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Changes in Sexual Behavior, PrEP adherence, and Access to Sexual Health Services Because of the COVID-19 Pandemic Among a Cohort of PrEP-Using MSM in the South

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Abstract

Background: The COVID-19 pandemic has had unforeseen consequences on the delivery of HIV and STD prevention services. However, little is known about how the pandemic has impacted PrEP-using men who have sex with men (MSM).

Methods: Data come from an online cohort of PrEP-using MSM in the Southern United States from October 2019 to July 2020. Participants were administered ten surveys in total, including one ad hoc survey specifically on COVID-19. We conducted a cross-sectional analysis of this ad hoc survey (n=56) and present changes in sexual behaviors and utilization of and access to sexual health services. Using linear mixed-effects regression models, we also analyzed data from the larger cohort and document how sexual behaviors and PrEP use varied longitudinally across several months.

Results: A fifth of participants discontinued or changed how often they take PrEP because of COVID-19. A quarter of the cohort documented challenges when attempting to access PrEP, HIV testing, or STD testing. For all sexual behaviors examined longitudinally—number of male sexual partners, anal sex acts, condomless anal sex, oral sex (all measured in the past 2 weeks)—there was a decrease from February to April followed by an increase from April to June.

Discussion: Our findings suggest reduced access to and utilization of STD and HIV services coupled with a continuation of behaviors which confer STD/HIV risk. Ensuring appropriate delivery of STD/HIV prevention services during this pandemic is imperative.

Keywords

HIV pre-exposure prophylaxis; STD testing; COVID-19; health services; men who have sex with men

Introduction

As of January 2021, there were over 20 million confirmed coronavirus disease 2019 (COVID-19) cases and over 370,000 deaths across the United States.[1] Efforts to control

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the pandemic have heavily relied on the implementation of social distancing guidelines[2] and stay-at-home orders[3] that intend to limit the number of social contacts and promote isolation at home. Such practices can have unforeseen consequences on the delivery of needed health services.

Evidence suggests the pandemic has already influenced access to and utilization of STD/HIV services, including a decline in HIV post-exposure prophylaxis prescriptions,[4] potential disruptions in the HIV care continuum,[5–7] and access to HIV/STD testing.[8] In the context of delivery of sexual health services, MSM who use HIV pre-exposure prophylaxis (PrEP) in the South are a key population of interest, as prescription guidelines for PrEP underscore the importance of routine health care visits and periodic HIV and STD testing for MSM at high risk for recurrent STDs.[9] Further, the focus on PrEP users in the Southern United States is warranted; the burden of HIV and STDs is disproportionately concentrated in the South[10,11] and many of the current COVID-19 hotspots are in the South.[1] Refills for PrEP are typically authorized at a check-up visit after negative HIV status is confirmed and prescriptions may require pick-up at a pharmacy. As a result, it is possible that access and adherence to PrEP may be affected by the COVID-19 pandemic, as well as compliance to routine HIV/STD testing.

Elucidating changes in sexual behaviors due to the pandemic is also important. In fact, reduced access to STD/HIV testing and PrEP discontinuation may be less concerning if coupled with a reduction in sexual risk. A nationwide study with MSM and a study with gay and bisexual men suggested reductions in sexual risk taking, including decreases in the number of sexual partners.[5,12] However, with the ongoing lifting of stay-at-home orders and declining compliance to social distancing guidelines,[13] it is not apparent if these decreases in sexual risk have persisted. For example, one recent study of gay, bisexual, and other MSM self-reported a mean increase of 2.3 sex partners during the COVID-19 pandemic.[14] There is a need to examine longitudinal trends in sexual behaviors in the context of the ongoing pandemic. Moreover, little is known about individuals' COVID-19 risk perceptions in the context of sexual behavior and such data can help contextualize behavioral changes. Accordingly, we examine changes to access and utilization of sexual health services and changes in sexual behavior due to the COVID-19 pandemic, as well as COVID-19 risk perceptions among a cohort of PrEP-using MSM in the South.

Methods

Data collection

Data come from a cohort study examining trajectories of PrEP use among MSM recruited online in the Southern United States from October 2019 to July 2020. Eligible participants were cisgender male, 18–34 years old, lived in the Southern United States, reported anal sex with a man in the past 6 months, were HIV-negative, and were current users of oral HIV PrEP. Participants were administered a baseline survey, seven identical biweekly surveys assessing sexual behavior and PrEP use, and a final survey on sexual behavior and future plans for PrEP use. All survey materials, including the screener, were administered in English. As the end of the study's timeline coincided with the COVID-19 pandemic, an ad hoc survey assessing how the pandemic has influenced participants' sexual behavior,

PrEP use, and access to sexual health services was administered in June-July 2020 to all current and previously enrolled participants, and will hereafter be referred to as the COVID-19 survey. Of participants enrolled at baseline (n=78), 56 participants responded to the COVID-19 survey (response rate = 72%). Participants were compensated for their participation. This study was approved by the Institutional Review Board at Emory University.

Measures

The COVID-19 survey included questions assessing how the pandemic and efforts to control it have influenced access to and utilization of sexual health services (e.g., STD testing, HIV testing, PrEP) and changes relating to a spectrum of sexual activities (e.g., anal sex, sexual activity with causal partners). Participants were asked to indicate the perceived level of COVID-19 acquisition risk on a scale of 0 (no risk) to 100 (highest risk) associated with specific sexual behaviors. Additionally, each of the seven check-in surveys, the final survey, and the COVID-19 survey included identical items assessed over the past 2 weeks: number of missed PrEP doses, number of male sexual partners, anal sex acts, oral sex, and condomless anal sex.

Analysis

This study includes both cross-sectional and longitudinal components. First, we conducted a cross-sectional analysis of the COVID-19 survey (n=56), presenting percentages and number of respondents endorsing response options for questionnaire items. We computed the median and interquartile range for the four items assessing perceived risk of COVID-19 acquisition for specific sexual behaviors.

For longitudinal analyses, we utilized data from the larger cohort study and fit linear mixed-effects regression models to examine potential period effects for the number of missed PrEP doses, number of male sexual partners, any anal sex with male partners, any oral sex with male partners, and any condomless anal sex with male partners, all measured in the past 2 weeks. The calendar month the survey was submitted was the independent variable. Using these models, means/percents and standard errors were computed for each repeated measure during seven months (November, December, January, February, March, April, and June) representing distinct periods (i.e., pre-pandemic, early pandemic, and later in the pandemic). All analyses were conducted in SAS 9.4 (SAS Institute, Cary, NC).

Results

At baseline (n=78), 45% were 18–24 years old (n=35) and the sample was 47% non-Hispanic white (n=35), 27% non-Hispanic Black (n=20), and 16% Hispanic (n=12, Table 1). The majority of participants identified as gay (n=71, 91%), had at least a college education (n=67, 88%), and a household income between $20,000–74,999/year (n=46, 63%). There were minor differences between the cohort at baseline and those who responded to the follow-up COVID-19 survey; notably, there was a smaller proportion who were non-Hispanic Black (n=10, 19%) and of ages 18–24 (n=22, 39%) who participated in the COVID-19 survey than at baseline.

Table 2 presents changes in STD/HIV testing, PrEP use, and sexual behaviors from the COVID-19 survey. Five participants (9%) reported discontinuing PrEP use. Several participants reported difficulties obtaining their PrEP medication (n=8, 16%) and few participants noted switching to event-based dosing (n=2, 4%). Many participants did not have an HIV test (n=18, 32%) or STD test (n=24, 43%) in the past 3 months. Further, several cited difficulty obtaining an HIV test (n=11, 20%) or STD test (n=10, 18%) due to the pandemic.

Since the beginning of social distancing guidelines, 79% of participants reported having sex (n=44), including with someone who lives with them (n=3, 7%), someone who does not live with them that lives alone (n=33, 75%), and someone who does not live with them that lives with other people (n=25, 57%). The majority of participants reported decreases in all sexual behaviors examined, ranging from kissing (n=34, 61%) to anal sex (n=38, 68%) since the beginning of the COVID-19 pandemic. Additionally, most reported decreases in sexual activity with casual partners (n=46, 82%). In contrast, fewer participants reported decreases in sexual activity with a main partner (n=21, 38%).

Examining longitudinal trends in sexual behaviors (Table 3), the percent reporting having ≥2 male sexual partner in the past 2 weeks was 31% in February (SE = 5), and this percent declined from February to April (percent= 8%, SE = 4), and then increased from April to June (percent= 25%, SE = 6). Examining earlier months before the pandemic (November – February), there did appear to be some random fluctuation in the percent reporting having ≥2 male sexual partner in the past 2 weeks. The three other sexual behavior indicators – percent having any anal sex, any oral sex, and any condomless sex—all measured in the past 2 weeks and with male partners also showed decreases from February to April, increases from April to June, and inconsistent, random fluctuations in months before the pandemic. In contrast, there did not appear to be substantial variation in the mean number of missed PrEP doses by calendar month among those who remained on PrEP.

On a scale of 0 (no risk) to 100 (highest risk), the median perceived level of COVID-19 acquisition risk was 100 (IQR: 14) for kissing; 74 for rimming (IQR: 66); 75 for oral sex (IQR: 67); 66 for anal sex (IQR: 75; data not shown).

Discussion

In our cohort study of PrEP-using MSM, we found the COVID-19 pandemic has impacted access to and utilization of numerous sexual health services: a quarter of the cohort reported challenges while attempting to access PrEP, HIV testing, or STD testing. Despite PrEP prescription guidelines indicating periodic HIV and STD testing for MSM at high risk for recurrent STIs,[9] our study found that many participants had not received a STD test or HIV test in the previous 3 months. However, it is not clear if these findings relating to STD and HIV testing are unique to the pandemic, as studies before the pandemic have also found imperfect compliance to STD and HIV testing guidelines for PrEP users.[15,16] Moreover, the pandemic's influence on PrEP use itself is inconclusive; a fifth of participants either indicated they discontinued PrEP use or changed how often they take PrEP because of

COVID-19 but there were minimal changes in the number of missed PrEP doses among those who remained on PrEP across time periods.

To contextualize these findings relating to delivery and utilization of services, we also examined changes in sexual behavior and found important variations by partner type and time period. Most participants indicated a decrease in sexual activity with casual partners, but fewer reported decreases with main partners. Examining longitudinal trends, there appeared to be a consistent pattern - the cohort's mean level of sexual risk dropped from February to April and then increased from April to June. While looking at data from several months before the pandemic, we found inconsistent and random fluctuations in the cohort's mean level of sexual risk, which further affirms the stark changes we observed in the months of the pandemic are likely not just due to noise. Our findings corroborate a recent longitudinal assessment of a cohort of Latinx sexual minority men and transgender women comparing two timepoints (May 2020 vs. 8–18 months before the pandemic) that also found reductions in condomless sex.[17] We extend the findings from this study, as well as aforementioned cross-sectional studies which documented reductions in sexual risk among MSM and gay bisexual men,[5,12] by evaluating multiple time points after the pandemic and found that such reductions may be short-lived. The impact of these potential "rebounds" in sexual risk in the context of persistent disruption of clinical services can be far-reaching — one modeling study projected hundreds of HIV cases and thousands of STI cases among MSM in Atlanta over the course of five years.[18] Although our study was unequipped to do so, examining how these service disruptions differentially affect populations is imperative, as they may magnify existing disparities in communities of color and result in the emergence of new disparities in HIV.[19]

However, there did not appear to be meaningful variation in the number of missed PrEP doses by calendar month among participants who remained on PrEP. Although evidence of period effects for PrEP adherence were not apparent, it is important to note that a fifth of the cohort reported discontinuing PrEP use altogether or taking PrEP less frequently. Further, as prescriptions typically need to be written every three months, it is possible that potential effects to PrEP adherence would not be captured due to our study's time frame.

Our study has limitations. Given limited sample size, we were unable to test for demographic and geographic differences in our findings. Further because participants are from several states in the South, we were unable to link our findings to specific state-level policies to control COVID-19. Our assessment of time since last STD and HIV test is from the ad-hoc COVID-19 survey and we were unable to longitudinally examine how testing behaviors were impacted due to the pandemic. All data are self-reported and are subject to social desirability biases and there is the potential for seasonal effects to influence our findings. All participants were eligible for the COVID-19 survey yet some participants did not complete this optional survey, potentially leading to selection bias. It is unclear what the potential direction of this bias would be. Findings may not be generalizable to other populations or settings. In particular, as all survey materials were administered in English only, the experiences of non-English speaking populations may not be adequately reflected.

Our findings underscore the need to maintain STD and HIV prevention efforts during the COVID-19 pandemic, as recent calls for action have stressed.[20,21] Finding unique ways to deliver these essential services is needed. Guidance from the US Centers for Disease Control and Prevention and other sources offer a host of options to ensure appropriate care during the pandemic,[22,23] including lab-only visits for indicated HIV/STD tests, at-home HIV/STD testing, self-testing for HIV via an oral swab-based test, extending the prescription of PrEP to a 90-day supply to decrease trips to the pharmacy, utilizing telemedicine when possible, and finally referring patients elsewhere if needed services cannot be provided. Clinical anecdotes illustrate the challenges, as well as opportunities, in ensuring high-quality PrEP care during the pandemic.[24,25] Moreover, a critical component of PrEP check-up visits is risk reduction counselling and incorporating discussions of COVID-19 risk into these discussions may be needed. For all sexual activities examined, most participants rated the COVID-19 acquisition risk as moderate to high (i.e., >50 on a scale of 0 (no risk) to 100 (highest risk)), aligning with a recent study of gay, bisexual, and other MSM.[14] However, for all sexual activities except kissing, there was substantial variability in the perceived level of COVID-19 acquisition risk, suggesting a need for clearer risk reduction messaging in clinical contexts[26]—and beyond. Public health messaging on COVID-19 risk and sex has largely been absent, although some local health departments have released guidance on safe sex during the pandemic.[27]

Continued monitoring of PrEP use, utilization of sexual health services, and sexual behaviors during the pandemic among PrEP-using MSM and other subpopulations is needed, including longitudinal studies powered to examine short- and long- term changes, qualitative investigations detailing specific barriers and facilitators to care, and analyses of pharmaceutical and medical claims data elucidating temporal changes in service utilization. Given our findings which suggest reduced access to and utilization of STD and HIV prevention services coupled with a continuation of behaviors which confer STD/HIV risk, ensuring appropriate delivery of these essential services and relevant risk-reduction messaging as this pandemic continues to unfold is critical.

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Table 1.

Sample characteristics of cohort at baseline (n=78) and at follow-up COVID-19 survey (n=56)

	Full cohort at baseline (n=78)	COVID-19 survey (n=56)
Characteristic	**n (%)**	**n (%)**
Age		
18–24	35 (45)	22 (39)
25–34	43 (55)	34 (61)
Race/ethnicity		
Hispanic	12 (16)	8 (15)
Non-Hispanic Black	20 (27)	10 (19)
Non-Hispanic White	35 (47)	29 (55)
Other/Multiple	8 (11)	6 (11)
Sexual identity		
Gay	71 (91)	53 (95)
Bisexual	7 (9)	3 (5)
Education		
High school or less	9 (12)	6 (11)
At least some college	67 (88)	49 (89)
Household income		
<$20,000/year	12 (16)	7 (13)
$20,000–74,999/year	46 (63)	33 (62)
$75,000+/year	15 (21)	13 (25)

Note: n's may not add up to total due to missing data

Table 2.

Changes in PrEP use, STD/HIV testing, and sexual behavior due to COVID-19 pandemic among PrEP-using MSM (n=56)

Experience	n (%)
Change in PrEP adherence	
Taking PrEP less frequently	6 (11)
Discontinued PrEP use	5 (9)
No change	45 (80)
Difficulties obtaining PrEP medication[1]	
Yes	8 (16)
No/I haven't tried to get my PrEP medication	42 (84)
Change in how PrEP is obtained[1]	
Yes	7 (14)
No	43 (86)
Change to event-based dosing in PrEP[2]	
Yes	2 (4)
No	45 (96)
Last HIV test	
Within past 3 months	38 (68)
4–6 months ago	15 (27)
7–12 months ago	3 (5)
Last STD test	
Within past 3 months	32 (57)
4–6 months ago	18 (32)
7–12 months ago	4 (7)
>1 year ago	2 (4)
Difficulty obtaining HIV test	
Yes	11 (20)
No	34 (61)
Have not tried	11 (20)
Difficulty obtaining STD test	
Yes	10 (18)
No	31 (55)
Have not tried	15 (27)
Had sex since social distancing guidelines began	44 (79)
Sex with someone who lives with me[3]	3 (7)
Sex with someone who does not live with me that lives alone[3]	33 (75)
Sex with someone who does not live with me that lives with other people[3]	25 (57)
Sex with someone who does not live with me whose living situation is unknown[3]	4 (9)
Sexual activity with casual partners	

Experience	n (%)
Decreased	46 (82)
No change	7 (13)
Increased	1 (2)
Does not apply	2 (4)
Sexual activity with main partner	
Decreased	21 (38)
No change	17 (30)
Increased	7 (13)
Does not apply	11 (20)
Frequency of kissing	
Decreased	34 (61)
No change	18 (32)
Increased	2 (4)
Does not apply	2 (4)
Frequency of oral sex	
Decreased	36 (64)
No change	18 (32)
Increased	1 (2)
Does not apply	1 (2)
Frequency of anal sex	
Decreased	38 (68)
No change	17 (30)
Increased	1 (2)
Frequency of rimming	
Decreased	37 (67)
No change	15 (27)
Increased	1 (2)
Does not apply	2 (4)
Number of sexual partners	
Decreased	44 (79)
No change	12 (21)
Increased	0 (0)

[1]Asked among those who are currently taking PrEP

[2]Asked among those who are currently taking PrEP and responded yes or unsure to whether they planned on continuing to take PrEP in the next 2 weeks and reported an intention to take PrEP daily. Event-based dosing of PrEP refers to only taking PrEP before and after sex.

[3]Asked among those who reported having sex since the beginning of social distancing guidelines

Note: Percentages may not add to a 100% due to rounding.

Table 3.

Longitudinal trends in PrEP use and sexual behaviors, November-June 2020

Repeated measure	November	December	January	February	March	April	June	Trend
	Mean (SE) or percent (SE)							
Mean number of missed PrEP doses in the past 2 weeks	1.1 (0.4)	1.2 (0.3)	1.2 (0.2)	0.7 (0.2)	0.7 (0.2)	0.4 (0.1)	1.2 (0.4)	
Percent having ≥2 male sexual partners in past 2 weeks	42 (7)	41 (6)	34 (4)	31 (5)	21 (4)	8 (4)	25 (6)	
Percent having any anal sex with male partners, past 2 weeks	78 (6)	75 (5)	63 (5)	59 (5)	40 (5)	20 (5)	42 (6)	
Percent having any oral sex with male partner, past 2 weeks	53 (7)	61 (5)	53 (5)	55 (5)	41 (5)	15 (5)	46 (6)	
Percent having any condomless anal sex with male partners, past 2 weeks	69 (7)	61 (5)	50 (5)	47 (5)	33 (5)	19 (5)	41 (6)	

SE = standard error

Note: Given small sample size, data for the months of October, May, and July are not presented.