2=partial high school, 3=high school graduate/GED, 4=partial college, 5=college graduate, 6=partial graduate school, 7=graduate school degree

^b White vs. Other

^c Gay vs. Other

Table II.

Reported use of HIVST at V1

V1 Survey question	N = 272 (%)
Heard of OraQuick In-Home HIV Test kit prior to study	182 (66.9)
Used OraQuick In-Home HIV Test kit to test <u>self</u>	59 (21.7)
Number of times used OraQuick In-Home HIV Test to test self	
5 times or less	56 (95.0)
> 5 times	3 (0.05)
Used OraQuick In-Home HIV Test kit to test <u>partner</u>	13 (4.8)
Number of times used OraQuick In-Home HIV Test to test partner	
1 time	10 (76.9)
> 1 time	3 (23.0)
Which HIV test result would you trust more?	N=271 (%)
Oral test results	14 (5.1)
Blood test results	135 (49.6)
Trust the results of both tests equally	122 (44.9)

Table III.

Difficulty storing the HIVST kits, getting more, and carrying with or without original packaging when going out

Level of difficulty	Very easy N (%)	Fairly easy N (%)	Fairly hard N (%)	Very hard N (%)
Find appropriate place to store (N=126)	90 (71.4)	31 (24.6)	3 (2.4)	2 (1.6)
Get more when ran out (N=62)	38 (61.3)	20 (32.3)	2 (3.2)	2 (3.2)
Carry in original packaging (N=107)	49 (45.8)	30 (28)	15 (14)	13 (12.1)
Carry without original packaging (N=77)	28 (36.4)	31 (40.3)	13 (16.9)	5 (6.5)

Table IV.

The likelihood of HIVST use if cost were not an issue, comparing pre- to post-study intentions

		Extremely unlikely	Unlikely	Likely	Extremely likely	p
Self	V1	0 (0.0)	10 (3.7)	64 (23.5)	198 (72.8)	1.000
	V3	2 (0.8)	10 (3.9)	53 (20.5)	194 (74.9)	
Sexual partners	V1	0 (0.0)	13 (4.8)	88 (32.4)	171 (62.9)	0.123
	V3	3 (1.2)	16 (6.2)	53 (20.5)	187 (72.2)	
Lovers	V1	2 (0.7)	10 (3.7)	78 (28.7)	180 (66.2)	0.687
	V3	2 (0.8)	21 (8.1)	56 (21.6)	178 (68.7)	
One-night stands	V1	3 (1.1)	20 (7.4)	98 (36.0)	150 (55.1)	0.824
	V3	4 (1.5)	29 (11.2)	71 (27.4)	155 (59.8)	
Other partners	V1	4 (1.5)	17 (6.3)	94 (34.6)	156 (57.4)	0.814
	V3	3 (1.2)	20 (7.7)	83 (32.0)	153 (59.1)	

Table V.

Willingness to spend on one HIVST at V1 (N=270) and V3 (N=258)

	\$1 – \$10	\$11 – \$20	\$21 – \$30	\$31 – \$40	>\$40
V1 (N=270)	118 (43.7)	87 (32.2)	39 (14.4)	16 (5.9)	10 (3.7)
V3 (N=258)	103 (39.9)	88 (34.1)	49 (19.0)	11 (4.2)	7 (2.7)