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Willingness to distribute HIV self-testing kits to recent sex partners among HIV-negative gay and bisexual men and an examination of free-response data from young men participating in the nationwide cohort

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Abstract

Sexual minority men (SMM)—and young SMM in particular—are disproportionately affected by HIV. Secondary distribution of HIV self-testing (HIVST) kits—wherein patients deliver kits to partners—is a novel strategy to increase HIV testing access. Using quantitative data, we assessed willingness to distribute HIVST kits to recent sex partners among a U.S. national sample of HIV-negative SMM ($n=786$). A thematic analysis was then conducted to identify barriers and facilitators of kit distribution to partners among young SMM (mean age=25.75 years; range: 20–

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COMPLIANCE WITH ETHICAL STANDARDS

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.

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29; $n=165$). Overall, 93.5% of SMM (and 97.0% of young SMM) were willing to deliver HIVST kits to recent sex partners. Among young SMM, main barriers and facilitators included concerns about their partners' reaction, availability and cost, protection beliefs for others, HIV stigma and perceived infidelity, packaging and support, communication skill needs, inability to contact partners, requests for anonymity, and dyadic self-testing with their partners. The findings highlight the need for supportive intervention strategies such as informational content for HIVST, using motivational interviewing when providing the testing kits to index clients, and providing skills-based training through role-playing exercises. Secondary distribution of HIVST kits through index patients is a potentially acceptable approach that could be used to expand access to HIV testing and aid in efforts to End the HIV Epidemic in the US.

Resumen

Los hombres de minorías sexuales (siglas en inglés SMM)—particularmente los SMM jóvenes—se ven desproporcionadamente afectados por el VIH. La distribución secundaria de kits de auto pruebas del VIH (siglas en inglés HIVST)—donde los pacientes entregan kits a sus parejas—es una estrategia novel para aumentar el acceso a las pruebas de VIH. Usando datos cuantitativos, evaluamos la disposición a distribuir kits de HIVST a parejas sexuales recientes entre una muestra nacional estadounidense de SMM VIH-negativos ($n=786$). Luego se realizó un análisis temático para identificar las barreras y los facilitadores a la distribución de los kits a las parejas entre los SMM jóvenes (edad promedio = 25.75 años; rango: 20–29 $n=165$). Por lo general, el 93.5% de los SMM (y 97.0% de los SMM jóvenes) estaban dispuestos a entregar kits de HIVST a sus parejas sexuales recientes. Entre los SMM jóvenes, las barreras y los facilitadores más importantes incluyeron la preocupación acerca de las reacciones de sus parejas, la disponibilidad y costo de la prueba, creencias sobre la protección para otros, el estigma del VIH y percepciones de infidelidad, el empaque de la prueba y el apoyo, la necesidad de herramientas de comunicación, la incapacidad de contactar a sus parejas, la solicitud de anonimidad, y el uso de auto pruebas en conjunto con sus parejas. Los resultados resaltan la necesidad de estrategias de intervención como contenido informativo sobre HIVST, utilización de entrevistas motivacionales al proveer los kits a los clientes índices, y provision de capacitación basado en habilidades a través de ejercicios de juego de roles. La distribución secundaria de HIVST a clientes índice es un enfoque potencialmente aceptable que podría usarse para ampliar el acceso a las pruebas de VIH y ayudar en los esfuerzos para poner fin a la epidemia de VIH en los EE.UU.

Keywords

HIV; HIV testing; HIV self-testing; men who have sex with men; sexual minority men; gay and bisexual men

INTRODUCTION

Sexual minority men (SMM)—and young SMM in particular—are disproportionately affected by the HIV epidemic in the United States (US). The Centers for Disease Control and Prevention (CDC) found young SMM to be highly vulnerable to HIV; SMM under the age of 24 accounted for 17% of all new HIV diagnoses in 2017 (CDC, 2017, 2018), despite accounting for an estimated 3.5–4.4% of men this age (Purcell et al., 2012). Further, the

rates of HIV diagnoses increased by 26% among SMM aged 25–34 years from 2011 to 2016, despite decreasing rates among SMM aged 35 and older (CDC, 2020). Nearly 50% of young SMM are unaware of their HIV infection (CDC, 2017, 2018) and increasing access to HIV testing is the first pillar of the US strategic initiative to *End the HIV Epidemic* (Fauci, Redfield, Sigounas, Weahkee, & Giroir, 2019). Given that an estimated 30% of new HIV infections are transmitted from individuals who are unaware of their status, strategies to improve testing rates and linkage-to-care could have a significant impact on HIV incidence (Lopez-Rios et al., 2019; Skarbinski et al., 2015).

The World Health Organization (WHO) has endorsed HIV self-testing (HIVST) as a pivotal tool to meeting the UNAIDS targets to end the HIV epidemic by scaling up HIV testing (WHO, 2015). HIVST among lay users yielded highly accurate and reliable test results that were comparable to testing conducted by healthcare workers (Figuerola et al., 2018; Johnson et al., 2017). The secondary distribution of HIVST kits—wherein patients deliver kits to partners—is a novel strategy to increase HIV testing access among vulnerable populations and similar to methods of partner treatment for bacterial sexually transmitted infections (STI) using patient-delivered partner therapy, which could be used in combination (Gamarel, Mouzoon, Rivas, Stephenson, & Mmeje, 2020; John, 2018; John, Starks, Rendina, Parsons, & Grov, 2020). In prior work, researchers found high acceptability for the use of HIVST with sexual partners prior to sex as a mechanism of disease avoidance resulting from the detection of previously unknown infections (Carballo-Dieiguez, Frasca, Balan, Ibitoye, & Dolezal, 2012). Moreover, qualitative researchers identified high willingness to use HIVST kits with sexual partners among vulnerable populations because of the benefits related to increased privacy and convenience (Brown, Carballo-Dieiguez, John, & Schnall, 2016; Freeman et al., 2018; Ibitoye, Frasca, Giguere, & Carballo-Dieiguez, 2014), with findings similarly reported for use of patient-delivered partner therapy because of stigma associated with HIV/STI testing clinics (John, 2018). Nonetheless, there is limited domestic data on the use of HIVST after the Federal Drug Administration (FDA) approved the over-the-counter sale of the OraQuick In-Home HIV Test. We sought to determine willingness to distribute HIVST kits to recent sex partners among a US nationwide sample of HIV-negative SMM, with an additional aim to understand barriers and facilitators to distributing HIVST kits to sex partners among young SMM under age 30.

METHODS

Participants

We used data from participants enrolled in the *One Thousand Strong* study, a national cohort of HIV-negative (confirmed with testing at baseline) gay and bisexual men in the US (Grov, Cain, Rendina, Ventuneac, & Parsons, 2016; Grov, Cain, Whitfield, et al., 2016). Briefly, 1,071 HIV-negative gay and bisexual men were recruited for the parent study to reflect census data on the distribution of same-sex households in the US based on age, race/ethnicity, and US geography in 2014 using a marketing firm (i.e., Community Marketing and Insights), which has a panel of over 22,000 SMM throughout the US. We then recruited an additional 133 non-White SMM (of $n = 222$ who were screened eligible) for the parent study between November 2016 and February 2017 (John, Rendina, Starks, Grov, & Parsons, 2019;

John et al., 2020), using the same recruitment strategy, to increase the diversity of non-White participants given their disproportionate HIV burden in the US (CDC, 2017). Enrollment procedures for new SMM in the sample included eligibility screening, providing informed consent, completing the computer assisted survey interview, and participating in the at-home HIV and STI testing procedures [i.e., OraQuick In-Home HIV Test (with results submitted via a photo of the test paddle) and STI self-sampling of urine and rectal swab for mailing to a laboratory for analysis] with a confirmed rapid HIV-negative result ($n = 133$); these procedures were the same for the original cohort (Groves, Cain, Rendina, et al., 2016; Groves, Cain, Whitfield, et al., 2016; John, Rendina, et al., 2019; John et al., 2020). Participants were sent an optional survey in 2017 that included measures relevant to this analysis. All study procedures were approved by the Institutional Review Board of the City University of New York.

Of the 1,204 SMM enrolled in the cohort, 825 completed the optional survey between April 2017 and July 2017. Thirty-eight men were excluded from analyses because of a technological error that resulted in partial survey completion. Another participant was excluded because he self-reported testing HIV-positive in the interim since the last assessment wave. This resulted in a final quantitative analytic sample of 786 HIV-negative SMM, including 156 young SMM aged 29 years or younger whose qualitative data were also used for analysis.

Measures

Demographics—We asked participants to report their age, race/ethnicity, educational attainment, and geographic region of residence determined from postal codes.

Secondary Distribution of HIV Self-Testing Kits—Individuals were asked about their willingness to deliver HIVST kits to recent sex partners with the following question: “Imagine you obtained HIV counseling and testing at a local provider. How willing would you be to give your recent sex partners (last 3 months) at-home, rapid HIV test kits for them to use (assuming your healthcare provider gave them to you for free)?” Response categories ranged from 1 (*not at all willing*) to 5 (*extremely willing*), which was dichotomized to willing (yes/no) with *slightly willing* and higher coded as willing based on the right-skewed distribution of the data ($M = 3.97$, $SD = 1.25$).

Barriers and Facilitators to Secondary Distribution of HIV Self-Testing Kits—After the quantitative survey question, we asked participants three free-response questions, individually, with required text entry prior to survey continuation. As a valid method of qualitative inquiry (O’Cathain & Thomas, 2004), we asked free-response questions to mimic a semi-structured interview guide. First, participants were asked “How do you think your sex partner(s) would respond to being given an at-home, rapid HIV test kit from you?” Second, we asked “What might prevent you from giving your sexual partner(s) an HIV test kit?” to elicit barriers to secondary HIVST kit distribution to partners. Finally, we asked “What might help you be able to give your sexual partner(s) an HIV test kit?” to identify facilitators to secondary HIVST kit distribution to partners.

Data Analysis

This mixed-methods study used both quantitative and qualitative data. Descriptive statistics were reported using frequency measures. Chi-squared comparisons were used to test for bivariate associations between demographics and dichotomized willingness to give recent sex partners an HIVST kit for the whole sample. Only qualitative data among the sample who were younger SMM, which we defined as 29 years old or younger, were analyzed based on current US HIV epidemic trends indicating higher HIV incidence for those under 30. A framework matrix in Microsoft Excel was used for data analysis, which allowed within- and between-participant analyses across themes (Spencer, Ritchie, Ormston, O'Conner, & Barnard, 2014). Free-response data were analyzed by two analysts (i.e., first and second authors) using inductive and deductive thematic analysis with constant comparison (Braun & Clark, 2006). More specifically, an initial codebook was developed after identification of codes during preliminary analyses. Codes were then collaboratively revised and defined during a data analysis meeting prior to each analyst independently coding all remaining free-response data. Coding discrepancies between analysts were resolved after discussion during subsequent data analysis meetings. This iterative process continued until coding was congruent between analysts, no new themes emerged, and data saturation had been reached. Final codes are described next, followed by interpretation in the discussion section using a commonly used theoretical framework as a conceptual guide to intervention planning.

RESULTS

Our mid-2017 optional survey was completed by 786 HIV-negative SMM. Mean age of the sample was 43.4 years, with 19.6% ($n = 154$) of the sample being 20–29 years old (see Table 1). Most were White (65.4%) and had a Bachelor's degree or higher education (62.1%). SMM from all four major US regions were represented, with 36.0% residing in the US South.

Nearly all (93.5%) SMM in our sample were willing to deliver an HIVST kit to recent sex partners. On average, younger men aged 20–29 years were more willing than men 30 years or older, although this was not significant ($p = 0.069$) with our predetermined alpha of 0.05. No significant differences in willingness were found by race/ethnicity or educational attainment, but willingness differed by region. SMM in the South had the highest percentage of men (i.e., 97.1%) willing to deliver HIVST kits to their recent partners compared to fewer than 93% of men in the Northeast, Midwest, and West regions.

Young SMM were more likely to be non-White compared to their older counterparts (51.3% vs. 30.5%; $p < 0.001$). Regional representation differed by age, with a greater percentage of young SMM residing in the South compared to SMM 30 years of age or older (42.7% vs. 34.4%; $p < 0.05$). No significant differences by educational attainment were found between young and older SMM.

Among our sample of young SMM, nine themes were identified as barriers and facilitators to distributing HIVST kits to sexual partners following hypothetical clinic-based HIV testing and counseling, which did not distinguish between main and casual partners based on the wording of our question or the responses recorded. Main barriers and facilitators included

concerns about their partners' reaction, availability and cost, protection beliefs for others, HIV stigma and perceived infidelity, packaging and support, communication skill needs, inability to contact partners, requests for anonymity, and dyadic self-testing with their partners.

Young SMM had concerns about their partner's reaction

The largest barrier to distributing an HIVST kit to a partner was concern about their partner's reaction, with 43% ($n = 66$) of young SMM mentioning this theme in free-response data. Young SMM thought their partners would be "suspicious, scared and anxious," as a 27-year-old Black participant wrote. Another worried "if giving it to them would cause them more anxiety because they misinterpreted why it was being given to them (Multiracial/other, 29 years old)," and others thought "they may freak out (White, 27 years old)" and that "they'd think it was intrusive (separate 27-year-old White participant)." Concerns about violence were infrequent, but one man expressed concerns about it within the potential range of responses: "I think some of them would have been openly hostile toward me for putting them at risk of HIV. Others would be appreciative of the warning and the free test-kit (White, 28 years old)."

Availability and cost were important

Offering free HIVST kits was found to be a facilitator to secondary distribution of HIVST kits because of cost barriers associated with buying kits. In total, 32% ($n = 49$) identified cost as a factor influencing future use. Consistently reported, young SMM mentioned "getting test kits for free could help me give them to my sexual partners (Black, 23 years old)," as well as "ease of getting one (White, 29 years old)" and "making it convenient (White, 27 years old)." One man also noted the potential benefit of having kits readily available. As he wrote, "the ability to request one at a time, and have it easily restocked after use (White, 27 years old)" would help him to distribute the kits to partners. In response to potential concerns about a partners' reaction, another man wrote "if I got an extra one every time I had my check-up and testing my partners was just standard care, not a response to a mistake, or even specifically meant for them, [it would help] (White, 25 years old)." Another (Latino, 27 years old) thought giving HIVST kits to their partners through the mail would be helpful.

Protection beliefs were salient based on perceptions of trust

Nearly one quarter (23%, $n = 36$) of young SMM expressed the need to protect their partners and community, with the quality of their relationship in the form of trust influencing perceived willingness to deliver an HIVST kit to a partner. One man wrote: "[my partner] would be grateful that I was watching out for their health (White, 28 years old)." Meanwhile, another wrote: "if I didn't really know them, I think it would be strange to leave them an HIV test kit with a one night stand," whereas he also wrote: "if I was in a more committed relationship with them, [it would encourage me to give it to my partner] (Black, 26 years old)." Another wrote about how the HIVST could be an opportunity to gain trust: "I think they would think it's strange, but it would be good to build trust (Latino, 28 years old)." Protection beliefs were also altruistic, with one writing: "it would be a responsible thing to do (White, 25 years old)." Nonetheless, men worried that delivering an HIVST kit

would cause distrust within the relationship. As one wrote: “[my partner] might think I don’t trust them (Multiracial/other, 23 years old).”

Young SMM worried about HIV stigma and perceptions of infidelity

Eighteen percent of men ($n = 28$) cited HIV stigma and concerns about perceptions of infidelity as barriers to secondary distribution of HIVST kits, which integrated perceptions of what they thought this would convey to their partner and what their partner might think about them. In particular, HIV stigma was cited as a barrier to secondary distribution of HIVST: “I don’t want to imply I think they are infected or dirty (Multiracial/other, 29 years old).” In contrast, reducing HIV stigma could help reduce barriers to HIVST, as one man wrote: “less stigma around STIs [would help me give the kit to my partners] (White, 27 years old).” Others were concerned about being perceived as HIV-positive or unfaithful, with men writing: “[my partner’s] first thought would probably be I’m HIV+ (Multiracial/other, 26 years old)” and “the thought that he might think I’ve cheated [would be a barrier] (White, 21 years old).” Within the added context of partner protection beliefs, one man wrote: “they would appreciate me thinking about their health but might be concerned that I was exposed (or had exposed them) to an HIV risk (White, 27 years old).”

Packaging and external support were facilitators

One fifth of young SMM ($n = 27$) found the packaging of the HIVST kit and opportunities for external support helpful. Men cited the importance of having thorough instructions as influencing their willingness to use with partners: “if the test kits were free and came with literature on how to do the test so I wouldn’t have to explain it, I’d be more willing (White, 28 years old).” Instructions that were informative but funny were also requested: “a test kit that seems fun to use, with directions that are humorous yet factual (White, 29 years old),” as was the use of “discrete packaging (White, 28 years old).” Aligned with concerns about being perceived as HIV-positive, a request for “a copy of my official negative results (Latino, 28 years old)” was made, as well as “a link to resources to receive the kit and help getting medication if needed (White, 28 years old).” Others thought more support was needed, such as quotes requesting “support or help from an HIV specialist or clinic (Latino, 21 years old)” and having provider-assisted testing referrals such as having someone “... contact them and let them know they need to be tested on my behalf (Multiracial/other, 27 years old).” Anonymous methods of delivering the HIVST kit were also requested, such as “if it could be mailed anonymously (Black, 27 years old).” Nonetheless, traditional HIV testing was mentioned as important because “if the results come back positive, I am not equipped to counsel someone through their issues (Black, 29 years old).”

Communication skill needs were identified

Sixteen percent of young SMM ($n = 24$) also requested support in the form of additional communication skills. Since “vulnerable conversations about sexual health [are a barrier] (Multiracial/other, 28 years old),” men requested “conversational training/coaching (White, 23 years old)” and “coaching with language and conflict resolution (Multiracial/other, 22 years old).” Specifically, one man requested “a flash card with a script (Multiracial/other, 29 years old).” Because of the stigma and other aforementioned challenges, men thought having conversations were important to address them. For example, one wrote “talking to my sexual

partner about it first [might help] (Latino, 28 years old),” rather than just showing up with the HIVST kit. The HIVST was also perceived to facilitate more conversations about sexual health. As one man said, “know[ing] that giving the test kits would be a great way to start the conversation about sexual habits and STIs [and] would help motivate me (White, 26 years old).” As such, the HIVST kit was sought to be a conduit for larger conversations about men’s relationships.

Inability to contact all partners could minimize use

Distribution of HIVST kits after traditional on-site HIV counseling and testing is not always appropriate. Some men ($n = 19$; 12%) described difficulty contacting partners as a barrier to distributing the kit. For example, men wrote “I don’t remember who they are (Latino, 28 years old)” and “I don’t have their contact information (White, 28 years old).” This lack of contact was further described with context. Men described “discontinued contact (Multiracial/other, 26 years old),” “deleted Grindr (White, 21 years old),” or “if they were a one-night-stand and you didn’t know how to get ahold of them again (White, 29 years old)” as reasons for not being able to distribute an HIVST kit to partners.

Anonymous delivery mechanisms were helpful

Eight men (5%) described an anonymous method of HIVST delivery as facilitating kit distribution. When asked what might help, “if it could be anonymous somehow (White, 21 years old)” or “if it could be mailed anonymously (Black, 27 years old)” options were described. “Anonymity (another Black man, 27 years old)” was particularly important for men with partners who they perceived would have a negative reaction towards them about the testing kit; three-quarters of the men with coding about anonymity were also coded as having concerns about their partner’s reaction.

SMM requested dyadic testing options

Although infrequent, six men (4%) described the role of dyadic testing methods. Five described the benefit of testing with their partner as a facilitator. “If we both agreed to get tested together (Latino, 29 years old)” was described by one man to help, and another mentioned “a dual kit that tests two people (another Latino man, 29 years old)” as beneficial to facilitating partner testing. Nonetheless, one man thought his partner would “think it was stupid since [they] test together regularly (White, 25 years old).”

DISCUSSION

The purpose of our study was to determine willingness to distribute HIVST kits to recent sex partners—inclusive to both main and casual partners—among a US nationwide sample of HIV-negative SMM, with an additional aim to understand barriers and facilitators to distributing HIVST kits to sex partners among young SMM under age 30. SMM in our sample had previously engaged in HIVST and had nearly universal willingness to provide testing kits to their recent sexual partners following clinic-based HIV counseling and testing at a local provider—an approach that could extend the sexual network impact of one person receiving clinic-based testing. SMM in the South had a higher percentage of men willing to engage in this behavior, which is noteworthy based on high current needs in the South to

address the HIV epidemic (CDC, 2017). Specifically, the distribution of HIVST kits from HIV testing and counseling centers could be one way to target the first pillar of the *End the HIV Epidemic* strategy—focused on diagnosing people living with HIV as early as possible (Fauci et al., 2019). Our research indicates expanding access to HIV testing services through the delivery of kits to partners after facility-based testing could be an avenue for increasing HIV testing in the US, particularly in the South.

Young SMM had high willingness to deliver HIVST kits to their partners. Nonetheless, notable barriers and facilitators included concerns about their partners' reaction, availability and cost, protection beliefs for others, HIV stigma and perceptions infidelity, packaging and support, communication skill needs, inability to contact partners, requests for anonymity, and dyadic self-testing with their partners. Based on our findings, accompanying interventions should be considered to support young SMM delivering HIVST kits to their partners, which could be developed using the information-motivation-behavioral skills (IMB) model (Fisher & Fisher, 1992). Briefly, the IMB model posits individuals need to be informed, motivated, and have the necessary skills to engage in a protective behavior (Fisher & Fisher, 1992; Fisher, Fisher, Misovich, Kimble, & Malloy, 1996); this theoretical framework has a strong foundation of empirical support in HIV prevention research (Amico et al., 2009; Horvath, Smolenski, & Amico, 2014; John, Walsh, & Weinhardt, 2017; Shrestha, Altice, Huedo-Medina, Karki, & Copenhaver, 2016; Walsh, Senn, Scott-Sheldon, Vanable, & Carey, 2011). We used the IMB model as a conceptual guide to discuss our findings in an effort to support theory-based intervention development.

Young SMM described the need for informational support to deliver HIVST kits to their recent sex partners. Although the at-home HIVST kit was approved as a package that includes self-testing instructions, supplemental instructions culturally tailored with factual—yet humorous—content was also requested. This type of informational support could reduce barriers for young men because they might perceive less need to answer their partners' questions. Moreover, listing contact information for healthcare providers who could answer questions would further help facilitate the delivery of HIVST kits, especially when partners have a preliminarily reactive HIV test result and confirmatory testing and counseling is required. These findings align with our prior work evaluating the self-testing components of our study, which identified the importance of instructional materials and supplemental content including a video to facilitate self-testing (John, Cain, Bradford-Rogers, Rendina, & Grov, 2019). Moreover, informational needs were also identified in prior work to facilitate HIVST kit inclusion with patient-delivered partner therapy for partner treatment of STIs (John, 2018), and informational deficits were found in prior research, such as an understanding of the testing window-period (Brown et al., 2016). Nonetheless, real-time monitoring is important for HIVST (John, Cain, et al., 2019) and accompanying testing kits with electronic devices to trigger follow-up by counselors who can answer questions to facilitate testing and/or assist with linkage-to-care for men who self-test with reactive results could be particularly helpful (Wray, Chan, Simpanen, & Operario, 2018).

Young SMM could also benefit from motivation-based interventions such as motivational interviewing, which is common in HIV counseling and testing practices and an effective approach to HIV prevention among young SMM (Parsons, Lelutiu-Weinberger, Botsko, &

Golub, 2014), which can be effective as single-session interventions (Wang et al., 2018). Feasibility for motivational interviewing interventions for HIV prevention is high (Naar-King, Outlaw, Green-Jones, Wright, & Parsons, 2009; Outlaw et al., 2010), and cost-effectiveness evaluations are currently underway (Naar, Parsons, & Stanton, 2019). Young SMM expressed the importance of protecting their partners and community from HIV as a motivating reason to deliver HIVST kits. Protection beliefs for others and partners were similarly documented among STI clinic patients for HIVST kit distribution with patient-delivered partner therapy and among same-sex male couples when considering condom use and pre-exposure prophylaxis (Goldenberg, Finneran, Andes, & Stephenson, 2015; John, 2018; Malone et al., 2018; Quinn, Zarwell, John, Christenson, & Walsh, 2020; Starks, Doyle, Shalhav, John, & Parsons, 2019; Starks, Pawson, Stephenson, Sullivan, & Parsons, 2018). Nonetheless, our data also revealed the nuanced decision-making young SMM had when considering whether to engage in this type of behavior, balancing the pros (e.g., protection beliefs) and cons (e.g., concerns about their partner's reaction). By design, motivational interviewing interventions are meant to help guide this decision process while respecting the patient or client's autonomy (Miller & Rollnick, 2013). Aligned with the IMB model and findings, motivation is only one construct to consider targeting, which could be supported with informational provision and skills to support secondary HIVST kit distribution. Furthermore, incorporating relationship skill building into individual motivational interviewing could be a particularly useful framework for intervention delivery, which is currently being tested in an HIV and drug use prevention intervention for young SMM (Starks, Robles, et al., 2019).

Young SMM need support to help prepare them to deliver an HIVST to their partner. The largest barrier described by young SMM was concern about their partner's reaction with additional concerns about HIV stigma and concerns about perceptions of infidelity. Collectively, these findings indicate the need to prepare young men to have conversations with their partners about sexual health and HIV/STI prevention, similarly acknowledged by the young men in their free-response data. Skills-based training could incorporate role-playing the behavior of talking to their partner about sexual health topics, breaking down HIV stigma through conversations about "undetectable equal untransmittable" (i.e., "U=U") (Rendina, Cienfuegos-Szalay, Talan, Jones, & Jimenez, 2020), and discussing the HIVST kit, which could focus on improving relationship skills in order to achieve accommodation. Describing standard of care inclusive to handing out HIVST kits to pass along to partners could also focus on epidemiological trends rather than personal perceived risk, where 35–68% of HIV infections are estimated to be transmitted between main partners (Goodreau et al., 2012; Sullivan, Salazar, Buchbinder, & Sanchez, 2009). Providing tools to support these conversations were mentioned by young SMM, who suggested example language they could use and coaching, which could be incorporated into role-playing exercises with variability in how their partner could respond to prepare them for different scenarios. Motivations related to partner protection beliefs for others were contingent upon perceptions of trust with their partner, further indicating the importance of these conversations to develop or maintain trust within the relationship.

Other factors mentioned by young SMM to facilitate the delivery of HIVST kits to their partners or partner testing included anonymous delivery of the HIVST kits—to reduce

relational demand—and dyadic testing options. Although some men would be willing to deliver HIVST kits to their partners, an anonymous option was also requested. Anonymity has been documented as a facilitator in other methods of partner testing and treatment options, including electronic partner notification after bacterial STI diagnosis (Gotz et al., 2014; John et al., 2020). Moreover, giving out more than one HIVST kit could be particularly helpful in assisting individuals with more than one partner and those interested in HIVST again with their partner. Couples voluntary HIV testing and counseling is an evidence-based HIV prevention strategy for use in clinical settings (Stephenson, Grabbe, Sidibe, McWilliams, & Sullivan, 2016; Stephenson et al., 2011; Sullivan, Stephenson, et al., 2014; Sullivan, Wall, et al., 2014) with current research testing the impact of couples home-based HIV testing (Stephenson et al., 2017), suggesting the benefits of concurrent testing with their partners. Nonetheless, some partners may not be able to be contacted, indicating the need for continued promotion of traditional HIV testing methods if HIVST is expanded in the US.

Limitations

Our findings should be understood in light of the study's limitations. First, social desirability bias may have resulted in an over-estimation of willingness to distribute HIVST kits to recent sex partners; however, we believe this effect is negligible because participants self-completed surveys from home with limited interaction with study staff. Second, we asked about participants' willingness to engage in behaviors. It is possible a slight variation of the wording to "would you" with omission of "willingness" would have resulted in slightly different responses. The subtle nuances in question wording and subsequent responses received should be noted. Third, free-response data did not allow us to elicit follow-up clarification as typical in qualitative interviews, which could have reduced the breadth of our data. Nonetheless, we used three free-response questions to mimic a brief semi-structured interview guide, which resulted in greater depth of free-response data than in our prior, single-item data collection procedures used previously. Last, SMM in our sample were generally older, with the youngest men 20 years old because of aging (i.e., 2 years) since enrollment. However, our sample of 154 SMM aged 20–29 years allowed adequate free-response data collection with saturation reached. Last, SMM in this sample were predominately White and of relatively higher socio-economic status, potentially limiting the generalizability of our findings.

Conclusion

Overall, 93.5% of SMM (and 97.0% of young SMM) were willing to deliver HIVST kits to recent sex partners. Thematic analysis of barriers and facilitators to secondary distribution of HIVST kits indicated young SMM would benefit from supporting intervention strategies using the IMB model. IMB-guided strategies could include developing supportive informational content for HIVST, using motivational interviewing when providing the testing kits to index clients, and providing skills-based training through role-playing exercises. Although further research is needed to develop supporting interventions, expansion of HIVST kits through index clients is a potentially acceptable approach that

could be used to expand access to HIV testing and aid in efforts to *End the HIV Epidemic* (Fauci et al., 2019) in the US.

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Table 1

Demographics and their associations with willingness to deliver HIV self-testing kits to recent sexual partners among gay and bisexual men (n = 786)

Categorical Variables	Willing to Deliver HIV Self-Testing Kits to Sex Partners				
	<i>n</i>	Column %	<i>n</i>	Row %	χ^2
Age ($M_{age} = 43.4$; $SD = 13.6$)					3.32 [†]
20–29 years old	154	19.6	149	96.8	
30 years or older	632	80.4	586	92.7	
Race/Ethnicity					0.92
Black	80	10.2	74	92.5	
Latino	121	15.4	114	94.2	
White	514	65.4	479	93.2	
Multiracial/other	71	9.0	68	95.8	
Education					2.54
Less than Bachelor's degree	298	37.9	284	95.3	
Bachelor's degree or more	488	62.1	451	92.4	
Geographic Region					9.74 [*]
Northeast	146	18.8	132	90.4	
Midwest	132	17.0	122	92.4	
South	279	36.0	271	97.1	
West	219	28.2	201	91.8	

Notes:

[†] $p < 0.10$;

^{*} $p < 0.05$;

^{**} $p < 0.01$.