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Factors Associated with Post-Exposure Prophylaxis Awareness Among Latino Sexual Minority Men in South Florida

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Abstract

Despite their efficacy, biomedical HIV prevention tools such as post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP) have been insufficiently scaled up and disseminated, especially among marginalized subgroups that face substantial HIV disparities. Given the minimal literature available on PEP among Latino sexual minority men (LSMM), this cross-sectional secondary analysis explored factors associated with PEP awareness among a group of LSMM living in South Florida, a US HIV epicenter. The parent study examined patterns of engagement in PrEP and behavioral health treatment services among LSMM ($N = 290$). The current secondary analysis ($N = 243$) identified factors associated with PEP awareness using three methods: stochastic search variable selection, participatory data science, and literature review—before being modeled using linear regression. Most participants (67.5%) reported having little to no awareness about PEP before initiating our study. Simple linear regression models suggested that higher PrEP knowledge ($B = 0.17$, SE = 0.02, $p < 0.001$), HIV knowledge ($B = 0.15$, SE = 0.04, $p < 0.001$), PrEP self-efficacy ($B = 0.37$, SE = 0.13, $p < 0.05$), and high perceived community norms for HIV testing ($B = 0.29$, SE = 0.14, $p < 0.05$) were each associated with LSMM's greater PEP awareness, while identity affirmation was associated with less PEP awareness ($B = -0.13$, SE = 0.05, $p < 0.01$). Results suggest the utility of our three-pronged variable selection approach and address gaps in PEP awareness and use among LSMM living in a US HIV epicenter to support *Ending the HIV Epidemic* goals.

Keywords: HIV/AIDS, sexual minority men, Latino/Latinx, post-exposure prophylaxis, biomedical HIV prevention

Introduction

HIV remains a major public health concern, despite advances in biomedical prevention and treatment. In 2020, 36,000 new HIV diagnoses were recorded, adding to the already >1.1 million cases in the United States (US).[1] Although biomedical HIV prevention tools, such as post-exposure prophylaxis (PEP) and pre-exposure prophylaxis (PrEP) have led to decreases in HIV incidence in recent years, these evidence-based interventions have been insufficiently scaled up and disseminated, especially among subgroups that face substantial HIV disparities.[2] Therefore, to increase access to and utilization of biomedical prevention tools like PrEP and PEP, the National Institute of Health derived the

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Ending the HIV Epidemic (EHE) plan, a federally sponsored program aimed at reducing new HIV infections in the United States by 75% by 2025 and by 90% by 2030.[3]

Conceptualized around four strategic pillars, diagnosing individuals with HIV as early as possible, treating HIV rapidly and effectively, preventing acquisition, and rapidly detecting and responding to clusters of HIV transmission,[3] the EHE plan has already yielded some preliminary success with EHE-funded service providers serving 19,500 clients who were new or re-engaged in HIV care and treatment, surpassing the goal of serving 18,000 clients.[4]

Perhaps due, in part, to the EHE plan, HIV incidence has stabilized or decreased among certain subgroups that have historically faced HIV-related health inequities, disparities are still apparent among certain minoritized populations. Sexual minority men (e.g., gay, bisexual, and men who have sex with men; SMM) are affected by HIV significantly more than their heterosexual counterparts, experiencing nearly 70% of all new diagnoses in 2018.[1] Latino sexual minority men (LSMM) are one of the few subgroups who have not shown decreases in HIV incidence in the past few years, with LSMM representing 29% of new HIV diagnoses among SMM in the United States in 2020, second only to Black SMM who also face alarming disparities.[1] Due to the HIV disparities affecting LSMM, this group is a priority of the EHE plan.[3]

The compounding impact of minority stress, intersecting structural systems of oppression, and life destabilizing syndemics may be responsible for the increased burden of HIV among the LSMM community. Minority stress theory suggests that the stress caused by societal stigma and discrimination leads sexual minorities to experience mental and physical health disparities in comparison with their heterosexual counterparts.[5–9] LSMM may experience sexual minority stress, in addition to stress due to stigma and discrimination based on other aspects of their identity as well, such as their ethnicity, race, and immigration status.

Intersectionality theory posits that these intersecting systems of oppression based on sexual orientation, ethnicity, and other aspects of identity can converge to create unique experiences for individuals whose identities place them at these intersections.[9] Due to their potential experiences of marginalization across and at the intersection of multiple identities, LSMM may be more likely to experience negative health outcomes—both general and HIV related.[10–12] This is of particular concern in Miami, the city with the highest HIV incidence in the US and where the disproportionate share of new HIV cases occurs among Latina/o/x individuals, and more specifically, LSMM.[13,14]

Despite being an Federal Drug Administration (FDA)-approved biomedical HIV prevention intervention tool for >7 years longer than PrEP, PEP awareness and usage of remains modest both domestically and internationally.[2,15–20] First approved by the FDA for both occupational and nonoccupational exposures in 2005, PEP consists of a 28-day course of highly active antiretroviral therapy, which must begin within 72 h of exposure to maximize its effectiveness.[15,21,22] When taken adherently, it is over 80% effective at preventing acquisition of HIV.[16,17] Past research suggests there is significant variability in PEP awareness among individuals experiencing HIV-related health inequities (e.g., SMM, people who inject drugs, transgender women) with rates ranging between 10% and 59%.[2,23] Further, PEP usage among these subpopulations lags far behind PEP awareness with <10% of SMM living in a major US metropolitan city reporting past PEP usage.[23]

Although the literature is sparse, several factors associated with PEP awareness among SMM have been identified.[2,23] Factors associated with greater PEP awareness among SMM include involvement with HIV/AIDS organizations, more frequent HIV testing, being part of a more interconnected community, and being younger.[2,23,24] HIV stigma was associated with less of PEP awareness among SMM, highlighting a potential challenge to PEP uptake as several theories of behavior change suggest that both attitudes and knowledge are critical components of engaging in health behavior change.[19,24–27]

Given the minimal literature on PEP awareness among SMM in general and LSMM in particular, there is a need to understand factors related to PEP awareness among subpopulations facing the greatest HIV-related inequities. More specifically, to our knowledge, there is no study that directly examines PEP awareness among LSMM—a subgroup disproportionately affected by the US HIV epidemic. PEP is one biomedical prevention tool that can help achieve the EHE goals if scaled up and disseminated to key populations, including LSMM.[3] Therefore, this study explored factors associated with PEP awareness among a group of LSMM living in Miami, Florida, a US HIV epicenter.

Methods

Participants and procedures

LSMM ($N = 290$) were recruited to participate in DÍME-LO, the parent study, which was a longitudinal cohort examining patterns of engagement in PrEP and behavioral health treatment services.[11,28] Baseline assessments were completed between February and September 2020. Participants with complete data for the relevant variables for this secondary analysis ($N = 243$) were included.

Participants (1) identified as SMM (i.e., gay, bisexual, or man who has sex with men), (2) identified as Latino/Hispanic, (3) self-reported negative or unknown HIV status at the time of their baseline assessment, (4) were 18 to 60 years old, and (5) lived in the greater Miami area. After reviewing consent information and clicking a box indicating consent to participate within REDCap, participants had the opportunity to complete assessments in English or Spanish.[29] All study procedures were approved by the University of Miami Institutional Review Board.

Participant recruitment was achieved by both active (e.g., community venues and events, ''consent-to-contact'' database) and passive (e.g., social media, listservs, and snowball recruitment) methods. More information on study recruitment and retention methods can be found elsewhere.[11,28]

At baseline, participants completed a self-report assessment composed of both established and newly developed measures. Measures were selected based on prior qualitative findings and relevant theories: intersectionality, minority stress, and syndemics.[5–7,9,12] Measures unavailable in Spanish were translated by bilingual study staff using a process established by Kurtines and Szapocznik, which includes forward translation (English to Spanish), back translation (Spanish back to English), and an evaluation of the original and back-translated versions to ensure meaning was

retained.[30] More information on measure selection and development can be found elsewhere.[11] Although participants completed a wide range of measures, only measures identified as being associated with PEP awareness through our variable selection processes are described in the subsequent sections.

Variable selection

Potential factors associated with PEP awareness were identified using a three-pronged approach before being modeled using simple linear regression.

Approach 1: stochastic search variable selection. Although missing data were sparse, 47 participants had at least some missing data at baseline. Since stochastic search variable selection (SSVS) requires complete data on all variables, participants with missing data at baseline were removed from SSVS analyses, leaving a final analytic sample of 243 participants. Measures with at least 80% completed items were scored such that sum and mean scores were computed based on the items completed.[31]

SSVS is useful in identifying the strongest and most reliable potential factors out of many possible predictors. As a Bayesian variable selection method, SSVS approximates the probability that each factor is associated with the outcome of interest (i.e., has a nonzero regression coefficient), while simultaneously controlling for uncertainty generated by the other independent variables included in the model.[32,33] To identify the best fitting models, SSVS samples thousands of independent variable combinations and then identifies the marginal inclusion probability for each factor (i.e., the proportion of times each variable was included in the sampled models). This process elucidates factors that are stably associated with the outcome, while also minimizing both Type I and Type II errors.

Approach 2: community-based participatory-driven variable selection. Informed by community-based participatory research (CBPR), we also sought feedback from the REACH Equity Team community advisory board (CAB), comprising LSMM living in the greater Miami area. CABs are an integral component of the CBPR because they solidify an active, bidirectionally beneficial partnership between researchers and the communities who are the focal point of the research.[34] Our goal was to leverage the lived experiences of CAB members to complement the SSVS method in identifying potential factors related to PEP awareness among LSMM.

During the March 2022 CAB meeting, the senior author provided CAB members with an overview of the parent study and secondary analysis, including specific information about study measures. Next, CAB members were asked to select up to five factors they believed would be most associated with PEP awareness among LSMM in the greater Miami area. After making their selections individually, the senior and first author facilitated a consensus discussion to select the top five most likely correlates of PEP awareness (found in Table 1) based on their lived experiences. In addition, CAB members reviewed results after analyses were completed and provided feedback for interpretation of findings.

Approach 3: factors already identified in the literature. A limited number of correlates of PEP awareness among Latinos and sexual minority men have been identified in the published literature. To be as inclusive as possible in our variable selection approach, factors identified in the literature, which were not selected based on the SSVS and CAB feedback, were included in the regression models.

Table 1. Descriptive Statistics for Participant Demographics and Potential Factors Associated Post-Exposure Prophylaxis Awareness Among Enrolled Latino Sexual Minority Men ($N = 243$)

Variable	*Frequency (%)/ mean (SD)*
Demographics	
Age	32.2 (8.32)
Sexual orientation	
Gay	207 (85.2%)
Other sexual minority orientation (e.g., bisexual, pansexual)	36 (14.8%)
Nativity	
US born	115 (47.3%)
Foreign born	128 (52.7%)
Study variables	
PrEP knowledge	8.03 (3.39)
PrEP self-efficacy	3.22 (0.57)
Currently on PrEP	
Yes	62 (25.5%)
No	181 (74.5%)
Perceived community norms for HIV Testing	
High	71 (29.2%)
Low	172 (70.8%)
HIV knowledge	8.30 (1.59)
Anticipated HIV stigma	2.69 (0.66)
Identity affirmation	5.05 (1.25)
Perceived risk	2.96 (2.28)
Problem solving	52.10 (9.09)
Sexual activity level	
Sexually active in past 6 months and PrEP eligible	88 (36.2%)
CDC PrEP eligible	130 (53.5%)
Not sexually active in past 6 months	25 (10.3%)
PEP awareness	2.93 (1.27)
I have never heard about it before today	43 (1.7.7%)
I've heard about it, but I don't really know what PEP is	44 (18.1%)
I know a little bit about it	77 (31.7%)
I know a fair amount about PEP	46 (18.9%)
I know a lot about PEP	33 (13.6)

CDC, Centers for Disease Control and Prevention; PEP, post-exposure prophylaxis; PrEP, pre-exposure prophylaxis.

Study measures

Demographics. Participants completed a demographic questionnaire (e.g., age, gender, sexual orientation) with items from the Center for Latino Health Research Opportunities (CLaRO) Measures Library and the Center for HIV and Research in Mental Health (CHARM) community survey.[35]

Anticipated HIV stigma. Participants completed a 7-item measure of anticipated HIV stigma.[36] Assessed using a 5-point Likert scale, this measure has strong internal consistency

within the sample (study alpha = 0.76). Example items from this measure include the following: ''If I became HIV positive no one would date or become involved with me'' and ''If I had HIV, I'd worry about people discriminating against me.'' A more comprehensive account of measure items and scoring guidelines can be found in Golub and Gamarel's 2013 publication.[36]

HIV knowledge. A 10-item HIV knowledge scale was administered across time points and had adequate internal consistency (study alpha = 0.66).[37,38] Correct responses were summed with higher scores reflecting greater knowledge. Example items include the following: ''There is a vaccine that can stop adults from getting HIV'' and ''A person can get HIV from oral sex.''

PrEP knowledge. A 13-item PrEP knowledge scale was administered across time points and had strong internal consistency (study alpha = 0.86).[39] Correct responses were summed with higher scores reflecting greater knowledge. Example items include the following: ''You should not use PrEP if you don't know your HIV status'' and ''PrEP is a daily pill you can take to reduce your risk of becoming infected with HIV.''

PrEP usage. Participants were asked to report if they were currently taking PrEP.

Anticipated likelihood of acquiring HIV. LSMM reported their anticipated likelihood of acquiring HIV in the next year on a visual analog scale ranging from 0 (not at all) to 100 (I will definitely get HIV in the next year) as an indicator of participants' perceived HIV risk.[36]

Perceived norms about HIV testing. Perceived community norms about HIV testing was assessed using a one-item measure asking how many people they know who have had a HIV test.[40,41] Those reporting ''all or almost all'' or ''half'' were coded as having high perceived HIV testing norms and those who did not endorse these were coded as having low perceived norms.

PrEP self-efficacy. Participants' self-efficacy for getting PrEP was assessed (study alpha = 0.83) using an 8-item measure.[39] Response options were reported on a 5-point Likert-type scale ranging from 1 ''Strongly Disagree'' to 5 ''Strongly Agree'' with higher mean scores reflecting more self-efficacy. Example items included ''how difficult would it be for you to seek out more information about PrEP to decide if it is right for you?'' and ''how difficult would it be for you to talk with your sexual partner(s) about the decision to take PrEP?'' A more comprehensive account of measure items and scoring guidelines can be found in the online supplementary materials from Walsh's 2019 publication.[39]

Problem solving confidence. A general measure of problem solving confidence was used to assess participants' self-efficacy for navigating challenging activities with higher scores reflecting greater problem-solving confidence.[42,43] This 11-item measure (study alpha = 0.94) included items like ''I trust my ability to solve new and difficult problems'' and ''Given enough time and effort, I believe I can solve most problems that confront me.''

Sexual behavior. As an indicator of PrEP need, participants' sexual activity level in the past 6 months was coded as follows: (1) not sexually active, (2) sexually active, but not meeting Center for Disease Control's and Prevention (CDC) HIV PrEP guidelines, or (3) sexually active and meeting CDC HIV PrEP guidelines.[44]

Identity affirmation. Identity affirmation was assessed using the affirmation subscale of the Lesbian, Gay, and Bisexual Identity Scale.[45–47] This 3-item subscale (study alpha = 0.95) assessed LSMM's degree of self-affirmation regarding their sexual orientation by asking them to respond to the following statements —''I am glad to be a LGB person,'' ''I'm proud to be a part of the LGB community,'' and ''I am proud to be LGB''—using a 6-point Likert scale ranging from 1 ''disagree strongly'' to 6 ''agree strongly.''

PEP awareness. Our outcome of interest was LSMM's PEP awareness. Participants were asked to report their level of awareness about PEP before engaging with the study using a one-item measure rated on a 5-point Likert scale. LSMM had the option to report the following: ''I've never heard of PEP before today,'' ''I've heard about it, but I don't really know what it was,'' ''I know a little bit about it,'' ''I know a fair amount about it,'' and ''I know a lot about it.''

Data analytic plan

First, descriptive statistics explored participant demographics and key variable distributions. Second, we performed SSVS using the SSVSforPsych shiny app, specifying the following: 0.5 prior inclusion probability, 1000 burn-in iterations, and 10000 total iterations.[32] Categorical variables were dummy coded (see Table 1 for reference levels). Third, we ran a multiple linear regression model which tested the association between the variables selected in the three-pronged approach and PEP awareness in one hierarchal model in SPSS version 27.[48]

Results

Descriptive statistics

The average participant age was 32 years (SD = 8.32) and the majority of LSMM identified as gay (85.2%). Just over a quarter (25.5%) of participants reported being on PrEP. Most participants (67.5%) reported having little to no awareness about PEP before initiating our study ($M = 2.93$, SD = 1.27). A more comprehensive review of participant demographics can be found in Table 1 and elsewhere.[28]

PEP awareness

SSVS identified five predictors with inclusion probabilities above 0.20, which were entered into a multiple linear regression model. Although SSVS suggests using an inclusion cutoff of 0.5, studies have successfully employed lower marginal inclusion probabilities, and thus, factors with markedly higher marginal inclusion probabilities (>0.2) were included in a simple linear regression model.[12,49] Using the three-pronged approach previously described, we also

included predictors identified by the CAB and in prior research. In addition to HIV knowledge, the CAB identified the following four variables as likely associated with PEP awareness: anticipated HIV stigma, perceived HIV risk, sexual activity level, and problem-solving confidence. According to the literature, another potential correlate with PEP awareness was younger age (see Table 2 for all model predictors).

Simple linear regression models suggested that of the variables for inclusion, higher PrEP knowledge ($B = 0.17$, $SE = 0.02$, $p < 0.001$), higher PrEP self-efficacy ($B = 0.37$, $SE = 0.13$, $p < 0.01$), higher HIV knowledge ($B = 0.15$, $SE = 0.04$, $p < 0.01$), and high perceived community norms for HIV testing ($B = 0.29$, $SE = 0.14$, $p < 0.05$) were each associated with LSMM's greater PEP awareness. Identity affirmation was associated with less PEP awareness ($B = -0.13$, $SE = 0.05$, $p < 0.01$).

Discussion

Despite being an effective FDA-approved biomedical HIV prevention tool for over 15 years, PEP is still relatively unknown and insufficiently scaled up and disseminated within the United States. This study is one of the first to our knowledge to explore multilevel factors associated with PEP awareness among LSMM, a group experiencing significant HIV disparities. Among this group of LSMM living in South Florida, an epicenter of the US HIV epidemic, greater HIV knowledge, PrEP knowledge, and PrEP self-efficacy, as well as high perceived community norms for HIV testing were all factors associated with more PEP awareness. In addition, affirmation in one's sexual orientation identity was associated with less PEP awareness among LSMM within in our study.

Overall, our findings suggest that LSMM living in South Florida reported little to no awareness about PEP. Within our study, participants with greater HIV and PrEP knowledge, PrEP self-efficacy, and high perceived community norms for HIV testing were more likely to be aware of PEP compared to their peers with lower levels of PrEP knowledge and self-efficacy, as well as lower perceived community norms for HIV testing. Health behavior change models like the Theory of Planned Behavior, Social Learning Theory, and the Health Belief Model posit that knowledge, self-efficacy, and attitudes/norms are key to health behavior change.[27,50,51] Therefore, it may be beneficial to focus on these mechanisms of behavior change (e.g., knowledge, self-efficacy) when developing interventions that aim to increase awareness and uptake of biomedical HIV prevention tools like PEP to help achieve the EHE goals.[3]

PrEP self-efficacy was one of the strongest predictors of PEP awareness within this study, potentially highlighting the similarities between the two established FDA-approved biomedical HIV prevention tools—PrEP and PEP. Although not identical, there is significant overlap in the steps required to initiate and stay engaged with both PrEP and PEP. Accessing both PrEP and PEP requires individuals to navigate similar structural (e.g., insurance concerns, access to pharmacies) and psychosocial (e.g., stigma, knowledge) barriers.

PrEP self-efficacy may serve as a proxy measure for PEP self-efficacy among a group of LSMM living in an HIV epicenter. These findings suggest a need to not only adapt currently established measures assessing PrEP self-efficacy to create an assessment tool specifically focused on PEP self-efficacy but also develop more holistic and inclusive measures that evaluate general self-efficacy for engaging with biomedical HIV prevention and treatment tools more broadly (e.g., PEP, oral and injectable PrEP, eventual HIV vaccine).[39]

In addition to greater PrEP self-efficacy, high perceived community norms for HIV testing, as well as more PrEP and HIV knowledge, were all associated with increased PEP awareness among LSMM in our study. Since those who were already knowledgeable about PrEP were more likely to be aware of PEP, it is plausible that PrEP knowledge may be a pathway to PEP awareness and uptake; therefore, future studies should analyze these indirect or mediating mechanistic pathways. Encouraging providers, clinics, and public health campaigns that promote PrEP to simultaneously promote PEP could facilitate increased community-level awareness and achieve EHE goals.

Our secondary analysis also identified some counterintuitive findings. Anticipated HIV stigma was identified across all three of our methods for variable selection yet was not associated with PEP awareness in our final model. Since stigma is often used as a proxy for attitudes in studies

Table 2. Review of Potential Factors Associated with Latino Sexual Minority Men Post-Exposure Prophylaxis Awareness with Corresponding Stochastic Search Variable Selection Inclusion Probabilities and Multiple Linear Regression Model Results

Potential factors of LSMM PEP awareness	*Source*	*SSVS marginal inclusion probability*	*Multiple linear regression model (B, SE)*
PrEP knowledge (objective)	SSVS	0.99	0.17 (0.02)***
PrEP self-efficacy	SSVS+CAB	0.69	0.37 (0.13)**
HIV knowledge	SSVS	0.59	0.15 (0.04)***
Identity affirmation	SSVS	0.24	–0.13 (0.05)**
High perceived community norms for HIV testing	SSVS	0.23	0.29 (0.14)*
Anticipated HIV stigma	CAB+LIT	—	–0.17 (0.11)
Anticipated risk for acquiring HIV	CAB	—	–0.03 (0.03)
Sexual activity	CAB	—	0.24 (0.13)
Problem solving	CAB	—	–0.01 (0.01)
Age	LIT	—	–0.01 (0.01)

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

CAB, Community Advisory Board; LIT, Literature; LSMM, Latino Sexual Minority Men; PEP, post-exposure prophylaxis; PrEP, pre-exposure prophylaxis; SSVS, Stochastic Search Variable Selection.

exploring the role of health belief models of behavior change and is an established predictor of suboptimal uptake of and adherence to HIV prevention and treatment tools [e.g., PrEP, antiretroviral therapy (ART)],[52] we were surprised to find this nonsignificant relationship within our analysis.

However, since stigma is a complex phenomenon, it is possible that our measure of anticipated HIV stigma did not capture the specific type of stigma that might affect PEP awareness among LSMM or that stigma's effects were subsumed by other variables in our model (e.g., HIV knowledge, which could potentially offset inaccurate and potentially stigmatizing information about PEP). This nonsignificant result is parallel to a prior finding that PrEP stigma and HIV testing stigma were not associated with a structural equation measurement latent factor of HIV prevention engagement behaviors among the same group of HIV-negative LSMM living in South Florida.[53] Another possibility is that because our outcome was PEP awareness, and not PrEP use, stigma may not have been as important a determinant.

Similarly, sexual behavior was not associated with PEP awareness, despite the CAB positing that it would. This may again pertain to the fact that the outcome was psychological awareness and not behavioral engagement. Finally, LSMM who reported more sexual orientation identity affirmation were less aware of PEP compared to their peers who reported less affirmation. This finding contrasts with past research suggesting that engagement in HIV-related organizations and being affiliated with a more interconnected community, both of which may be similar to or overlapping with identity affirmation, may lead to greater PEP awareness.[2,23,24] However, identity affirmation is a unique construct from community involvement and may function different in relation to PEP awareness.

Overall, the extremely low levels of PEP awareness among LSMM in this study underscore the urgent need to scale up and disseminate PEP, a key tool for achieving EHE goals, rather than focusing exclusively on PrEP. As of May 2022, no program in the CDC compendium of HIV prevention interventions identifies PEP awareness or uptake as a primary or secondary study outcome.[54] To fill this gap, public health agencies and funders could encourage researchers to develop supporting interventions and implementation strategies to scale up and disseminate PEP in general and to key groups, including LSMM.

Despite the strengths of this study, it also had limitations. First, our secondary analysis is cross-sectional; therefore, we are unable to make conclusions about temporality of effects. Future research should assess how multilevel determinants may relate to PEP awareness longitudinally. Second, due to the lack of established and validated, PEP-specific measures, authors were unable to assess how theoretical constructs such as PEP self-efficacy, knowledge, and stigma may have affected PEP awareness.

However, PrEP knowledge, use, and self-efficacy may have served as proxies for PEP knowledge, use, and self-efficacy in our study. Finally, due to this study's focus on LSMM living in South Florida, generalizing findings to other subgroups disproportionately affected by HIV should be cautioned. Nonetheless, the fact that the number of LSMM in our study taking PrEP (25.5%) was only slightly higher than the number observed in a large sampling of men who have sex with men in the United States (20%) demonstrates a potential for generalizing these findings outside of just LSMM in south Florida.[55]

The contributions of this study outweigh the limitations described above. First, this study employed a participatory data science approach that strengthened the findings by contextualizing them in the lived experiences of LSMM in the greater Miami area. Participatory data science stems from the larger literature on CBPR and embodies the belief individuals with lived experience of the phenomenon under study not just be ''subjects'' of the research but also be actively involved in various components of the research, including variable selection and interpretation of findings.[56] By including the CAB during the initial stages of the study, authors were able to gain valuable insights as to which indicators were potentially related to PEP awareness among LSMM living in South Florida.

Although only one of the five variables identified by the CAB was significant in the final model, several of the other variables selected by the CAB were related to factors that were identified by the final model. For example, the CAB selected problem solving as a likely predictor of PEP awareness, which could be considered a more generalized construct of PrEP self-efficacy. Further, the fact that CAB members were able to offer additional insights to help contextualize the findings from the perspective of members of the community allowed ''member checking,'' a process integral in CBPR that asserts the information being disseminated in the research has been ''approved'' by community members.[57]

Another strength of this project is the three-pronged approach used to select potential correlates of PEP awareness among a group of LSMM living in an epicenter of the US HIV epidemic. Authors' use of SSVS—a methodologically rigorous approach to variable selection that enhances replicability—in combination with guidance from both the CAB and past literature allowed for a more comprehensive and inclusive process of exploring the potential relationships between certain structural and/or psychosocial indicators and PEP awareness among LSMM. Future studies should strive to employ similar multipronged approaches for variable selection, which are theory driven and methodologically rigorous, and leverage participatory data science.

Authors' Contributions

Conceptualization (E.W., A.L., and A.H.), data curation (A.H.), formal analysis (E.W. and A.L.), funding acquisition (A.H.), investigation (E.R.W., A.H., and S.A.S.), methodology (A.H., E.W., and A.L.), project administration (A.H.), writing—original draft (E.W., A.L., M.J., and A.H.), writing—review and editing (E.W., A.L., M.J., A.H., and S.S.).

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