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Addressing missed opportunities for HIV testing by including rapid-HIV self-testing kits with patient-delivered partner therapy

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Abstract

Patient-delivered partner therapy (PDPT) is the practice of providing patients diagnosed with bacterial sexually transmitted infections (STIs) medication to give directly to their partner for treatment, which can result in missed opportunities for partner HIV testing. Fifteen STI clinic patients were asked about their opinions of including HIV self-testing (HIVST) kits with PDPT. Interview data fit well into constructs of the information-motivation-behavioral skills (IMB) model. Patients' motivations to deliver HIVST kits to their partners included the importance of earlier identification of HIV, convenience, avoidance of STI clinic stigma, and empowerment of individual and partner protection against HIV. Patients described the need for more information with worries about the quality of the HIVST device and questions about how it worked. Patients worried about their partners' reaction, including the potential for violence, and needed skills to support their partner with HIVST. Public health policies should support the inclusion of HIVST kits with PDPT, but additional intervention research is needed to more fully support patients and their partners with HIVST and PDPT.

Keywords

HIV testing; HIV self-testing; patient-delivered partner therapy; expedited partner therapy; sexually transmitted infections; IMB model

Introduction

An estimated 19.7 million new sexually transmitted infections (STIs) occur annually within the United States (US) with a direct cost to the healthcare system estimated at \$15.6 billion

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Compliance with Ethical Standards

Conflict of Interest: The author declares that he has no conflict of interest.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

(Owusu-Edusei et al., 2013). While more than 1.2 million people are living with HIV in the US and nearly 40,000 new HIV infections are diagnosed each year (CDC, 2016a), roughly 1 in 8 people living with HIV are undiagnosed (CDC, 2016c). In addition to a continued HIV epidemic, over 1.5 million cases of chlamydia and nearly 400,000 cases of gonorrhea were reported to the Centers for Disease Control and Prevention (CDC) in 2015 (CDC, 2016b). Individuals with bacterial STIs are at two- to five-fold higher-HIV risk (CDC, 1998; Nusbaum, Wallace, Slatt, & Kondrad, 2004; Wasserheit, 1992), indicating the need for combined STI and HIV prevention strategies. Given this epidemiological synergy, efforts that simultaneously reduce community prevalence of bacterial STIs and link undiagnosed people living with HIV into care are urgently needed.

Patient-delivered partner therapy (PDPT) is one biomedical strategy to reduce community prevalence of bacterial STIs (Golden et al., 2015). PDPT is the practice of providing patients diagnosed with a bacterial STI medication to give directly to their partner for treatment without requiring their partner to participate in STI/HIV counseling and testing (Ferreira, Young, Mathews, Zunza, & Low, 2013). Evidence is clear that PDPT is highly effective; PDPT reduces risk of repeat infection, increases the number of partners notified and treated, and reduces community prevalence of bacterial STIs compared to simple partner referral (Ferreira et al., 2013; Golden et al., 2015).

Despite a growing body of evidence in support of PDPT, PDPT offered within clinical practice has limitations. Mainly, PDPT could result in a missed opportunity to screen for HIV an important barrier identified by both healthcare providers and hypothetical partners (Jotblad et al., 2012; McBride, Goldsworthy, & Fortenberry, 2009; McBride, Goldsworthy, & Fortenberry, 2010). One method to minimize the barrier of a missed opportunity to screen for HIV is the provision of self-administered rapid-HIV test kits with PDPT packs. The CDC recommends all partners who receive PDPT to obtain HIV testing (Workowski, Bolan, Centers for Disease, & Prevention, 2015); however, no guidelines exist regarding the mechanism of HIV testing for partners.

Distribution of HIV self-testing (HIVST) devices is a promising avenue to identify undiagnosed people living with HIV (Figueroa, Johnson, Verster, Dalal, & Baggaley, 2016) and advance efforts to promote treatment as prevention (i.e., TasP) (Cohen et al., 2011). The US Food and Drug Administration (USFDA) recently approved an over-the-counter, rapid-HIV test kit for HIVST (USFDA, 2012), perhaps increasing the accessibility of HIV testing for those in need. Research with international and US domestic samples has identified high acceptability of patients delivering HIVST kits to partners (Kalibala et al., 2014; Krause, Subklew-Sehume, Kenyon, & Colebunders, 2013; Lippman et al., 2016; Masters et al., 2016; Prestage et al., 2016; Thirumurthy et al., 2016), with similarly high acceptability from partners receiving the kits (Kalibala et al., 2014; Masters et al., 2016; Thirumurthy et al., 2016). Providing HIVST kits to patients for their partners resulted in much higher partner HIV testing rates compared to standard of care (i.e., invitation cards for clinic-based HIV testing) in a randomized controlled trial (RCT); nearly 91% of partners were self-tested for HIV when patients were given the HIVST devices compared to only half (52%) of patients' partners receiving standard testing referrals for facility-based HIV testing (Masters et al., 2016). In non-RCT studies, 73% of people offered an HIVST kit for their partner delivered it

(Kalibala et al., 2014), and 75–91% of partners found this method acceptable and underwent HIVST (Kalibala et al., 2014; Thirumurthy et al., 2016). Thus, distributing HIVST kits is an encouraging method to expand HIV testing, is acceptable among various international and domestic populations, and results in higher partner HIV testing compared to standard referrals.

Despite increasing support of HIVST kit distribution in prior research, the provision of HIVST kits for secondary distribution to sexual partners has not been studied with US-based STI clinic patients. Public STI clinics are a unique setting to consider the use of secondary distribution of HIVST kits for a two noteworthy reasons. First, public STI clinic patient populations are predominately lower income and uninsured or on public health insurance (Alcaide et al., 2016; Scott-Sheldon et al., 2010), which identifies a population with disproportionately lower access to care. This could create barriers for patients' partners to obtain facility-based HIV/STI testing and counseling—expanding the need for distribution of HIVST kits and PDPT, when applicable. Second, many public STI clinics are geographically located in urban centers with higher-HIV prevalence compared to the state or region-specific prevalence rate, thus allowing more targeted identification of people living with HIV in prevention efforts. For instance, the Milwaukee metropolitan area and state of Wisconsin rank low compared to other urban centers and states in terms of overall HIV incidence (CDC, 2016a), but the City of Milwaukee—the city center excluding the surrounding suburban areas and geographical location of this study—has an HIV rate nearly four times greater than the state of Wisconsin and above the national average (Greer et al., 2013). Moreover, individuals in the lowest socioeconomic bracket—who more commonly visit free, public STI clinics—are the subpopulation at highest-HIV risk with incidence nearly double the national average, and a hyper-endemic rate of HIV is evident among Black men who have sex with men (MSM) in this city (CDC, 2011). Expanding the use of secondary distribution of HIVST kits among STI clinic patients could expand access to HIV testing to higher-risk and harder-to-reach populations in urban centers. While more targeted implementation to subpopulations of STI clinic patients at even higher-HIV risk (e.g., MSM) might be more efficient in identifying individuals living with HIV, wider implementation of HIVST kit distribution within the whole STI clinic patient sample could help prevent stigmatization of this intervention, minimizing potential affiliation of HIVST kit distribution with same-sex sexual behavior.

The aforementioned research suggests the strong potential of increasing HIV testing initiatives and alleviating missed opportunities for partner HIV testing associated with PDPT distribution for bacterial STI treatment *if* PDPT is accompanied with HIVST devices. However, no known prior research has studied the potential acceptability of combining PDPT and patient-delivered HIVST to simultaneously combat the STI and HIV epidemics. Current research on HIVST in the US has been limited mostly to study samples of MSM and transgender women, and further study with a diverse sample of STI clinic patients is warranted. The purpose of this paper was to investigate the potential of including rapid-HIV test kits with PDPT packs to patients in an effort to alleviate the risk of missed HIV testing opportunities for partners who receive PDPT.

Methods

Data for this analysis were taken from a larger, three-phase mixed-method study with STI clinic patients intended to identify potential intervention mechanisms, barriers and facilitators to PDPT delivery, and other important information for planning an RCT (John, Walsh, Cho, & Weinhardt, 2017). Briefly, 600 patients being seen at a publicly funded STI clinic in Milwaukee, Wisconsin, USA, were approached to be screened for study eligibility. Of those, 427 were screened, 394 were eligible (i.e., 18 years or older), and 200 enrolled in this phase of the study; patients who enrolled in the study were not significantly different from those who were screened and did not enroll in terms of demographic characteristics, reason for STI clinic visit, or first-choice preferences for partner notification. After participation in a quantitative survey, patients were sampled for in-depth qualitative interviewing using heterogeneous, purposive sampling (Ritchie, Lewis, Elam, Tennant, & Rahim, 2014). This sampling strategy resulted in a sample balanced in terms of sex, race, and rating of PDPT acceptability. Further details have been described elsewhere (John et al., 2017). All study procedures were approved by the Institutional Review Board of the University of Wisconsin-Milwaukee.

Data Analysis and Theoretical Framework

Participants were asked “How would you feel if an over-the-counter, rapid-HIV test was provided with the medications for you to give to your partner?” as part of semi-structured qualitative interviews discussing a hypothetical scenario where participants were diagnosed with a bacterial STI and partner notification was recommended. The author conducted all interviews and data analysis. Interviews were audio recorded and transcribed verbatim before undergoing thematic content analysis. Analysis was conducted using an iterative process, which included writing post-interview reflections and thematic notes, quality assurance of interview transcriptions, identification of initial themes, recoding after codebook refinement, and extraction of quotes for input into a framework matrix in Microsoft Excel. The framework approach to data analysis allowed within- and between-participant analyses across themes (Spencer, Ritchie, Ormston, O’Conner, & Barnard, 2013). Representative quotes were then selected as illustrations of the resulting themes. During the iterative analytic process, themes emerged that aligned well with the constructs of the information-motivation-behavioral skills (IMB) model (Fisher & Fisher, 1992). The IMB model posits that individuals must be highly informed, motivated, and behaviorally skilled to initiate HIV prevention behaviors (Fisher & Fisher, 1992). This model has been well tested and empirically supported for HIV prevention with STI clinic patients (John, Walsh, & Weinhardt, 2016; Walsh, Senn, Scott-Sheldon, Vanable, & Carey, 2011); thus, the IMB model was used as a framework for data presentation. To assist with reader interpretation, each quote in the results section was labeled with the participant’s age, race/ethnicity (B = Black or African American; W = White; M = Multicultural), and gender (M = man; W = woman) in that order within their abbreviation. For example, a 22-year-old Black man was referred to as 22BM, a 21-year-old Black woman was referred to as 21BW, and when two or more participants had the same demographics they were referred with a secondary numerical label to allow delineation (e.g., 58WM-1; the first 58-year-old White man interviewed).

Results

Sixty-five percent ($n = 15$) of survey respondents invited ($n = 23$), from a sample of 200 survey respondents (John et al., 2017), participated in the in-depth qualitative interviews used for analysis. The purposive sampling strategy resulted in the recruitment of five participants who were scored as low PDPT acceptors, four who were scored as medium PDPT acceptors, and six who were scored as high PDPT acceptors. Seven men and eight women participated in this phase of qualitative interviewing; 12 participants were Black or African American, two were White, and one described their race/ethnicity as Multicultural. Mean age was 36.7 years old ($SD = 15.2$; range: 19–62), 93.3% had a high school diploma or more education, 60% were unemployed, and two-thirds (66.7%) were at the clinic for STI symptoms or had a partner diagnosed with an STI. Of additional note, two participants self-identified as gay men. Participants provided substantive feedback on the potential of including HIVST kits with PDPT. Preliminary analyses suggested the data fit well into the IMB model constructs with data saturation by the final interviews; therefore, data were arranged by motivational factors, informational needs, and necessary behavioral skills associated with secondary distribution of HIVST kits to partners in conjunction with PDPT.

Motivational Factors

Patients embraced concepts of TasP, which prioritizes identification of people living with HIV to connect them to treatment. Many respondents responded favorably about including HIVST kits with PDPT, suggesting HIVST kits provide safety against HIV, allow earlier identification of people living with HIV, and are convenient for their partner to check their HIV-status. Moreover, patients thought the provision of HIVST with PDPT helped partners avoid the negative implications of STI clinic stigma, offering an empowering approach to protecting their own and their partners' health. Nonetheless, divergence in the sample was evident because some responded negatively to components of HIVST, suggesting the importance of informational and behavioral skills components as well.

Embracing TasP—Patients worried about other STIs—including HIV—when delivering PDPT because their partner would not require a full diagnostic screening. The inclusion of an HIVST kit with the treatment pack for a bacterial STI offered the potential for earlier identification of an HIV-positive partner. These factors positively influenced patients' consideration of delivering HIVST kits to their sexual partners.

I would want my partner to personally come here [to the clinic to get screened before treatment] and make sure that's all he got ... just to be on the safe side. (21BW)

If someone is positive for HIV, the sooner they know, the better off that individual will be, most likely, and less potential people it will be passed onto. (58WM-1)

The first quote illustrates an issue with diversionary care tactics, where the individual worried about missed opportunities for screening for other STIs using PDPT. However, this woman responded positively to the inclusion of an HIVST kit with PDPT, and she thought her and others' partners would similarly find this beneficial. One of these benefits was described in the second quote in terms of HIV prevention. Earlier diagnosis of a person

living with HIV is better for both the individual and the community because of earlier entry into care for the previously undiagnosed person and reducing onward HIV transmission to sexual partners—core components of TasP.

Convenience and confidentiality of HIVST—In addition to the added protection afforded by HIVST of partners, patients spoke about the convenience and confidentiality of an HIVST kit that had a similar positive influence on their perceptions of it.

It's certainly very convenient to not have to carve out an evening to figure out going and getting tested for an HIV test. I think that - that's a plus because people - like I said, people are busy and it's - it's something that is easily put off so you can want to go and get a test, but inconvenient enough that you don't go. And so if someone comes to you with a test in a STD treatment kit, it just makes the process easier. (58WM-1)

That would be real convenient for people. ... I think that would be nice and then it'll help a lot because it's real secretive. (28BW)

Understanding the context of the public STI clinic is important for the interpretation of the quotes above. Mainly, the STI clinic is a first-come first-serve clinic with an open waiting room where patients wait for testing and counseling services with other patients at the clinic. While staff attempt to minimize patient wait times, many visits last several hours from intake to departure. As discussed above, this can create a barrier to obtaining HIV testing, especially if placed in the context of having successfully received treatment for a bacterial STI with PDPT—removing a motivational factor for clinic attendance. In addition to making HIV testing more convenient for partners, the use of HIVST allows greater confidentiality to testing because it does not require a person to sit in an open waiting room with other patients at the clinic.

'Be on the safe side.'

Patients thought taking a rapid-HIV test to their partner would benefit their partner because it would allow them to know their HIV-status when receiving treatment for the bacterial STI with PDPT, while simultaneously offering the patient the safety of knowing their partner's HIV-status. This biomedical intervention provided both individual and partner protection against HIV, which is why many patients responded favorably to its inclusion with PDPT despite accompanying reservation by some.

[It'd make me feel] happy because I don't know if he got AIDS or not. ... You would feel more safe and secure with it. (42BW)

I would feel that would be a great addition ... We'd be covering several situations at once. Where, being treated for this and then we able to find out and make sure that we have a visual of the rapid results from the test. (53BM-2)

I feel actually good because I would be able to take, he'll be able to take it, so we'd be on the safe side to know. (20BW)

The inclusion of an HIVST kit with PDPT is a method of health security for patients, where partner HIVST would remove the unknown about their partners' HIV-status. As some people

interviewed described having limited trust in their partners, the visualization of the test result offers a mechanism for individual protection against HIV if concerns of trust are evident; this was perceived as a component of safety.

Avoiding the negative implications of STI clinic stigma—Many participants gave feedback on how an HIVST would remove the negative implications of STI clinic stigma by avoiding the clinic. Patients worried about patients and doctors talking about their confidential sexual health, which was a substantial barrier to coming to the clinic for STI treatment and HIV screening and a reason for wanting HIVST kits for their partners.

I think it's a good idea. ... They don't have to come to a clinic. ... It's just, those experiences is you feel people are talking about you. Rather if it's doctors or nurses, you feel like somebody is talking about you or you feel like somebody is going to say something about you, behind your back and it just prevent that from happening. (22BM)

You could do it only in the privacy of your home and stuff like that without having to go somewhere ... thinking about people wondering why you're here [at the clinic] and stuff like that. ... It might be just a personal issue that you're wondering and you don't really want anybody to see you or want anybody to know. (62BM)

If they need to get tested [for HIV], they don't want to go to a hospital. Some people don't want to go to a hospital or a clinic. (35BW)

[We] got so much stuff going around in this community. I think that will be great because for those who are embarrassed to even step foot into a clinic, that will be a great way for them to go about maybe getting tested for things. (21BW)

Patients described their or others' negative perceptions of the STI testing settings including the clinic of recruitment. These negative perceptions were based on issues of stigma rather than the care received, and the inclusion of HIVST kits with PDPT were discussed as a mechanism to remove a major barrier to clinic-based HIV testing. These barriers included general distrust in the healthcare providers, worries about being seen at the STI clinic, and general dislike in healthcare settings, as described in the first three quotes, respectively, representative of the perceived stigma of the clinic experienced by some. The last quote describes the potential benefit of including an HIVST kit with PDPT to help partners avoid this stigma, a major barrier to clinic-based testing.

Empowering individual and partner protection beliefs—Finally, patients talked within the context of empowering themselves to take charge of their and their partners' health. Some perceived the HIVST kit delivered with PDPT as a beneficial component because it would allow their partners to take responsibility for their health without navigating insurance programs and getting to an HIV testing center; however, this opinion was not universal because of negative attitudes towards STIs in general expressed by others.

[It allows them to] take their health in their own hands and be more responsible and having the options. (35BW)

Just this one big package where you are getting treated and you are testing yourself is basically, you doing everything yourself. You don't have to worry about healthcare provider ... [or] paying for insurance. (22BM)

I'm not sure how I would feel about that because STD's and STI's aren't the height of a person's day. (32MM)

The concept of empowerment—considered here as the ability to have autonomy—in HIV testing was evident within patients' narratives. Some patients described this in terms of having options available, implying the ability of their partner to still obtain traditional types of HIV testing if preferred. The HIVST kit would allow partners to take care of this issue themselves with fewer—or perhaps different—barriers, but some negatively perceived this autonomy because of potential issues associated with self-testing. One issue described was the perceived avoidance of STI-related matters in general because of the stigma and shame associated with them. This level of apprehension despite general positive attitudes towards HIVST is further illustrated in quotes in the next sections.

Information

Interview data suggest patients need to be more informed about HIVST and HIV transmission risk. Patients discussed their worries about the quality of the HIVST kit and had questions about how to administer HIVST, negatively influencing their perceptions of it.

Knowledge—Participants discussed the importance of knowledge within the context of delivering an HIVST kit to a partner. Knowing one's HIV-status was discussed as important, but patients questioned why their partner needed to be tested if they tested negative in the clinic. When foreseeing partners having questions that the patient wouldn't be able to answer, patients discussed the potential benefit of having a nurse or hotline available to answer questions about HIVST.

I would concentrate on the concept that knowledge is power and knowing is better than not knowing (58WM-1)

I wouldn't give it to him ... if I find out mine is negative. ... If I ain't got it then why would I give him the test? ... I wouldn't want that result from him to start thinking like, okay, why would you give it to me if you ain't got it. (44BW)

That they should call [a] number [for more assistance] is all I know. (58WM-2)

The availability of resources for information would likely improve acceptability of secondary distribution of HIV testing kits, whereby reducing barriers associated with having limited information or knowledge. The first quote illustrated above ties the constructs of information and motivation together. Knowing your HIV-status is a motivation for HIVST, but HIV-status awareness is only a motivation if one is aware of the successful treatment options available and having access to those services—a potential barrier because of the clinic demographic with meager insurance and financial resources. Similarly, a knowledge gap in the rationale for partner HIV testing was similarly a negative motivational factor, further connecting the two constructs of information and motivation. The second quote illustrates this gap in the context of questioning why her partner would need HIV testing if

she tested negative. She worried about what her partner would think if she brought him an HIVST kit with PDPT, perhaps indicating a perception of a lack trust between the couple, wherein suggesting he needs a test even when she tested negative implies potential infidelity and a lack of trust.

Worry about quality of test—HIV testing with over-the-counter devices was thought to have a higher risk of an incorrect test result and lowered perceived legitimacy, which negatively influenced patients' perceptions of HIVST.

I wouldn't do that ... 'cause I prefer getting it from the doctor ... Because there's a difference from over the counter and from a doctor. (53BM-1)

I think I wouldn't want to take the kit. I would really want to go see my doctor and let my doctor handle it. ... I would be more comfortable with my doctor telling me than receiving some email from the company or that, I don't know, I just, I don't, I'm not comfortable with at-home tests. Like it's not really that accurate. ... Like it gave you a big scare for unnecessary reason. ... (Interviewer: What would your opinion be if the result came immediately to you?). Oh, it goes immediately? I think I'd be more hurt than waiting to see the results. ... It's like you're going to go see if you got it and then you get the test and then it's like a pregnancy test. If I, okay, now I got it, now what I'm going to do with it. Like at least going to the doctor and talking about it and getting tested and then waiting for your results and it's either you is or you're not, but it is something you could think about instead of just getting all of it at once. It could be overwhelming. (19BW)

Both of these quotes illustrate the negative perceptions some had about HIVST based on their current understanding of the HIVST kit. The difference in quality between HIVST and a test received at the clinic was discussed in the first quote, where the patient would prefer the best available test. The current HIVST available to consumers is of lower quality than the testing used at the clinic in regards to diagnostic capabilities (e.g., window periods), but this perception was based more in the context of how the test is available to them rather than the specifics of the HIV testing technology. Worries about the quality of the test were also based on an interpretation of the potential for a false HIV-positive result, and a described issue with HIVST is the lack of pre- and post-test counseling available to the person testing. Motivation (i.e. perceived worries) and behavioral skills (i.e., managing the test result) are similarly apparent in the second quote, implying the interconnectedness of IMB constructs.

Questions about how the test works—Respondents did not have a clear idea of how the HIVST was administered, but talked about that influencing their opinions of it; an easier testing method was preferred. Patients wanted to know how to do it before considering whether they would take an HIVST kit to their partner, underscoring the importance of the transfer of behavioral skills to facilitate their partners' ability to take the test.

If it's simple, I think that would be a good idea. (21BW)

If it's like a urine thing or something from taking a swab, a test with a swab or something like that [would be easy], but anything else with having to draw blood or something, you'd have to be skilled to do that. (62BM)

My concern would be if they would do it properly, if the testing would be done properly. There's certain little controls you do with certain at-home tests and whatnot to make sure you're doing them properly. ... But if there were easy instructions ... [and the ability] to talk to a pharmacist or someone ... [it'd be important] to explain to them how you do that. (35BW)

I think that would be a good idea. ... And then I think it's a bad thing because if it has to do anything with a needle, ... I think it's dangerous. (22BM)

While a limitation of this study was not showing the participants the HIVST device or any educational material about the test, the patients were relatively uninformed about HIVST and gave hypothetical responses indicating a desire for the easiest method of testing possible. From these responses, individuals would prefer the current USFDA approved over-the-counter HIVST device to self-testing methods that require collecting blood samples, which were perceived as more dangerous. Patients had multiple questions, indicating the need for additional informational materials and other resources to answer questions during testing.

Behavioral Skills

Patients discussed what they needed to successfully deliver HIVST kits with PDPT to their partner. Participants discussed mixed opinions about how their partners would respond to being given the HIVST kit, specifically. Patients' needs were identified, including behavioral skills to be able to handle the interpersonal factors associated with delivering an HIVST kit and supportive services if the patient or partner needed guidance or social support. The risk of potential violence associated with delivering an HIVST kit provides further rationale for adequate patient counseling prior—if deemed appropriate and safe—to patients attempting to deliver HIVST to their partners.

Positive and negative perceptions of their partners' reaction

Participants discussed their perceived partners' reaction to the HIVST kit provision with PDPT. Specifically, some thought their partner would respond positively to being given the HIVST kit because it provides confidentiality to HIV testing, but others thought their partners would be suspicious about why they were delivering an HIVST kit with PDPT. Of note, participants' reactions sometimes changed when the focus was diverted from their perceptions of their partners' reaction to how they would respond *as* a partner.

Just to be on the safe side, I think they would be completely fine with it. (21BW)

They'd be highly upset. ... She wouldn't take that well. She wouldn't taking it good, especially if she think I have it. I know she wouldn't take that well. (53BM-1)

They would love it. ... Because it's being provided and no one knows that they had it. No one would know. It's still private and confidential. ... [If it was delivered to me,] I would be scared. ... Because I would like why, I got this, what, I may have this. That would scare me. (44BW)

If it was delivered to me, I'd be mad, like really mad because like why am I getting this. Like I never had a disease so why should, why are you bringing this to me. I

would really want to know why they bringing the HIV test to me because I don't be asking for no one. (20BW)

He would think about it more and be wondering why did I even bring a kit to the house to get tested for HIV. ... They're going to think more than what it is. They might think they have it. They might think that you gave them that and in order for them to get tested, you want to see if they have it because you have it. That's what they would think. (23BW)

The perceived benefits of delivering an HIVST kit to their partner were in contrast to their worries about responding to their partners' negative response. Described as a convenient, private, and confidential mode of HIV testing for their partner, the inclusion of HIVST kits with PDPT was a benefit for their partners' health. Nonetheless, some thought their partner would think they were assuming they *might* have HIV, hence why they are delivering the kit. As illustrated in the last quote, some thought their partner would respond similarly to being delivered PDPT under the impression that they are being delivered the kit because the person who was seen at the clinic was diagnosed with HIV. From these quotes, HIV stigma could be driving some of the negative responses to HIVST, despite the potential benefits, indicating the need for training patients provided HIVST kits with the necessary skills to communicate the rationale for HIVST.

Supportive skills—Patients discussed barriers to delivering an HIVST kit, potentially ameliorated with enhanced behavioral skills, and support services were called for especially in circumstances when the kit results in identification of an HIV-positive test result.

You've got some important things to think about because the sexual partner may not want to get a positive test and be alone and so then you've got some issues there where you have to think about the whole conversation about - you know, most of us get tested and we're negative, but there are the occasional person who gets an HIV test and it's positive, then there's a whole set of different reactions that can occur and the - you've got to kind of consider that when you send one of those self-kits. (58WM-1)

The participant above discussed the need for supporting their partner in HIVST because of the potential that they would test positive, which would be a major life event requiring a mechanism of social support. In this sense, delivering an HIVST kit through a sexual partner has the benefits of offering a supportive environment for testing, but this may not be universal given the aforementioned quotes indicating a lack of trust and perceived negative reaction from their partner, indicating that might not make HIVST with a partner a good option.

Risk of violence—Participants worried about the risk of violence when delivering an HIVST kit to a partner because of their partners' suspicion of them or in the event of a positive test result.

She gonna be highly upset [if I bring an HIV kit for her]. And I think if I would give it to her, I would have a stick on the end tied on a rope and hand it to her just like this here. She be like, 'What you want?' She might want to kill me or

something by saying, 'I ain't got nothing.' ... I don't think she would take that well. Uh-uh. I'd have to have somebody call her and talk to her about that one.

Serious. 'Cause she know I ain't got it, but she still gonna say, 'Why is you giving me this?' Man she'd probably jump on me. She wouldn't take that well, though. (53BM-1)

[If I tested positive with the HIVST kit,] I would be very furious. I would be very upset. And it might turn into, okay, so it's my partner, so it might turn into some violence. (28BW)

They would be afraid of me then. It's like, what are you, an undercover cop and you're spying, what are you, a detective? (58WM-2)

While this risk was not universal, the few who indicated this worry identify an important caveat to recommending HIVST kit delivery to sexual partners of some patients. The quotes above illustrate the potential severe repercussions of patients offering an HIVST to partners, suggesting the critical importance of screening for potential violence prior to distributing testing kits. Even with screening for violence, patients need to be informed and prepared in advance about the potential for an unforeseen adverse event, even if this unforeseen event is simply risk aversion resulting from issues of lack of trust illustrated in the third quote above.

Discussion

The potential of providing over-the-counter, rapid-HIV self-testing kits with PDPT was explored with a diverse sample of STI clinic patients. Several prominent themes emerged from the semi-structured qualitative interview data that was arranged within the constructs of the IMB model. In general, patients had mixed feelings about the inclusion of an HIVST kit with PDPT. HIVST was perceived to offer many benefits, supporting positive motivations for delivering HIVST to partners. Patients discussed how the provision of HIVST kits would provide a private, confidential, and convenient approach to HIV testing for their partner, especially for individuals too embarrassed to step into an HIV testing center. Patients also requested and described the need for more information about HIVST, responding about questions they and their partners might have. The complexity of delivering an HIVST in conjunction with PDPT added another layer of difficulty to partner HIV testing, and patients described the need to be able to counsel and support their partner regardless of the test result. Nonetheless, patients felt empowered to take charge of their partners' and their own sexual health offered by the inclusion of HIVST devices with PDPT. These data reveal the behavioral needs of patients for using biomedical interventions, indicating the need for a bio-behavioral strategy—compared to only a biomedical focus—to STI and HIV prevention with secondary distribution of HIVST kits and PDPT.

TasP centers on early identification of people living with HIV to enter them into the HIV continuum of care (CDC, 2012; Cohen et al., 2011), and distribution of patient-delivered HIVST kits with PDPT is a promising strategy to motivate HIV testing and reduce HIV transmission. Interview data provided rationale for why STI clinic patients might be willing to deliver HIVST kits to their partners with PDPT, which could help facilitate disruption of STI and HIV transmission if implemented with favorable uptake. This data supports a

growing body of evidence supporting the acceptability of HIVST (Ahmed-Little et al., 2016; Bavinton et al., 2013; Bustamante et al., 2017; Choko et al., 2015; Gaydos et al., 2011; Kelvin et al., 2016; Kurth et al., 2016; Lee, Brooks, Bolan, & Flynn, 2013; Pal et al., 2016; Prestage et al., 2016; Witzel, Rodger, Burns, Rhodes, & Weatherburn, 2016). Moreover, this research adds to prior data on the acceptability of secondary distribution of HIVST kits to sexual partners (Kalibala et al., 2014; Lippman et al., 2016; Masters et al., 2016; Prestage et al., 2016; Thirumurthy et al., 2016), indicating rationale for why individuals might find it acceptable. Patients supported the idea of bringing HIVST kits to partners when delivering PDPT because it was perceived to provide extra safety against HIV, consistent with other research findings about patients' desires to make more informed decision-making regarding sexual behaviors with their partners (Kelvin et al., 2016; Lippman et al., 2016). Support for earlier identification of people living with HIV was discussed by participants to reduce the negative health implications of untreated infections for their partners and continued risk of HIV transmission. This critical finding suggests STI clinic patients not only worry about their own health, but also their partners' health, further supporting the importance of both individual and partner protection beliefs in HIV prevention behaviors.

PDPT is highly recommended for patients with partners unwilling or unable to obtain STI testing at a clinic (Workowski et al., 2015); thus, some partners who receive PDPT are also unlikely to present for clinic-based HIV testing after STI treatment (Kerani, Fleming, & Golden, 2013). A substantial barrier to using STI and HIV clinic-based services is the accompanying stigma associated with them. Patients in this sample discussed their negative perceptions about the STI clinic, including worries about limited privacy and breached confidentiality. Prior research has identified avoiding healthcare providers as a facilitator for HIVST (Ahmed-Little et al., 2016; Bavinton et al., 2013). STI clinic stigma is further exacerbated with worries about social network members seeing them at the clinic (Lippman et al., 2016), necessitating the need for PDPT and secondary distribution of HIVST kits to reach some at-risk populations. Providing HIVST kits with PDPT was described as a convenient mechanism to overcome this barrier, consistent with prior findings about the convenience associated with HIVST (Ahmed-Little et al., 2016; Bavinton et al., 2013; Kelvin et al., 2016; Lippman et al., 2016; Witzel et al., 2016).

While a promising strategy, patients need to be prepared for approaching their partner with HIVST kits—a difficult task when coupled with the distribution of PDPT resulting from STI exposure. Participants thought highly of HIVST, but worried about their partners' negative reactions and potential risk of violence. Patients discussed the need for knowing one's HIV-status, but had reservations about HIVST because they knew little about it. Patients had questions about why their partner needed HIV testing, how the test worked, whether the test was safe or not, and how to self-test correctly. Moreover, patients discussed worries that the HIVST devices would be of lower quality than what would be used in facility-based testing, supporting previous literature about the questioned trustworthiness and quality of the test (Gaydos et al., 2011). Prior research has found HIVST to be perceived as relatively easy in some samples and complicated in others (Thirumurthy et al., 2016; Witzel et al., 2016). In this sample, STI clinic patients had many questions indicative of the need for better informing patients if HIVST kits are provided. These data add to a growing body of evidence about the information that should be provided with HIVST kits and supported by

patient counseling. High-risk young adults in New York City had similar deficits about how the test worked, and they also had questions about the HIV window period when tests are non-reactive (Brown, Carballo-Diequez, John, & Schnall, 2016). MSM in the United Kingdom also had perceptions of a lower quality HIVST device (Witzel et al., 2016). Provision of PDPT and HIVST devices from an STI clinic does not preclude partners from receiving facility-based STI and HIV counseling and testing, and patients should still be encouraged to try to persuade their partners to go to a clinic for testing to alleviate some of these concerns.

Patients require a high level of behavioral skill with secondary distribution of HIVST kits because of the substantial interpersonal barriers patients perceive. Many patients thought their partner would respond favorably to the provision of HIVST because of the convenience and privacy it offered, but some thought their partner might respond negatively. Patients need to be behaviorally skilled when delivering the HIVST kit to their partner with PDPT to avoid unforeseen circumstances. Some thought their partner would be mad or suspicious about the need of the HIV test, and others described the potential for intimate partner violence (IPV) associated specifically with delivering the HIVST kit. Although rarely reported in prior studies distributing HIVST (Choko et al., 2015; Masters et al., 2016; McMahon et al., 2015; Musheke, Bond, & Merten, 2013; Thirumurthy et al., 2016), these findings should not be discredited because of their potentially severe implications for patients. IPV worries have been described as worrisome by patients associated with secondary distribution of HIVST previously (Brown et al., 2016), including the potential for coercion of partners into HIV testing (Musheke et al., 2013). While coercion is a major potential harmful effect associated with secondary distribution of HIVST devices, risks of coercion did not emerge from this data. Nonetheless, healthcare providers need to discuss and screen for potential IPV and discuss coercion issues associated with secondary distribution of HIVST kits to their patients in an effort to better inform their clinical recommendations and reduce the risk of harm for their patients and patients' partners.

Secondary distribution of HIVST kits can result in earlier diagnosis of a person living with HIV, but participants discussed the need to be able to counsel their partner and address the potential of a possible HIV-positive test result. Patients described the importance of third-party support, such as a nurse, pharmacy, or hotline to call for assistance. These findings align with prior research that found patients desire counseling before and after HIVST (Pal et al., 2016), highlighting the need for social support systems for partners' self-testing. HIVST with a partner was seen to inform perceptions of support (Lippman et al., 2016), and patients in primary care have described the need to play the role of HIV counsellor with their partners—perceiving a need to take responsibility for helping their partners link to care for confirmatory testing and treatment (Kelvin et al., 2016). Further efforts are needed to prepare patients and partners for HIVST given the enormity of an HIV-positive test result and the necessity for follow-up counseling, testing, and treatment.

Limitations

This research is not without limitations. First, these data were analyzed from a predetermined small sample of STI clinic patients; however, the purposive sampling strategy

provided a large degree of diversity in the responses provided from patients—particularly related to the even distribution of low, medium, and high PDPT acceptors sampled. This sampling strategy helped obtain data saturation related to IMB themes, but further research is warranted to extend the generalizability of these findings given the small and selective sample. Second, patients were sampled after conducting a quantitative survey, perhaps contributing to response bias. Participants were not asked about the distribution of HIVST to partners within the survey, only providing responses to measures associated with distributing PDPT. Participants were also not interviewed on the same day of the survey, further reducing the impact of any potential response bias. Finally, most STI clinic patients were rather uninformed about HIVST. Patient perceptions might have been dramatically different if participants were given an actual HIVST kit to examine, further informing them about the mode of testing (i.e., oral swab versus needle-based testing conducted at clinic). Nonetheless, this provided data useful for recommendations of current and future generations of HIVST kits that become available over-the-counter.

Conclusion

Participants had mixed feelings about including an HIVST kit with PDPT. Patients' motivations to deliver HIVST kits to their partners included the importance of earlier identification of HIV, convenience of HIVST, avoidance of STI clinic stigma, and empowerment of individual and partner protection against HIV. Patients described the need for more information with worries about the quality of the HIVST device and how it worked. Patients worried about their partners' reaction, including the potential for IPV, and needed skills to support their partner with HIVST. Behavioral interventions are needed to more fully support patients to improve outcomes for patients and their partners, but revised public health guidelines for PDPT should consider adding healthcare provider recommendations for including HIVST kits with PDPT packs. Given the epidemiological synergy between bacterial STIs and HIV, bio-behavioral strategies are needed to concurrently combat STI and HIV transmission.

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