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Quantitative assessment of brief messages about HIV pre-exposure prophylaxis among HIV-infected and HIV-uninfected black/African American and Hispanic/Latino MSM

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Abstract

Background: HIV pre-exposure prophylaxis (PrEP) is efficacious, however many MSM (especially racial/ethnic minorities) are still unaware of and under-utilize it.

Methods: The 2014 *Messages4Men Study* focuses on black and Hispanic/Latino MSM in Chicago, Fort Lauderdale, and Kansas City (n=937). Brief (2–3 sentence) messages were tested: a PrEP message tailored for HIV-uninfected MSM (n=607) and a PrEP message tailored for HIV-infected MSM (n=330). After reading the message, participants reported believability and awareness, and intent to use PrEP and condoms. Analyses consisted of bivariate and multivariable approaches.

Results: Among HIV-uninfected MSM, black (vs. Hispanic/Latino) MSM indicated greater intentions to use PrEP (81% vs. 70% respectively, $p < .05$); 72% overall had similar intentions to use condoms after hearing a PrEP message. PrEP information was new (63%) and believable (80%), with no racial/ethnic differences ($p > .05$). In multivariable analysis, men who reported recent condomless anal sex were less likely to report the PrEP message enhanced their intent to use condoms in the future.

Discussion: Several years into the availability of PrEP, black and Hispanic/Latino MSM continue to be unaware of PrEP and its benefits, although information is largely believable once provided. The HIV prevention field should be prepared to incorporate new information about HIV prevention options into brief messages delivered through technology and social media.

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Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Keywords

PrEP; pre-exposure prophylaxis; MSM; gay men; prophylaxis; HIV; prevention; messaging; black/African American; Hispanic/Latino

INTRODUCTION

Men who have sex with men (MSM) continue to be disproportionately affected by HIV in the US. MSM comprise an estimated 2% of the adult population,¹ but they accounted for nearly 70% of all new HIV diagnoses in 2016.² MSM of color are particularly impacted, with blacks/African Americans and Hispanics/Latinos accounting for an estimated 33% and 23% (respectively) of new diagnoses among all men,² when those race/ethnicities only represent 13% and 16% in the general US population.³ Following successful trials of daily tenofovir/emtricitabine for oral HIV pre-exposure prophylaxis (PrEP) among MSM,⁴⁻⁶ in 2012 the FDA approved⁷ and in 2014 CDC released comprehensive guidelines for clinical implementation of daily PrEP.⁸ In this new era for HIV prevention, curbing HIV infections requires awareness of novel prevention options through effective health messaging. Messages are needed for emerging and complex scientific information, allowing MSM to make informed decisions about their prevention behaviors. While there are a few qualitative studies,^{9,10} quantitative messaging research on PrEP is lacking. This study developed and tested PrEP efficacy messages in a large sample of black and Hispanic/Latino MSM, populations that could greatly benefit from novel prevention methods. We assessed awareness of efficacy information, message believability, intent to use and promote PrEP use, and intent to use condoms after reading brief PrEP efficacy messages. This study includes both HIV-infected (potential messengers about PrEP for HIV-uninfected men) and HIV-uninfected men. Findings will inform HIV prevention message development and implementation.

METHODS

Recruitment

From June-October 2014, men enrolled in the Messages4Men study in Chicago, Fort Lauderdale and Kansas City metropolitan statistical areas (MSAs). Recruitment included online (e.g., Facebook) and print advertisements, referrals, and venue-based outreach; materials were in English and Spanish. Peer recruiters approached men at gay venues, described the study, and referred interested MSM through palm cards and flyers to local agencies. Details are reported elsewhere.¹¹⁻¹³

Eligibility requirements included: male; black or Hispanic/Latino; age 18 or older; live or work in one of the MSAs; sex with a man in the past year; and not involved in another HIV-related study or program currently or in past 3 months. Both (self-reported) HIV-infected and HIV-uninfected MSM were included in the study, with the exception of men newly-diagnosed within the prior 6 months due to a well-documented recency effect of behavior change following diagnosis.¹⁴ A targeted sampling strategy ensured representation of three groups: HIV-infected MSM, HIV-uninfected MSM reporting recent (past 3 months)

condomless anal sex, and HIV-uninfected MSM reporting no recent condomless anal sex. Enrollment by HIV-status/behavioral risk group for black and Hispanic/Latino MSM was closely monitored, in tandem with focused recruitment efforts and group enrollment closings.

Study Procedures

Protocols were reviewed and approved by the John Snow, Inc. IRB. Eligible men scheduled an appointment and reported to the local CBO at a specified time. After re-confirming eligibility, men provided written informed consent and completed a computer-based assessment including presentation of brief prevention messages and responses and a cognitive-behavioral survey. Men received a \$40 gift card for participation.

Messages

Brief messages were developed to convey new and emerging HIV prevention information about PrEP efficacy, among other prevention topics.^{11–13} Prior to implementation, messages were tested with black and Hispanic/Latino MSM through qualitative research.¹⁵ In this analysis, messages included PrEP messages customized for HIV-uninfected and HIV-infected men. The estimate of PrEP efficacy came from the iPrEX trial, the only PrEP trial results for MSM available at the time.⁴ The message for HIV-uninfected men focused on individual-benefit, stating *“There is a pill you can take every day to reduce your risk of getting HIV. A recent study was done of gay and bisexual men who did not have HIV and were asked to take the pill. For the men who said they were good at taking the pill every day (they rarely missed a dose), the group as a whole reduced their chance of getting HIV by 73%.”* Similarly, the message for HIV-infected men emphasized PrEP benefit: *“There is a pill that people without HIV can take every day to reduce their risk of getting HIV.”*

Measures

Immediately after reading the PrEP message, HIV-uninfected men were asked whether the information made them more or less likely to take a pill every day to prevent HIV, and whether the information made them more or less likely to use condoms in the future with anal sex. HIV-infected men were asked whether the information made them more or less likely to talk to an uninfected partner about taking a pill every day to prevent HIV, and whether the information made them more or less likely to use condoms in the future during anal sex with an uninfected partner. Five-point Likert-scale response options were used for all of the behavioral intention variables. The PrEP and condom use intentions variables were dichotomized, so participants who were definitely or somewhat more likely to use PrEP/condoms (1–2) were compared against those not more likely to use PrEP/condoms (3–5). This was done to reflect participant increased likelihood vs no change/decreased likelihood.

Participants were asked whether the information presented in the prior message was new to them, with response options of ‘Yes,’ ‘Unsure’ and ‘No.’ The ‘Unsure’ and ‘Yes’ responses were combined for the purposes of this analysis to represent the message being new information. We asked participants to indicate how fully they believed the information presented in each message. Five-point Likert response options were provided. Responses

were recoded into two categories: believe message (1–2) and don't know/disbelieve message (3–5).

Data Analyses

Bivariate analyses (chi-square tests) and multivariable logistic regression analyses identified associations. A two-sided significance level of 0.05 was employed for all statistical tests, and all analyses were conducted using SAS, version 9.3 (SAS Institute, Cary, NC). Outcomes were analyzed for associations with recent condomless anal sex and demographic variables (race/ethnicity, age, education, and city/MSA). Men who identified as both black and Hispanic/Latino ($n=73$) were categorized as Hispanic/Latino in analyses.

RESULTS

Sample Characteristics

Overall, 927 MSM enrolled in the study (Table 1); 65% were HIV-uninfected and 35% were HIV-infected. Participants split nearly equally in terms of race/ethnicity (49% black; 51% Hispanic/Latino) and city/MSA (34% Chicago, 33% Fort Lauderdale, 33% Kansas City). The sample was young, with 42% aged 18–29; half (52%) reported condomless anal sex in the past 3 months.

PrEP Message Efficacy

HIV-uninfected MSM—The PrEP efficacy message was new information for 63% of HIV-uninfected MSM, and 76% reported enhanced intent to use or recommend PrEP after reading the message (Table 2). In bivariate analysis, black men were more likely than Hispanic/Latino men to intend to use PrEP (81% vs 70%, $p<.05$). Men reporting condomless anal sex in prior 3 months were less likely than others to report increased intent to use condoms after seeing the PrEP message (66% vs 77%, $p<.05$). Men with education beyond high school were less likely to report increased intent to use condoms, and the PrEP message was less likely to be new information for men with more education. No demographic or behavioral differences were found for PrEP message believability ($p's>.05$). In multivariable analysis, the PrEP efficacy message was less likely to be new information for men with a college degree or more compared to men with a high school diploma or less (Table 2). MSM who reported recent condomless anal sex and more education were less likely to report the PrEP message enhanced their intent to use condoms.

HIV-infected MSM—A majority (89%) of men reported enhanced intentions to talk to a partner about PrEP after viewing the efficacy message, with Hispanics/Latinos more likely than blacks to indicate so (93% vs 86% respectively, $p<.05$; non-significant in multivariable analysis). The PrEP message was new information for only 36% of HIV-infected men, and more likely to be new for black compared to Hispanic/Latino men (46% vs 26%, $p<.05$) in bivariate analysis. Believability was high for HIV-infected men (88%), and more so in bivariate analysis for Hispanic/Latinos vs. blacks (94% vs 81%, $p<.05$). In multivariable analysis, men who reported recent condomless anal sex were less likely to report the PrEP message enhanced their intent to use condoms in the future.

DISCUSSION

HIV-uninfected black and Hispanic/Latino MSM were largely unaware of PrEP at the time of the study, which was conducted within 3 months of CDC's publication of PrEP clinical practice guidelines.⁸ After reading a brief message about PrEP, most HIV-uninfected MSM reported willingness to take "a daily pill to prevent HIV infection" in the future, and felt 73% efficacy information was believable. Although reaching and informing HIV-uninfected MSM of color about PrEP and its benefits is a challenge, once men receive these messages they are receptive to the information and willing to consider using PrEP. This finding may be promising for other future HIV prevention products. Recent data suggest that although PrEP uptake by MSM has increased over the recent past, substantial racial disparities in use exist. The majority of US PrEP prescriptions are filled by white men despite higher rates of HIV infection among MSM of color.¹⁶ Lack of PrEP awareness among MSM of color in our study seemed to be more pronounced among younger and less educated men. These findings suggest a need for targeted PrEP messaging to these men. Given no differences by age or education in men's intentions to use PrEP after learning of it, or in PrEP message believability, messaging to all MSM could be beneficial.

HIV-infected MSM, in contrast, were largely familiar with PrEP and willing to discuss PrEP with their HIV-uninfected partners. These findings are not surprising as HIV-uninfected MSM of color tend to be less engaged in the healthcare system,^{17,18} and are more likely to report stigma-related barriers to PrEP use and have more difficulty talking to their providers about sex.¹⁸ Research is needed to determine exactly where and how HIV-infected MSM are receiving PrEP information. Regardless, our findings indicate that a promising avenue for disseminating information about PrEP benefits to HIV-uninfected MSM is through their HIV-infected partners and friends. Peer messengers are a promising prevention messaging modality in the context of PrEP, and have been successful in changing behavior among MSM in the past.¹⁹⁻²¹ Moreover, men who reported having recent sex without condoms did not report lower intentions to use PrEP. This finding is encouraging, as it suggests MSM who use condoms inconsistently are equally as likely as men who use condoms to regularly use PrEP.

While this is the first study to quantitatively test brief messages about new HIV prevention options in a large sample of black and Hispanic/Latino MSM, there are limitations. We are unable to determine whether brief prevention messages have an effect on behavior as this was a cross-sectional study. Second, all messages were presented to all men by HIV serostatus, which may have biased some responses. Third, the study was limited to three cities/MSAs. Fourth, other PrEP trials with MSM published findings since this 2014 study, reporting even greater PrEP efficacy and good adherence.^{22,23} Ongoing research is needed to test messages with the higher efficacy estimates. Finally, this study was based on participant self-report and subject to potential reporting bias, as is most HIV prevention behavioral research.

The majority of new HIV infections in the US occur among black and Hispanic/Latino MSM,² yet our findings suggest most HIV-uninfected men did not know about PrEP at the time of the study but were willing to use PrEP once they knew of it. HIV-infected men could

potentially be effective messengers about PrEP and other future HIV prevention methods naturally, or perhaps through a popular-opinion-leader intervention.^{19,21} More research is needed concerning brief messaging for multiple HIV prevention options in a changing landscape for prevention, especially studies that measure the link between messages and behavior. At the same time, society is increasingly communicating quickly through brief messages (texting, social media) and becoming more sophisticated at understanding and interpreting brief messages. HIV prevention practitioners and researchers need to be prepared to incorporate emerging information about new HIV prevention options into brief messages that are compatible with the ever-changing technology landscape.

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Table 1.

Sample characteristics overall and by HIV status (n=927), Messages4Men Study

	Overall		HIV-uninfected		HIV-infected		p-value
	N	(%)	N	(%)	N	(%)	
Overall	927	100	607	65	320	35	
UA Sex, past 3 months							0.2611
Yes	480	52	318	52	162	51	
No	447	48	289	48	158	49	
Race/Ethnicity							0.0961
Black/African American	457	49	297	49	160	50	
Hispanic/Latino	470	51	310	51	160	50	
Age							<0.0001
18–29	392	42	304	50	88	27	
30–39	226	25	153	25	73	23	
40	309	33	150	25	159	50	
Education Level							0.0004
HS diploma	301	33	184	31	117	37	
Some post-HS education	324	35	199	33	125	40	
4-year college degree	291	32	217	36	74	23	
MSA							0.1957
Chicago	309	33	196	32	113	35	
Fort Lauderdale	316	34	201	33	115	36	
Kansas City	302	33	210	35	92	29	

MSA, Metropolitan Statistical Area; UA, unprotected (condomless) anal sex; HS, high school.

Table 2.

PrEP message responses, after hearing 73% PrEP efficacy message, stratified by sample characteristics (n=927), Messages4Men Study

	More likely take/recommend PrEP		More likely use condoms		PrEP info is new		Believe PrEP info	
	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)
<i>HIV-uninfected MSM</i>								
Overall	76	--	72	--	63	--	80	--
UA Sex, past 3 months								
Yes	77	1.13 (0.77–1.66)	66	0.54 (0.37–0.79)	64	1.07 (0.75–1.53)	82	0.82 (0.54–1.24)
No	75	ref	77	ref	62	ref	78	ref
Race/Ethnicity								
Black/African American	81	ref	69	ref	67	ref	82	ref
Hispanic/Latino	70	0.69 (0.38–1.23)	73	0.93 (0.54–1.59)	60	0.91 (0.54–1.54)	77	0.57 (0.30–1.07)
Age								
18–29	77	0.78 (0.47–1.29)	73	0.86 (0.53–1.39)	65	0.64 (0.41–1.02)	81	1.10 (0.65–1.86)
30–39	71	0.75 (0.44–1.28)	65	0.59 (0.35–0.99)	58	0.60 (0.36–1.00)	77	0.87 (0.49–1.55)
40	77	ref	73	ref	64	ref	81	ref
Education Level								
HS diploma	78	ref	81	ref	75	ref	80	ref
Some college	77	0.84 (0.52–1.36)	72	0.57 (0.35–0.94)	66	0.67 (0.42–1.06)	80	1.03 (0.62–1.71)
4-year college degree	73	1.08 (0.66–1.78)	61	0.35 (0.22–0.57)	51	0.39 (0.25–0.61)	81	1.12 (0.67–1.87)
MSA								
Chicago	75	ref	64	ref	46	ref	83	ref
Fort Lauderdale	69	0.87 (0.51–1.48)	79	2.41 (1.40–4.13)	66	2.89 (1.74–4.81)	78	0.92 (0.51–1.65)
Kansas City	83	1.42 (0.80–2.50)	70	1.15 (0.70–1.91)	76	3.77 (2.29–6.20)	79	0.60 (0.32–1.09)
<i>HIV-infected MSM</i>								
Overall	89	--	75	--	36	--	88	--
UA Sex, past 3 months								
Yes	86	0.61 (0.27–1.38)	60	0.17 (0.09–0.31)	34	0.85 (0.51–1.40)	85	1.73 (0.82–3.66)
No	92	ref	89	ref	38	ref	90	ref
Race/Ethnicity								
Black/African American	86	ref	78	ref	46	ref	81	ref
Hispanic/Latino	93	4.54 (0.98–21.2)	72	0.49 (0.21–1.17)	26	0.48 (0.21–1.12)	94	3.08 (0.81–11.77)
Age								
18–29	86	0.68 (0.27–1.76)	73	0.52 (0.25–1.10)	43	1.17 (0.63–2.16)	88	1.54 (0.65–3.66)
30–39	95	2.07 (0.55–7.82)	67	0.50 (0.24–1.04)	30	0.94 (0.49–1.82)	95	2.82 (0.88–8.96)
40	89	ref	79	ref	35	ref	84	ref
Education Level								
HS diploma (ref)	87	ref*	79	ref	37	ref	89	ref
Some college	92	1.38 (0.64–2.98)	70	0.59 (0.31–1.12)	33	0.88 (0.50–1.53)	84	0.55 (0.25–1.22)
4-year college degree			76	0.88 (0.40–1.91)	39	1.90 (0.97–3.75)	89	0.47 (0.16–1.36)

	More likely take/recommend PrEP		More likely use condoms		PrEP info is new		Believe PrEP info	
	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)
MSA								
Chicago	86	ref	72	ref	32	ref	87	ref
Fort Lauderdale	92	0.56 (0.11–2.93)	75	1.45 (0.61–3.44)	27	1.01 (0.43–2.35)	93	1.09 (0.25–4.67)
Kansas City	90	2.55 (0.85–7.62)	78	0.96 (0.40–2.29)	52	1.90 (0.93–3.88)	80	0.76 (0.30–1.97)

Bold, p<0.05 significance. AOR, Adjusted Odds Ratio; 95% CI, 95% Confidence Interval; Ref, referent group; MSA, Metropolitan Statistical Area; HS, high school; UA, unprotected (condomless) anal sex; PrEP, HIV pre-exposure prophylaxis.

* HS diploma compared with combined higher levels of education due to small cell values

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