



Sexual and Gender Minority Individuals' Interest in Sexual Health Services at Collective Sex Venues in New York City

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Abstract

Sexual and gender minority individuals who attend collective sex venues (CSVs; establishments where people can have sex in groups or the presence of others) are at elevated risk for HIV and STIs. On-site sexual health interventions have been attempted at CSVs, but attendees' interest in receiving such services is under-investigated. This paper presents results from a 2020 online cross-sectional survey completed by 342 sexual and gender minority individuals who attended CSVs in New York City. Interest in services such as on-site testing for STIs, testing vans near CSVs, and informational referrals was overall high, particularly among younger participants. Among participants who reported being HIV negative, those of younger age and those who were not using PrEP reported being more likely to take an HIV test if it would be offered at CSVs. In open-text survey responses, participants expressed interest in CSVs providing free prevention services such as HIV/STI testing, PEP, PrEP, and STI medications or vaccination, as well as in ways to improve norms surrounding condom use and consent at these venues. Some participants expressed barriers to on-site services such as privacy concerns, preexisting access to health services, an emphasis on personal responsibility, and negative reactions to the presence of service providers. However, some participants also felt that these services could be delivered in a positive, acceptable, and non-judgmental way, especially by involving CSV organizers and attendees in their implementation. Findings from this study can inform future initiatives to develop sexual health interventions at CSVs.

Keywords Collective sex venues · Sexual and gender minority individuals · HIV/STI prevention · Sexual behaviors

Introduction

Although the annual number of newly diagnosed HIV infection in the US has decreased from 2015 through 2019, the proportion of diagnoses attributable to gay, bisexual, and

other men who have sex with men (GBMSM) has remained constant at around 69%, and has increased among transgender persons [1]. Biomedical prevention strategies such as pre-exposure prophylaxis (PrEP) have contributed to the decline in HIV incidence [2], but further interventions are needed to promote sexual health among sexual and gender minority individuals at high risk for HIV [3, 4].

Among sexual and gender minority populations, those who attend collective sex venues (CSVs) may be at elevated risk for HIV. CSVs such as bathhouses, sex clubs, or private sex parties are places where large numbers of people have sex in groups or in the presence of others. In an online survey with GBMSM users of an online sexual networking site in the US, 45.2% reported having visited a sex party in the prior year [5], while a New York City (NYC) study found that 30.1% had attended a sex club past year [6]. Several other studies have documented that GBMSM who engage in group sex or attend CSVs are at elevated risk for HIV, as they report more sex partners,

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more instances of condomless anal sex, more substance use, and more STI diagnoses compared to those who do not attend them [7–13]. Although there are little data about transgender and gender non-conforming individuals' participation in collective sex, some of them attend the same CSVs as GBMSM [14] and could thus be subject to similar HIV/STI risks.

It is unclear whether the high prevalence of risk behavior among CSV attendees is because these venues attract individuals more prone to or accepting of such risks, or whether the context of these settings is conducive to risk-taking [15]. In CSVs, the setting (e.g., dark or dimly lit rooms, densely crowded spaces) and interactional norms that favor non-verbal communication around sex can make it difficult to practice safer sex [16–19]. Indeed, such venues have been described as “littoral spaces... where social boundaries and sensory perceptions are altered,” which can pose challenges to both safer sex and the conducting of on-site sexual health interventions [20].

Several types of interventions could reduce the risk of HIV or STIs at CSVs. Initiatives to facilitate safer sex at CSVs have included establishing condom-use policies [21] or using markers such as wristbands to communicate HIV serostatus [22]. Additionally, voluntary on-site HIV & STI testing and informational referral programs have been implemented within CSVs across different cities in the US [23–25]. Such programs have been successfully implemented in bathhouses in NYC and have been able to identify a higher proportion of recent/acute HIV infections than in clinical settings [26]. Reports about on-site sexual health promotion services at CSVs have emphasized the importance of mobilizing community stakeholders and peers for successful implementation and delivery [27, 28]. However, there are still few data available about sexual and gender minority populations' interest toward HIV and STI services at CSVs. Up-to-date information about this topic is also important as the recent introduction and popularization of biomedical HIV prevention strategies (e.g., PrEP and treatment as prevention) may change what types of services people are interested in.

Sexual health services provided at CSVs could be instrumental in decreasing HIV/STI transmission risk in these environments. This study thus examined interest toward on-site services among sexual and gender minority individuals who have sex with men and attended CSVs in NYC. We chose a cross-sectional survey methodology as it is appropriate to collect descriptive and attitudinal information from a large sample [29]. In this paper, we present a descriptive analysis of quantitative and open-text survey items exploring interest toward various sexual health promotions strategies.

Methods

Participants and Recruitment

This paper reports on a cross-sectional survey conducted between May and September 2020 among NYC sexual and gender minority individuals who attended CSVs. Although the initial study design intended to conduct the survey at CSVs, the recruitment was conducted online due to the COVID-19 pandemic. Study recruitment ads were sent by email by sex venue promoters and posted on social media and hookup applications targeting sexual minority men. The ads invited people who attended sex venues to fill a screener questionnaire of no more than 5 min to determine eligibility. To participate in the study, individuals had to: (a) be at least 18 years old; (b) report living in the NYC metropolitan area on March 1, 2020; (c) identify as a cisgender man or as a transgender or nonbinary individual; (d) report having had sex with a male partner in the prior year; and (e) report having had sex, in the prior 12 months, in a collective sex venue (defined as a bathhouse, bar/nightclub, sex club, sex party, or adult video store/theater). Eligible participants were emailed an individual, single-use weblink to complete the full survey of approximately 20 min. Those who completed the survey were offered a \$10 electronic gift card.

Measures

Participants were asked about their demographic information at the beginning of the online survey, which was recoded into categorical variables for analysis. Recoded demographic variables included: age (categorized in two groups around the median, i.e., 18–34 and 35–72 years old), gender identity (i.e., cisgender men or transgender, non-binary and nonconforming), racial/ethnic identity (i.e., Asian, Black, Latinx, Multiracial, or White), sexual orientation (i.e., gay or queer, or bisexual, straight or other), relationship status (i.e., single or partnered), educational achievement (i.e., Associates degree and less or Bachelor degrees and more), past-year income levels (i.e., below 50k, 50–99k, 100k and more). Participants were also asked about sexual health and behaviors, including the use of hard drugs in sex parties during the past year (i.e., used GHB, meth, cocaine, crack cocaine, heroin, MDMA or opioids; or did not use), past-year alcohol use (i.e., yes or no) & cannabis use (i.e., yes or no) at CSVs, past-year frequency of sex party attendance (i.e., 1 to 4 times or more than 4 times), self-reported HIV status (i.e., HIV negative or unknown, or living with HIV), and, for those reporting being HIV negative/unaware, current PrEP use status (i.e., not using, event-driven/intermittent use, or daily use).

The outcome variables for this analysis were participants' interest in four types of HIV/STI prevention strategies at CSVs. A series of items developed by the study team were prefaced with the question: "How interested would you be in the following services if they were completely free?" Items included: (1) STI testing, "testing for STIs (e.g., gonorrhea, chlamydia, syphilis) at the sex venue (results would only be available 2 or 3 days later)", (2) informational referral, "the sex venue provides information on where to get tested for HIV or STIs", and (3) testing vans, "a testing van located near the sex venue where people can get tested before or after attending." Participants could answer on a Likert scale between 1 ("not interested at all") and 5 ("extremely interested"). Our fourth outcome variable, HIV testing, was only asked to participants who reported being HIV negative or unsure: "In the future, if HIV testing is offered at a sex venue you're visiting, how likely would you be to use that service?" Participants could answer on a Likert scale between 1 ("extremely unlikely") and 5 ("extremely likely"). After these series of items, participants were asked the following open-text questions: "What other things do you think sex venues could do to promote sexual health?"

Quantitative Analysis Plan

Statistical analyses were performed using SPSS version 26. We first examined the bivariate associations between the four outcome variables and participants' characteristics. We conducted Mann–Whitney *U* tests for categorical variables with 2 sub-levels, and Kruskal–Wallis *H* tests for categorical variables with 3 or more sub-levels. When the difference was significant between categorical variables with 3 or more sub-levels, we conducted post hoc tests using the Mann–Whitney *U* test. Finally, for the outcome variables that had more than one bivariate association, we conducted separate ordinal logistic regressions to identify associations between the outcome variables and the variables found to be significantly associated with each of the outcome variables in the bivariate analyses. All reported differences were significant at the $\alpha=0.05$ level.

Qualitative Analysis Plan

Qualitative analysis was performed using Dedoose version 9. We coded the data using a qualitative content analysis strategy, with the aim of producing an exhaustive list of participants' responses in a way that contained all the data [30]. The first and last authors first independently read the open text responses and developed a preliminary set of codes to categorize the data. They then compared their analyses and collaboratively developed a single coding guide. The first author then coded the data according to the guide and the last author reviewed the analysis. As participant answers

were relatively short, the two authors/coders were able to agree on the entirety of the coding. The qualitative results presented below reflect the structure of the coding guide.

Results

Participant Characteristics

Participant characteristics are reported in Table 1. Our sample consisted of 342 individuals, most of them (90.6%) identifying as cisgender men and 9.4% identifying as transgender, nonbinary, or gender nonconforming. The majority (59.1%) identified as white non-Hispanic, while 10.5% identified as Black non-Hispanic, 9.4% as Asian non-Hispanic, 5.0% as multiracial non-Hispanic, and 16.1% as Latinx of any race. Age ranged from 18 to 72 years old with a median of 34. The sample was of relatively high socioeconomic status as most (85.1%) participants had obtained a bachelor's or higher degree, and 68.3% reported a yearly income of \$50,000 or more.

More than half of the sample (53.8%) reported having visited CSVs more than four times in the past year. Regarding substance use during their visits to CSVs in the prior year, most (59.6%) participants reported alcohol consumption, while 30.1% reported cannabis use, and 23.1% reported any hard drug use. The substances participants reported using were GHB (10.8%), MDMA (10.2%), ketamine (9.4%), powder cocaine (9.1%), crystal methamphetamine (6.4%), and LSD (2.3%). Fifty-eight participants (17.0%) reported having received a positive diagnosis for HIV. Among those reporting never having been diagnosed HIV positive, most participants (64.1%) reported daily PrEP use, 6.7% reported using PrEP intermittently (e.g., event-driven), and 29.2% reported not currently using PrEP.

Interest in Sexual Health Services at Sex Venues

As shown in Table 2, participants indicated overall high interest in sexual health services at CSVs. Two-thirds (66.9%) of all participants reported being either very or extremely interested in on-site STI testing; 60.5% were very or extremely interested in informational referral; 58.2% were very or extremely interested in a testing van close to the sex venues. Almost half (47.2%) of participants who were HIV negative or unsure indicated that they would be somewhat or extremely likely to get tested for HIV at CSVs.

Table 1 shows bivariate associations between participant characteristics and interest in sexual health services at CSVs. Sexual orientation was the only characteristic significantly associated with interest in on-site STI testing, with participants identifying as gay or queer expressing less interest than those who identified as bisexual,

Table 1 Participants characteristics and interest in on-site sexual health services at CSV

	Total (<i>n</i> = 342)		STI testing		Informational referral		Testing vans		HIV testing (<i>n</i> = 284)	
	<i>n</i>	%	Mean	M–W K–W <i>U</i> <i>H</i> ^d	Mean	M–W K–W <i>U</i> <i>H</i> ^d	Mean	M–W K–W <i>U</i> <i>H</i> ^d	Mean	M–W K–W <i>U</i> <i>H</i> ^d
Age				12,984		12,227**		11,693***		8477.5*
34 or younger	166	(48.5)	3.99		3.90		3.80		3.35	
35 or older	176	(51.1)	3.75		3.48		3.35		2.99	
Gender				4491.5		4848		4695.5		3089
Cisgender men	310	(90.6)	3.88		3.68		3.58		3.14	
Transgender, nonbinary, or nonconforming	32	(9.4)	3.72		3.66		3.44		3.55	
Race				0.34		1.568		1.946		0.758
Asian ^a	32	(9.4)	3.84		3.59		3.72		3.06	
Black ^a	36	(10.5)	3.83		3.67		3.31		3.14	
Latinx (any race)	55	(16.1)	3.89		3.85		3.80		3.28	
Multiracial ^a	17	(5.0)	3.71		3.35		3.53		3.00	
White ^a	202	(59.1)	3.88		3.68		3.52		3.20	
Sexual orientation				2299.5*		3001.5		2781		1762
Gay or queer	322	(94.2)	3.83		3.67		3.54		3.14	
Bisexual, straight or other	20	(5.8)	4.45		3.85		3.90		3.78	
Relationship status				12,515		12,974		13,340		9281.5
Partnered	128	(37.4)	3.98		3.59		3.54		3.23	
Single	214	(62.6)	3.79		3.74		3.58		3.16	
Education				6842		7319.5		6662.5		3521
Associates degree or less	51	(14.9)	3.71		3.71		3.33		3.31	
Bachelor's degree or more	291	(85.1)	3.89		3.68		3.60		3.17	
Income (<i>n</i> = 335) ^b				4.004		8.851*		8.469*		5.219
Under \$50,000 (a)	112	(32.7)	3.86		3.66	(<i>b</i> ≠ <i>c</i>)	3.50	(<i>b</i> ≠ <i>c</i>)	3.33	
\$50,000 to \$99,999 (b)	127	(37.1)	4.02		3.91		3.82		3.31	
Over \$100,000 (c)	96	(28.1)	3.67		3.38		3.33		2.92	
CSV attendance past year				13,877.5		13,252		14,399		9382.5
1 to 4 times last year	158	(46.2)	3.84		3.59		3.58		3.26	
More than 4 times last year	184	(53.8)	3.90		3.76		3.55		3.11	
Alcohol use at CSV, past year				13,687		13,442		14,014.5		8205.5
No alcohol use	138	(40.4)	3.84		3.63		3.57		3.35	
Used alcohol	204	(59.6)	3.88		3.72		3.56		3.09	
Cannabis use at CSV, past year				11,421.5		11,828.5		11,876		7641
No cannabis use	239	(69.9)	3.82		3.64		3.54		3.23	
Used cannabis	103	(30.1)	3.97		3.77		3.61		3.07	
Hard drug use at CSV, past year ^b				10,115.5		9627.5		10,041.5		5572.5
No hard drugs used	263	(76.9)	3.87		3.62		3.54		3.26	
Used hard drugs	79	(23.1)	3.85		3.87		3.65		2.88	
HIV status (self-reported)				8031.5		7100.5		7538		
HIV positive	58	(17.0)	3.83		3.47		3.40		–	–
HIV negative	284	(83.0)	3.87		3.73		3.60		3.18	–
PrEP use (<i>n</i> = 284)				3.795		4.14		7.127*		20.42***
Not using PrEP (a)	83	(29.2)	4.00		3.98		3.70	(<i>b</i> ≠ <i>c</i>)	3.73	(<i>a</i> ≠ <i>b</i>)
PrEP use daily (b)	182	(64.1)	3.77		3.59		3.48		2.95	
Use PrEP but not daily (c)	19	(6.7)	4.26		3.89		4.26		3.05	

^aNot Hispanic/Latinx^bExcluding 7 participants who selected “No answer.”^cParticipants who reported using any one of the following substances at collective sex venues in the prior year: GHB, MDMA, Special K,

Table 1 (continued)

cocaine, crystal meth, or LSD

^dMann–Whitney U tests for categorical variables with 2 sub-levels, and Kruskal–Wallis H tests for categorical variables with 3 or more sub-levels. For variables with more than 2 sub-levels, specific group differences are specified if they were significant in post-hoc tests at the $\alpha = .05$ level using Bonferroni corrections

CSV: collective sex venues; STI: sexually transmitted infections; PrEP: pre-exposure prophylaxis

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Table 2 Interest in sexual health services at collective sex venues among participants who attended such venues

	Entire sample	
	<i>n</i>	%
	342	(100.0)
Testing for STIs (e.g., gonorrhea, chlamydia, syphilis) at the sex venue (results would only be available 2 or 3 days later) ^a		
Not interested at all	27	(7.9)
Slightly interested	34	(9.9)
Moderately interested	52	(15.2)
Very interested	74	(21.6)
Extremely interested	155	(45.3)
The sex venue provides information on where to get tested for HIV or STIs ^a		
Not interested at all	36	(10.5)
Slightly interested	31	(9.1)
Moderately interested	68	(19.9)
Very interested	78	(22.8)
Extremely interested	129	(37.7)
A testing van located near the sex venue where people can get tested before or after attending ^a		
Not interested at all	39	(11.4)
Slightly interested	39	(11.4)
Moderately interested	65	(19.0)
Very interested	88	(25.7)
Extremely interested	111	(32.5)
In the future, if HIV testing is offered at a sex venue you're visiting, how likely would you be to use that service? ($n = 284$) ^b		
Extremely unlikely	45	(15.8)
Somewhat unlikely	50	(17.6)
Neither likely nor unlikely	55	(19.4)
Somewhat likely	76	(26.8)
Extremely likely	58	(20.4)

STI sexually transmitted infections

^aThese three items were prefaced with: "How interested would you be in the following services if they were completely free?"

^bItem only asked to participants who reported never having been diagnosed positive for HIV

straight, or other identities ($U = 2299.5$, $p = 0.023$). Characteristics significantly associated with higher interest in informational referrals included being part of the younger age group ($U = 12,227$, $p = 0.007$) and income levels ($H = 8.851$, $p = 0.012$). Specifically, participants who earned \$50,000 to \$99,999 per year showed significantly higher interest in informational referral than those

who earned more than \$100,000 per year. Similarly, higher interest in testing vans also significantly associated with younger age ($U = 11,693$, $p < 0.001$) and income levels ($H = 8.469$, $p = 0.014$), with participants who earned \$50,000 to \$99,999 per year showed significantly higher interest in testing vans than those who earned more than \$100,000 per year. Interest in testing vans was also

associated with PrEP use ($H = 7.127$, $p = 0.028$). In particular, participants who used PrEP intermittently indicated a significantly higher interest in testing vans compared to those who used PrEP daily, with no significant difference with those who were not using PrEP. Among participants who reported being HIV–negative or unsure of their status, characteristics significantly associated with interest in on-site HIV testing were age ($U = 8477.5$, $p = 0.020$) and PrEP use ($H = 20.42$, $p < 0.001$). Specifically, participants in the younger age group expressed higher interest in on-site HIV testing, and participants not currently using PrEP indicated higher interest than those who used PrEP daily.

Tables 3, 4, and 5 show results from the ordinal regression models. For each outcome, all bivariate associations remained significant in the multivariable analyses. Those who were 34 years old or younger (adjusted odds ratio [aOR] 1.539, 95% confidence interval [CI] 1.031–2.297, $p = 0.035$) and those who made \$50,000 to \$99,999 per year (aOR 1.866, 95% CI 1.138–3.059, $p = 0.013$) showed higher interest in informational referrals compared to their older and higher-earning counterparts (Table 3). Similarly, those who were younger than 35 years old (aOR 1.994, 95% CI 1.270–3.131, $p = 0.003$), those who made \$50,000 to \$99,999 per year (aOR 2.113, 95% CI 1.238–3.609, $p = 0.006$) showed higher interest in accessing testing vans close to the venues. Those who used PrEP intermittently (aOR 2.775, 95% CI 1.006–7.659, $p = 0.049$) showed higher interest in such service compared to those who did not use PrEP (Table 4). Among participants who were HIV negative or unsure, those who were 34 years old or younger showed higher interest in on-site HIV testing services compared to those who were older (aOR 1.703, 95% CI 1.119–2.592, $p = 0.013$). Participants who used PrEP daily (aOR 0.320, 95% CI 0.198–0.518, $p < 0.001$) reported lower interest in such service compared to those who did not use PrEP (Table 5).

Qualitative Results

Eighty participants provided an answer to the open text question asking how sex venues could promote sexual health (six responses were excluded as they were not

Table 3 Ordinal regression: Interest in on-site referral programs

Variable	aOR	95% CI	<i>p</i> value
34 years old or younger ^a	1.539	1.031–2.297	0.035
Under \$50,000 ^b	1.265	0.770–2.078	0.354
\$50,000–\$99,999 ^b	1.866	1.138–3.059	0.013

aOR adjusted odds ratio; CI confidence interval

^aCompared to participants who were older than 34 years old

^bCompared to participants who made over \$100,000 annually

Table 4 Ordinal regression: Interest in testing van close to venues

Variable	aOR	95% CI	<i>p</i> value
34 years old or younger ^a	1.994	1.270–3.131	0.003
Under \$50,000 ^b	1.225	0.686–2.189	0.493
\$50,000–\$99,999 ^b	2.113	1.238–3.609	0.006
Using PrEP but not daily ^c	2.775	1.006–7.659	0.049
Using PrEP daily ^c	0.731	0.444–1.203	0.218

^aCompared to participants who were older than 34 years old

^bCompared to participants who made over \$100,000 annually

^cCompared to participants who were not using PrEP

aOR: adjusted odds ratio; CI: confidence interval; PrEP: pre-exposure prophylaxis

Table 5 Ordinal regression: Interest in on-site HIV testing (among HIV–negative/unsure participants)

Variable	aOR	95% CI	<i>p</i> value
34 years old or younger ^a	1.703	1.119–2.592	0.013
Using PrEP but not daily ^b	0.417	0.171–1.018	0.055
Using PrEP daily ^b	0.320	0.198–0.518	<0.001

^aCompared to participants who were older than 34 years old

^bCompared to participants who were not using PrEP

aOR: adjusted odds ratio; CI: confidence interval; PrEP: pre-exposure prophylaxis

related to the question). The 74 responses retained were organized into three general categories: (1) ideas of interventions participants would like to see at sex venues; (2) barriers or reservations towards on-site testing services; (3) keys for successful intervention implementation. Within each general category, concepts reported by at least 3 participants are reported.

Category 1: Ideas for Interventions

Participants offered several recommendations on how to promote sexual health at sex venues, including the on-site provision of biomedical HIV/STI prevention and changes to the culture and environment of sex venues. Consistent with the quantitative results, many participants expressed support for on-site HIV/STI testing. For instance, a participant felt that, at sex venues, there should be *testing at entry optional* (21, nonconforming, HIV–). Another participant further expressed how providing this service for free at sex venues could remove barriers to regular HIV/STI testing: *Provide free testing! People I play with who aren't taking precautions tend to do it out of financial concerns, not dislike* (34, nonconforming, HIV–).

Participants also suggested services to increase uptake of biomedical HIV/STI prevention at sex venues, for instance, by offering vaccines, PEP, or PrEP for HIV and/or STIs or information about them. For example, a participant said, *They can have PEP medication readily available so that one who is exposed can start taking meds ASAP* (41, cisgender man, HIV–). Another one felt that antibiotic (e.g., doxycycline) treatments to prevent STIs could be offered at CSVs, *Be able to prescribe Doxy PrEP... I'm very interested to learn more* (44, cisgender man, HIV–). Finally, some participants expressed interest in getting information about or receiving vaccines for STIs such as hepatitis, HPV, or the *MenB vaccine for gonorrhea* (30, cisgender man, HIV–).

For others, linkage to existing HIV/STI services seemed more appealing than providing them at the venues. For instance, a participant thought attendees could be connected to programs that could help them get on PrEP for free: *PrEP info and screenings, hooking up people with the Advancing Access Program so they know they can get it for low or no cost* (49, cisgender man, HIV–). Another participant thought that providing detailed information about STI testing sites would be helpful: *Making it clear how/where to get *free* STI testing and what kind of experience to expect (how long to wait for results, how the test is done, etc.)* (35, cisgender man, HIV–).

Relatedly, some participants were interested in printed information, for example, *brochures, posters to promote great sexual health. I think people should be reminded constantly* (39, cisgender man, HIV–). Another participant expressed interest in *erotic, sex-positive, sexual health posters* (62, cisgender man, HIV–). In contrast, some younger participants pointed out the advantage of using modern technologies (i.e., emails listserv) as a useful tool to discreetly disseminate sexual health resources. For instance, a participant claimed: *clubs could absolutely use their mailing lists to make these resources widely available before or after events as well* (27, cisgender man, HIV–).

Some participants offered suggestions to improve the practice of safer sex at sex venues. They recommended environmental changes to venues, for example, to *make sure condoms and lube are available everywhere* (25, cisgender man, HIV–) or *having the space well-lit enough to see visible (STI) symptoms* (35, cisgender man, HIV–). Some participants also wished for sex venues to have norms more supportive of condom use, or that organizers establish guides of conduct that support safer sex. For instance, some participants suggested to *enforce condom use* (30, cisgender man, HIV–) or *encourage 'safe only' parties* (30, cisgender man, HIV–). Others expressed that attitudes should be more respectful towards those who wish to use condoms: *No condom shaming! A lot of younger people really get crazy when you mention you want to use a condom* (49, cisgender

man, HIV–). Another participant said that party attendees should be more considerate of some people's choice to rely on condoms:

Condoms can't be required because so many people are on PrEP now but, as someone who is not, I wish people were more polite and cooperative about wearing condoms. I meet lots of guys who refuse to have sex unless it is bareback. (36, transgender man, HIV–)

Beyond safer sex, some participants felt that interventions could improve norms around sexual consent at sex venues. They suggested that organizers should work to *"actively establish a culture of consent"* (32, cisgender man, HIV–) or *"make sure everything is consensual between people"* (30, cisgender man, HIV–).

Participants also expressed interest in interventions to facilitate the exchange of information about sexual health among sex-venue attendees. For example, a participant suggested the use of *color-coded bracelets if you're on PrEP, or if you had certain vaccines already like HPV* (45, cisgender man, HIV–). Other participants mentioned tracking systems to notify organizers and attendees when someone gets diagnosed with HIV or an STI after their visit. For example, a participant suggested *have an anonymous way for attendees to communicate with sex club organizers if they contract an STD and then that be communicated with all party attendees* (36, cisgender man, HIV–). Similarly, another participant thought organizers could use technology to allow attendees to safely share test results:

Keep records of who was there and what our testing results are, so they can let people know if someone later tests positive for something. Could be very difficult to execute while also protecting privacy, but there's got to be a smart technological way to help communicate. (24, cisgender man, HIV–)

Category 2: Reservation Towards On-site Testing Services

While most participants showed support for on-site testing services, participants also expressed some reservations about them. Some participants thought testing in sex venues would not be useful. One participant pointed out that *you can't get relevant results in time and you're engaged in behavior that is likely to change results from the test conducted at the venue* (31, cisgender man, HIV–). Others remarked that they already had access to the services they needed: *I wouldn't personally use them because I get tested regularly at the doctor and have a good relationship with him and good health-care* (37, cisgender man, HIV–). Others emphasized that taking care of one's sexual health should be done outside of CSVs: *more in-depth medical care belongs before and after*

attending the event, and is the responsibility of the attendees (65, cisgender man, HIV+).

In addition, some participants felt CSVs might not be the appropriate place for sexual health services. For instance, a participant felt that the purpose of CSVs was to have sex and that the presence of clinicians would be uncomfortable:

I think that sexual health is on the individual more so than the sex venue. I would be extremely uncomfortable with testing and clinicians at a sex venue, but I would enjoy seeing material and information on safe sex and where to get tested. At the end of the day, people go to a sex club for sex and should have the individual responsibility to know their status and be safe. (26, cisgender man, HIV–)

Another participant thought the presence of services could be concerning to attendees, and that providing informational material might be better than having providers present: *I think providing information is the BEST course of action. Don't set up vans... Don't give people a reason to be nervous about their privacy at the venue* (23, cisgender man, HIV–). As aptly described by the following participants, the discomfort with seeing health service providers at CSVs might stem from a long history of complex relationships between gay men and public health authorities:

Honestly, when there's a large presence of sexual health materials and/or workers, it is counterproductive. I know many people see them and immediately associate them as almost enemies. Like suddenly they are the embodiment of the people who made the 80s that much harder for gays. I know that sounds crazy. It is the reality. Or if not so extreme, at least they see them as opposition to the event. (31, cisgender man, HIV+)

Category 3: Keys for Successful Intervention Implementation

Finally, some participants shared their thoughts on how to make sexual health services at CSVs successful. A few participants emphasized the importance for these services to be delivered in a way that is non-stigmatizing, non-judgmental, and sex positive. For instance, a participant pointed out that the services should not be prescriptive: *Ensure it's a judgement-free zone. People are likely to listen if they are not being chided into any particular type of behavior* (31, cisgender man, HIV–). Another participant felt that the service should emphasize the positive aspects of taking care of one's sexual health: *I think anything to keep the atmosphere casual and positive surrounding sexual health is a good thing. I think the problem comes when we demonize those with STIs to the point where people don't want to know their status on*

any given STI

 (33, cisgender man, HIV–). As expressed by the following participant, the service could help reduce the stigma related to HIV and STIs:

Promoting sexual health with resources and making sure to not stigmatize with words like "clean" and "unclean" or making anyone feel bad. I feel like sometimes, people get scared and would rather not know what they have and just avoid getting tested, when we should all be getting tested regularly if we're sexually active and know that we'll be ok if we do test positive for anything. (33, nonconforming, HIV–)

Some participants stressed the importance of sexual health services to be inclusive of people of diverse sex and gender identities. For instance, a participant wanted *information on how to prevent UTIs when your partners have front holes* (52, nonconforming, HIV–), while another thought, it would be nice to see more *trans and genderqueer inclusive language in general at sex parties* (28, nonconforming, HIV–).

Finally, some participants felt that the services would be successful if delivered by people who fit the environment and are engaging: *make services a part of the event so it doesn't feel alienating, but still make it stand out* (27, cisgender man, HIV–). For example, a participant thought that it could be delivered in a way that matches the erotic environment of CSVs: *Have hosts dressed in sexy skimpy attire handing out condoms, lube, or business cards for testing spots. A show with models showing the safe way to do sexual acts* (48, cisgender man, HIV+). Another participant thought that efforts should be made to actively engage attendees in the service and that more people would use it if they saw others do so:

Advertise it! People are drawn to inclusivity and if the option exists, I bet many people will engage if someone they think is attractive also engages in getting tested or takes advantage of sexual health services. It should be an active and encouraging conversation. (23, cisgender man, HIV–)

Discussion

Though CSV attendees might be at elevated risk for HIV and STIs, these venues present great opportunities for innovative prevention strategies. The current study explored the acceptability of on-site sexual health services among adults who identified as men, transgender, or gender nonconforming and who had sex with men at CSVs in NYC in the prior year. The study found that participants were in general very interested in on-site HIV and STI testing, testing vans, and informational referrals at CSVs. Our multivariable

analyses indicated that participants who were younger, who did not use PrEP daily, and who had lower income were significantly more interested in some of the on-site sexual health services we suggested. Our findings echo other studies, which reported socio-economic status and inadequate access to healthcare services to be persistent structural barriers for sexual minority individuals to access HIV prevention services [31]. Indeed, offering on-site testing and referral programs at CSVs may present a vital pathway to promote sexual health among those who need it most. In open-text survey responses, participants also expressed further ideas and opinions that should be considered in future research on sexual health service provision at CSVs.

Our study found higher interest in sexual health services at CSVs among participants under the age of 35, a demographic group who is a priority for current HIV prevention efforts. According to the Centers for Disease Control and Prevention [1], GBMSM aged 25 to 34 had the largest number of HIV diagnoses in the US between 2015 and 2019. Younger sexual and gender minority individuals may also face several barriers to accessing sexual health services in clinical settings; for instance, previous literature has shown that younger GBMSM may lack experience and core competence in navigating the complex medical system to receive HIV testing services [31]. Younger individuals might thus benefit more from sexual health services in nonclinical settings than older ones who—as expressed by one of our participants—might already *have a good relationship with [their providers] and good healthcare*. Further, studies have shown that people who engage in non-normative sexual practices (such as collective sex) can worry about stigma when discussing sexual health with providers [32], a barrier that might be more important among younger sexual and gender minority individuals who are less likely to have established relationships with medical providers. Research also indicates that many young GBMSM struggle with economic instability and financial strain, and may perceive medical services as an inaccessible luxury [31]. Convenient and free HIV and STI testing at venues attended by young sexual and gender minority individuals can therefore be a promising solution to overcome the multiple barriers to accessing sexual health services among this population [33]. Collective sex events targeted at younger GBMSM in NYC [34] could be highly strategic places to offer on-site sexual health services, especially considering that our survey found high interest in such services among participant of younger age.

Aligned with previous literature [35], we found that participants were interested in sexual health information being provided at CSVs. In open-text answers, participants expressed interest in such information being provided in various formats (e.g., brochures or email listserv) and about a wide range of health-related topics. They expressed interest in biomedical preventions strategies for HIV (i.e., PEP, PrEP,

and TasP) ones in development for STIs (e.g., Doxy PEP/ PrEP or STI vaccines). They thought informational referrals should help access sexual health services (e.g., by providing information about locations of testing sites or about payment assistance plans). Participants also felt that the information and resources provided at CSVs should be made relevant to the wide diversity of people attending them. For instance, participants thought there could be more resources specific to transgender and gender-nonconforming individuals. Few studies of CSVs have included transgender and gender non-conforming individuals, although some of them attend the same CSVs as cisgender GBMSM. Researchers have emphasized the need to address the specific health needs of transgender and non-binary people, and the stigma they may experience in accessing healthcare [4]. On-site services and information at CSVs might thus also be a strategic way to increase healthcare utilization by tailoring them to the specific needs and interest of the people who attend them.

Our findings support studies that underscored the important role of CSV organizers in the provision of on-site sexual health services [36]. Several participants expressed interest in clearer guidelines around safer sex and sexual consent at CSVs, and organizers can be instrumental in establishing such norms [19, 37]. Some also felt that modification to the environment (e.g., increasing lighting) could facilitate safer sex. Other participants thought that sexual health information could be distributed through email listservs, which are often the tools used by organizers to communicate with their clientele. Similar to studies that emphasized the importance of involving community members in HIV prevention [38, 39], our study suggests that party organizers and attendees might be instrumental in the development and implementation of sexual health services at CSVs. With the insight and input from community members, future interventionists could be better able to develop on-site sexual health interventions that will be relevant and acceptable to CSV attendees.

However, while most participants in the study expressed high interest in sexual health services at CSVs, in the open-text questions, a few of them raised concerns about them. As expressed in past studies [40], some of our participants expressed privacy concerns related to the presence of health workers at CSVs. Additionally, a small number of participants expressed that sexual health promotion should take place outside of CSVs, a perspective also discussed in prior research [15]. However, some participants also felt that sexual health services could be delivered in a non-judgmental and non-stigmatizing way at CSVs, and that interventionists could find ways to make the services match the atmosphere of the environment. As discussed above, involving CSV organizers and attendees in the development and delivery of these services might be key to ensure their acceptability.

The findings from this study should be interpreted considering their limitations. Our results are based on a convenience sample and results cannot be generalized to the population of sexual and gender minority individuals who have sex with men and attend CSVs. Recruitment was conducted on social media, sexual networking apps, and through the listservs of a few CSV organizers in NYC. Consequently, the perspectives of participants who do not use these online venues are not represented. Further, participants self-enrolled in the study, and individuals who choose to participate in a public health study might generally be more supportive of the services we presented in the survey [41]. It is also possible that the high interest in sexual health services we observed was biased by our instruments, for instance, because our questions asked about interest in sexual health services and did not explicitly ask about potential barriers or concerns related to them. Additionally, responding to the open-text question was optional, and only 23% of participants did so; the qualitative analysis might thus not reflect the perspective of all survey participants. Finally, responses were self-reported and could be subject to recall error or misreporting.

Conclusion

Our study contributes to the scarce literature examining the acceptability and efficacy of on-site sexual health interventions from the perspective of CSV attendees. We found that sexual and gender minority individuals who attend CSVs in NYC are, in general, highly interested in receiving on-site or mobile HIV/STI testing services and informational referrals. Moreover, our study identified potential areas of concern and improvement that could be considered in the development of on-site sexual health interventions at CSVs. Our findings suggest that a wider variety of sexual health services beyond HIV/STI testing (e.g., medication prescription and vaccines) are of interest to CSV attendees and could be further examined in future research about on-site health services. Intervention studies could try to assess the efficacy of the various types of sexual health services at CSVs that were of interest to this study's participants.

Author Contributions The study was designed by ÉM under the mentorship of CBF. All authors contributed to the development of the questionnaires. Data collection was conducted by ÉM, DA, and ST. XC and ÉM collaborated on the analyses of quantitative and qualitative analysis survey data. All coauthors contributed to interpretation of findings. XC was responsible for the initial drafting of the manuscript with assistance by ÉM, and all coauthors participated in its revision.

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Data Availability Not applicable.

Code Availability Not applicable.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

Ethical Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Institutional Review Board at Columbia University (Protocol #AAAS6360).

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

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